

Predictors of English Reading Skills in Spanish-Speaking English-Language Learners (SpELLs)

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1. Introduction

Little research is available regarding language and literacy development in bilingual children (Genesee, Paradis, & Crago, 2004; Gutierrez-Clellen, 2002; McCardle, 2006; Slavin & Cheung, 2005); however, the need for such information is increasingly important. According to The Center for Research on Education, Diversity, & Excellence, English will be the second language for 40% of the nation's K-12 population by 2030 (2002, as cited by Harris, 2003). Recent educational assessments show that children learning English as an additional language in United States (U.S.) schools lag far behind their monolingual English-speaking peers in reading comprehension skills (U.S. Department of Education, 2005, 2007). As of the 2000 Census, five and one half million English-language learners (ELLs) attended U.S. public schools and of these, 80% were Hispanic (McCardle, Mele-McCarthy & Leos, 2005). Therefore, for teachers, administrators and policy makers, there is a critical need to identify early factors that lead to the later development of English literacy skills in Spanish-speaking English-Language Learners (SpELLs) as well as to examine the effects of different approaches to literacy instruction (August & Shanahan, 2006; Geva & Zadeh, 2006; National Institute of Child Health and Human Development, 2000; Rolstad, Mahoney & Glass, 2005).

2. Review of Literature regarding Literacy Acquisition

A brief review of recent research regarding acquisition of literacy skills by ELLs follows (see Haynes, Ayre, Haynes & Mahfoudhi, 2009, for an extended review). Recent findings regarding the effectiveness of English immersion and bilingual program models are also discussed.

2.1. *Word Reading*

A substantial body of research with monolingual English speakers suggests that in beginning readers, word reading skills are related to phonological and orthographic processing skills, as well as rate of processing (e.g., Adams, 1990; Badian, 2005; Catts, Fey, Zhang, & Tomblin, 2001; Katzir, Youngsuk, Wolf, O'Brien, Kennedy, Lovett, & Morris, 2006; Vellutino, Tunmer, Jaccard, & Chen, 2007; Wagner, Torgeson & Rashotte, 1994; Wolf & Katzir-Cohen, 2001). Such relationships have also been observed in children learning to read in languages other than English and in ELL beginning readers.

Studies have shown that phonological awareness (PA) is closely related to literacy skills development in a range of languages with varied orthographies (e.g., Goswami, 2002; Kobayashi et al, 2005; Wimmer, 1993) and that PA skills have been shown to transfer from L1 to L2. For example, Dickinson and colleagues (2004) found evidence of cross-linguistic transfer of PA (as measured through deletion detection and rhyming tasks) in Spanish-English bilingual preschool children. Studies have also identified L1 rapid retrieval (as measured by rapid automatic naming, or RAN), print knowledge, and word reading as primary predictors of English (L2) word reading skills in SpELL beginning readers (e.g., Bialystok, Luk, & Kwan, 2005; Durgunoglu, Nagy, & Hancin-Bhatt, 1993; Genesee & Geva, 2006; Gottardo et al., 2008; Manis, Lindsey & Bailey, 2004; Pérez & Rinaldi, 2006;

Quiroga, Lemos-Britten, Mostafapour, Abbott, & Berninger, 2002). While it is important to note the key role of L1 predictors in literacy development in bilingual learners, the current paper focuses on L2 English predictors of L2 English literacy. (The reader is referred to Haynes et al., 2009, for a discussion of L1 predictors of L2 literacy).

Performance on measures of English (L2) phonological processing and rapid retrieval has predicted English word reading performance in ELLs. For example, Manis, Lindsey and Bailey (2004) found that first grade performance on measures of English PA accounted for more variance than did any Spanish language predictor of second grade English letter and word identification. Gottardo and colleagues (2008) examined first grade L2 English predictors of second grade English reading performance and, as has been found in English-speaking monolinguals, performance on English phonological measures like pseudoword repetition, PA, and rapid retrieval (i.e., RAN) predicted second grade word attack and word identification.

Although some ELLs with reading difficulties may rely on knowledge of L2 oral vocabulary when reading words (Gupta & Jamal, 2007), oral language proficiency has generally not been found to predict word reading performance in beginning readers (e.g., Chiappe et al., 2007; Dickinson et al., 2004; Durgunoğlu et al., 1993; Gottardo, Yan, Siegel, & Wade-Woolley, 2001; Roberts, 2005).

2.2. *Text Level Reading Fluency*

Remarkably little research exists regarding development of text level reading fluency in SpELLs in particular and in ELLs in general. The most widely cited study of L2 reading fluency provides us with parallel findings from languages other than Spanish. Geva and Zadeh's (2006) study of second grade ELLs whose native languages included Cantonese, Punjabi, Tamil, and Portuguese, focused on L2 English predictors of L2 reading fluency. The researchers found that rapid retrieval of letter names (RAN), PA and word reading performance in English predicted both word-level automaticity and text-level reading efficiency in English. These results are comparable to patterns of prediction seen in studies of L1 English readers.

Geva and Zadeh (2006) found that context enhanced English reading performance in ELLs as well as in monolingual English speakers; however, children in the ELL group benefited less from context than did native English speaking peers when reading in English. This finding suggests that beginning readers' English oral language proficiency may be related to ELLs' English text level fluency, but its role is small. Geva and Zadeh further clarify that, when children read texts judged to be at or just below their level of oral proficiency -- in line with texts read fluently in Chall's stage two (decoding fluency), oral proficiency does not significantly affect performance (Chall, 1996, as cited in Geva & Zadeh, 2006). More demanding texts characteristic of Chall's stage three (reading to learn, Chall, 1983, as cited in Roswell & Chall, 1994), which include longer, less familiar words and more complex concepts, may require additional cognitive resources and reduce comprehension. While the above findings are instructive, replication and elaboration of these findings is needed.

2.3. *Reading Comprehension*

Findings of studies of reading comprehension in SpELLs and other ELLs are similar to results of studies in monolingual children. In the earliest grades, where the focus is on learning to decode accurately and then fluently, L2 English PA and RAN are strongly related to L2 English reading comprehension. For example, Manis and colleagues (2004) found that first grade English PA, RAN and expressive language were significant predictors of SpELLs' second grade English passage reading comprehension. In comparison to PA and RAN, however, expressive language accounted for a much smaller percentage of unique variance. First grade English PA was the strongest predictor of second grade English reading comprehension.

As children move into the upper grades where they are required to read texts containing longer words, new knowledge and more complex sentence structures, English vocabulary and sentence processing skills become stronger predictors of English reading comprehension. For example, in their study of reading skills in Spanish-English bilingual third graders, Swanson and colleagues (2008) investigated the predictive value of English and Spanish oral language proficiency and PA. While

English PA contributed unique variance to English reading comprehension, syntax emerged as the strongest predictor in these third graders. Proctor and colleagues (2005) conducted a four-year longitudinal study and found that SpELLS' oral language skills (listening comprehension and vocabulary knowledge) in English were found to predict more variance in fourth grade English reading comprehension than did English pseudo word recognition and word level decoding automaticity.

In a reanalysis of the above data, Proctor and colleagues (2006) found that initial language of instruction and assessment had a predictably strong effect on reading comprehension performance: English oral language proficiency and reading comprehension scores were highest for fourth graders initially receiving reading instruction in English, while Spanish oral language proficiency and reading comprehension scores were highest for those initially receiving reading instruction in Spanish. In general, more cross-linguistic research is needed in order to better understand SpELLS' reading in grades 3-6.

2.4. Effective Literacy Instruction for ELLs

Transitional bilingual education (TBE) and two-way bilingual (TWB) programs are two types of program models for bilingual education in the U.S. TBE program models are the most common and usually involve literacy instruction in the child's native language, followed by a transition into English-only instruction. TBE programs may be early-exit, in which children are transitioned within the first three years of school, or late exit, in which native language literacy instruction continues throughout elementary school (Francis, Lesaux & August, 2006). In contrast, TWB models, sometimes referred to as dual-language models, emphasize development of proficiency in both languages. Some programs begin with native language literacy instruction and then add English language instruction in second or third grade. Others incorporate both from the beginning. Classes may include native speakers of either of the two languages in which instruction is provided. According to Rossell and Baker (1996) two-way bilingual programs are implemented far less frequently than other models of bilingual education due to a lack of political support and funding. Despite the lack of funding, some studies (e.g., Rolstad et al., 2005) have suggested that TWB programs are the most effective form of bilingual education, or at the very least that some amount of native language instruction may be associated with better reading, mathematics and language outcomes (e.g. Francis et al., 2006; Willig, 1985.)

These models of bilingual education contrast with English immersion programs, which include enrollment in regular education classes conducted in English, with or without English as a Second Language support services or "structured immersion" (SI) classes, in which ELLs are grouped together and taught the regular curriculum in English; however, the level of English used is modified or scaffolded for ELLs in order to ensure children's comprehension as they are developing English skills (Francis et al., 2006).

Reviews and meta-analyses of the literature regarding the effects of bilingual education have drawn contradictory conclusions, due to differing criteria for selection of studies and different methodologies. If differences are seen, they often favor bilingual education slightly (Francis et al., 2006); however, the varied implementation of "bilingual education," both across and within bilingual education model types, complicates analyses of instructional efficacy. In addition, bilingual programs vary widely in their curriculum and program design and evaluation studies typically do not describe the amount of instructional time in particular languages received by the participants (Francis et al., 2006; Willig, 1987). Gándara and colleagues (2000, as cited by Francis et al., 2006) found evidence of much variability within broadly defined program types, due in part to different interpretations of program models by individual school districts, as well as differences in teachers' beliefs regarding implementation and teachers' language skills.

Reviews advocating the implementation of SI programs over TBE programs have been publicized broadly (e.g., Baker & de Kanter, 1981; Rossell & Baker, 1996) and influenced public policy (Cummins, 2000; Willig, 1985). Baker and de Kanter (1981) reviewed 28 studies (out of 300 studies published between 1968 and 1980) determined to be methodologically acceptable and concluded that TBE programs should not be the exclusive method of instruction mandated by law. Rossell and Baker (1996) reviewed 72 program evaluations and concluded that TBE was not more effective than SI.

More recently, however, meta-analyses by Rolstad and colleagues (2005; see also Willig, 1985, and Greene, 1997) found positive effects on reading outcomes for children enrolled in various types of bilingual education programs, as did Slavin and Cheung (2005) and the National Literacy Panel Report (Francis et al., 2006). Rolstad and colleagues (2005) meta-analyzed 17 studies conducted after Willig's 1985 meta-analysis and reported a positive effect for bilingual education in English reading and math. They concluded that instruction conducted in children's native language and English was more effective than English only approaches, resulting in higher levels of academic achievement in English, as well as in the native language. When types of bilingual education programs were compared, Rolstad and colleagues (2005) noted an effect size of .18 for long-term TWB programs in comparison to an effect size of -.01 for short-term TBE programs. A best-evidence synthesis conducted by Slavin and Cheung (2005) found evidence favoring bilingual approaches for English reading instruction in Spanish dominant elementary school students, stating, "weighted by sample size, an effect of 0.33 was computed" (p. 247). Francis and colleagues (2006) examined 20 studies, including studies from previous meta-analyses and other studies conducted before 2004 and found small to moderate effect sizes for bilingual education in English reading outcomes.

Given the increase in the population of minority language speakers and ELLs, the persistent achievement gap between ELLs and their monolingual English peers in reading, as well as the continuing controversy over bilingual education, more research regarding bilingual language and literacy development is needed in order to inform efforts to select and develop the most effective educational practices and policies.

3. Research Questions

In light of the information provided above, a retrospective longitudinal study was conducted in order to (1) examine the relationship between first grade English literacy skills of Spanish-English speaking English Language Learners (SpELLs) and third grade performance on English reading outcome measures and (2) compare the third grade performance of SpELLs taught in a two-way bilingual program (TWB) versus SpELLs instructed in English immersion classes (EIM). First grade predictors included: English phonological awareness, fluency (including speed and accuracy of letter naming, segmentation of spoken words into phonemes, pseudo-word reading and text level oral reading fluency), knowledge of orthography, and word recognition. Third grade outcome variables included English text level oral reading fluency and reading comprehension. We hypothesized that, singly or in combination, early measures might serve as predictors of later performance on measures of L2 English reading skills, and that children in the TWB group would make equivalent or greater levels of progress than children in the EIM group.

4. Methods

4.1. Participants

Test scores from 53 bilingual Spanish-English speaking elementary school children were analyzed. Seventeen children participated in a two-way bilingual (TWB) Spanish-English program from grades 1-3 (mean age at G1: 6;8) while 36 participated in English immersion (EIM) regular education classrooms, also from grades 1-3 (mean age at G1: 6;8). Of the 17 children enrolled in the TWB program, 6 were girls and 11 were boys. Twenty girls and 16 boys were enrolled in the EIM group. Approximately 85% of children in the school qualified for free or reduced lunch during the years studied, and similar socioeconomic status was assumed for the participants. Due to the retrospective nature of this study, detailed information regarding individual children's proficiency in English versus Spanish was not available.

4.2. Subject Selection

The study occurred in an urban grade school in which 95% of the children were from homes in which Spanish was one language spoken. The principal of the school drew upon children's registration forms and personal knowledge of children's diagnoses and educational plans to identify participants

from Spanish speaking homes and exclude those who met standard exclusionary criteria (global cognitive delays, frank neurological damage, sensory impairments, primary emotional disturbance, gross environmental deprivation). Spanish-English speaking status was defined as primary home language listed as Spanish on school registration forms. In addition, test scores of two children whose primary home language was listed by parents on school registration forms as English were included, based on the principal's observations of the child's preference for and proficiency in speaking Spanish.

4.3. EIM and TWB Group Treatments

In part, this longitudinal retrospective study examines effects of receiving instruction in both English and Spanish, in a two-way bilingual (TWB) program, versus receiving instruction in English immersion classes (EIM). The information below was provided by school staff.

During the time that children were enrolled in grades 1-3, the Open Court Reading series, published by McGraw Hill/SRA, was utilized by classroom teachers in both the TWB and EIM programs. The Open Court Reading series involves a systematic, structured approach to literacy instruction in which all five components of reading identified as essential by the National Reading Panel (National Institute of Child Health and Human Development, 2000) are addressed: phonemic awareness, phonics, fluency, vocabulary and reading comprehension. In the EIM group, only the English text was used during language arts instruction. In the TWB group, English and Spanish Open Court texts (containing the same content) were used. Explicit instruction in writing was also provided.

Children enrolled in the school's TWB Spanish-English program alternated weekly between two teachers. One teacher instructed the children primarily in Spanish throughout the week and the other primarily in English. Teachers were usually native speakers of the language in which they offered instruction. For the majority of first grade, children received language arts instruction in their dominant language, as determined by teachers through formal and informal assessments. Therefore, the amount of literacy instruction provided in English ranged from 15% to 85%, depending upon the child's dominant language. Regardless of the language of instruction, TWB students participated in daily two-hour literacy blocks, including phonological awareness and phonics activities, use of decodable text books, read-aloud activities in which comprehension strategies were modeled and participation in a writing workshop. Additional time for independent reading and teacher-student conferences was set aside as well. Instruction in math, social studies, science and independent reading was provided in Spanish or English, depending upon the language of the week. Total first grade instructional time in English ranged from approximately 40% to 80%, depending upon the child's dominant language. In second and third grades, the children were instructed in the language of the week in all subjects, including language arts; approximately 50% of literacy instruction and 50% of overall instruction was provided in English.

In the EIM group, academic subjects (i.e., language arts, math, social studies, and science) were taught in English by classroom teachers in grades 1-3. All classes included a 90 minute uninterrupted literacy block. An additional 45 minutes of workshop time was also provided, during which students received individualized intervention or participated in small group instruction or independent reading activities. Teachers conducted reading conferences with students and students kept a reading log. In addition to the literacy block and workshop time, all students received writing instruction.

Class sizes for the TWB and EIM groups were comparable. Children in both groups attended one of five special classes conducted in English for approximately 40 minutes each day, including physical education, music, art, computer or an additional science class. Each September children in both groups identified as being "at risk" or "some risk" through DIBELS test scores (i.e., children with scores falling below the 20th percentile, or between the 20th and 40th percentiles) participated in individual or small group intervention sessions, conducted in English. September GRADE scores and information from the *Lexia Quick Reading Test* were also used in determining which children received intervention. Intervention classes were usually 40 minutes in duration, five times per week, with a reading teacher. The number of children participating in intervention whose test scores were included in this study was not available.

4.4. Measures

As first and third graders, children were administered subtests of the Diagnostic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) and the Group Reading Assessment and Diagnostic Evaluation (GRADE; Williams, Cassidy & Samuels, 2001). In grade 1, children were administered Level K, form A of the GRADE (with scores based on norms for first graders taking Level K). As third graders, children were administered the GRADE Level 3, form A (with scores based on norms for third graders taking level 3) and the Iowa Test of Basic Skills (ITBS; Hoover, Dunbar, & Frisbie, 2001) Form A, level 9. Spanish language data for the same subjects was not available at the time of this study.

This study focuses on L2 (English) early literacy skills and later English reading outcomes. Data were available regarding one measure of first grade receptive oral language skills, the GRADE Listening Comprehension subtest, administered in fall of 2004. However, this measure was not included in this study, as ceiling effects were observed. English measures included are listed in Table 1.

Table 1. *Description of English measures employed*

Underlying Constructs/Measures	Administered
<i>Grade 1</i>	
Phonological Awareness Composite	
GRADE Sound Matching (raw)	Fall 2004
GRADE Rhyming (raw)	Fall 2004
Fluency Composite	
DIBELS Letter Naming Fluency (NPR)	Fall 2004
DIBELS Phoneme Segmentation Fluency (NPR)	Fall 2004, Spring 2005
DIBELS Non-Word Fluency (NPR)	Fall 2004, Spring 2005
DIBELS Oral Reading Fluency (NPR)	Spring 2005
Knowledge of Orthography Composite	
GRADE Print Awareness (raw)	Fall 2004
GRADE Letter Recognition (raw)	Fall 2004
GRADE Same Word/Different Word (raw)	Fall 2004
Word Recognition	
GRADE Word Reading (raw)	Fall 2004
<i>Grade 3</i>	
Text Level Oral Reading Fluency	
DIBELS Oral Reading Fluency (NPR)	Fall 2006
Reading Comprehension	
ITBS Passage Comprehension (NPR)	Winter 2007

NPR: national percentile rank scores available; Raw: raw scores available

4.5. Procedures

A longitudinal retrospective analysis of standardized test scores collected by school staff between the fall of 2004 and the winter of 2007 was performed subsequent to receiving IRB approval and permission from the school district's superintendent. Because test scores were anonymous, subjects' parents were not asked individually for consent.

4.5.1. Statistical Analyses

Standardized test scores of children in both groups were analyzed with descriptive statistical measures. First grade variables included English phonological awareness, fluency (including speed and accuracy of letter naming, segmentation of spoken words into phonemes, pseudo-word reading and

text level oral decoding fluency),), knowledge of orthography, and word recognition. Third grade outcome variables included English text level oral reading fluency and reading comprehension. (See Table 1, above, for specific measures.) Correlations among first grade measures as predictors and third grade measures as outcomes were examined. Parallel correlational analyses were performed in order to compare results between groups. Parallel multiple regression analyses were then used to determine which individual predictors accounted for significant variance in outcome measures. T-tests were performed in order to examine differences in mean scores obtained by children enrolled in TWB classes versus those of children enrolled in EIM classes. A p-value of < 0.05 was considered a significant result in all analyses.

5. Results

5.1. Correlations among First and Third Grade Variables

Parallel correlational analyses were conducted in order to examine the strength of relationships between first grade English literacy skills and third grade reading outcome measures in each group. One-tailed tests were used in correlation analyses because previous research has established positive relationships between the predictors and outcome variables. Table 2 presents the Pearson product-moment correlations among first and third grade measures.

Table 2. *Correlations among first grade measures and third grade outcomes for participants in two-way bilingual (TWB; upper diagonal) and those in English immersion (EIM; lower diagonal).*

Variable	1	2	3	4	5	6
1. Phonological Awareness 1	—	.61**	.37	.20	.57**	.40
2. Fluency Composite 1	.54**	—	.51*	.46*	.77**	.55*
3. Knowledge of Orthography 1	.26	.45*	—	.38	.57**	.67**
4. Word Recognition 1	.32*	.43*	.37*	—	.44*	.48*
5. Text Level Oral Reading Fluency 3	.35*	.67**	.07	.21	—	.79**
6. Reading Comprehension 3	.53**	.57**	.25	.00	.59**	—

* $p < 0.05$ level (1-tailed)

** $p < 0.01$ level (1-tailed).

As shown in Table 2, first grade PA correlated significantly with third grade text level oral reading fluency in both groups. However, early PA correlated significantly with later reading comprehension only in the EIM group, while in the TWB group, trend level significance was observed ($r = .40$, $p = .06$). The first grade fluency composite correlated significantly with third grade text level oral reading fluency and reading comprehension outcome measures for both groups. First grade knowledge of orthography and word recognition correlated significantly with third grade text level oral reading fluency and reading comprehension in the TWB group, but not in the EIM group.

5.2. Multiple Regression Analyses

First grade measures that correlated significantly with third grade text level oral reading fluency and reading comprehension were included in multiple regression analyses in order to evaluate how well scores on first grade measures predicted third grade performance on reading outcome measures. (See Table 3.)

Table 3. *Summary of Regression Analyses on Third Grade Outcome Measures.*

Outcome Measure Predictor Variable	TWB			EIM		
	β	t	p	β	t	p
<i>Text Level Oral Reading Fluency</i>	53% of variance $F(4,12) = 5.56$ $p < .01$			45% of variance $F(2,33) = 13.6$ $p < .001$		
Phonological Awareness	.15	.70	.50	-.01	-.01	.93
Fluency Composite	.52	2.12	.06	.68	4.45	.000
Knowledge of Orthography	.21	1.06	.31	-	-	-
Word Recognition	.09	.45	.66	-	-	-
<i>Reading Comprehension</i>	54% of variance $F(3,13) = 5.0$ $p = .02$			40% of variance $F(2,32) = 10.66$ $p < .001$		
Phonological Awareness	-	-	-	.32	2.00	.05
Fluency Composite	.21	.9	.39	.40	2.649	.02
Knowledge of Orthography	.49	2.2	.05	-	-	-
Word Recognition	.20	.92	.38	-	-	-

Composite models were significant in accounting for variation in text level oral reading fluency and reading comprehension outcomes in both groups. However, the significance of individual predictors varied between groups.

Phonological awareness, fluency, knowledge of orthography and word recognition accounted for 45% of the variance in text level oral decoding fluency scores in the TWB group, $F(4,12) = 5.56$. Phonological awareness and fluency accounted for 53% of the variance in text level oral reading fluency scores in the EIM group, $F(2,33) = 13.6$. In the EIM group, a significant beta weight was observed only for the fluency composite ($\beta = .68$, $p = .00$), while trend level significance ($\beta = .52$, $p = .06$) was observed for fluency in the TWB group. No other individual predictor variables approached significance.

Fluency, knowledge of orthography and word recognition accounted for 54% of the variance in reading comprehension scores in the TWB group, $F(3,13) = 5.0$. Phonological awareness and fluency accounted for 40% of the variance in reading comprehension scores in the EIM group, $F(2,32) = 10.66$. Significant beta weights were observed for PA and fluency skills only in the EIM group ($\beta = .32$, $p = .05$; $\beta = .40$, $p = .02$) whereas a significant beta weight was observed for knowledge of orthography only in the TWB group ($\beta = .49$, $p = .05$).

5.3. Comparison of Mean Scores in the TWB vs. EIM groups

The second aim of this study was to compare the third grade performance of SpELLS taught in a two-way bilingual program (TWB) versus that of SpELLS instructed in English immersion classes (EIM).

Independent t-tests revealed no significant differences between groups' mean first grade scores. (See Table 4.)

Table 4. *Comparison of mean scores for first grade measures administered to participants in two-way bilingual group (TWB) and English immersion group (EIM).*

Variables	Maximum Possible	TWB, N=17	EIM, N=36	t
	Raw Score	Mean (SD)	Mean (SD)	
Phonological Awareness	26	20.88 (4.48)	19.78 (4.49)	.84
Fluency Composite (NPR*)	na	58.37 (21.34)	56.71 (17.07)	.31
Knowledge of Orthography	24	22.00 (2.45)	22.92 (1.32)	-1.78
Word Recognition	10	8.53 (1.94)	8.22 (1.59)	.61

*NPR: National Percentile Rank

While no significant differences between mean scores on third grade outcome measures were found, differences between groups' mean scores on third grade measures were larger than differences in mean scores on first grade measures. In addition, although not significant, mean scores for the TWB group third grade reading outcomes were higher in comparison to the EIM group. However, within group variations were large for both groups. (See Table 5.)

Table 5. *Comparison of mean scores for third grade measures administered to participants in two-way bilingual group (TWB) and English immersion group (EIM).*

Variables	TWB, N=17 Mean (SD)	EIM, N=36* Mean (SD)	t
Text Level Oral Reading Fluency	57.53 (24.47)	48.97 (25.60)	1.00
Reading Comprehension	63.59 (23.56)	52.54 (18.72)	1.83

* N=35 in EIM group for Passage Comprehension

Both scores are national percentile rank scores.

In addition, percentages of children falling in the above average range were higher for the TWB group than for the EIM group. This discrepancy was particularly notable for the measure of reading comprehension. (See Table 6.)

Table 6. *Comparison of number of children (and percentages of children) whose national percentile rank scores on outcome measures fell into below average, average and above average ranges.*

Variables	< 25 th below average	25 th -75 th average	75 th -100 th above average	missing values
Text Level Oral Reading Fluency				
TWB	2 (12%)	10 (59%)	5 (29%)	0
EIM	6 (17%)	23 (64%)	7 (19%)	0
Reading Comprehension				
TWB	0	9 (53%)	8 (47%)	0
EIM	2 (6%)	28 (80%)	5 (14%)	1

6. Discussion

The main purposes of this study were to (1) examine the relationship between Spanish-speaking English-Language Learners' (SpELLs) early literacy skills and later performance on English reading outcome measures and (2) to compare the performance of SpELLs instructed in a two-way bilingual program (TWB) with that of SpELLs instructed in regular education English immersion classes (EIM). Predictor variables included first grade phonological awareness, reading fluency skills (including speed and accuracy of letter naming, segmentation of spoken words into phonemes, pseudo-word reading and text level oral reading fluency), knowledge of orthography, and word recognition. Third grade outcome variables included English text level oral reading fluency and reading comprehension.

6.1. Early Predictors of Later Reading Skills

Early predictors of later reading skills were examined in each group (TWB vs. EIM). Although data from one measure of underlying language (GRADE Listening Comprehension subtest) were available for this retrospective analysis, results were not included in the study due to an observed ceiling effect. While the absence of semantic predictors (e.g., vocabulary knowledge, listening comprehension) may be considered a flaw by some, studies of beginning readers have shown a negligible correlation between underlying language comprehension and basic reading skills in decoding and decoding fluency stages of reading acquisition (e.g., Curtis, 1980; Nation & Snowling,

1998; Nation and Snowling, 1999). With such findings in mind, the present study focused on early phonological awareness, fluency, knowledge of orthography and word recognition skills as predictors of later reading performance. Specific findings regarding predictor variables and outcome measures for participants in the TWB vs. EIM groups are discussed below.

6.1.1. Text Level Oral Reading Fluency

As expected, first grade measures of English PA (i.e., the ability to match initial or final sounds in words and to recognize rhyming words) and fluency (i.e., speed and accuracy of letter naming, segmentation of spoken words into phonemes, pseudo-word reading and text level oral reading fluency) correlated significantly with third grade text level oral reading fluency outcome measures for both groups. This supports previous research findings regarding the relationship between early phonological awareness and fluency skills and later performance in reading connected text fluently (i.e., with accuracy and speed).

Although previous studies reviewed did not examine the relationship between knowledge of orthography and text level oral reading fluency, significant correlations among first grade knowledge of orthography and later text level oral reading fluency were anticipated in both groups, based on findings regarding the importance of orthographic processing in word reading performance in monolingual English readers (e.g., Badian, 2005). Similarly, significant correlations among first grade word recognition and third grade text level oral reading fluency were expected in both groups as well, based on previous research (e.g., Geva & Zadeh, 2006). However, first grade knowledge of orthography and word recognition correlated significantly with third grade text level oral reading fluency only in the TWB group.

One possible explanation for this is that Spanish and English share common morphological roots (e.g., edificio = edifice, psicología = psychology) that are orthographically and semantically similar but not identical. Movement between these orthographies may have stimulated students in the TWB program to attend more carefully to orthographic and semantic features of words. Thus, these children may have relied more heavily on orthographic processing and word recognition skills in comparison to peers in the EIM group.

Multiple regression analyses revealed early fluency skills as a significant predictor of later text-level oral reading fluency only in the EIM group ($\beta = .68, p = .00$). However, this variable reached trend level significance in the TWB group ($\beta = .52, p = .06$) and correlational analyses results suggest that a larger TWB group sample size may have shown fluency as a significant predictor of text level oral decoding fluency outcomes. Thus, early fluency may be considered as a potential indicator of later oral reading fluency skills for SpELLs.

6.1.2. Passage Comprehension

In line with previous research with beginning readers, a significant correlation among PA and reading comprehension was observed in the EIM group. In the TWB group, trend level significance ($r = .40, p = .06$) was observed. This suggests that with a larger sample size, a significant correlation may have emerged in the TWB group, as well. First grade performance on fluency tasks correlated significantly with third grade reading comprehension scores in both groups. Overall, correlation analyses suggest that early PA and fluency skills are potentially useful indicators of later reading comprehension in SpELLs.

Similar to findings regarding text level oral reading fluency, one unanticipated finding to emerge is that first grade knowledge of orthography and word recognition correlated significantly with reading comprehension for the TWB group, but not for the EIM group. Furthermore, multiple regression analysis identified knowledge of orthography as a significant predictor of reading comprehension in the TWB group whereas PA and fluency skills were significant predictors of reading comprehension in the EIM group. As discussed above, children in the TWB group may have been stimulated to attend to orthographic and semantic features of words more carefully, perhaps contributing to this difference between groups. In addition, although both groups received structured, explicit phonics instruction, students receiving instruction only in English may have relied more heavily on phonics based decoding

strategies. However, it is also possible that with a larger sample size, significant variance may have been captured by PA and fluency in the TWB group.

An examination of children's third grade passage comprehension scores offers insight regarding the strength of reading outcomes in these SpELLs. Only one of the 53 participants' scores fell in the below average range. Given that percentile ranks were developed from a normative sample consisting primarily of monolingual English speaking children, this result was not anticipated. Furthermore, children in the TWB group demonstrated particularly strong performance in reading comprehension. The majority of children in the EIM group scored in the average range (28 of 35 participants, or 80%), while 5 of the 35 (14%) scored in the above average range. In the TWB group 9 of the 17 children (53%) scored in the average range and the remaining 8 of the 17 children (47%) scored in the above average range. This achievement is striking considering the fact that these children were exposed to approximately half as much instruction in English.

6.2. Effectiveness of Two-Way Bilingual Education

We hypothesized that children in the TWB group would make equivalent or greater levels of progress in comparison to children in the EIM group. Consistent with the hypothesis, no significant differences between groups were evident in mean scores on measures of third grade English reading outcomes. In addition, regardless of group, the majority of learners demonstrated average or above average performance on third grade measures of text level oral reading fluency and passage comprehension. However, from the perspective of clinical and educational practitioners, it is especially noteworthy that performance on reading comprehension, arguably the ultimate goal of reading instruction, was particularly strong in the TWB group (as described above), despite their having received approximately half the amount of English instruction.

Given the gap between academic achievement of monolingual English speakers and that of ELLs apparent nationwide and the predominantly low socioeconomic status of children in the school in question, this large percentage of children scoring in the average and above average range was not anticipated. It is possible that the high scores of these SpELLs may be attributed in part to the fact that both groups were exposed to a systematic and balanced literacy curriculum, which provided a framework for instruction in all five components of reading identified as essential by the National Reading Panel (National Institute of Child Health and Human Development, 2000): phonemic awareness, phonics, fluency, vocabulary and comprehension, as well as explicit instruction in writing. This implies that areas of instruction identified as important for monolingual English-speaking children apply to ELLs as well and should be included in bilingual program curricula.

6.3. Future Research

Results should not be interpreted as suggesting all SpELLs would do equally well in a two-way bilingual program versus a regular education English immersion program. A greater number of rigorous research studies is necessary to learn more about the characteristics of children who benefit from such an approach, as well as the characteristics of their instructional and home environments. For example, investigation of oral language skills, home language use and literacy practices, individual differences in students' motivation or response to teachers' instructional style, background knowledge and effects of supplemental instruction was beyond the scope of this study and should be examined in future studies. Future studies should also include detailed information regarding children's bilingual status. The working definition of "bilingual" used in this study was necessarily imprecise.

Prospective longitudinal studies are needed in order to provide a more comprehensive model of growth in reading skills over time. The fact that this is a retrospective analysis rendered control over which measures were administered impossible. In addition, the current study was restricted to examination of longitudinal growth to two points in time: first grade and third grade.

The present study's small sample size necessitated the use of fewer predictor variables than may have been feasible with a larger sample. For example, DIBELS subtest scores were combined into one composite measure of fluency skills in order to reduce the number of predictor variables; however, this compromised our ability to differentiate between contributions of rapid naming (i.e., speed and

accuracy of letter naming), phonemic awareness fluency (i.e., segmentation of spoken words into phonemes), decoding automaticity (as measured by pseudo-word reading) and text level oral reading fluency as predictors of third grade outcomes. Power may not have been adequate to show effects that may in fact exist. Large scale longitudinal studies are needed.

7. Conclusion

Overall, early fluency skills stand out as an important predictor of later reading skills. A composite measure of early fluency skills (including speed and accuracy of letter naming, segmentation of spoken words into phonemes, pseudo-word reading and text level oral decoding fluency) correlated significantly with both text-level oral reading fluency and reading comprehension outcomes for both groups. When multiple regression analyses were conducted, significant beta weights were observed for fluency skills in both outcomes for the EIM group. Trend level significance was noted for early fluency skills in predicting oral text reading fluency outcomes in the TWB group. These findings suggest that monitoring students' fluency skills may provide insight to educators and clinicians regarding which students are most likely to struggle with reading and may need additional support in order to prevent future difficulties or lessen current struggles.

Results also suggest that a TWB program that offered systematic instruction in all five components of reading (i.e., phonemic awareness, phonics, fluency, vocabulary and comprehension), as well as writing skills, in both languages was effective for these SpELLs. In fact, participation in the TWB group may have benefited these SpELLs in terms of strong English reading comprehension and opportunity to develop proficiency in Spanish. Given the absence of available Spanish language performance data, consideration of proficiency with oral and written Spanish was beyond the scope of the present study. However, it is highly likely that the children in the TWB group would have exhibited stronger Spanish skills in comparison to children in the EIM group. Spanish is the second most commonly spoken language in the United States and is the language of the cultural community of SpELLs. This suggests that becoming literate in both Spanish and English will prove increasingly beneficial for these children; they may leave school with stronger, more marketable language skills. The fact that SpELLs' English performance was strong combined with the potential social and economic benefits of developing proficiency in two languages suggests that two-way bilingual programs such as the one described in this study should be considered a viable and effective program model for providing English literacy instruction.

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