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Preschool Matters: Predicting Reading Difficulties for Spanish-Speaking Bilingual Students in First Grade

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Abstract

This article reports on a longitudinal analysis of factors that predict the word reading skills in English and Spanish for a sample of 234 Spanish-speaking students in first grade. The children were assessed at the end of preschool, kindergarten, and first grade. Data include three subtests of the Woodcock Language Proficiency Battery and a researcher-developed phonological awareness task. Results showed that, on average, children's English word reading skills were similar to those of monolingual norms, while their Spanish word readings skills were, on average, one standard deviation below the mean. English vocabulary, English recalling skills, Spanish vocabulary, and Spanish word reading skills in preschool were found to be significant predictors of English word reading skills in first grade. Educational implications for assessment and instruction for this population during the early childhood years are discussed.

Keywords

Word Reading Skills; Bilingual Children; Spanish-Speaking

During the past several decades, many immigrant families, most of whom do not use English as their home language, have arrived and settled in the United States. Consequently, in the decade between 1990 and 2000, the number of school-aged children in the United States who were dominant in a language other than English doubled; these children now make up close to 10% of the school-age population. Although as many as 329 different languages may be spoken in the homes of these children (U.S. English, Inc., 2002), the largest proportion – 77% – speak Spanish at home and are considered bilingual (Office of English Language Acquisition, Language Enhancement, and Academic Achievement for Limited English Proficient Students, 2002).

As well as having an impact on public elementary and secondary education, this pattern of increasing numbers of children who are bilingual learners has also had an impact on preschool education, including federally funded programs such as Head Start. Head Start is the largest and oldest early intervention program in the country for young children and families from low socioeconomic backgrounds. The program has been in the forefront of early childhood intervention programs that include children with disabilities and use responsive instruction with culturally and linguistically diverse populations (Powell, 2005). In 2004–2005, 24% of Head Start children nationwide were from homes speaking primary Spanish (Hamm, 2006). In addition 13% of children during this enrollment year were children with disabilities.

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Given the trend of recent immigration and the tendency of immigrants to under-report the use of non-English languages at home (Suárez-Orozco & Páez, 2002), these numbers may even underrepresent the actual totals. Successfully educating these children is now a major challenge throughout the United States. Education and language researchers have emphasized the urgency of addressing the needs of young bilingual learners, in particular those from Spanish-speaking backgrounds. One area that has received increased attention by both researchers and practitioners concerns these students' language and literacy acquisition given the higher risk of reading problems associated with lack of proficiency in English (McMillen, Kaufman, & Klein, 1997; National Center for Education Statistics, 2003). The risk for reading difficulties is compounded when literacy instruction is in the child's second language and when poverty and low levels of parental education are also present (Snow, Burns, & Griffin, 1998). In response to these concerns, research involving Spanish-speaking bilingual students has been growing as part of an effort to understand and improve their language and literacy skills.

The Early Childhood Study of Language and Literacy Development of Spanish-speaking Children (ECS) directed by Patton Tabors and Mariela Páez at the Harvard Graduate School of Education and Boston College was developed with two major goals: (a) to collect data longitudinally from pre-kindergarten to second grade for a group of young children from homes where Spanish is spoken, and (b) to identify factors related to the development of language and literacy skills in their two languages. In this article we report findings on the word reading abilities of Spanish-speaking students in kindergarten and first grade and present a predictive model for explaining the diversity of skills found in this sample.

Overview of Research on Language and Literacy Skills

The focus on language and literacy skills is important given the growing consensus that early childhood is a critical time for language and literacy learning (Dickinson & Tabors, 2001; Lonigan, 2003; Snow & Tabors, 1993). Thus, research with monolingual children has shown that language experiences and early exposure to language and literacy are important precursors of children's language development and literacy acquisition (Dickinson & Tabors, 2001; Snow et al., 1998). More recently, research with bilingual populations has also shown the importance of oral language abilities, letter name knowledge, and first language as important predictors of children's success with literacy (August & Shanahan, 2006). In particular, literacy-related skills in three broad categories have been identified as important during the early school years: (a) phonological skills, including phonological awareness and phonological processing; (b) early literacy skills, specifically letter and word recognition, writing, and spelling; and (c) oral language abilities, specifically vocabulary, listening comprehension, and sentence recall skills. Researchers who have studied precursors to literacy have demonstrated that the skills in these domains are foundational for monolingual children's ability to read and write (Dickinson & Snow, 1987; Lonigan, 2003; Storch & Whitehurst, 2002; Whitehurst & Lonigan, 1998).

Wagner and Torgesen (1987) defined phonological awareness as a set of linguistic and metalinguistic skills involving sensitivity to the sound structure of spoken words. Phonological skills are of undeniable theoretical importance in reading development, as noted in research both with monolingual students (Wagner & Torgesen, 1987; Wagner et al., 1997) and, more recently, with bilingual students (Lindsey, Manis, & Bailey, 2003). Phonological awareness has been directly related to word-level reading skills (Manis, Lindsey, & Bailey, 2004). However, it is important to consider other factors such as oral language skills and the possibility of transfer from first-language skills to form a more complete picture of the predictive factors in early reading achievement in English.

Oral language skills (vocabulary knowledge and listening comprehension) have also been found to be important precursors of literacy (August & Shanahan, 2006; Dickinson & Tabors, 2001), as well as an area of special vulnerability in the population of Spanish-speaking bilingual students (August, Carlo, Dressler, & Snow, 2005). Findings from the ECS confirm that many young Spanish-speaking students lag behind monolingual children of the same age in their oral language abilities (Páez, Tabors, & López, in press; Tabors, Páez, & López, 2003). Further, a recent review of the literature on literacy in second-language learners supports the critical importance of oral language proficiency in English for successful literacy development and instruction (August & Shanahan, 2006).

Past research with bilingual populations has supported the interdependency theory, or the notion that first-language skills transfer and support the learning of a second language (Cummins, 1979, 1991; Royer & Carlo, 1991). Although studies on transfer of reading-related skills from one language to another have not been numerous, the evidence for transfer between English and Spanish has been growing (August & Shanahan, 2006). Specifically, recent studies with bilingual Spanish-English children have shown transfer in vocabulary (Ordoñez, Carlo, Snow, & McLaughlin, 2002; Snow, 1990) and phonological awareness (Dickinson et al., 2004; Lindsey et al., 2003; López & Greenfield, 2004). Cross-language effects have also been useful in predicting English reading and comprehension skills (Manis et al., 2004; Proctor, August, Carlo, & Snow, 2006). More research is needed to understand which language and early literacy skills do and do not transfer and under what conditions. In particular, research is needed that focuses on young English Language Learners (ELL) to identify, intervene with, and prevent reading difficulties in the elementary years. In sum, few studies have used the best predictors of reading in combination to investigate patterns of acquisition in Spanish-speaking bilingual students.

In addition, few studies have investigated the preschool years from a longitudinal perspective. Among existing investigations that have considered this age period, two studies that relate to the present research have focused on bilingual preschoolers' language and literacy experiences (Dickinson et al., 2004; Hammer et al., 2003). Hammer et al. (2003) investigated the home literacy experiences and emergent literacy skills of 43 Puerto Rican children recruited from Head Start programs. They divided the sample based on whether the children had learned Spanish and English from birth (simultaneous learners) or Spanish from birth and English at Head Start (sequential learners). Findings showed no differences between these groups in English emergent reading abilities at ages 3 and 4. Focusing on the phonological awareness of 123 Spanish-English bilingual preschool children attending Head Start, Dickinson et al. (2004) found that their phonological skills were stable across the preschool year and showed transfer across languages. These results about transfer are consistent with previous work with grade school bilingual children (see Cummins, 1991, for review).

In this article, we describe the early word reading abilities of Spanish-speaking bilingual students¹ and identify factors that predict English word reading skills. We report findings from the data on children who were followed from preschool through first grade. Specifically, we investigated the word reading skills in English and Spanish of bilingual students in preschool, kindergarten, and first grade. Then we examined the impact of preschool phonological awareness and oral language abilities on English word reading skills in first grade and whether Spanish language abilities contribute to these students' English word reading skills.

¹Although we could have selected several different terms to refer to children in our study (e.g., English language learners, language-minority children), we selected the term bilingual to reflect that these children are learning two languages – Spanish at home and English at school.

Method

Participants

We examined data from a subsample of 234 low-SES bilingual children drawn from the larger sample of the ECS (see Páez et al., in press; Tabors et al., 2003). ECS participants were recruited by contacting parents in Head Start and public preschool programs in three communities in Massachusetts and one community in Maryland. All of the children were 4 years old at the time of recruitment and were age-qualified to attend kindergarten the following year. Additionally, the children in the sample were living in homes where Spanish was at least one of the languages spoken. Children with severe special needs and/or global delays were excluded from the sample.

Description of the Sample

The bilingual children in the sample were recruited from Head Start classrooms when they were 4 year olds. They were all enrolled in public school districts during their kindergarten and first-grade year. English was the primary language of instruction in all preschool classrooms, but a small number of students received varying levels of exposure to Spanish (Tabors & Páez, in preparation). In kindergarten and first grade, all children ($N=234$) attended English immersion programs.

The 234 children were assessed in English and Spanish at the end of pre-kindergarten in 2002 (Time 1), at the end of kindergarten in 2003 (Time 2), and at the end of first grade in 2004 (Time 3). The sample mean age for the data collection during preschool was 4.57, in kindergarten, 5.45, and for first grade, 6.56. The sample was comprised of 120 males and 124 females. The majority of the children were born in the United States (84.4%); 37 children (15.6%) were born in different countries in Latin America.² Although most of the children in the sample were born in the United States, their parents come from 13 countries in Latin America and the Caribbean, as well as the U.S. territory of Puerto Rico.

Information on language use at home, parents' years of education, and family income revealed that all children were exposed to Spanish at home and were mostly from a low socioeconomic background. Thirty-two percent of the fathers were not present in the home. Of the participating families, 62% of the mothers reported using only Spanish at home, 20% reported that they used mostly Spanish, 14% reported using Spanish and English equally, and 4% reported speaking mostly English. Only one mother reported using only English at home.³ Forty-eight percent of the fathers reported using only Spanish at home, 27% reported that they used mostly Spanish, 14% reported using Spanish and English equally, 7% reported speaking mostly English, and 4% reported using only English at home. The average years of formal education for mothers ($M=11.25$, $SD= 3.8$) was slightly higher than that for fathers ($M=10.67$, $SD= 3.8$). Seventy-nine percent of the families in the sample reported making less than \$30,000, with 16.8% reporting annual income of less than \$10,000.

Instruments

The ECS language and literacy battery used was based on previous work on the language and literacy skills of young children and included measures identified as predictive of reading skills (Dickinson & Tabors, 2001; Snow, Tabors, Nicholson, & Kurland, 1995), taking into account the need for tasks in both Spanish and English, high reliability and

²All family demographic information is derived from the parent survey that was administered by telephone or in person during the 2001–2002 academic year. Most of the interviews were done with the mothers of the participating children and lasted 15 to 20 minutes. Data are missing for two families out of the 234 students in the sample.

³In this family, the mother reported using only English, and the father reported using mostly Spanish.

validity, and age appropriateness. For this article, we report on performance on three subtests of the Woodcock Language Proficiency Battery and a researcher-developed phonological awareness task.

Phonological awareness task—The phonological awareness task was developed by the research team, due to the unavailability of such a measure in Spanish and English that was appropriate across the needed age range. The task consists of five subtests: rhyme recognition, rhyme production, initial phoneme recognition, sentence segmenting, and syllable segmenting, in both Spanish and English versions (Tabors et al., 2003).

Rasch analyses indicated a reliability of .68 on the English version and a reliability of .59 for the Spanish version. Rank-order correlations revealed that each subtest contributed positively to the total score for both versions of the test; therefore, all subtests were retained. In order to determine the internal consistency, reliability analysis using Cronbach's alpha was calculated for each of the tests in each language for the two initial test times when the children were in preschool (Time 1 and Time 2) both time points. For the English assessment, the 26 test items showed moderately high consistency at both time points ($\alpha = 0.81$ and 0.86); for the Spanish assessment, the 26 test items showed moderate consistency at both time points ($\alpha = 0.78$ and 0.79). The internal reliability in both languages allowed us to confidently proceed with the statistical analysis of this measure using mean scores (López & Tabors, 2004). As no norms have yet been developed for this measure, it is used descriptively to document individual children's phonological awareness abilities.

The Woodcock Language Proficiency Battery - Revised (WLPB-R)—The Woodcock Language Proficiency Battery - Revised is a standardized assessment consisting of a set of subtests used to measure various aspects of language and literacy skills (Woodcock, 1991a). There are two versions of the tests, one in Spanish and one in English.

Standard scores for all of the WLPB-R subtests were normed on a mean of 100 and a standard deviation of 15. The English form was normed on a randomly selected sample of 6,359 English-speaking subjects in the United States, stratified, and weighted to be representative of the distribution and characteristics of the U.S. population. Thus, the norms are based on monolingual English-speaking children.

The Woodcock Language Proficiency Battery-Revised - Spanish Form (Woodcock & Muñoz-Sandoval, 1995) is parallel in content and structure to the English Form. The Spanish Form was normed on 3,911 native Spanish-speaking subjects from the United States, Mexico, Spain, and several Latin American countries. Although some of the subjects used to provide norming data lived in the United States, these children were, by design, monolingual Spanish speakers (Woodcock & Muñoz-Sandoval, 1995). The reliability and validity characteristics of both forms of the WLPB-R meet basic technical requirements (see Woodcock, 1991b, p. 124).

When interpreting the results on these tests with the present bilingual population, it is important to note that we are comparing bilingual children to norms that have been developed for monolingual children. This is necessary because no tests measuring these skills have been normed on bilingual populations. In addition, a current review of the literature by the National Institutes of Health (NIH) and the U.S. Department of Education noted that “a comparison group of English-speaking monolinguals is not always the optimal comparison group for bilingual individuals; however, for purposes of studying ELL students in the U.S. education system, including such comparisons can be important” for screening assessments and identification of educational needs for bilingual students (McCardle, Mele-McCarthy, & Leos, 2005, p. 70).

We report data from the three subtests of the WLPB-R: Letter-Word Identification (Identificación de Letras y Palabras), Picture Vocabulary (Vocabulario Sobre Dibujos), and Memory for Sentences (Memoria para Frases).

For the Letter-Word Identification subtest, students first identify letters and then words that increase in difficulty. This test was used to index students' letter recognition and word reading abilities. In the Picture Vocabulary subtest, students selected pictures to match words and were asked to say a word when shown a picture. Although a child's receptive vocabulary skills are measured at the beginning of this test, this is primarily an expressive vocabulary task, and was used to index students' vocabulary. Memory for Sentences required children to repeat words, phrases, and then whole sentences. This subtest requires the use of both short-term memory and ability to extract meaning from the sentences in order to aid recall, and was used in the present study to index students' language recalling skills and general oral language abilities.

Procedures

Assessment sessions were conducted one-on-one at the school sites and lasted approximately 45 minutes. During the sessions, children were allowed to discontinue the testing situation at any time. Students were assessed twice, once in English and once in Spanish; the assessments were conducted on different days. The order of language was determined randomly for each child based on the availability of the assessor and particular testing times.

Two teams of assessors, composed of native speakers of each language, received extensive training on administering the assessment battery. Prior to assessing a child, the assessor spent some time in the classroom getting to know the child. Assessors spoke only in the language of the assessment during both the warm-up sessions in the classroom and the assessment sessions. These procedures – having separate language teams and using only the language of the assessment – were used to minimize code-switching during testing sessions. The same procedures were used for data collection at Time 1, Time 2 and Time 3.

Data Analysis

As a first step, measures of central tendency and measures of variance were calculated for the total scores of the phonological awareness task and the standardized scores for each of the three subtests of the WLPB-R.⁴ These analyses were done for the two waves of assessment data in both languages.

A repeated-measures multivariate analysis of variance (MANOVA) procedure was conducted to investigate the primary variable in this study – word reading skills as measured by the Letter-Word Identification subtest scores. In this analysis there were two within-subject factors, with three and two levels: Time (Time 1, Time 2, and Time 3) and Language (English, Spanish).

To clarify differences found to be significant in the MANOVA analysis and examine change in other language assessments, post hoc paired-samples *t*-tests were used. Effect sizes of these comparisons were determined by computing the value of Cohen's *d* using the means and standard deviations for the scores. Since eight *t*-tests were computed to examine changes from preschool to kindergarten, and from kindergarten to first grade, a Bonferroni

⁴Raw scores for each of the subtests were converted into standard scores using the Woodcock Compuscore and Program Profiles software program.

correction indicated that a p -value of .003 should be used to keep the actual Type I error at $p < .05$.

Further, regression analyses were conducted to predict first-grade English reading skills based on preschool measures. These ordinary least-square regression analyses were conducted using a stepwise method to compute changes in R -squared statistics and examine separately the contributions of English and Spanish variables. Models were fitted to examine the effects of phonological awareness, English vocabulary, and memory for sentences on English reading skills. Once the final model was established, we tested for the effects of Spanish vocabulary and word reading. Interactions between the variables were tested to determine if the effects of one variable differed by the level of another variable. For each of the fitted models, the assumptions of regression analysis were examined by checking residual distributions and univariate statistics, using the Wilks-Shapiro W statistic, and inspecting scatter plots of the residuals.

Results

The means, standard deviations, and ranges of standardized scores in each subtest of the WLPB-R and total scores for the phonological awareness task are presented in Table 1. Results for preschool (Time 1), kindergarten (Time 2), and first grade (Time 3) are presented in English and Spanish.

Descriptive Results for Word Reading

In the Letter-Word Identification subtest in English, students performed, on average, within one standard deviation of the monolingual population mean at Time 1 and Time 2, making significant gains between these times. At Time 3 student gains placed in the average range, with a sample mean standard score of 105.61. The English standardized scores of Letter-Word Identification at Time 3 showed great variability in students' word reading skills, as 22% performed at one standard deviation or more above average (≥ 116) compared to monolinguals; 65% performed at an average range (85–115); 7.4% performed one standard deviation below the average (70–84); and 2% performed two standard deviations below the mean (≤ 69). These scores approach a normal distribution, with the majority of students performing close to the mean and fewer students at either end of the distribution. However, in Spanish Letter-Word Identification the bilingual students' mean performance was moderately lower at Time 2 and Time 3, and the average gains were not significant. In Spanish Letter-Word Identification at Time 3, there was also variability in word reading skills: 10% performed at one standard deviation or more above average (≥ 116) compared to monolinguals; 27% performed at an average range (85–115); 25% performed one standard deviation below the average (70–84); and 38% performed two standard deviations below (≤ 69).

Results from the MANOVA analyses of Letter-Word Identification showed a significant effect of Time, $F_{(2, 231)} = 19.25, p < .001$, effect for Language, $F_{(1, 232)} = 212.16, p < .001$, and a significant two-way interaction between Time and Language, $F_{(2, 231)} = 72.24, p < .001$. Students made significant gains in their English word reading skills over time whereas their Spanish skills showed significant declines.

Descriptive Results for Oral Language Tests and Phonological Awareness

On average, students' English and Spanish oral language abilities were below average compared to monolingual norms. As displayed in Table 1, the English and Spanish mean scores for Vocabulary and Memory for Sentences from preschool to first grade fell at least one standard deviation below monolingual norms. While students did not make significant

gains in their Vocabulary and Memory for Sentences English mean scores from Time 1 to Time 2, significant gains were noted from Time 2 to Time 3 for both oral language measures. In Spanish, however, students' Vocabulary mean scores decreased significantly over time. In Memory for Sentences, mean scores showed a significant decline between Time 1 and Time 2, whereas a small significant gain was noted at Time 3. Similar to word reading skills, there was a wide range and variability in the standardized scores for these oral language subtests in this sample.

Scores on the phonological awareness task demonstrated that the students in this sample were making significant gains in both English and Spanish over time from Time 1 to Time 3. The highest possible total score for the test is 26; students' average scores in first grade were 21.05 in English and 17.18 in Spanish. In English at Time 3, the distribution of scores for this task was skewed towards the higher scores. In Spanish, there was more variability in the scores and the distribution approached a normal curve.

Regression Analyses: Predicting First-Grade Word Reading Skills

Table 2 displays the models fitted to predict first-grade English word reading, as indexed by the Letter-Word Identification test, using preschool English measures. Predictors for these models were selected based on correlations among pre-school and first-grade measures. Step 1 shows the simple effect of preschool English phonological awareness on first-grade English word reading. Variation in phonological awareness scores explained 7% of the variation in word reading, and the association was positive. Thus, on average, higher English phonological awareness scores in preschool predicted higher English word reading skills in first grade. In Step 2, we added preschool vocabulary in English. Significant effects were found for both measures and a significant increase that explained 16% of the variation in word reading. In Step 3, we added Memory for Sentences. Significant effects were found for both Vocabulary and Memory for Sentences; however, phonological awareness was no longer a significant contributor. Variation in phonological awareness and oral language skills (i.e., combination of vocabulary and Memory for Sentences) appears to be explaining similar proportion of the variation in reading skills. The addition of Memory for Sentences increased the explanatory power of our model significantly, to 20%. Thus, we selected as a final model the one that includes English vocabulary and Memory for Sentences in preschool, displayed in Table 3, Step 1. On average, higher vocabulary and Memory for Sentences skills in preschool predicted higher English word reading skills for these bilingual students.

To test the contributions of Spanish, we tested for the effects of preschool vocabulary and word reading skills in Spanish while controlling for the English measures. As displayed in Step 2 of Table 3, Spanish vocabulary was found to have a significant effect on first-grade English word reading even when controlling for Vocabulary and Memory for Sentences in English. The additional variation explained by Spanish vocabulary was significant, and this model explained 25% of the variation in English word reading. In Step 3, we added Spanish word reading skills and found significant effects. The additional variation explained by Spanish word reading was significant, and this final model explained 31% of the variation in English word reading. On average, higher Spanish vocabulary and word reading skills in preschool predicted higher English reading skills in first grade, controlling for other English language measures.

Discussion

Researchers in the field of bilingual studies in the United States acknowledge the need for longitudinal studies that investigate and predict reading success during the primary years (McCardle, Mele-McCarthy, Cutting, Leos, & D'Emilio, 2005). The main purpose of this

study was to describe the word reading skills for a group of Spanish-speaking bilingual students during the early childhood years and identify a model that could predict these skills from preschool to first grade.

Results show that students displayed varied levels of word reading skills in English and Spanish, with the English sample mean scores approaching the monolingual population mean. Results from the regression analysis demonstrate that oral language abilities in English, including vocabulary and recalling skills, predict English first-grade word reading ability. In addition, preschool vocabulary and word reading skills in Spanish were also found to be predictive of English first-grade word reading ability even after controlling for the English measures.

Our findings dispel the common belief that most Spanish-speaking bilingual students are struggling early readers. Results from the letter identification and word reading test show that the distribution of scores in this sample of bilingual students is similar to that expected of monolingual populations. Similarly, we found great variability in the oral language skills of students in the sample, specifically Vocabulary and Memory for Sentences. However, their performance on these standardized tests was below average in both English and Spanish when compared to monolingual norms.

These results support the findings from the National Literacy Panel on Language-Minority Children and Youth (August & Shanahan, 2006) and previous research with Spanish-speaking bilingual students in their early school years (Cobo-Lewis, Pearson, Eilers, & Umbel, 2002; Páez et al., in press). In particular, our results support previous studies that have found that Spanish-speaking English-language learners skills in letter word identification and word reading develop at a normal rate based on monolingual norms during the early childhood years, but English oral language lags significantly behind.

We also found that, on average, the students in our study performed significantly better on the English than on the Spanish language tasks. Thus, while students are exposed to Spanish at home and are using this language to communicate with their family members, their academic language skills in this language are not developing at the same rate as their English skills.

One possible explanation for the lower scores on Spanish standardized tests compared to English has to do with the language of instruction in school programs as students in this sample participated in English immersion programs. It is important to consider variability in language of instruction when exploring bilingual students' language skills. Future studies should be designed to compare and describe how the process of reading acquisition might differ for bilingual students who participate in different types of language programs.

In line with previous research with monolingual and bilingual students on early language and literacy skills (August & Shanahan, 2006; Snow et al., 1998), we found that oral language abilities in preschool, Vocabulary and Memory for Sentences, both explained unique variation in English word reading skills in first grade. In previous analysis with these data for this sample of bilingual students, we had found that English phonological awareness in kindergarten was among the strongest predictors of English word reading skills in first grade (see Páez & Rinaldi, 2006). However, when considering preschool factors, our current analysis shows that English oral language abilities are more predictive of word reading skills in first grade than phonological awareness. These findings seem to highlight the differences between early predictors based on students' language abilities as 4-year-olds vs. predictors in later years as students enter elementary schools. Our predictive model that includes kindergarten Vocabulary and Memory for Sentences accounts for 19% of the variation in English word reading skills. These longitudinal findings support a theoretical model for

language and literacy acquisition in bilingual children that incorporates the importance of oral language skills in predicting word reading. Our results also support the recommendation that these measures be used for screening reading difficulties in this population of students.

The predictive findings from our study also present an interesting addition to the research literature in this area. Unlike previous research that has pointed to the critical importance of phonological awareness during the early childhood years (Snow et al., 1998), for this population of bilingual learners from low-socioeconomic backgrounds, oral language abilities played a more important predictive role for reading as they entered elementary school. Perhaps the role of phonological awareness is limited because of these students' low levels of oral language proficiency. These factors need to be considered when (a) assessing bilingual students and deciding between a language need or a language disability and (b) deciding on appropriate interventions that could improve the English learning of these students. Further research is needed to confirm these findings, and future longitudinal studies should consider the combination of predictors of reading for Spanish-speaking bilingual students.

Moreover, our results add to this picture the important contribution of these students' first language skills in Spanish to their English reading development. When Spanish skills were examined, Spanish vocabulary and word reading skills accounted for an additional 12% of the variation in English word reading skills over and above the contributions of the English predictors. The total variation explained by this predictive model is 31%. These findings add to the growing number of studies investigating transfer between Spanish and English in bilingual students' reading-related skills (see August & Shanahan, 2006, for a recent review). They support findings by Lindsey et al. (2003) regarding transfer from Spanish to English letter and word knowledge and by August, Calderon, and Carlo (2001) of transfer between these languages in word reading for older children.

In conclusion, findings from this study build on the previous research on bilingual students and contribute to work that can help practitioners identify and distinguish between language differences and learning disabilities (see McCardle et al., 2005). We have highlighted the great variability found in the language skills of these bilingual students and presented a predictive model for word reading skills. Perhaps early identification of children who have limited oral language skills in preschool can help educators develop targeted instruction in the early elementary years.

Implications for Practice

The early school years have been identified as a critical time to evaluate children's pre-readiness skills for reading acquisition (Lonigan, 2003; Snow et al., 1998; Torgesen, 1998). Our predictive model for English word reading may be used for early identification, progress monitoring, and targeted instruction that supports reading development in bilingual students. Based on our findings, we recommend that three areas be targeted in educational planning for Spanish speaking-bilingual students from low socioeconomic backgrounds.

First, an active screening and assessment process should be implemented early in the school years to identify children who might be at risk for reading difficulties based on their first- and second-language abilities. Second, attention to pre-readiness skills with a special focus on vocabulary instruction during early childhood seems of particularly importance for this population of Spanish-speaking children, as noted by the current study and previous research (August et al., 2003; August & Shanahan, 2006). Third, language programs for Spanish-speaking bilingual students should provide the opportunity for the maintenance and development of Spanish language and literacy skills where possible. As the predictive model

in this study suggests, Spanish vocabulary and word reading skills can contribute to students' word reading abilities in English.

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Table 1
Means, Standard Deviations, and Range of Performance on Language Assessments (N=234)

	Letter-Word Identification			Picture Vocabulary			Memory for Sentences			Phonological Awareness		
	PreK	K	1 st grade	Pre-K	K	1 st grade	Pre-K	K	1 st grade	PreK	K	1 st grade
English												
<i>M</i>	91.28	96.83	105.61	70.33	72.37	79.41	78.03	77.38	85.14	6.97	16.86	21.05
<i>SD</i>	12.57	14.49	15.86	18.819	19.67	19.56	14.914	15.65	15.57	5.00	5.33	3.78
Range	59–127	48–163	59–149	2–11	12–120	12–120	37–129	0–142	28–134	0–23	2–26	8–26
Spanish												
<i>M</i>	86.23	80.08	81.88	63.47	53.24	48.81	72.50	66.82	69.22	7.42	13.64	17.18
<i>SD</i>	8.538	19.56	29.99	18.908	22.16	24.64	15.82	16.64	13.95	4.255	4.32	4.08
Range	63–118	48–163	30–174	0–133	0–125	0–120	29–113	0–103	36–111	0–23	2–26	6–26

Note. Paired-samples *t*-tests indicated a significant difference from preschool to kindergarten in English Letter-Word Identification, $t(233) = 7.01, p < .001, d = .41$, and Phonological Awareness, $t(233) = 28.96, p < .001, d = 1.91$. No significant differences were found for English Picture Vocabulary and Memory for Sentence. Paired-samples *t*-tests with the Spanish measures were all significant: Letter-Word Identification, $t(233) = -5.24, p < .001, d = .41$; Picture Vocabulary, $t(233) = -9.88, p < .001, d = .50$; Memory for Sentences, $t(227) = -6.38, p < .001, d = .96$; and Phonological Awareness, $t(232) = 17.71, p < .001, d = 1.45$. Paired-samples *t*-tests indicated a significant difference from kindergarten to first grade in English Letter-Word Identification, $t(233) = -11.87, p < .001, d = .58$; Picture Vocabulary, $t(233) = -7.19, p < .001, d = .35$; Memory for Sentences, $t(233) = -9.57, p < .001, d = .51$, and Phonological Awareness, $t(233) = -14.83, p < .001, d = .90$. Paired-samples *t*-tests with the Spanish measures did not show a significant difference in Letter-Word Identification, $t(233) = -1.42, p = .16$, but significant differences were found in Picture Vocabulary, $t(233) = 4.21, p < .001, d = .18$, Memory for Sentences, $t(233) = -3.17, p = .002, d = .20$, and Phonological Awareness, $t(233) = -12.64, p < .001, d = .84$.

Table 2

Summary of Hierarchical Regression Analysis for Preschool Variables and Income Predicting English Word Reading in First Grade (N=244)

Variable	B	SE B	β
Step 1			
Income Level	1.32	.68	.13
Phonological Awareness	.81	.20	.26***
Step 2			
Income Level	.50	.67	.05
English Phonological Awareness	.48	.21	.15*
English Vocabulary	.29	.06	.34***
Step 3			
Income Level	.08	.67	.01
English Phonological Awareness	.26	.21	.08
English Vocabulary	.19	.07	.22*
English Memory for Sentences	.26	.09	.25**

Note. $R^2 = .07$ for Step 1, $.16$ for Step 2, and $.20$ for Step 3; $\Delta R^2 = .09$ for Step 2 ($ps < .001$) and $\Delta R^2 = .04$ for Step 3 ($ps < .01$).

* $p < .05$

** $p < .01$

*** $p < .001$.

Table 3

Summary of Hierarchical Regression Analysis for Testing the Contribution of Spanish Skills and Income in Preschool to English Word Reading in First Grade (N=244)

Variable	B	SE B	β
Step 1			
Income Level	.02	.67	.001
English Vocabulary	.20	.07	.23**
English Memory for Sentences	.30	.08	.28***
Spanish Vocabulary	.22	.05	.26***
Step 2			
Income Level	.25	.66	.02
English Vocabulary	.24	.07	.28***
English Memory for Sentences	.25	.08	.24**
Spanish Vocabulary	.20	.05	.23***
Step 3			
Income Level	-.30	.65	-.03
English Vocabulary	.19	.06	.22**
English Memory for Sentences	.28	.08	.27***
Spanish Vocabulary	.11	.06	.12*
Spanish Word Reading	.49	.12	.27

Note. $R^2 = .19$ for Step 1, $.25$ for Step 2, and $.31$ for Step 3; $\Delta R^2 = .06$ for Step 2 ($ps < .001$), and $\Delta R^2 = .06$ for Step 3 ($ps < .001$).

* $p < .05$

** $p < .01$

*** $p < .001$.