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Predictors of Second Language Acquisition in Latino Children With Specific Language Impairment

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Abstract

Purpose—This study evaluated the extent to which the language of intervention, the child’s development in Spanish, and the effects of English vocabulary, use, proficiency, and exposure predict differences in the rates of acquisition of English in Latino children with specific language impairment (SLI).

Method—In this randomized controlled trial, 188 Latino preschoolers with SLI participated in a small-group academic enrichment program for 12 weeks and were followed up 3 and 5 months later. Children were randomly assigned to either a bilingual or an English-only program. Predictors of English growth included measures of Spanish language skills and English vocabulary, use, proficiency, and exposure. Performance on English outcomes (i.e., picture description and narrative sample) was assessed over time. A series of longitudinal models were tested via multilevel modeling with baseline and posttreatment measures nested within child.

Results—Children demonstrated growth on the English outcomes over time. The language of intervention, Spanish skills, English vocabulary, and English use significantly predicted differences in rates of growth across children for specific measures of English development.

Conclusions—This study underscores the role of the child’s first language skills, the child’s level of English vocabulary development, and level of English use for predicting differences in English acquisition in Latino preschoolers with SLI. These factors should be carefully considered in making clinical decisions.

Keywords

specific language impairment; English language learners; language development

Predictors of Second Language Acquisition in Latino Children With Specific Language Impairment

Researchers examining the language acquisition patterns of children with specific language impairment (SLI) have primarily focused on the developmental trajectories of monolingual children (e.g., Rice, 2003; Rice & Wexler, 1996; Rice, Wexler, & Hershberger, 1998; Tomblin et al., 1997). There is limited research examining the language development of bilingual children with SLI (Bedore & Leonard, 2001, 2005; Bedore & Peña, 2008; Gutiérrez-Clellen & Simon-Cereijido, 2010; Gutiérrez-Clellen, Simon-Cereijido, & Wagner,

2008; Jacobson & Schwartz, 2005; Simon-Cerejido & Gutiérrez-Clellen, 2009). These children may demonstrate different developmental trajectories in each language depending on a variety of factors unique to the process of acquiring two languages in a given sociolinguistic context. For example, children who do not receive sufficient stimulation in the first language (e.g., Spanish) may not show the same patterns of growth of Spanish monolinguals. These Spanish speakers may show gender errors and subjunctive mood errors that are less frequent in the speech of monolinguals (Anderson, 1999, 2001; Montrul, 2004). In addition, in previous research with Latino children with SLI, we found that children who spoke more English as a second language in the classroom showed a relatively slower rate of growth in Spanish as their first language (Simon-Cerejido, Gutiérrez-Clellen, & Sweet, in press).

The English developmental trajectories of Latino English language learners (ELLs) are also likely to differ from those of English monolinguals. ELLs are children who are in the process of acquiring English as a second language. The large majority of Latino ELLs begin to learn English when they enter preschool. For these children, growth in English may be related to individual differences in the development of their Spanish language skills as well as the child's current level of English proficiency (i.e., how well the child speaks English), exposure (i.e., how much input the child receives in English), or use (i.e., how frequently the child uses English). The purpose of this study was to evaluate the factors that may help predict differences in rates of growth of English in Latino ELL children with SLI. Examining these questions with this population is critically needed because Latino children are the vast majority of ELLs among preschoolers in the public schools (T. Smith, Kleiner, Parsad, & Farris, 2003) and in Head Start programs (Collins & Ribeiro, 2004; Garcia & Jensen, 2009), and there is limited research on their language development that can be applied to clinical practice.

In the next sections, we first discuss the potential effect of the language of intervention as well as individual differences in first language (i.e., Spanish) development. Then, we focus on the role of the child's English use, proficiency, and exposure as factors that may contribute to different rates of growth in the acquisition of English.

Language of Intervention

Examining the effect of the language of intervention is considered important for practical and theoretical reasons. If the language of intervention (i.e., bilingual or English-only) predicts differences in rates of acquisition, clinicians may be able to consider these associations when they select a language for intervention. Theoretically, it is of interest to investigate whether children with SLI who are in the initial stages of learning a second language acquire conceptual knowledge through the first language. Within Kroll and Stewart's Revised Hierarchical Model (Kroll & Stewart, 1994; Kroll, Van Hell, Tokowicz, & Green, 2010), conceptual knowledge is mediated initially by the first language, and one may predict that preschool Latino children who are just beginning to learn English will benefit more from a bilingual intervention because, at this stage of their development, they will be mapping a second language onto their first language. Alternatively, it is also possible that children can learn directly in their second language without mediation from the first language. In this case, one may find that the language of intervention does not have a differential effect on the rate of growth of the second language. Yet, not all children may respond in the same manner to interventions delivered in a second language. For example, the language of intervention may have a different effect depending on the child's initial level of English development. Peña and Kester (2004) speculated that as children become more proficient in their second language, mediation in the first language may not be necessary. Children may need a minimum level of English proficiency to benefit from an intervention

delivered in the second language. However, the specific minimum level of English proficiency is still unknown.

There is limited research examining the effect of the language of intervention in children with SLI. The majority of the studies addressing this issue are based on children with typical language development. This literature tends to be broad and focused on the reading outcomes of school-age ELLs. A recent synthesis of research focused on the English reading outcomes of Spanish-speaking children found positive effects for the bilingual programs (nine out of 13 studies) or no differences between bilingual and English-only programs (four out of 13 studies; Slavin&Cheung, 2005). When comparing the language and reading performance of children in bilingual versus English-only programs, bilingual programs have yielded positive effect sizes between 0.20 and 0.23 (Greene, 1998; Rolstad, Mahoney, & Glass, 2005; Willig, 1985) and a small but significant advantage of bilingual programs (Francis, Lesaux, & August, 2006).

The available studies investigating the role of the language of instruction in preschool children also suggest a positive effect for bilingual compared to English-only approaches. Campos (1995) followed a group of Spanish-speaking children who attended either a bilingual or English-only program retrospectively. In kindergarten, the children who attended the bilingual preschool had higher scores in reading and language measures than their peers in the English-only program; by fifth grade, a significantly larger percentage of children in the bilingual program reached English proficiency. In a randomized trial study, 94 Spanish-speaking preschool children were randomly assigned to three groups: (a) a control or “business-as-usual” group, (b) an English-only group, and (c) a bilingual group who received intervention in Spanish for 9 weeks followed by English for 12 weeks (Farver, Lonigan, & Eppe, 2009). Children’s English vocabulary growth was measured with the Receptive and Definitional Vocabulary subtests of the Preschool Comprehensive Test of Phonological & Print Processing (Lonigan, Wagner, Torgesen, & Rashotte, 2002). Both intervention groups showed greater growth for Receptive and Definitional Vocabulary than the control group. However, the bilingual condition led to significantly greater gains on Definitional Vocabulary than the English-only group, even after controlling for initial level of English ability (Farver et al., 2009).

There is no evidence that the use of a bilingual approach leads to a slower learning rate of English. In a recent study, a total of 147 ELL preschoolers and other children were randomly assigned to either bilingual (two-way immersion or dual language program) or English-only preschool programs (Barnett, Yarosz, Thomas, Jung, & Blanco, 2007). Fifty-seven percent of the children spoke primarily Spanish, 37% spoke primarily English, and 5% had another first language. To measure growth, children’s English vocabulary was assessed using the Peabody Picture Vocabulary Test—III (PPVT—III; Dunn & Dunn, 1997) and the Picture Vocabulary subtest of the Woodcock–Johnson Tests of Cognitive Ability—Revised (Woodcock & Johnson, 1989) in the fall and in the spring. Regression analysis and hierarchical linear modeling did not reveal significant differences between the two program conditions. Children in the bilingual program had English vocabulary gains comparable to the gains of children in the English-only program, although they received less input in English. In another study, 31 Spanish-speaking preschoolers attending Head Start centers were randomly assigned to a two-way immersion or an English-only program and followed up from fall to spring (Duran, Roseth, & Hoffman, 2010). The language of instruction was the only variable distinguishing these two programs, as evidenced by treatment fidelity evaluations and results from the Early Language and Literacy Classroom Observation Tool (M. W. Smith, Dickinson, Sangeorge, & Anastasopoulos, 2002). English outcomes were evaluated using the Peabody Picture Vocabulary Test—Fourth Edition (Dunn & Dunn, 2007), the Woodcock–Muñoz Language Survey—Revised (Woodcock, Muñoz-Sandoval,

Ruef, & Alvarado, 2005), and the Early Literacy Individual Growth and Development Indicators (McConnell, Priest, Davis, & McEvoy, 2002). Linear mixed-model analyses revealed comparable growth across both programs, indicating that the Spanish instruction (and reduced English input) did not slow English development (Duran et al., 2010).

There is a scarcity of research assessing the effect of the language of instruction in children with language impairments. The few available studies suggest that a bilingual approach may lead to faster language acquisition than an English-only approach to instruction with these children (Bruck, 1982; Perozzi & Sanchez, 1992). A bilingual approach was found to be important to facilitate positive outcomes in the first language (Restrepo, 2003; Simon-Cereijido et al., in press). However, to our knowledge, there are no published studies that have directly examined the effect of the language of intervention on the rate of growth of English as a second language.

Individual Differences in the Development of the First Language

In addition to the potential role of the language of intervention, ELLs with SLI may show English growth differences depending on developmental differences in the first language. The fact that bilingual children do not take twice as long to learn the grammar of a second language suggests that there is interdependence between the languages. Having learned a basic infrastructure of a lexicon and grammar in the first language may help bootstrap the learning of a second language in children with minimal English experience (Paradis, 2010). If so, the child's first language skills may need to be considered in predicting outcomes in the second language. In a study of 49 Spanish-speaking preschoolers, the children's Spanish skills at preschool entry were found to significantly correlate with English outcome measures 9 months later (Castilla, Restrepo, & Perez-Leroux, 2009). Specifically, a Spanish cloze test at baseline was significantly correlated with an equivalent English measure at posttesting ($r = .74, p < .001$), and a Spanish sentence repetition task was significantly correlated with its English counterpart ($r = .59, p < .001$). The Spanish cloze test at baseline accounted for 55% of the variance of the English cloze test at posttest, and the Spanish sentence repetition accounted for 44% of the variance of the English measure (Castilla et al., 2009).

It is important to note, however, that oral language skills may not show consistent cross-linguistic associations. Oral language measures may not be equivalent at different age or grade levels as children switch language dominance or preference. A study with 704 Spanish-English bilingual children attending kindergarten, second grade, and fifth grade that used the English PPVT-III and subtests of the Woodcock Language Proficiency Battery—Revised: Spanish Form (Woodcock & Muñoz-Sandoval, 1995) found no significant correlation between Spanish and English tests (Cobo-Lewis, Eilers, Pearson, & Umbel, 2002). Yet, in a study of 344 Latino preschoolers who participated in the Early Childhood Study of Language and Literacy Development, results for the English and Spanish subtest of Memory for Sentences of the Woodcock Language Proficiency Battery—Revised (Woodcock & Muñoz-Sandoval, 1995) revealed a positive correlation between English and Spanish ($r = .252, p < .001$) at the entrance of prekindergarten Head Start programs (Tabors, Paez, & Lopez, 2003). English and Spanish Picture Vocabulary scores obtained with the same battery were negatively correlated ($r = -.284, p < .001$). Negative correlations between English and Spanish Picture Vocabulary scores on the Woodcock–Muñoz Language Survey—Revised (Woodcock et al., 2005; $r = -.42, p < .05$) were also reported in a separate study (Duran et al., 2010). Expressive vocabulary measured by the Picture Naming subtest of the Early Literacy Individual Growth and Development Indicators (McConnell et al., 2002) also resulted in a negative correlation across languages ($r = -.47, p < .05$). The negative correlations observed for vocabulary may be the result of children's diverse experiences learning context-specific vocabulary.

All in all, the effect of the child's first language skills on the acquisition of the second language has been primarily studied with ELL children with typical language development. It is unclear how the two languages might interact in children with SLI. In the next sections, we briefly summarize the potential role of the child's English vocabulary as well as the child's English use, English proficiency, and English exposure in predicting rates of growth differences in English as a second language.

Level of English Vocabulary, English Use, English Proficiency, and English Exposure

The available literature suggests that the child's level of vocabulary development in English, extent of use of the language, level of proficiency, and level of exposure to English may also help predict growth differences in the acquisition of English as a second language in children with SLI. We hypothesized that children might show different English growth curves depending on the child's baseline English vocabulary, the child's proficiency and use of English, and the child's exposure to English in the classroom.

Within children with typical language development, initial grammatical skills in a language are predicted by the child's vocabulary development in that language (e.g., Bates & Goodman, 1997; see Simon-Cerejido & Gutiérrez-Clellen, 2009, for a review). Our research with Latino children found positive correlations between number of different words (NDW) and mean length of utterance in words (MLU_w) as well as between number of different verbs (NDV) and MLU_w in typically developing speakers of Spanish and English. Both NDW and NDV positively correlated with the use of ditransitive verbs (i.e., verbs accompanied by both a direct and indirect object) in each language. We found similar relationships in the English samples of children with language delays (40 children). For these children, English NDW was significantly correlated with English MLU_w ($r = .59, p < .001$; Simon-Cerejido & Gutiérrez-Clellen, 2009).

Children's vocabulary development in the second language may be an important factor to consider when assessing grammatical growth in that language. A study with 92 Latino children with typical language development found that their receptive vocabulary measured by PPVT-III scores correlated with an experimental measure of grammar targeting plurals, noun-verb agreement, verb tense, and adjectives in English (PPVT-III and English grammar: $r = .67, p = .001$; Gottardo, 2002).

The child's level of English use and English proficiency as well as the child's level of exposure to the language may also have an effect on the rate of acquisition of English. For example, Oller and Eilers (2002) found that Latino children with typical language development who used English at home had either equal or higher English abilities than their peers who did not use English at home in kindergarten and second grade. This effect, however, disappeared by fifth grade. Recent research has shown that the level of exposure to English at home has a direct impact on the child's vocabulary development in English. Preschool children with no English exposure at home had lower English vocabulary scores than their peers with exposure to the two languages. This difference did not disappear after 2 years in Head Start (Hammer, Lawrence, & Miccio, 2008).

The level of exposure to English in the classroom may also contribute to differences in the acquisition rates of English. Early studies report positive correlations between the amount of English used in the classroom by teachers and peers and the child's mean length of utterance (MLU) in English (Chesterfield & Chesterfield, 1985; Chesterfield, Hayes-Latimer, Chesterfield, & Chávez, 1983). However, a large study of 345 Spanish-speaking preschoolers with typical language development who participated in the National Center for Early Development and Learning's Multi-State Study and the State-Wide Early Education Programs Study indicated that the amount of English spoken in the classroom was not

related to children's English vocabulary (Chang et al., 2007). Similarly, a cross-sectional study of Latino school-age children with typical language development found that the amount of exposure to English at school did not correlate with the children's production of grammatically correct utterances (Gutiérrez-Clellen & Kreiter, 2003). It was the child's frequency of use of English as reported by teachers ($r = .61, p < .0001$) and the child's level of English proficiency ($r = .44, p < .005$) that correlated with the production of grammatical sentences in English (Gutiérrez-Clellen & Kreiter, 2003). Most recently, a study with 757 Latino preschoolers and kindergartners with typical language development reported that the child's level of English output predicted his or her English morphosyntactic development (Bohman, Bedore, Peña, Mendez-Perez, & Gillam, 2010).

Thus far, the available research has focused on the acquisition of English as a second language in children with typical language development. Little is known about the factors that may predict English growth differences in children with SLI. The purpose of this study was to evaluate the extent to which the language of intervention, the child's development in the first language, and the potential effect of English vocabulary, English use, English proficiency, and English exposure predict differences in the rates of acquisition of English in children with SLI.

Method

All the participants were attending preschool programs with bilingual teachers and/or assistants who varied in their use of the two languages. Thus, in order to evaluate the role of the language of intervention, the study manipulated the language of intervention used in academic enrichment group activities conducted outside the classroom. The study was a randomized controlled trial involving a total of 188 Latino children with SLI sampled from 60 preschool classrooms in 14 schools in Southern California and Arizona. In a randomized controlled trial, participants are assigned to treatment conditions at random (i.e., they have an equal probability of being assigned to any group). Random assignment ensures that *known and unknown* participant and environment characteristics that could affect the outcome of interest are *evenly distributed* across conditions. Random assignment *equalizes* the influence of nonspecific processes not integral to the intervention whose impact is being tested. Therefore, differences in the services children receive are assumed to be evenly distributed across groups. The purpose of the study was to determine the effect of the language of instruction *above and beyond* the language used by any other service provider(s) available to the child.

The goal of randomization is to produce groups that are comparable on known and unknown extraneous influences that could affect the study outcome. The sample was recruited in several cohorts of approximately 46 children each during a period of 3 years and then followed up from preschool to kindergarten. Children were pulled out from different classrooms to participate in the academic enrichment activities provided by 11 project specialists specifically trained for this study. The randomization procedure was performed by one of the coinvestigators. The collection and scoring of language data were blind to the condition the children were assigned to. Children were pretested before the interventions began, posttested immediately after the intervention, and followed up 3 months and 5 months later.

Children were randomly assigned to either a bilingual ($n = 91$) or an English-only ($n = 97$) language condition. Only three children (1.5%) abandoned the study before the end of the program due to family issues (e.g., moving to a new town or changing preschool programs). The final number of participants in the bilingual condition was 90 and 95 in the English-only condition.

Intervention Conditions

Children participated in academic enrichment activities 4 days per week for 45 min each day in small groups of no more than four children for a total of 12 weeks. The lessons applied curriculum-based hands-on activities (e.g., picture sorting, manipulatives, and storytelling) to facilitate vocabulary development and numeracy skills (see the Appendix for a sample lesson and activities). The content and the activities selected have been used to promote aspects of academic readiness (e.g., Fey, Long, & Finestack, 2003; Justice & Kaderavek, 2004; Restrepo, Thompson, Morgan, Smyk, & Kapantzoglou, 2009; Schwanenflugel et al., 2004; Senechal, 1997). The academic enrichment program was provided in addition to any speech or language services that the children were receiving at the preschool.

The language of the academic enrichment program was manipulated in two conditions. In the English-only condition, each session was conducted in English. In the bilingual condition, the teachers alternated the language of instruction each day. Each lesson was taught in Spanish followed by the same lesson taught in English on a consecutive day. For the remaining two lessons, the two languages were alternated in different order each week. Both language conditions utilized the same books, materials, vocabulary targets, and activities. For example, teachers read books such as *Little Red Riding Hood* (Grimm, Grimm, & Estrada, 1999) and taught target vocabulary (e.g., *forest* and *gather*) in the English-only program and on “English days” of the bilingual enrichment program. On the “Spanish days” of the bilingual program, teachers read the Spanish version of the book (e.g., *La Caperucita Roja*) and taught the target words in Spanish (e.g., *bosque* and *recoger*). The selected books had Spanish versions that were deemed appropriate and were commercially available. Children were encouraged to use the language of the day, although they could respond in any language to demonstrate knowledge and skills.

Teachers were trained to explain activities with simple phrases; to use slow speech rate, stress, and intonation when introducing vocabulary words; to recast (restate) what the child said throughout the lesson and request repetitions; to provide paralinguistic cues (e.g., gestures and pantomime); and to be encouraging and enthusiastic. To ensure fidelity in the use of the language of intervention, the principal investigator and research associates observed each interventionist with each group. A project-designed checklist was used to assess adherence to predetermined performance standards for language use. The checklist rated the interventionist’s performance related to the structure of the lesson (evidence of a daily routine and theme-based activities), the prompts used (appropriate use of each language and paralinguistic cues), and the number of interaction opportunities and instances of feedback. The interventionists demonstrated high compliance with the protocol (i.e., 90% or more). To ensure completeness and dosage of intervention, student attendance data for each participant were also collected and reviewed on a weekly basis. There were no differences between the two groups.

Participants

All participants were 4 years of age ($M = 53$ months, $SD = 4$ months) and were sampled from preschools in California and Arizona. There were 113 (61%) boys and 72 (39%) girls in the sample. The majority of the children (94%) were Mexican American. The remaining families were of Central and South American descent. Because family income level and maternal education are deemed to be risk factors for language delays (Dollaghan et al., 1999; Jewkes, 2004; Payne, Whitehurst, & Angell, 1994), we collected this information using two methods. Income level was determined by the family’s eligibility for the school lunch program because each school determines eligibility based on family income and the number of occupants in the household. Information regarding educational level was obtained through a parent questionnaire administered in a structured interview. See Table 1 for

additional details regarding maternal education and eligibility for free lunch. At the time of the study, children attended bilingual classrooms, verified through interview with their preschool director and through two classroom observations.

Identifiers of SLI

The children with SLI were qualified based on scores below cutoff on two of three measures as determined by previous research with these measures (Gutiérrez-Clellen, Restrepo, & Simon-Cereijido, 2006; Gutiérrez-Clellen & Simon-Cereijido, 2010). The measures were (a) the Spanish Morphosyntax Test of the Bilingual English Spanish Assessment (BESA; Peña, Gutiérrez-Clellen, Iglesias, Goldstein, & Bedore, n.d.), (b) the Spanish Semantics Test of the BESA, and (c) the Spanish nonword repetition task. Our studies indicated that the measures have adequate sensitivity (i.e., between 86% and 87.5%) and high specificity (between 86% and 100%) when used with this population. A recent meta-analysis evaluating the diagnostic accuracy of the BESA showed that it had a high positive likelihood ratio (i.e., 15) and a low negative likelihood ratio (i.e., 0.15; Dollaghan & Horner, 2011). That is, children scoring below the cut score on this measure are very likely to have a language disorder, and children scoring in the unaffected range are very likely not to have a language disorder. Table 2 presents the test scores of the sample and cut scores for these measures. Many children were in the process of being referred for assessments at their schools, and 51 had an individualized education program. Only 13 children had attended preschool at age 3 years.

None of the children had hearing impairments, mental retardation, emotional disturbances, motor difficulties, or neurological deficits, according to parent report and school records. All children passed a bilateral hearing screening that consisted of a pure-tone hearing test at 25 dB HL at 1000, 2000, 3000, and 4000 Hz administered by the schools. They also demonstrated nonverbal cognitive development within the normal range based on scores obtained with the Differential Ability Scales (Elliott, 1983; $n = 147$) or the Kaufman Assessment Battery for Children, Second Edition (Kaufman & Kaufman, 2004; $n = 38$) and no evidence of other special needs based on parent report, teacher report, and school records. See Table 2 for the sample's nonverbal cognitive development mean and standard deviation.

Language Characteristics

All children met the following criteria: They (a) spoke Spanish as their first language as reported by parents and teachers, and (b) spoke no English or minimal English, verified by parent interview, teacher report, and child conversational sample. The language characteristics of the participants were determined using questionnaires validated in previous research (Gutiérrez-Clellen & Kreiter, 2003). Parents were asked to rate the Spanish and English receptive and expressive language skills of their children using a 5-point rating scale for each measure (1 representing *no comprehension and no use* and 5 representing *native-like comprehension and use all the time*). They also reported the amount of time the child interacted with his or her mother, father, and other family members in Spanish and English using a 4-point rating scale of exposure to each language (1 representing *never* and 4 representing *all the time*). Table 2 describes the participants' Spanish and English receptive and expressive language skills as well as their exposure to the languages at home based on parent report.

Procedures

To evaluate the role of the child's Spanish language skills in predicting growth in English, children were administered a Spanish sentence repetition task (SRT), a Spanish picture description task, and measures obtained from Spanish narrative samples. Measures of English vocabulary, English use, English proficiency, and English exposure were used to

predict differences in acquisition rates as well. A description of these measures is presented below.

Spanish Predictors—Given the fact that children’s performance varies significantly across elicitation tasks, language measures were obtained from both spontaneous language samples and elicited tasks (sentence repetition and picture description). The same elicitation tasks were used to test the two languages. For example, lexical diversity and MLU_w were derived from spontaneous Spanish language samples and used to predict lexical diversity (i.e., NDW) and MLU_w in English language samples.

SRT: The SRT included 21 sentences that were manipulated to contain seven intransitive, seven transitive, and seven ditransitive predicates (Simon-Cerejido, 2009). The task included a total of 21 verbs and 42 arguments, for a possible total score of 63. Children were asked to repeat exactly what the evaluator said and were given practice items. To estimate the child’s level of language development as a potential predictor of growth over time, children were classified based on a predetermined criterion level (i.e., the ability to repeat six or more target verbs) before the intervention began. This criterion (low severity or high severity) was developed based on previous work (Simon-Cerejido, 2009). Morphological errors were not penalized in this analysis. Using this cut score, 60% of the sample fell in the low severity group, while 40% fell in the high severity group.

Spanish picture description task: For the picture description task, children were first presented with a blank page while the experimenter provided a statement of the target structure: “The [subject] is going to [target verb (+ arguments)]”; for example, “El perro va a brincar/The dog is going to jump.” Then, the child was shown a picture and asked to tell what was happening in the picture. The task had 63 targets (21 verbs and 42 arguments); this was the maximum score. Subjects and indirect objects were animate, while direct objects were inanimate. Total scores were the proportion of target verbs and arguments across sentences. Because Spanish is a null subject language, it was not appropriate to penalize for the use of null subjects. Therefore, credit for marking the subject was given whenever the verb was marked for third person singular (e.g., the response “duerme”—“(she/he) sleeps”—was considered to have a subject and a verb). This scoring rule was judged to be suitable because children were asked to answer a question (e.g., “What’s happening?”) in the presence of a visual stimulus depicting the doer and the action, and it was pragmatically appropriate to answer without an overt subject. If the verb was in the infinitive or not marked for third person singular, the subject was scored as absent (e.g., the response “comer pan”—“to eat bread”—was considered to have a verb and a direct object but no subject). In these cases, no credit was given for the subject. The mean score on this measure was 31.20 ($SD = 15.74$).

Spanish narrative sample measures: Narrative samples were used to obtain MLU_w , NDW, and total number of verbs (TNV). Children produced Spanish narratives based on two different wordless picture books: *Frog Goes to Dinner* (Mayer, 1974) and *Frog on His Own* (Mayer, 1973). A bilingual research assistant first told *Frog on His Own* using the same script with all children, and the child was encouraged to retell the story with assistance of the book illustrations. The second sample was a spontaneous narration of the second book (i.e., *Frog Goes to Dinner*). Children were encouraged to produce at least one utterance per picture. Only spontaneous utterances were included in the narrative samples. The spontaneous narrative samples were digitally recorded using an Olympus DS-2200 digital voice recorder. Trained bilingual assistants transcribed the narratives. Transcription reliability was calculated on 25% of the samples across transcribers and exceeded 92%.

The NDW and the MLU_w were generated by the Systematic Analysis of Language Transcripts (SALT) program (Miller & Iglesias, 2006). The TNV was generated using the SALT Explore command. Neither the copula and auxiliary verbs *ser* and *estar* nor the auxiliary *haber* were included in the total count of verbs. In infinitival phrases such as “va a VERB” (“is going to VERB”), the auxiliary “go” was not counted (coded as *auxir*), and the lexical VERB was counted as a verb. Verbs were counted when used as main verbs and when used as modifiers. This is frequent in Spanish, for example, “va corriendo/*(he) goes running.” The number of lexical verbs was used as a verb productivity measure. These procedures have been used in previous research (Simon-Cerejido et al., in press) and are detailed in Simon-Cerejido and Gutiérrez-Clellen (2009). The co-principal investigator on this project conducted random reliability checks on all the samples to ensure that the TNV were counted with a minimum of 95% accuracy. The mean scores for NDW, MLU_w , and TNV were 47.08 ($SD = 22.04$), 3.63 ($SD = 1.30$), and 34.16 ($SD = 22.87$), respectively.

English Predictors—In addition to evaluating the potential role of the child’s skills in the first language, we hypothesized that children might show different English growth curves depending on the child’s baseline English vocabulary, proficiency and use of English, and exposure to English in the classroom. The following section describes these predictors.

English vocabulary: The English Picture Vocabulary subtest of the Woodcock Language Proficiency Battery—Revised (Woodcock, 1991) was administered. Given the fact that this test was normed on a large sample of monolingual English-speaking subjects in the United States, each participant was tested from the first test item, and raw scores (as opposed to standard scores) were used in the analysis. Validity and reliability of this battery meet basic technical requirements (Woodcock, 1991). The Picture Vocabulary subtest has been used reliably in studies of ELLs (Cobo-Lewis et al., 2002; Duran et al., 2010; Tabors et al., 2003) and was considered appropriate for the purpose of this study. The mean English vocabulary raw score at baseline was 9.54 ($SD = 5.42$).

English use: The frequency of English use by the child in the classroom was determined by trained observers at baseline using a Likert-scale measure, adapted from Gutiérrez-Clellen and Kreiter (2003). In our previous work, the classroom teacher was asked to observe the child across different contexts and rate the child’s use of English. The teacher ratings significantly correlated with the child’s production of grammatical utterances in the language and validated the measure for its use in the present study. In the current study, the measure was administered by a trained observer who observed the child for at least 1 hr during classroom activities as well as during play with peers. The observer rated the language the child preferred to use with the teacher, support staff, and peers. Each child received a language rating for each context (i.e., 1 = *no English used*; 2 = *more Spanish than English*; 3 = *equal amounts of Spanish and English*; 4 = *more English than Spanish*; 5 = *all English*), and an average rating was then calculated (see Table 3). There were no differences in the level of English use across interactions with teachers ($M = 1.86$, $SD = 1.23$) versus peers ($M = 1.77$, $SD = 1.17$).

English proficiency: Project testers rated the child’s English proficiency using a 5-point rating scale (1 representing *no proficiency* and 5 representing *native-like proficiency*), adapted from Gutiérrez-Clellen and Kreiter (2003). Within this continuum of proficiencies, a rating of 5 was used to describe the ability to speak with few grammatical errors, good vocabulary, and good listening comprehension in the target language. In our previous research, these ratings were provided by the classroom teachers. In the current study, the ratings were provided by project language testers based on their observations during testing sessions with the child. Children’s mean rating was 1.31 ($SD = 1.04$). A Spearman

correlation examining the relationship between the rating of English proficiency and the child's MLU_w at baseline was .44 ($p = .034$).

English exposure in the classroom: The children attended bilingual classrooms, as verified through interview with their preschool director and through two classroom observations conducted by two different observers on different days. During each observation, the language used by the teacher, staff, and other children during instructional and noninstructional time was rated using a 5-point rating scale (1 representing *all Spanish* and 5 representing *all English*). The mean rating was 2.09 ($SD = 0.92$). The language ratings were significantly correlated across the two observations (Spearman $R = .957$, $p < .001$). On average, children were almost equally exposed to the two languages during instructional time, and they were exposed to more Spanish during noninstructional time.

Outcome Measures—Children's growth in English was assessed using the English version of the picture description task and measures of English spontaneous narrative samples. The English picture description task was administered before the interventions began, posttested immediately after the end of the intervention, and followed up 3 months and 5 months later. English spontaneous narrative samples were administered pre- and postintervention and 5 months later, not to overburden the children's attention span and motivation.

English picture description task: The English picture description task evaluated the child's use of verb and arguments using a cloze task (Simon-Cerejido, 2009). It included seven intransitive, seven transitive, and seven ditransitive predicates, for a total of 21 target sentences. Subjects and indirect objects consisted of animate objects, and direct objects were always inanimate objects. Children were presented with a blank page while the experimenter stated that "X is going to [target verb + argument structure]" (e.g., "Ana is going to dance" and "Ana is going to eat bread"). Then, the child was shown a picture depicting the target sentence while the evaluator asked what was happening (e.g., "What's happening here?"). This phrase was chosen to avoid pragmatically correct omissions of the subject or the inflected auxiliary in response to a question such as "What is she doing?" The children's responses were scored based on the presence of the target verbs and arguments, and a total score was derived. The maximum possible score was 63. Grammatical errors were not penalized, as long as the children produced a form of the target verb and the corresponding noun or pronoun.

English narrative sample measures: English narrative samples were used to obtain MLU_w and MLU in morphemes (MLU_m), NDW, and TNV. Children produced English narratives based on two different wordless picture books: *Frog, Where Are You?* (Mayer, 1969) and *One Frog Too Many* (Mayer, 1975). For the retell, a script was consistently used for all participants. The children were encouraged to retell the first story with assistance of the book illustrations and to spontaneously tell the second story. Children were encouraged to produce at least one utterance per picture. As with the Spanish narratives, only spontaneous utterances were included in the narrative samples. Procedures for transcription and calculation of reliability were identical in the two languages. Transcription reliability was above 90%.

The NDW, MLU_w , and MLU_m were generated by the SALT program (Miller & Iglesias, 2006). As with the Spanish narratives, the TNV was obtained as follows. First, a list of lexical verbs was extracted using the SALT Explore command. Then, the TNV used by each individual was calculated manually. Neither the copula nor auxiliary verbs *be* or *do* were included in the total count of verbs. English verbs used as nouns were also excluded. In infinitival phrases such as "is going to VERB," the auxiliary *go* was not counted (coded as

aux), and the lexical VERB was counted as a verb. Reliability checks were conducted in the same manner as described for the Spanish analysis and were above 90%. These procedures are detailed in Simon-Cerejido and Gutiérrez-Clellen (2009).

Statistical Procedures

A series of longitudinal growth models were conducted to evaluate the extent to which the language of intervention, Spanish language skills, English vocabulary, English use, English proficiency, and English exposure predicted differences in English growth. The longitudinal models were tested via multilevel modeling using SAS Proc Mixed, full maximum likelihood method. These statistical procedures were the most appropriate given sample size limitations. Two-level hierarchical linear models estimating a random-effects intercept and linear change over time for each child were conducted to examine the repeated measures. Level 1 models were calculated to estimate individual change over time (and individual differences in intercepts, when appropriate). Level 2 models were calculated to explore potential child-level predictors of change over time. For these analyses, children were considered a random factor, with baseline and posttreatment measures nested within child. Two models were calculated for each outcome: an unconditional growth model and a conditional model. The unconditional model was used to determine whether children were improving their English skills over time and to assess variability in growth rates. The conditional model examined the effect of the factors that predict differences in English growth. Although random intercepts were included in all models to account for individual differences in baseline measures and relationships, these results are not presented because we were primarily interested in the rates of change in the acquisition of English and its potential predictors.

The first analysis focused on the effect of the language of intervention and the role of the child's Spanish baseline level as potential predictors of English growth. For this analysis, each Spanish measure at pretest was entered in conjunction with the language of instruction to predict growth differences in English. This was done to examine the possibility that the language of intervention interacted with the child's Spanish skills at baseline.

The second analysis examined the effect of the language of intervention in conjunction with the English vocabulary scores, English use, English proficiency, and English exposure at baseline. The role of these factors was evaluated separately and in interaction with the language of instruction of the academic enrichment programs.

Results

Table 3 presents the means and standard deviations of the outcome measures at the four testing points. As the data show, not all of the children were capable of completing the narrative tasks due to their limited English skills. It is important to note that there were sample size differences due to missing data points across testing points. These differences were not due to participant attrition.

Unconditional growth models were calculated to determine whether children were improving their English skills over time and to assess the variability in their growth. Table 4 presents the estimates of the average rates of change (β estimates) as well as the variability in these rates of change (σ^2 estimates), along with the associated standard errors. The analysis indicated that children were acquiring more skill on all of the English language measures from baseline through the follow-up period. In addition, there was significant variability in rates of change across children from baseline through the follow-up period on all outcomes.

Table 5 displays the rates of English acquisition for English picture description, English MLU_w, English MLU_m, English NDW, and English TNV predicted by the language of intervention, Spanish picture description, Spanish MLU_w, Spanish NDW, and Spanish TNV. Spanish MLU_w was used to predict English MLU_m and MLU_w. In addition, the analysis examined the rates of growth predicted by the classification level (i.e., high severity or low severity) obtained with the Spanish SRT and the interactions between the language of intervention and the Spanish measures.

There was a significant difference between the language of intervention conditions for English MLU_w ($\beta = 1.28$, $SE = 0.58$), $F(1, 21) = 4.94$, $p = .04$, and English MLU_m ($\beta = 1.28$, $SE = 0.61$), $F(1, 21) = 4.37$, $p = .05$. Children in the bilingual condition improved at a greater rate than the children in the English-only condition for both MLU_w ($d = 1.79$) and MLU_m ($d = 1.69$). The effect sizes are considered large (Cohen, 1988; Feingold, 2009).

The child's Spanish skills also contributed to predict growth in English over time. Greater baseline values of Spanish MLU_w were associated with greater rates of change in English MLU_w ($\beta = 0.52$, $SE = 0.23$), $F(1, 21) = 5.24$, $p = .03$. Greater baseline values of Spanish MLU_w were also associated with greater rates of change on English MLU_m ($\beta = 0.54$, $SE = 0.24$), $F(1, 21) = 5.02$, $p = .04$. The effect size ($d = 0.89$) was large (Cohen, 1988; Feingold, 2009).

There was a significant interaction with the language of intervention for English MLU_w, $F(1, 21) = 4.21$, $p = .05$. The relationship between baseline Spanish MLU_w and growth in English MLU_w was stronger for the English-only program children ($\beta = 0.22$, $SE = 0.12$, $p = .10$) than for the bilingual program children ($\beta = -0.002$, $SE = 0.11$, $p = .98$), although it was not statistically significant. The interaction with the language of intervention for English MLU_m approached significance, $F(1, 21) = 3.66$, $p = .07$. For these measures, lower Spanish MLU_w was associated with lower rates of growth in the English-only academic enrichment program.

Within this model, no other significant effects were found for the rates of growth of the English picture description task, NDW, or TNV.

The next model examined the rate of English acquisition as predicted by the language of intervention, the child's English vocabulary, English use, and English exposure in the classroom (see Table 6). The results showed significant main effects for English vocabulary and English use, but not for the language of intervention, the child's proficiency, or the child's exposure to English in the classroom. Children's English vocabulary scores at baseline significantly predicted rate of growth on the English picture description task ($\beta = 0.74$, $SE = 0.37$), $F(1, 145) = 4.01$, $p = .047$. Those children who had higher vocabulary scores at baseline tended to improve at greater rates on this measure. There was also a significant interaction between the language of intervention and English vocabulary, $F(1, 145) = 3.90$, $p = .05$. The relationship between English vocabulary and growth on the English picture description task was stronger and more positive for the group attending the English-only program ($\beta = 0.30$, $SE = 0.17$, $p = .10$) than for the bilingual program group ($\beta = -0.15$, $SE = 0.16$, $p = .37$).

The child's English use also emerged as a significant predictor of growth on the English picture description task, $F(1, 145) = 6.18$, $p = .01$. Children who had a high level of English use at the beginning of the program tended to improve more on this measure ($\beta = 3.64$, $SE = 1.46$).

Within this model, no other significant effects emerged for MLU_w, MLU_m, TNV, or NDW.

Discussion

The present study investigated the role of several factors that might help predict differences in the rate of acquisition of English as a second language in Latino children with SLI. First, we examined the effect of the language of instruction of an academic enrichment program. In the first model, we evaluated the effect of the language of intervention in conjunction with Spanish development measures to see whether the language condition had a differential effect on rates of English growth depending on the child's level of development in the first language. We speculated that children with limited Spanish skills might show greater growth in English when the child's language learning skills were also targeted in the first language (i.e., Spanish), compared to interventions provided only in English. The results of this analysis showed that growth in English MLU_w and MLU_m was predicted by the child's baseline level of Spanish MLU_w . Children who had higher MLU_w in Spanish were more likely to show greater growth over time in English MLU_w and English MLU_m . Moreover, the children in the bilingual condition demonstrated a more rapid growth in English MLU_m than the children in the English-only condition. Interestingly, the "advantage" of having a higher Spanish MLU_w was more pronounced in the English-only program. In other words, placement in the English-only program did not result in the same positive growth if children had low MLU_w in Spanish. Fine-grained analyses examining outcomes across children with different language characteristics and measures will be needed to determine which children might benefit from which language of instruction conditions and when the optimal time may be to intervene using only the child's second language.

The positive effects of the bilingual condition on the English outcomes of children with SLI found in the present study replicate research findings with Latino children with typical language development (Barnett et al., 2007; Duran et al., 2010; Farver et al., 2009). Children with language impairments also appeared to benefit from a bilingual approach, even though they received less English input than their peers receiving instruction only in English. The findings of the study may also provide support to the notion of "transfer" of syntactic skills from the first to the second language in language pairs that share similar sentence structure such as Spanish and English (Castilla et al., 2009; Paradis, 2010). Having the ability to combine words in utterances in Spanish may allow the child to produce word combinations at greater MLU rates in English because children use their Spanish syntactic knowledge to represent sentences with different lexical items in a different language.

The results suggest cross-linguistic interdependence in the syntax domain. Spanish MLU predicted growth in both MLU_w and MLU_m measures in English obtained from the child's spontaneous language samples. However, it is important to note that this effect was not found for the picture description task, a task that required children to use specific English lexical items (as opposed to telling stories in their own words). Likewise, the child's English NDW and TNV are likely to be related to the child's level of English vocabulary. Available studies evaluating developmental outcomes based on the English NDW or total number of words have been inconclusive, probably because the child's level of proficiency and use of English was not controlled (e.g., Muñoz, Gillam, Peña, & Gulley-Faehnle, 2003; Uccelli & Paez, 2007). Research examining the interactions between the two languages in children with SLI who have sufficient vocabulary development in both languages will be needed to further evaluate the role of the child's first language in the acquisition of the second language. There is some evidence that bilingual children with typical language development show better performance on vocabulary tasks for cognates (i.e., for words in which the phonological features of the two languages overlap). This research may suggest that the child's vocabulary skills in the first language may facilitate the learning of cognates in the second language (Kohnert & Derr, 2004).

The second model focused on the effect of the language condition in a different way. In this analysis, we evaluated the potential interaction between the language of intervention and the child's level of English vocabulary and use of English at baseline. Here, we expected to find greater rates of English growth in children who had higher English skills and use of English upon entry to the program. The results demonstrated that these children showed more growth when the program was provided only in English, whereas for children who had limited English skills this approach was not as beneficial. The study has shown that children may respond differently to English-only interventions depending on their level of vocabulary knowledge and use of the language.

The teacher ratings of English proficiency were not a significant predictor of English growth in the present study. The measure was not able to capture differences in English development, probably because there was limited variability in their ratings across children. In contrast, direct and structured observations of the child's English use were reliable and provided useful information about a child's English "readiness." Children who showed a greater use of English demonstrated a faster rate of English growth.

The analysis also examined the effect of the child's exposure to English in the classroom. The language used in the preschool classroom did not have discernible effects on any of the measures of English growth. These results corroborate the research of Chang et al. (2007) and Gutiérrez-Clellen and Kreiter (2003). Detailed quantitative classroom measures across instructional and noninstructional interactions will be needed to further evaluate the characteristics of the preschool language environment and their potential effect on second language learning in these children.

Clinical Implications

The findings of this study suggest that not all children with SLI will respond the same to the language selected for intervention. Children who have limited development in the first language are likely to show a more protracted rate of acquisition in their learning of the second language. For these children, a bilingual approach may be more beneficial. If these findings are corroborated, the child's first language development should be considered when assigning children with language impairments to different language of instruction programs. We also found greater rates of English growth in children who had higher English skills and use of English upon entry to the program compared to children with lower levels of English development. Children with limited English skills did not appear to benefit to the same extent when they received instruction only in their second language. These differences will need to be addressed when planning services for Latino children with SLI in order to maximize these children's response to intervention. The study indicates that children may need sufficient English vocabulary development to support their English grammatical development.

Although the present study underscores the role of the child's English development and use at baseline, it is still unknown what minimum level of English development may be optimal to transition children with language impairments to an English-only method of instruction. The available research with preschool children with typical language development has focused on the level of English development that may be needed for academic readiness. However, for children with language disorders, it will be equally important to consider the level of language development in the first language. Based on the findings of the present study, both the child's first language development and the child's level of English use are important factors that will need to be considered in making clinical decisions. Although this study has shown several factors that may help predict differences in English acquisition, clinicians should also consider other factors when choosing a language in intervention (Gutiérrez-Clellen, 1999). There is evidence to suggest that children may not demonstrate

growth in the first language if that language is not directly targeted in intervention (Simon-Cerejido et al., in press). These possibilities should be carefully evaluated because for many families, Spanish will be the primary language needed for communication at home. Furthermore, the present research has shown the impact of several factors within a very narrow time window. Yet, the developmental trajectories of these children are likely to vary as the characteristics of their language learning environments change.

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Appendix

Appendix

Example of Academic Enrichment Activities

Week 1 – Day 2 – Little Red Riding Hood – ENGLISH

- 1 **PREVIEW BOOK:** “Do you remember the title of this book? In English the title is Little Red Riding Hood.”
- 2 **PREVIEW WORDS:** FOREST, STRAIGHT, GATHER, HUNTER
 - a. Show one picture at a time and say the word. “This is a picture of ... Say ...”
- 3 **READ BOOK:** Read the book and show illustrations.
- 4 **TEACH WORDS:**
 - a. Remind children how the word was used in the book. “Remember in the story...”
 - b. Remind children of word in Spanish, then say it in English. “In Spanish the word is ... In English it is ...”
 - c. **Say definition.**
 - d. Have children repeat word altogether. “Everyone say...”
 - e. Do the activity and talk about the new word. “Now we are going to look at...”

Definition: The FOREST is a place with many trees growing together.

Activity: Have the children make a forest by placing the trees and plants in the container.

Definition: STRAIGHT is something that is not in a curve.

Activity: Have children separate straight objects from non-straight objects.

Definition: To GATHER is to bring things together in one place.

Activity: Have children GATHER together the (plastic) animals from around the room and put them into a container.

Definition: A HUNTER is a person or animal who catches animals to eat them.

Activity: Lay out different toy animals and have children hunt them using the doll to represent a hunter

- 5 **TALK AND PLAY TIME:** Telling Grandma “What big teeth you have!”
 - a. Have picture of wolf dressed as grandma. Each child will tell the wolf something like “What big eyes you have”. Then take that body part from the wolf. Play until all of the pieces are gone, the wolf is revealed, and everyone has had a turn. “Little Red Riding Hood tells Grandma that she has big ears, big eyes, big hands, and great big teeth! NOW IT'S YOUR TURN. WHAT DID YOU TELL GRANDMA?”

Other activities

Activity #1 “Count Clap and Stomp”: 1–5 (counting with movement/voice)

Activity #2 “Show Me” (counting different collections of objects)

Activity #3 “Henrietta Sees Numbers” (“See” the correct number without counting)

Activity #4 Draw two eyes and two ears on a series of funny faces

TABLE 1

Education and income characteristics of the children's families ($N = 185$).

Characteristic	<i>n</i>
Educational level in the home	
Primary and some secondary	20
High school graduate	96
Some college or more	55
Eligibility for lunch program	
Free or reduced	140
Regular	13

Note. Fourteen families did not report educational level, and 32 families did not report eligibility for lunch program.

TABLE 2

Means and standard deviations of the sample on the Spanish BESA, Spanish nonword repetition, and nonverbal IQ, as well as on measures of language proficiency, use, and exposure.

Measure	<i>M</i>	<i>SD</i>
Identifiers of specific language impairment		
Spanish BESA Morphosyntax (cut score = 50)	23.48	15.74
Spanish BESA Semantics (cut score = 6)	5.08	2.84
Spanish nonword repetition (cut score = 71)	48.50	15.24
Nonverbal IQ	93.32	13.65
Language proficiency, use, and exposure at home		
Parent rating of Spanish receptive skills	4.36	0.90
Parent rating of Spanish expressive skills	4.17	1.028
Parent rating of English receptive skills	3.61	1.22
Parent rating of English expressive skills	2.81	1.15
Spanish exposure at home	3.45	0.57
English exposure at home	2.09	0.64

Note. BESA = Bilingual English Spanish Assessment (Peña et al., n.d.).

TABLE 3

Means and standard deviations of outcome measures by time of testing.

Outcomes	Baseline		End of program		3-month follow-up		5-month follow-up	
	M (SD)	n	M (SD)	n	M (SD)	n	M (SD)	n
Picture description	12.07 (15.49)	173	21.37 (18.38)	177	25.86 (19.63)	148	24.27 (19.61)	111
MLU _w	2.93 (1.43)	67	3.58 (1.58)	95			4.21 (1.90)	69
MLU _m	3.11 (1.55)	67	3.85 (1.74)	95			4.54 (2.03)	69
NDW	29.87 (27.94)	67	35.07 (29.27)	95			41.52 (29.57)	69
TNV	13.51 (18.18)	67	17.41 (19.95)	95			22.35 (21.48)	69

Note. MLU_w = mean length of utterance in words; MLU_m = mean length of utterance in morphemes; NDW = number of different words; TNV = total number of verbs.

TABLE 4

Rates of English acquisition, standard errors, and variability across children.

Outcomes	Change over time		Variability in slopes	
	Est. β	SE	Est. σ^2	<i>p</i>
Picture description	5.75*	0.47	12.21	.004
MLU _w	0.59*	0.08	0.17	.03
MLU _m	0.67*	0.08	0.20	.02
NDW	6.81*	1.28	56.48	.007
TNV	4.86*	0.92	30.05	.01

Note. Narrative samples were only collected at baseline, end of program, and 5-month follow-up.

**p* < .0001.

TABLE 5

Rates of English acquisition as predicted by the language of intervention, the Spanish baseline, and the Spanish SRT, with associated standard errors.

Predictors	Picture description		MLU _w		MLU _m		NDW		TNV	
	β	(SE)	β	(SE)	β	(SE)	β	(SE)	β	(SE)
Language of intervention	0.23	(2.95)	1.28 (0.58)	1.28 (0.61)	0.90	(7.41)	1.89	(4.24)	0.013	(4.24)
Spanish baseline	0.031	(0.11)	0.52 (0.23)	0.54 (0.24)	1.55	(8.21)	2.07	(4.24)	0.002	(0.11)
Spanish SRT	2.99	(3.38)	0.47	(0.52)	0.44	(0.55)	0.23	(0.13)	0.002	(0.11)
English-only × Spanish baseline			0.22	(0.12)	0.02	(0.11)				
Bilingual × Spanish baseline			0.002	(0.11)	0.02	(0.11)				

Note. SRT = sentence repetition task. Boldface indicates significance ($p < .05$).

TABLE 6

Rates of English acquisition as predicted by the language of intervention, English vocabulary, English use, English proficiency, and English exposure in the classroom, with associated standard errors.

Predictors	Picture description		MLU _w		MLU _m		NDW		TNV	
	β	(SE)	β	(SE)	β	(SE)	β	(SE)	β	(SE)
Language of intervention	2.98	(3.04)	-0.009	(0.57)	0.26	(0.58)	-2.56	(9.21)	0.86	(6.83)
English vocabulary	0.74	(0.37)	0.057	(0.073)	0.081	(0.075)	0.10	(1.13)	0.03	(0.88)
English use	3.64	(1.46)	0.093	(0.22)	0.13	(0.22)	2.74	(3.48)	1.63	(2.57)
English proficiency	-0.51	(1.98)	-0.24	(0.36)	-0.25	(0.37)	-5.84	(5.67)	-3.97	(4.30)
English exposure in the classroom	0.87	(2.22)	-0.068	(0.30)	-0.026	(0.30)	2.48	(5.11)	0.92	(3.46)
English-only × English vocabulary	0.30	(0.17)								
Bilingual × English vocabulary	-0.15	(0.16)								

Note. Boldface indicates significance ($p < .05$).