

# Spanish Language and Literacy Intervention for Bilingual Children at Risk for Developmental Language Disorder

## A Pilot Study

**Christine E. Fiestas, Mirza J. Lugo-Neris, Amy S. Pratt, Elizabeth D. Peña, and Lisa M. Bedore**

This pilot study evaluates the feasibility of an integrated intervention titled *Language and Literacy Together* developed to target semantic and narrative skills in bilingual children at risk for developmental language disorder (DLD). Thirteen first-grade bilingual children who scored in the risk range for DLD on the Bilingual English Spanish Oral Screener received intervention. Children completed pretest and posttest evaluations of semantics and narrative comprehension and production in Spanish and English. Intervention participants demonstrated significant gains in both semantics and narrative skills, in both the language of the intervention (Spanish) and in English. The largest gains were observed for Spanish narrative comprehension and English narrative production. The Spanish *Language and Literacy Together* intervention appears a feasible approach for improving bilingual children's semantic skills and supporting generalization to narrative comprehension and production skills, which underpin literacy. Gains in both languages suggest evidence of cross-language transfer. **Key words:** *bilingual, developmental language disorder, dual language learners, intervention, language impairment, literacy, narrative, semantics, Spanish, vocabulary*

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**Author Affiliations:** College of Rehabilitative Sciences, University of St Augustine for Health Sciences, Austin, Texas (Dr Fiestas); Department of Speech, Language and Hearings Sciences, The University of Texas at Austin (Dr Lugo-Neris); College of Education, University of California, Irvine (Drs Pratt and Peña); and Department of Communication Sciences and Disorders, Temple University, Philadelphia, Pennsylvania (Dr Bedore).

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safe use of specific forms/tools from the book, *Bilingual English-Spanish Assessment (BESA)*, and the *Bilingual English Spanish Oral Screener (BESOS)*. This presentation will focus on forms/tools authored by Dr Peña and will not include information on other similar or related forms/tools.

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**Corresponding Author:** Christine E. Fiestas, PhD, College of Rehabilitative Sciences, University of St Augustine for Health Sciences, 5401 Lacrosse Ave, Austin, TX 78739 ([cfiestas@usa.edu](mailto:cfiestas@usa.edu)).

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**M**ODELS of skilled reading (e.g., the Simple View of Reading, Gough & Tunmer, 1986; the Lexical Quality Hypothesis, Perfetti, 2007) emphasize the role of oral language in children's reading ability. Oral language skills associated with meaning such as vocabulary knowledge and discourse processing (which includes narrative language skills) explain significant variability in reading comprehension (Catts et al., 2015). Conversely, deficits in meaning-based oral language skills are predictive of later reading difficulties (Catts et al., 2006). Children whose oral language deficits warrant a diagnosis of developmental language disorder (DLD) are roughly five times more likely to persistently struggle with reading than a child with typical language (Snowling et al., 2020).

Bilingual children face the additional challenge of learning to read in a language that often is unfamiliar to them. Years of data from the National Center for Educational Statistics (NCES, 2019) show that bilingual children who are classified as English language learners (ELLs, because they speak a language other than English at home and arrive at school with limited English proficiency) perform, on average, one standard deviation below monolingual peers on standardized assessments of reading. Bilingual children with DLD experience difficulty with meaning-based oral language skills in their first language as well as English (Sheng et al., 2012), which creates major barriers for comprehending what is read (Goodrich & Lonigan, 2017; Language and Reading Consortium; Mesa & Yeomans-Maldonado, 2019; Proctor et al., 2005, 2006). Interventions to improve bilinguals' meaning-based oral language skills could ameliorate these gaps, especially for bilinguals with language disorders. Intervention studies that feature adult-child shared book reading have been shown to facilitate development of oral language skills via embedded teaching strategies (see the study by Hur et al., 2020, for a review). With bilinguals, many of these shared book-reading interventions feature elements of evidence-based vocabulary instruction to support dual

language or first language instruction and intervention. Common methods include (a) targeting Tier 1 (basic) and Tier 2 (mature and frequent text-based vocabulary) words; (b) providing repeated practice with and multiple exposures to vocabulary targets in sentence and discourse contexts; (c) incorporating phonological cues to aid storage and retrieval of vocabulary; (d) expanding on word definitions in context; and (e) providing for metalinguistic analysis such as morphological or word study (e.g., Carlo et al., 2004; Cena et al., 2013; Cirino et al., 2009; Lugo-Neris et al., 2015; Restrepo et al., 2013). Intervention with a cognitive focus, such as mediated learning experiences (MLE), also has been successful in improving bilinguals' vocabulary (Peña & Quin, 1997). Mediated learning experiences intentionally focus the learner's attention in a meaningful way to the learning goal by providing examples, bridging understanding beyond the immediate context, and helping the child plan and use strategies for successful use of the target. In a study conducted by Peña et al. (2006), by focusing children's attention on story macrostructure and cohesive aspects of narration, children in the treatment group produced more and a greater variety of words in a narrative context following MLE. For bilingual children, when a narrative MLE protocol was delivered in either Spanish or English (Fiestas & Peña, 2018), children in both language treatment groups produced more and a greater variety of words and improved their narrative macrostructure more than did controls. Important to the notion of cross-linguistic transfer, children's meaning-based skills also increased in the language not targeted during intervention.

Bilingual intervention can be delivered either in one of the bilingual child's two languages or in both (e.g., Lugo-Neris et al., 2015; Spencer et al., 2019). Lugo-Neris et al. (2015) delivered interventions first in one language and then the other with one group Spanish first, the other English first. Children who presented with risk for DLD showed gains in expressive narrative skills in both

languages, in narrative comprehension in English, and in semantic performance in Spanish, regardless of the order of intervention. An adaptation of the *Story Champs* intervention (Spencer & Petersen, 2012) alternated language by day, including instruction on vocabulary and story scripts for preschool bilinguals in both English and Spanish. Children made gains in English narrative production and in vocabulary, with a large effect size in English ( $d = 0.98$ ) and a more modest effect size in Spanish ( $d = 0.34$ ; Spencer et al., 2019). Together, these studies highlight the importance of monitoring progress in both languages and suggest differential effects across languages, which may support notions of cross-linguistic transfer.

Cross-linguistic transfer can be defined as the ways that semantic knowledge in one language impacts knowledge of the other language. The present study tests the *Language and Literacy Together* (LLT) intervention, which was designed to support positive transfer by focusing on meaning as a source of connection across languages (see the study by Bedore et al., 2020, for further discussion). We focus on developing vocabulary in the language of intervention because in early bilingual development, lexical-grammatical associations are stronger within languages than across languages (Marchman et al., 2004). Deliberately strengthening meaning-based connections in the primary language of intervention provides a foundation for word-learning processes in one language to influence both (e.g., Pace et al., 2021). We also focus on the linguistic constructions in which words are used in the language of intervention as sentence structure is another source of connection across languages. When children have continued bilingual input (such as an intervention that makes deliberate connections across languages), associations between morphological knowledge, semantic knowledge, and discourse structure strengthen throughout the early school years (Lucero, 2015; Uccelli & Pérez, 2007). Such associations

can be explained using models of bilingual development such as the Unified Model (MacWhinney, 2005), where cross-language relationships in word meaning and sentence structure emerge from shared semantic representations. Moreover, efficient processing of word meaning appears to be central to cross-language transfer (Chung et al., 2019). Based on these findings, we hypothesize that building rich semantic networks and illustrating the use of vocabulary in sentence constructions will permit children who participate in intervention in one language to leverage their vocabulary knowledge and support new vocabulary growth in the other language.

Few studies have delivered a comprehensive oral language intervention solely in Spanish for bilinguals with risk for DLD. There is some evidence that a focus on the home or first language (L1) promotes oral language and discourse gains in Spanish for children with DLD (Bedore et al., 2020; Restrepo et al., 2010). However, these studies typically lack information about semantic depth (such as categorization, associations, functions, and descriptions) and comprehension outcomes, which have been shown to be particularly challenging for children with DLD. Furthermore, few of the extant studies measure functional progress across languages, so it is unclear how instruction in one language may impact skills in the other. Thus, with a small exploratory sample of Spanish-English bilingual first graders with risk for DLD, we explore the feasibility of the LLT intervention and pose the following research questions in this pilot study. First, what are the effects of the LLT intervention, adapted from the integrated curriculum targeting language and literacy, on these children's narrative comprehension and production skills in the language of intervention (Spanish) and are there effects in the nontreated language (English)? Second, what are the effects of the LLT intervention on children's vocabulary knowledge (breadth and depth) in the language of the intervention and are there effects in the nontreated language?

## METHOD

### Participants

Thirteen Spanish–English bilingual first graders ( $M = 6;8$  years,  $SD = 0;6$  years) from various elementary schools in central Texas participated in the current study. Participants were selected from a larger pool of 63 students because they scored in the “risk” range (at or below the 25th percentile) for DLD in both languages (with possible concomitant reading difficulties) based on their performance on the Bilingual English Spanish Oral Screener (BESOS; Peña et al., 2008), and they were receiving academic instruction in Spanish.

Table 1 describes participants’ demographic information, which included eight boys and five girls. Children’s bilingual status was determined through use of parent and teacher questionnaires. Based on results of the Bilingual Input Output Survey (Peña et al., 2018), all 13 participants were exposed to or used each language at least 10% of the time any given week. All participants were exposed to and used more Spanish than English, with an average Spanish input/output of 69.52%. Mother and father educational level was rated using the Hollingshead rating scale (Hollingshead, 1975). A score of 1 corresponds to less than seventh-grade education and a score of 7 corresponds to graduate or professional training. For this sample, average mothers’ education level was 1.75 on the Hollingshead scale (indicating that most mothers had attended junior high and/or par-

tial high school); average fathers’ educational level was 1.29 (indicating that most fathers had less than seventh-grade education and/or some junior high school education).

### Procedures

Children were invited to participate in the intervention study if their BESOS (Peña et al., 2008) standard scores were at or below the 25th percentile in semantics or morphosyntax in Spanish and English. The BESOS (semantics subtest) also was administered as a posttest measure in both languages. We also administered the Test of Narrative Language (TNL) in English (Gillam & Pearson, 2004) and Spanish (Gillam et al., n.d.), the Expressive One-Word Picture Vocabulary Test—Third Edition: Spanish–Bilingual Edition (EOWPVT-3: SBE; Brownell, 2001) in Spanish, and the Expressive One-Word Picture Vocabulary Test—Third Edition (EOWPVT-3, Brownell, 2000) in English at pretest and posttest. Only one language was tested during any single session and children were individually assessed over several sessions for pre- and posttesting. Bilingual examiners administered and scored all measures, and scores were verified by a bilingual research assistant.

Participants were seen in groups of one to five children three times a week for 8 weeks (24 sessions). Each session consisted of 30–35 min of oral language activities and 10–15 min of literacy activities from the *Intervenciones Tempranas de la Lectura* (Early Interventions in Reading, Science Research Associates, 2012) curriculum using the adaptation known as LLT. As this was a pilot

**Table 1.** Participant demographic information

	Range	<i>M</i>	<i>SD</i>
Age (years; months)	6;0–7;6	6;8	0;6
English exposure (% each week)	12–49	30.47	12.01
Spanish exposure (% each week)	51–88	69.53	12.01
Age of first English exposure (years)	0–7	3.08	2.66
Mothers’ education <sup>a</sup>	0–4	1.75	1.14
Sex	62% male		
Ethnicity	100% Latino		

<sup>a</sup>Based on Hollingshead rating scale. From “Four-Factor Index of Social Status,” by A. B. Hollingshead, 1975, *Yale Journal of Sociology*, 8, pp. 11–20.

study to examine feasibility and initial efficacy, no control group was included. The intervention was delivered in Spanish to parallel children's core reading instruction and support academic progress. Sessions were scheduled with teachers and were administered in environments determined by local campus administrators to be appropriate for tutoring or pullout supports. Because of scheduling constraints at one school, one student had to be seen individually. The first and second authors, who are bilingual and certified speech-language pathologists, delivered the intervention in Spanish. One interventionist, who delivered approximately 20% of the intervention sessions, is a native Spanish speaker from Puerto Rico. The interventionist who delivered 80% of the intervention sessions learned Spanish as a second language in Texas, has good Spanish proficiency, and has used Spanish in the home with a native speaker about 25% of a typical week for more than 10 years preceding the intervention.

### Measures

*Bilingual English Spanish Oral Screener* (Peña et al., 2008): The BESOS-1st grade is a language screener designed to identify

Spanish-English bilingual children at risk for DLD. The screener contains semantics and morphosyntax subtests. The semantics subtest taps definitions, item functions, semantic similarities and differences, semantic categories, and analogies. This subtest in English has 14 items and in Spanish includes 16 items. Scores are given in Table 2. The morphosyntax subtests contains 8 cloze and 10 sentence repetition items (18 items) in each language. Items are specific to each language and were developed to include targets difficult for children with DLD in each language. Scores are listed in the study by Bedore et al. (2020). Sensitivity and specificity measures of the screener using a composite of the higher semantics score in either language (Spanish vs. English) and the higher morphosyntax score yield a sensitivity of 93% and specificity of 92% using  $-1 SD$  below the mean as the cut-off score.

*Test of Narrative Language* (Gillam & Pearson, 2004; Gillam et al., n.d.): The Spanish TNL was developed to parallel the English TNL. This assessment includes story prompts for children to answer questions, retell stories, and tell analogous stories. As in the English TNL, there are three Story

**Table 2.** Means and standard deviations for pretest and posttest measures<sup>a</sup>

Measure	Pretest <i>M</i>	Pretest <i>SD</i>	Posttest <i>M</i>	Posttest <i>SD</i>
English				
TNL comprehension	3.18	2.04	4.45	2.62
TNL production	2.45	1.81	3.64	1.91
BESOS—semantics	67.87	8.31	77.17	14.35
EOWPVT	58.46	5.61	59.08	8.21
EOWPVT—raw score	21.62	11.06	25.08	14.74
Spanish				
TNL comprehension	6.36	2.50	9.45	1.92
TNL production	5.00	2.61	6.18	2.86
BESOS—semantics	78.20	10.53	98.61	14.29
EOWPVT	90.92	13.60	94.38	10.74
EOWPVT—raw score	42.85	8.10	46.38	5.71

*Note.* BESOS = Bilingual English Spanish Oral Screener; EOWPVT = Expressive One-Word Picture Vocabulary Test; TNL = Test of Narrative Language.

<sup>a</sup>TNL standard scores have a mean of 10 and standard deviation of 3; BESOS and EOWPVT standard scores have a mean of 100 and standard deviation of 15.

Comprehension and Oral Narration tasks. Coefficient alpha levels for the TNL–English average .76 for narrative comprehension and .87 for oral narration; preliminary internal consistency reliability data on the TNL–Spanish yield alpha levels of .89 for narrative comprehension and .93 for oral narration.

*Expressive One-Word Picture Vocabulary Test—Third Edition: Spanish–Bilingual Edition* (EOWPVT-3: SBE; Brownell, 2001) and *Expressive One-Word Picture Vocabulary Test—Third Edition* (EOWPVT-3, Brownell, 2000): Both are norm-referenced tests of single-word expressive vocabulary in which items are developmentally sequenced. The EOWPVT-3: SBE test was administered in Spanish and the EOWPVT-3 in English to obtain scores for each language. Starting points and ceiling rules were used to administer a subset of items. Coefficient alpha levels for the English version of the EOWPVT-3 range from .93 to .98, and .93 to .95 for the Spanish version.

### Intervention

*Language and Literacy Together* is a broad intervention developed for bilinguals at risk for DLD and reading difficulties. *Language and Literacy Together* targets both oral language and literacy components (Bedore et al., 2020; Peña et al., 2017). Supplemental Digital Content Appendix A, available at <http://links.lww.com/TLD/A76>, depicts a broad overview of LLT inputs, processes, outputs, and outcomes. *Language and Literacy Together* evolved from *Intervenciones Tempranas de la Lectura* or Early Interventions in Reading (Science Research Associates, 2012), an effective, evidence-based literacy curriculum for U.S. ELLs (Vaughn et al., 2006) delivered in Spanish. To simultaneously boost reading and language skills, LLT incorporates vocabulary comprehension and production at the single-word and text levels, as well as literacy activities. First-grade curriculum materials linked to the Texas Essential Knowledge and Skills were used to develop five thematic units, each incorporating an expository and a narrative text at or above the second-grade

reading level as a contextual basis for the 24 lessons. The vocabulary targets for LLT were selected from texts used in the thematic units and included Tier 1 and Tier 2 words (nouns, adjectives, and verbs). Of these targets, 33% were English and Spanish cognates to enhance comprehension and cross-language transfer. Supplemental Digital Content Appendix B, available at <http://links.lww.com/TLD/A77>, provides a list of the themes, books, text types, and vocabulary targets for Spanish LLT. Interventionists used scripts in Spanish to guide each intervention session. A typical LLT lesson included the following activities: (1) introduction and preview of target vocabulary using mediated teaching strategies; (2) a book preview; (3) book reading; (4) direct vocabulary instruction to promote depth of vocabulary knowledge; (5) narrative structure instruction, during which children identify story grammar components of the text read or participate in comprehension activities of both narrative and expository texts; and (6) a summary of the story and the target words introduced in that session. Next, we expand on the semantic and narrative components of the lessons directly relevant to the data presented in this article and their contribution to the pilot study design.

### Semantic instruction

Principles of effective vocabulary and narrative teaching were incorporated into the intervention. To support cross-language transfer, strategies focusing attention on language learning and meaning were employed (Bedore et al., 2020; Lugo-Neris et al., 2015) as well as the use of cognates. Effective strategies included applying components of MLE; shared book reading; targeting Tier 1 and Tier 2 vocabulary; providing multiple exposures to and production practice with vocabulary targets at the single-word, phrase, and discourse levels; use of phonological cues and orthographic cues; discovering meaning and producing definitions; and providing metalinguistic analysis (Beck & McKeown, 2007; Carlo et al., 2004; Cena et al., 2013; Hur et al.,

2020; Lugo-Neris et al., 2015; Munro et al., 2008; Peña et al., 2006; Restrepo et al., 2013). These components were designed to support deeper processing of word meanings and retention of vocabulary.

Vocabulary targets also were used for practicing decoding and text fluency skills in the literacy portion of the lesson. Children received printed cards with three to six vocabulary words per lesson, which also were produced verbally. In addition, they identified these words when select parts of the text were read, read select sentences including the vocabulary targets, viewed a picture used to represent each word, and used the words to describe pictures from the texts. Children actively discovered word meaning using contextual and morphosyntactic cues from the book, heard definitions, mapped the word to the part of speech using visual aids, and were exposed to the word multiple times over the course of the lesson where meaning was reinforced using the discourse structure. A visual aid was used in the form of a “Vocabulary Monster,” a picture of an angry monster on top of a building. The visual evoked word functions (label a person/thing, place, action, time and descriptive attribute—monster, city, attacking, daytime, green) and then was used to assist children in mapping new words to their functions. Finally, children reviewed the words at the end of the lesson and provided definitions for the words. Children had opportunities to hear and produce the words during story retells and recaps, underscoring the importance of the integrated components of the intervention. Thus, building semantic depth and breadth was supported not only through the explicit vocabulary activities listed previously but also by the wholistic nature of LLT.

### ***Narrative instruction***

Narrative intervention was embedded throughout the storybook reading as well as targeted through direct activities. Targets and teaching strategies with demonstrated effectiveness (Peña et al., 2006) were implemented using mediated learning techniques.

Targets included identifying and including the following elements in narratives: setting, character information, temporal order, causal relationships, complexity of ideas, vocabulary and grammar, and episode structure. Story grammar icons were provided to introduce story components and support story retells. On average, one to two story grammar components were targeted per lesson. To support comprehension, a book walk and charts were used to make predictions, activate prior knowledge, and identify what children already knew, wanted to know, and had learned (called KWL) about the concepts presented in both the narrative and the expository texts.

### **Treatment fidelity**

A checklist was used to assess treatment fidelity and included provision of the following elements: optimal positioning of children, instructional pacing, scaffolding, individual practice, sustaining participants’ attention, eliciting active participation, use of mediated learning strategies, and adherence to session script to include session activities (e.g., introduction, book preview, book reading, vocabulary activity, grammar activity, narrative structure instruction, literacy activity). Videotapes of 20% of the sessions were coded by trained Spanish-English bilingual undergraduate research assistants and demonstrated 95% fidelity of implementation.

## **RESULTS**

### **RQ 1: Effect of intervention on narratives**

Our first research question sought to understand the effect of the LLT intervention on children’s narrative comprehension and production. Pre- and posttest raw scores on the TNL in English and Spanish were converted to scaled scores (mean of 10 and standard deviation of 3) based on child’s age. Table 2 lists the means and standard deviations for children’s TNL results in both languages. At pretest, children’s average scores were significantly below the mean in both.

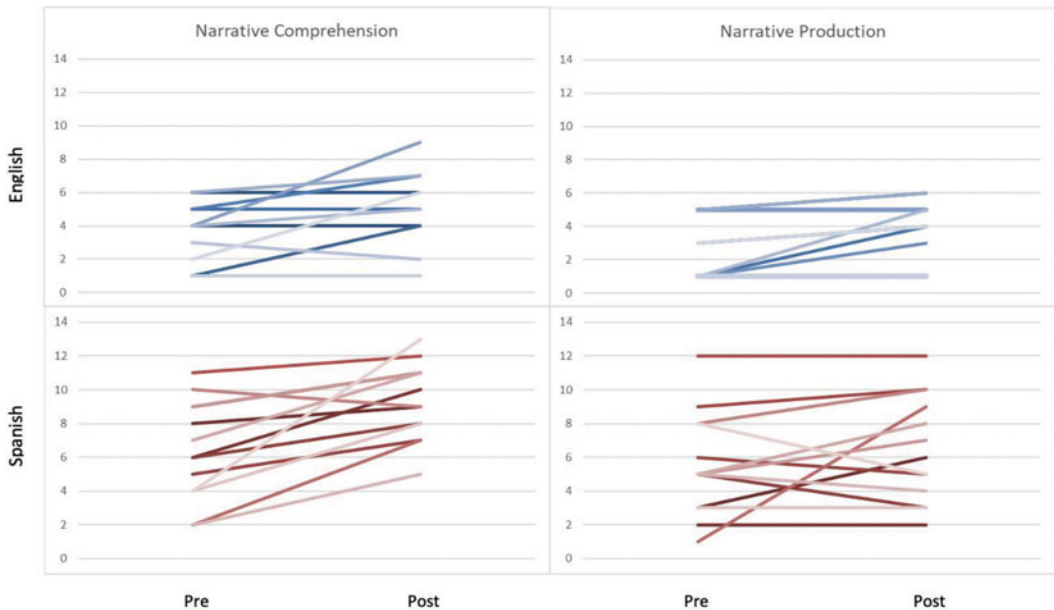
To assess pretest to posttest gains, we conducted a repeated-measures analysis of variance (ANOVA) with time (pretest and posttest), mode (comprehension and production), and language (English and Spanish) as the within-subjects variables. There was a significant main effect for time ( $F_{1,12} = 28.26, p < .001$ ) with a large effect size,  $\eta_p^2 = .739$ . Children scored significantly higher at posttest ( $M = 5.93$ ) than at pretest ( $M = 4.25$ ), indicating general gains in narrative language ability over the 8-week (plus posttest administration time) course of the intervention.

There also was a significant main effect for language ( $F_{1,12} = 42.11, p < .001$ ) with a large effect size,  $\eta_p^2 = .808$ . Children scored higher on Spanish narratives ( $M = 6.75$ ) than on English ( $M = 3.43$ ). This aligns with previous work (e.g., Fiestas & Peña, 2018; Spencer et al., 2019) where narrative language skills of ELLs in early grades are stronger in L1 (Spanish).

Also in line with prior research of bilingual narrative development (Gibson et al., 2018), children performed significantly better

on narrative comprehension ( $M = 6.17$ ) than on narrative production ( $M = 4.46$ ); thus, the main effect for mode was significant ( $F_{1,12} = 21.27, p < .001$ ) with a large effect size,  $\eta_p^2 = .680$ . There also was a significant language-by-mode interaction ( $F_{1,12} = 5.81, p = .037, \eta_p^2 = .367$ ). Between-language differences were greater for comprehension (Spanish  $M = 6.36$ , English  $M = 3.18$ ) than for production (Spanish  $M = 5.00$ ; English  $M = 2.45$ ). Figure 1 shows narrative comprehension and production scores.

Finally, we evaluated a time-by-language interaction to assess whether gains were observed only in the language of the intervention (Spanish) or whether children made gains in English, as well. Figure 1 shows children's narrative scores at pretest and posttest. The time-by-language interaction was not significant ( $F_{1,12} = 2.37, p = .155$ ), indicating that similar gains were observed across Spanish and English. This is suggestive of possible cross-linguistic transfer of narrative language skills from Spanish to English. Results replicate previous work (Fiestas & Peña, 2018) in which children demonstrated transfer of



**Figure 1.** Pre- and posttest scores on narrative comprehension and production in English and Spanish. This figure is available in color online ([www.topicsinlanguage disorders.com](http://www.topicsinlanguage disorders.com)).



narrative skills to the nontargeted language following MLE in either Spanish or English. A summary of these (and those discussed later) main effects and interaction effects is shown in Table 3.

## RQ2: Effect of intervention on vocabulary breadth and depth

### Vocabulary breadth

We also evaluated the effect of LLT on vocabulary breadth and depth. To evaluate gains in breadth, we conducted a repeated-measures ANOVA using the EOWPVT. Time (pretest and posttest) and language (English and Spanish) were the within-subjects factors. Table 2 shows participants' English and Spanish EOWPVT scores at pretest and posttest. There was a significant and large effect for language ( $F_{1,12} = 130.97, p < .001, \eta_p^2 = .916$ ). Children scored significantly higher in Spanish ( $M = 92.65$ ) than in English ( $M = 58.77$ ). We found no effect for time ( $F_{1,12} = 1.91, p = .192, \eta_p^2 = .137$ ) and no language-by-time interaction ( $F_{1,12} = .74, p = .406, \eta_p^2 = .058$ ), indicating that children did not make significant gains in expressive vocabulary.

Although there was no significant pretest-posttest change on the EOWPVT standard score, we noted that 10 of the 13 children had a standard score of 55 at both pretest and posttest in English. This is the lowest possible

standard score on the EOWPVT, representing a range of possible raw scores. Thus, we reran the analysis to determine whether there were possible gains in the raw number of words. A separate repeated-measures ANOVA was conducted using raw scores, with time and language as the within-subjects factors. Results using raw scores indicated a main effect for language ( $F_{1,12} = 53.64, p < .001, \eta_p^2 = .817$ ). Consistent with the standard score results, children performed better in Spanish ( $M = 44.62$ ) than in English ( $M = 23.35$ ). In addition, there also was a main effect for time ( $F_{1,12} = 18.03, p < .01, \eta_p^2 = .600$ ). Children scored higher at posttest ( $M$  gain = 3.50) than at pretest. The language-by-time interaction was not significant ( $F_{1,12} = 0.01, p = .981, \eta_p^2 = .001$ ), indicating that the minimal gains observed were not different across English and Spanish.

### Vocabulary depth

Finally, we examined changes in vocabulary depth (semantic knowledge) using the BESOS semantics subtest. As mentioned previously, we conducted a repeated-measures ANOVA with time and language as the within-subjects factors. Results indicated significant and large main effects for time ( $F_{1,14} = 44.96, p < .001, \eta_p^2 = .763$ ) and language ( $F_{1,12} = 34.63, p < .001, \eta_p^2 = .743$ ). Children scored higher at posttest ( $M = 87.90$ ) than at pretest ( $M = 73.04$ ) and in Spanish ( $M = 88.41$ ) than in English

**Table 3.** Summary of language and time effects

Measure	Language	$\eta_p^2$	Time	$\eta_p^2$	Mode	$\eta_p^2$	Interaction	$\eta_p^2$
TNL	S > E	.808	Post > Pre	.739	Comp > Prod	.689	Language × Domain	.367
BESOS— Semantics	S > E	.739	Post > Pre	.743	NA	-	Language × Time	.486
EOWPVT— standard score	S > E	.916	Post = Pre	.137	NA	-	NS	-
EOWPVT—raw score	S > E	.817	Post > Pre	.600	NA	-	NS	-

*Note.* BESOS = Bilingual English Spanish Oral Screener; EOWPVT = Expressive One-Word Picture Vocabulary Test; NA = not applicable; NS = not significant; TNL = Test of Narrative Language.

( $M = 72.53$ ). There was a significant and moderate time-by-language interaction ( $F_{1,12} = 11.37, p = .006, \eta_p^2 = .486$ ). Children demonstrated greater gains in Spanish (pretest  $M = 78.20$ ; posttest  $M = 98.61$ ) than in English (pretest  $M = 67.88$ ; posttest  $M = 77.18$ ). Figure 2 shows semantic scores from the BESOS and EOWPVT-3.

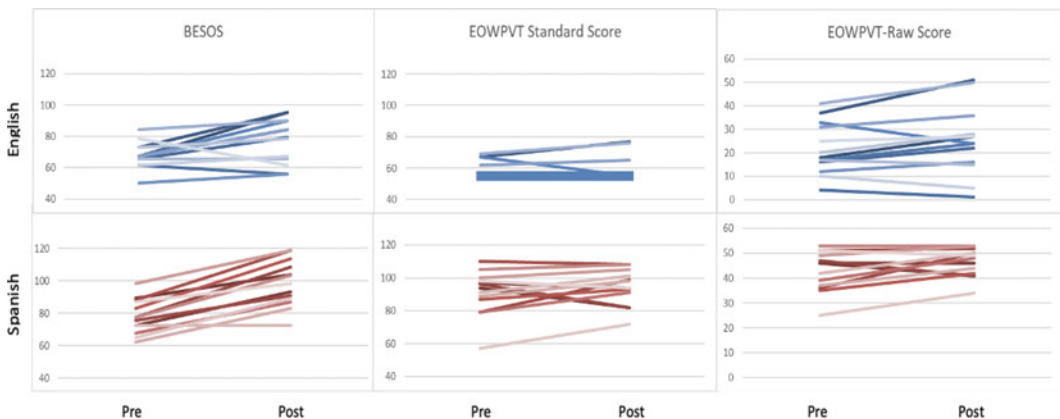
Recall that children were recruited to the intervention if they scored at or below the 25th percentile on the BESOS semantics and/or morphosyntax screener in both their languages. We wanted to know whether children changed risk status on the BESOS semantics subtest following the intervention. At pretest, 12 of the 13 children scored below the 25th percentile on BESOS semantics in both languages. At posttest, only 2 of the 13 children scored below the 25th percentile in both languages; 11 children scored within normal limits in their better language. We used the McNemar  $\chi^2$  test to determine whether these differences in classification were significant. Results indicated significant change in risk status from pretest to posttest,  $\chi^2(1, N = 12) = 8.1, p = .004$ .

## DISCUSSION AND CONCLUSIONS

The current pilot study explored the feasibility of implementing a comprehensive

oral language and literacy intervention in the child's L1 (and language of reading instruction) and its effectiveness in promoting overall growth as well as facilitating between-language transfer for bilingual first graders. However, the intervention results were not matched to a control group, included a small number of participants, and measured only posttest outcomes 1 week following the intervention, which does not illuminate long-term response to the intervention. Nonetheless, our preliminary findings provide useful information to guide future studies.

In general, children demonstrated greater gains in Spanish, the language of intervention, specifically in narrative comprehension, production, and semantic breadth and depth. Although Spanish was the children's first and stronger language, our findings demonstrate that children were able to leverage knowledge of narrative structure and semantics based on several key aspects of LLT over a relatively brief time period. As shown in Supplemental Digital Content Appendix A, available at <http://links.lww.com/TLD/A76>, there is consistent reinforcement of the connections between narrative and semantic knowledge across the sessions. Supplemental Digital Content Appendix B, available at <http://links.lww.com/TLD/A77>, highlights that the semantic targets presented were of



**Figure 2.** Pre- and posttest scores on measures of vocabulary depth and breadth. BESOS = Bilingual English Spanish Oral Screener; EOWPVT = Expressive One-Word Picture Vocabulary Test. This figure is available in color online ([www.topicsinlanguage disorders.com](http://www.topicsinlanguage disorders.com)).

potentially high interest and linked across sessions, allowing children to establish a rich semantic network, and this appears to be reflected in children's improved BESOS scores.

Our findings also highlight the importance of monitoring outcomes in the untreated language. Over a short 8-week period, participants made statistically significant pre/post gains in English on all outcome measures (except EOWPVT-3 standard scores), which supports the notion of cross-linguistic transfer for structural-level knowledge captured in narrative performance as well as semantics. *Language and Literacy Together* focused on both teaching word meanings and strategies for connecting meaning and structure, which may have facilitated cross-language transfer in these areas. Future studies should focus on including a control group and more participants to disambiguate the effects of the intervention from other factors to help illustrate patterns of growth in narrative and semantics that support growth across two languages.

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