Predicting English Word Reading Skills for Spanish-Speaking Students in First Grade

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Abstract

This article describes the word reading skills in English and Spanish for a sample of 244 Spanish-speaking, English-learning (hence, bilingual) students in first grade and presents a predictive model for English word reading skills. The children in the study were assessed at the end of kindergarten and first grade, respectively. Data were gathered with 3 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 monolingual norms whereas their Spanish word reading skills averaged 1 *SD* below the mean. English vocabulary, English phonological awareness, and Spanish word reading skills in kindergarten were found to be significant predictors of English word reading skills in first grade. Educational implications for screening language and reading skills and promising areas for targeted instruction for this population are discussed.

Keywords

bilingual children; first grade; language assessments; Spanish-speaking; word reading skills

Education and language researchers have emphasized the urgency of addressing the needs of young bilingual learners. Children from Spanish-speaking backgrounds make up a particularly high percentage of the English language learners entering American schools (Suárez-Orozco & Páez, 2002). Between 1979 and 2004, the number of school-aged children (ages 5–17) who spoke a language other than English at home increased from 3.8 million (or 9%) to 9.9 million (or 19%). Of the students who spoke a language other than English at home, 71% spoke Spanish (National Center for Education Statistics, 2004). The higher risk of reading problems associated with lack of proficiency in English on school entry is widely documented (McMillen, Kaufman, & Klein, 1997; National Center for Education Statistics, 2003). This risk 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, current research with Spanish-speaking bilingual students has been growing, and better efforts are being made to understand and improve the language and literacy skills of these students.

The Early Childhood Study (ECS) of language and literacy development of Spanish-speaking children was developed with two major goals: (a) to collect data longitudinally from prekindergarten 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

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literacy skills in the children's 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.

The focus on language and literacy skills is an important one, given the growing consensus that kindergarten and primary grades are a critical time for language and literacy learning (Dickinson & Tabors, 2001; Lonigan, 2003; Snow & Tabors, 1993). Research with monolingual children has shown that language experiences and early exposure to literacy are important precursors for children's language development and literacy acquisition (Dickinson & Tabors, 2001; Snow et al., 1998). 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 importance in reading development as noted in research both with monolingual students (Wagner et al., 1997; Wagner & Torgesen, 1987) 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 also 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 been found to be important precursors to literacy (Dickinson & Tabors, 2001). They also are an area of special vulnerability in the population of Spanish-speaking bilingual students (August, Carlo, Dressler, & Snow, 2005). Recent findings from our ECS confirm that many young Spanish-speaking students lag behind monolingual children of the same age in their oral language abilities in English and Spanish (Páez, Tabors, & Lopez, in press; Tabors, Páez, & Lopez, 2003). A review of the literature on literacy in second-language learners also supported the critical importance of oral language proficiency in English for successful literacy development and instruction among bilingual learners (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). Research studies on transfer of reading-related skills from one language to another are relatively rare, although the evidence for transfer between English and Spanish has been growing (August & Shanahan, 2006). Recent studies with bilingual Spanish-English children have provided evidence of transfer in vocabulary (Ordoñez, Carlo, Snow, & McLaughlin, 2002; Snow, 1990) and phonological awareness (Dickinson, McCabe, Clark-Chiarelli, & Wolf, 2004; Lindsey et al., 2003; López & Greenfield, 2004). Cross-language effects also have 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 ELL children, to identify, intervene with, and prevent reading difficulties in the

elementary years. In sum, few studies have used combinations of the strongest predictors of reading to investigate patterns of acquisition in Spanish-speaking bilingual students.

In this article, we describe a study of the early word reading abilities of Spanish-speaking bilingual students[1] that aimed at identifying factors that predict English word reading skills. We report findings from the data on children who were seen in kindergarten and followed into first grade. Specifically, we investigated the word reading skills in English and Spanish of bilingual students in kindergarten and first grade. Then, we asked which kindergarten English language skills predicted word reading skills in first grade and whether Spanish reading abilities contributed to these students' English word reading skills.

METHODS

Participants

We examined data from a subsample of 244 low socioeconomic status, 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. In addition, 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 244 children were assessed in English and Spanish at the end of kindergarten in 2003 (Time 1) and at the end of first grade in 2004 (Time 2). The sample mean age for the data collection during kindergarten was 5.45 years and for first grade 6.56 years. The majority of the children in the sample were born in the United States (84.4%), and 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. Thirty-two percent of the sample did not have a father or male figure present in the home.

Information on language use at home, parental years of education, and family income revealed that all children were exposed to Spanish at home and were mostly from a low socioeconomic background. 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.

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[1]Although we could have selected a number of 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.
[2]All 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 min. Interviews were conducted in Spanish or English according to the parents' preference with the majority of interviews occurring in Spanish. Data are missing for two families out of the 260 students in the sample.
[3]In this family, the mother reported using only English and the father reported using mostly Spanish.

The bilingual children in the sample were recruited from Head Start classrooms when they were 4-year-olds, and they were all enrolled in public school districts during their kindergarten and first-grade years. All children (*n* = 244) attended English immersion programs in which English was the primary language of instruction.

Instruments

The ECS language and literacy battery used in this study was based on previous work on the language and literacy skills of young children. It included measures identified as predictive of reading skills (Dickinson & Tabors, 2001; Snow, Tabors, Nicholson, & Kurland, 1995), taking into account the need for age-appropriate tasks in both Spanish and English with high reliability and validity. For this article, we report on performance on three subtests of the Woodcock Language Proficiency Battery (WLPB) and a researcher-developed phonological awareness task.

The Phonological Awareness Task—The Phonological Awareness Task was developed by the research team, because of the unavailability of such a measure available in Spanish and English that was appropriate across the needed age range. There are 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 for the English version of the test and a reliability of .59 for the Spanish version. Rank-order correlations indicated that each subtest contributes positively to the total score for both versions of the test; therefore, all subtests were retained in the measures. To determine the internal consistency, reliability analysis using Cronbach's alpha was calculated for each of the tests in each language at both time points. For the English assessment, the 26 test items showed moderately high consistency at both time points (α = .81 and .86); for the Spanish assessment, the 26 test items showed moderate consistency at both time points (α = .78 and .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—The Woodcock Language Proficiency Battery—Revised (WLPB-R) is a standardized assessment consisting of a set of subtests used to measure different aspects of language and literacy skills (Woodcock, 1991a). There are two versions of these tests, one in Spanish and one in English.

Standard scores for all of the WLPB-R subtests are 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 WLPB-R—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 for these assessments lived in the United States, these children were selected by design to represent 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 this bilingual population, it is important to note that we are comparing the norms for bilingual children with norms that have been developed for monolingual children. This is necessary because there are no tests measuring these skills that are normed on bilingual populations. In addition, a current review of the literature by NIH and the U.S. Department of Education noted that for screening assessments and identification of educational needs for bilingual students, "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" (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 to aid recall. It was used in this 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 min. During the assessment session, children were allowed to discontinue the testing situation at any time. Students were assessed twice, once in English and once in Spanish, and the assessments were conducted on different days. The order of language was determined randomly for each child on the basis of 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 and Time 2.

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.

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

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, each with two levels: TIME (Time 1, Time 2) and LANGUAGE (English, Spanish). In addition, we tested for the effects of exposure to English at home as a between-subjects variable in the MANOVA procedures and no significant effects were found.

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. Because eight *t* tests were computed to examine changes from kindergarten to first grade, a Bonferroni correction indicated that a *p* value of .006 should be used to keep the actual type I error at *p* < .05.

Second, regression analyses were conducted to predict first-grade English reading skills on the basis of kindergarten measures. These ordinary least square regression analyses were conducted using a stepwise method to compute changes in R^2 statistics and examine separately the contributions of English and Spanish variables. Models were fitted to examine the effects of English vocabulary, Memory for Sentences, and phonological awareness on English reading skills; once the final model was established, we tested for the effects of Spanish word reading on English word reading skills. Interactions between the variables were tested to determine whether 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 kindergarten (Time 1) and first grade (Time 2) are presented in English and Spanish.

Descriptive results for word reading at Time 1 and Time 2

In the Letter–Word Identification subtest in English, students performed, on average, within 1 *SD* of the monolingual population mean at Time 1 and made significant gains at Time 2 for a sample average score of 105.40. However, in Spanish the bilingual students' mean performance was moderately lower at Time 1 and Time 2 and the average gains were not significant. The English standardized scores of Letter Word Identification at Time 2 show great variability in students' word reading skills, as 22% performed at 1 *SD* or more above average (≥ 116) than monolinguals, 65% performed at an average range (85–115), 7.4% performed 1 *SD* below the average (70–84), and 2% performed 2 *SD* 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. In Spanish Letter Word Identification at Time 2, there is also variability in word reading skills: 10% performed at 1 *SD* or more above average (≥116) than monolinguals, 27% performed at an average range (85–115), 25% performed 1 *SD* below the average (70–84), and 38% performed 2 *SD* below the average (≤69).

Figure 1 shows a bivariate plot depicting individual standardized scores in both English and Spanish on the Letter–Word Identification subtest. The lines indicate the monolingual population mean of 100. As shown in this plot, students' dual abilities also vary, with some

students demonstrating low and high scores in both languages, whereas some demonstrate high scores in English and low scores in Spanish or vice versa.

Results from the MANOVA analyses of Letter–Word Identification show a significant effect of TIME, $F(1, 243) = 290.12$, $p < .001$; effect for LANGUAGE, $F(1, 243) = 25.73$, $p < .001$; and a significant two-way interaction between TIME and LANGUAGE, $F(1, 243) = 394.72$, $p < .001$. The interaction effect can be explained by the fact that students made significant gains in their English word reading skills from kindergarten to first grade whereas no significant differences were found in their Spanish skills over time.

Descriptive results for oral language tests and phonological awareness

On average, students' English and Spanish oral language abilities for the children in this study were below average compared to monolingual norms. As displayed in Table 1, the English and Spanish means scores for Vocabulary and Memory for Sentences at Time 1 and Time 2 fell at least 1 *SD* below monolingual norms. Significant gains were noted in the English mean scores from Time 1 to Time 2 for both oral language measures. In Spanish, however, students' Vocabulary mean scores significantly decreased from Time 1 to Time 2, while significant increases were noted for Memory for Sentences. Similarly 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 from Time 1 to Time 2. The highest possible total score for this test is 26; students' average scores in first grade were 20.96 in English and 17.14 in Spanish. In English at Time 2, the distribution of scores for this task is skewed toward 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 kindergarten measures in English. Predictors for these models were selected on the basis of correlations among kindergarten and first-grade measures. Step 1 shows the simple effect of kindergarten English vocabulary on first-grade English word reading. Variation in vocabulary scores explained 21% of the variation in word reading, and the association was positive. Thus, on average, higher English vocabulary scores in kindergarten predicted higher English word reading skills in first grade for these bilingual children. In Step 2, we added kindergarten Memory for Sentences in English, and found significant effects for both measures and a significant increase that explained 23% of the variation in word reading. In Step 3, we added phonological awareness and found significant effects for both vocabulary and phonological awareness; however, Memory for Sentences was no longer a significant contributor. The addition of phonological awareness increased significantly the explanatory power of our model to 31%. Thus, we selected as a final model the one that includes English vocabulary and phonological awareness in kindergarten, displayed in Table 3, Step 1. On average, higher vocabulary and phonological awareness skills in kindergarten would predict higher English word reading skills for these bilingual students.

To test the contributions of Spanish, we added kindergarten Spanish word reading as displayed in Step 2 of Table 3. Interestingly, kindergarten Spanish word reading was found to have a significant effect on first-grade English word reading, even when controlling for vocabulary and phonological awareness in English. On average, higher Spanish readings skills in kindergarten predict higher English reading skills in first grade, controlling for other

language measures. The additional variation explained by Spanish word reading was significant, and this final model explained 40% of the variation in English word reading.

DISCUSSION

Researchers in the field of bilingual studies 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 the current study was to describe Spanish-speaking bilingual students' word reading skills and identify a practical model that could predict these skills from kindergarten 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. In addition, results from the regression analysis show that vocabulary and phonemic awareness skills in English and word reading skills in Spanish in kindergarten predict English first-grade word reading ability.

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. There are three groups of early readers within our sample: above average, average, and below average (who might be at risk). Thus, this research supports previous work with bilingual students that states that being limited English proficient, in and of itself, does not account for low reading achievement (see Snow et al., 1998, for a review).

As for word reading skills, we found great variability in the oral language skills of students in the sample, specifically in their 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 of 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 are very similar to those found by Manis et al. (2004) in their longitudinal study of 251 Spanish-speaking English-language learners from kindergarten through second grade in that letter identification and word reading developed at a normal rate on the basis of monolingual norms, but English oral language lagged significantly behind.

We also found that, on average, students in our study performed significantly better in the English language tasks than in 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 in Spanish standardized tests compared to English has to do with language of instruction in their school programs. All 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. This study was not designed to investigate or evaluate the effectiveness of school programs, but rather to explore the growth and association between language and early literacy skills for this group of bilingual students. 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, we found that vocabulary, memory for sentences, and phonological awareness are predictive of early reading abilities. In confirmation of the work conducted by

Snow et al. (1998) and Whitehurst and Lonigan (1998), we found that phonological awareness was the strongest predictor of word reading, followed by vocabulary skills. Two measures of kindergarten oral language abilities, vocabulary and memory for sentences, explained unique variation in English word reading skills in first grade. However, when phonological awareness skills were entered into the equation, memory for sentences was no longer a significant predictor. Our final model, which includes kindergarten vocabulary and phonological awareness, accounts for 31% 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 (especially vocabulary knowledge) and phonological awareness in predicting word reading. Our results also support the recommendation that these measures be used for screening reading difficulties in this population of 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 word reading skills accounted for an additional 10% 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 40%. These results add to the growing number of studies that are 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. The relation of transfer effects in word reading to language program or language of instructions in early reading remains to be investigated. Such work would further our understanding of the impact of first-language skills on second-language literacy.

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, identified different groups of dual language abilities, and presented a predictive model for word reading skills. Perhaps early identification of children who are lacking skills in one of both of their languages (in this case English and Spanish) can help educators develop targeted instruction in the early elementary years. We have outlined a series of implications that can help drive these processes.

Implications for practice

The early school years have been identified as a critical time to evaluate children's prereadiness skills for reading acquisition (Lonigan, 2003; Snow et al., 1998; Torgesen, 1998). Our predictive model for English word reading can be used by practitioners for early identification, progress monitoring, and targeted instruction that supports reading development in bilingual students. On the basis of our findings, we recommend that three areas be targeted in educational planning for Spanish-speaking bilingual students.

First, an active screening and assessment process should be implemented early in the school years. Practitioners should assess language abilities and phonological awareness in the child's first language, as well as in English, to monitor the child's progress in early reading skills from kindergarten to first grade. Assessment and monitoring in kindergarten should identify those Spanish-speaking bilingual students who are at risk for difficulties in the development of letter identification and early word reading abilities. Assessment of first-language skills could enable school professionals (speech-language pathologist, special educators, and reading specialists) to begin to distinguish between what might be a learning

disability and a specific language need or developmental language difference. Figure 1, which presents Spanish and English skills for individual children, can be used as a tool in helping practitioners identify students at possible risk for later reading difficulties. For example, practitioners can assess students' dual language abilities and graph them in a similar way to identify students who display low levels of skills in both Spanish and English. These procedures would help ensure a timely and effective instructional response when difficulty or delay is identified.

Second, reading instruction for Spanish-speaking bilingual students should incorporate a focus on vocabulary development, including conceptual knowledge and lexical development, in addition to the already-established important instruction in phonemic awareness (Goldstein, 2004). Furthermore, research-based strategies for teaching new vocabulary words should be implemented. For example, presenting vocabulary in the context of meaningful text and through the use of rich literature that connects to the life experiences and sociocultural context of the students (Goldenberg, 1994). Attention to vocabulary seems of particularly importance for this population of Spanish-speaking children from low socioeconomic status as noted by the current study and previous research (August et al., 2005; August & Shanahan, 2006; Lindsey et al., 2003). Findings from the current study support the inclusion of these essential components—including opportunities for students to develop oral language skills such as vocabulary and to become sensitive to the sounds, as well as meanings, of spoken words—as recommended elements of instruction for reading success (Snow et al., 1998).

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 word reading skills can contribute to students' word reading abilities in English. Therefore, educators should support parents' use of their first language at home and also encourage parents to read in this language as an additional tool in the goal of educating and supporting reading achievement in this population.

In summary, the ultimate goal of predictive research is to help inform clinicians and practitioners, be they speech-language pathologists, teachers, school administrators, reading specialists, and other professionals serving these children, to successfully identify risk and potential problems and track the progress of language and literacy development for bilingual students. A major goal of early identification is clearly early intervention, to enable all professionals working with these children during the early school years to optimize the educational opportunities and achievement for bilingual students. We have proposed that looking at these abilities as early as kindergarten could help ensure that students are developing the necessary skills to succeed in learning to read.

Acknowledgments

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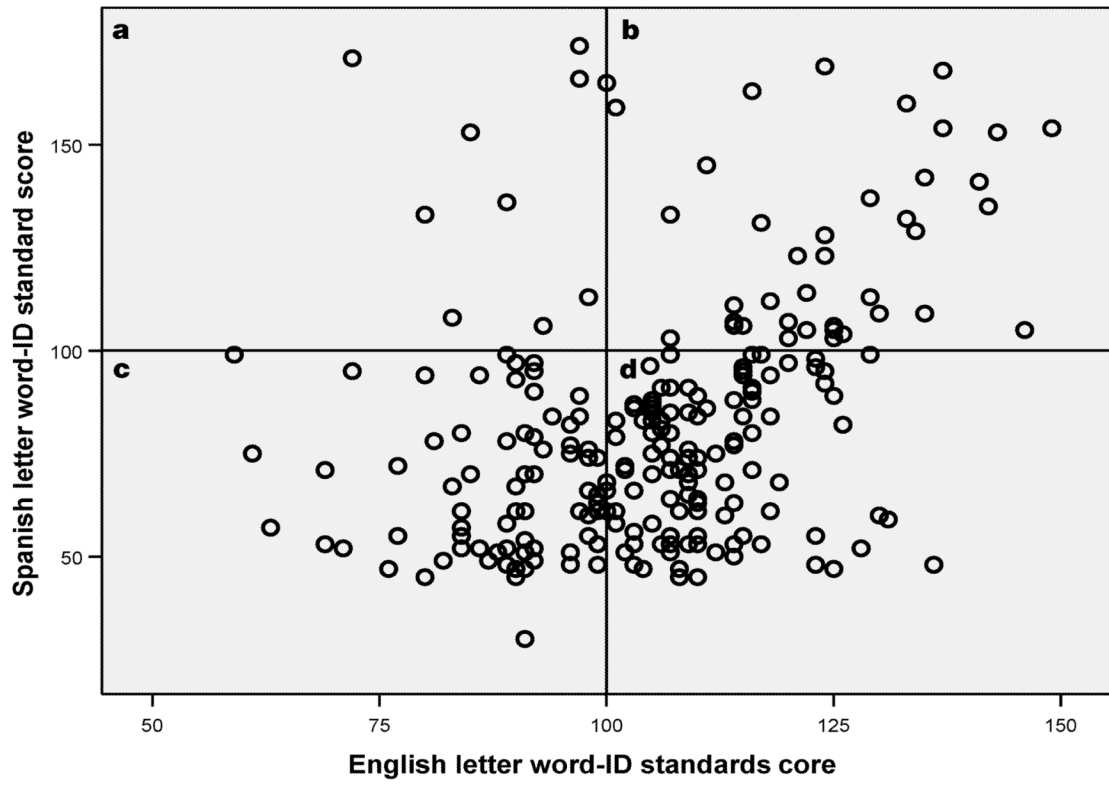
Figure 1.
Dual language abilities in word reading (*n* = 244).

Table 1

Means, standard deviations, and range of performance on language assessments ($n = 244$)

	Letter–word identification		Picture vocabulary		Memory for sentences		Phonological awareness	
	Kindergarten	First grade	Kindergarten	First grade	Kindergarten	First grade	Kindergarten	First grade
English								
M	96.52	105.40	72.73	79.51	77.25	85.52	16.74	20.96
Range	55–145	59–149	12–120	12–120	0–142	28–138	2–26	8–26
Spanish								
M	79.98	81.89	53.03	48.79	66.20	69.31	13.57	17.14
SD	19.56	29.77	22.15	24.61	17.59	14.11	4.34	4.16
Range	47–163	30–174	0–125	0–120	0–103	36–111	2–26	6–26

Note. Paired-samples *t* tests indicated a significant difference from kindergarten to first grade in English Letter–Word Identification, $t(243) = -11.87$, $p < .001$, $d = 0.58$; Picture Vocabulary, $t(243) = -7.19$, $p < .001$, $d = 0.35$; Memory for Sentences, $t(243) = -9.57$, $p < .001$, $d = 0.51$; and Phonological Awareness, $t(243) = -14.83$, $p < .001$, $d = 0.90$. Paired-samples *t* tests with the Spanish measures did not show a significant difference in Letter–Word Identification, $t(243) = -1.42$, $p = .16$, but significant differences were found in Picture Vocabulary, $t(243) = 4.21$, $p < .001$, $d = 0.18$; Memory for Sentences, $t(243) = -3.17$, $p = .002$, $d = 0.20$; and Phonological Awareness, $t(243) = -12.64$, $p < .001$, $d = 0.84$.

Table 2

Summary of hierarchical regression analysis for kindergarten variables predicting English word reading in first grade ($N = 244$)

Variable	B	SE B	B
Step 1			
English vocabulary	0.38	0.05	0.46***
Step 2			
English vocabulary	0.29	0.06	0.35***
English memory for sentences	0.17	0.07	0.18*
Step 3			
English vocabulary	0.24	0.06	0.29***
English memory for sentences	0.08	0.07	0.08
English phonological awareness	0.92	0.18	0.31***

Note. $R^2 = .21$ for Step 1, .23 for Step 2, and .31 for Step 3; $\Delta R^2 = .02$ for Step 2 ($ps < .05$) and $\Delta R^2 = .07$ for Step 3 ($ps < .001$).

*
$p < .05$.

***
$p < .001$.

Table 3

Summary of hierarchical regression analysis for testing the contribution of Spanish word reading in kindergarten to English word reading in first grade ($N = 244$)

Variable	*B*	SE *B*	*B*
Step 1			
English vocabulary	0.27	0.05	0.33***
English phonological awareness	0.98	0.17	0.33***
Step 2			
English vocabulary	0.29	0.04	0.36***
English phonological awareness	0.70	0.17	0.24***
Spanish word reading	0.26	0.04	0.32***

Note. R^2 = .30 for Step 1, and .40 for Step 2; ΔR^2 = .10 for Step 2 (*p*s < .001).

***
  p < .001.