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The Effect of Maternal Language on Bilingual Children's Vocabulary and Emergent Literacy Development During Head Start and Kindergarten

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Abstract

This investigation examined the impact of maternal language and children's gender on bilingual children's vocabulary and emergent literacy development during 2 years in Head Start and kindergarten. Seventy-two mothers and their children who attended English immersion programs participated. Questionnaires administered annually over a 3-year period revealed that mothers increased their usage of English to their children. In addition, more mothers of sons reported using "More or All English" with their children than mothers of daughters. Growth curve modeling indicated that increased usage of English did not impact children's English vocabulary or emergent literacy development. However, increased usage of English slowed the growth of children's Spanish vocabulary. Despite differences in mother-to-child language usage, gender did not impact growth in either language. These findings provide evidence that maternal usage of Spanish does not negatively affect children's developing English vocabulary or emergent literacy abilities. Maternal usage of Spanish appears necessary to maximize children's developing Spanish vocabulary.

Literacy is essential for success in the United States, and although most individuals read relatively well, some experience reading difficulties. Statistics indicate that the reading abilities of 40% of Hispanic kindergarteners in the United States are in the lowest quartile. This trend continues as children progress through school with Hispanic children reading below the mainstream population in Grades 4, 8, and 12 (U.S. Department of Education, 2000). This situation is of great concern, as limited literacy has far-reaching consequences that impact not only children's success in school but also their overall well being and ability

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to compete in the world (Alexander, 1996; Lyon & Chhabra, 1996). Furthermore, the number of children enrolled in public schools rose by 10% between 1993 and 2002, with Hispanic children accounting for 64% of the increase (Fry, 2006). Similarly, the percentage of Hispanic children in Head Start increased from 30% in 2002 to 34% in 2006, to-taling more than 309,000 Hispanic children (Office of Head Start, 2007). Thus, the identification of factors that affect Hispanic children's academic outcomes is of paramount importance.

One factor that is hypothesized to impact children's outcomes is the language used in the home. Many educators in the United States assert that children should be exposed to English at home so that they can become literate in English. Others argue that the parents' native language should be the home language of choice with the assumption that children need to develop a strong foundation in their home language (L1) to support learning a second language (L2) at school.

Relatively limited evidence exists, however, about the influence of the children's home language on children's English or native language outcomes (Goldenberg, Rueda, & August, 2006). Schecter and Bayley (2002) conducted an ethnographic study of the language and literacy development of Spanish–English bilingual, Mexican-American children living in California and Texas. Through their observations of children's language usage, the researchers concluded that "use of Spanish [L1] in the home is critical for minority-language maintenance" (p. 190). Gutiérrez-Clellen and Kreiter (2003) showed that parental report of the amount of language input in Spanish (L1) at home was related to second-grade children's Spanish grammatical development. Surprisingly, the amount of time reading or engaging in other language activities in Spanish was not associated with Spanish outcomes. More recently, Duursma and colleagues (2007) studied factors that predicted bilingual children's Spanish oral vocabulary in fifth grade. Their results revealed that support for Spanish in both the home and the classroom was necessary to promote children's Spanish vocabulary.

Similar findings have been found with regard to the relationship between home language usage and literacy outcomes. Dolson (1985) found that fifth- and sixth-grade Hispanic children from Spanish-speaking homes had higher Spanish reading abilities than children from homes where English was the predominant language. In a study of 10-year-old Italian children living in Australia, the use of Italian (L1) in the home was associated with higher L1 literacy outcomes (Cahill, 1987). Brunell and Linnakylä (1994) studied 9- and 14-year-old Swedish children living in Finland and found that children from bilingual (Swedish–Finnish) homes and monolingual L2 (Finnish) homes scored lower on Swedish (L1) reading tests as compared to children from monolingual L1 (Swedish) homes. Thus, a non-majority language (L1) is supported when that language is spoken in the children's home.

One might hypothesize that continued usage of the first language may negatively impact children's abilities in a second language; however, none of the studies previously reviewed found a negative relationship between usage of L1 in the home and children's language and literacy outcomes in L2. It appears that children receive sufficient exposure to their second language at school to support gains in their L2 literacy abilities. Cahill (1987) found that press for L1 literacy achievement was positively associated with English reading outcomes in Italian-Australian 10-year olds. Similarly, Dolson (1985) found that usage of Spanish in the home promoted English literacy outcomes. These findings support Cummins's (1979) interlinguistic dependence hypothesis that asserts that bilingual children are able to use their knowledge of their first language to support the acquisition of a second language.

Other investigators, however, have identified negative associations between home language usage and children's literacy outcomes in their second, non-minority language. For example,

Monzó and Rueda (2001) studied the reading outcomes of five Spanish-speaking children and found that the three children who went on to become successful readers in English had English-speaking family members. The two that did not read well did not have support for English at home. Similarly, Hansen (1989), Aarts and Verhoeven (1999), and Kennedy and Park (1994) found that usage of the first language at home was negatively associated with reading outcomes in the second language. Kennedy and Park's results, however, applied to the Asian bilingual sample in their study. These researchers found no relationship between home language usage and literacy outcomes in a second language in a sample of Spanish-speaking children.

Overall, the relationship between the home language and children's outcomes remains uncertain. Although evidence indicates that home language usage promotes children's language and literacy outcomes in that language, the relationship between the home language and children's outcomes in the majority language is less clear. Differences in the populations studied, educational environments, and measures used may explain the lack of consensus.

The studies previously reviewed involved children who were in first grade or higher and measured home language use at a given point in time. Given the current emphasis on preschool education, longitudinal studies that take into account changes in the home language environment and investigate the impact of parents' language use early in children's educational careers are needed.

Although few studies have directly examined changes in parental language usage, many parents modify their home language patterns to match the language practices of the schools (Hammer, Lawrence, Davison, & Miccio, 2007; Li, 2007; Pacini-Ketchabaw & Armstong de Almeida, 2006; Schecter & Bayley, 2004). This change is likely because of the message that English is the valued language in mainstream institutions (Pacini-Ketchabaw & Armstong de Almeida, 2006; Pagett, 2006). As a result, parents view usage of English at home as a necessity for their children's school success. This sentiment is expressed well by a mother who participated in Schecter and Bayley's (2004) investigation. She stated, "Because I *know* if he went into the school system, he'd learn English. And I spoke English, so I could always help him out in that way" (p. 612). Data on immigrant adults support this conclusion. For example, Veltman (1988) found that nearly 7% of a sample of Hispanic individuals, which included Puerto Ricans, made English their first language within 18 months of moving to the U.S. mainland. Close to 25% reported speaking English often, and the majority of individuals spoke English regularly after 9 years.

Gender differences, however, appear to exist in the maintenance of the home language. Females tend to be more proficient in their home language and are more likely to be fluent bilinguals than males from similar socioeconomic and family backgrounds (Arriagada, 2005; Portes & Hao, 2002; Portes & Rumbaut, 2001; Portes & Schauffler, 1994). In fact, gender was found to be one of the strongest predictors of bilingualism in a study of adolescent immigrants to the U.S. (Portes & Rumbaut, 2001).

Further evidence suggests that mothers differ in the language used with their children depending on the children's gender. Hammer, Lawrence, Davison, and Miccio (2007) studied the reported language usage of Hispanic mothers to their young children during 2 years in Head Start—kindergarten and first grade. The results revealed that the mothers used increasingly more English over the 4-year period, and that mothers were more likely to speak to their female children using "more or all" Spanish when compared to mothers of sons. Gender differences in the childrearing practices of Puerto Rican families, which are established and reinforced early in children's lives, were thought to explain this.

Indeed, mothers have been credited with being the conveyors of culture, traditions, and language (Arriagada, 2005; González, 2005; Veltman, 1981; Zentella, 1997). Within a Puerto Rican sample living in New York, mothers were found to be more loyal to Spanish than men, and women were more likely to believe that knowledge of Spanish was a key aspect of their Puerto Rican identity than men (Zentella, 1997). In addition, Veltman (1981) found that immigrant mothers' language characteristics were closely tied to those of their children. Seventy percent of the children studied who were English monolinguals had mothers who were also English monolinguals, whereas only 20% of English monolingual children had a mother who spoke a minority language. Girls are expected to become mothers and, as a result, are socialized to assume this role. Girls typically stay at home with their mothers and other women in the family. Through these experiences, they are immersed in Spanish. Boys, on the other hand, as future fathers and breadwinners are encouraged to be independent and to spend time out of the home where they are removed from Spanish-dominant social networks (cf. De Von Figueroa-Moseley, Ramey, Keltner, & Lanzi, 2006; Flannagan, Baker-Ward, & Graham, 1995; González, Umana-Taylor, & Bamaca, 2006; McHale, Updegraff, Shanahan, Crouter & Killoren, 2005; Sánchez-Ayéndez, 1998; Zentella, 1997).

Clearly, more research is needed to examine home language usage earlier in children's development. Given the current emphasis on preschool education, studies that investigate the impact of home language early in children's educational careers would yield valuable information. The purpose of this study was to investigate the effect of mothers' language usage during Head Start and kindergarten on children's Spanish and English receptive vocabulary and English emergent literacy development. The following was hypothesized:

1. Changes in maternal language usage from more Spanish to more English would have a negative impact on children's Spanish receptive vocabulary development and a positive impact on children's English vocabulary development and English emergent literacy abilities.
2. Continued usage of Spanish would have a positive impact on children's Spanish receptive vocabulary and a negative effect on their English receptive vocabulary.
3. Being female would positively impact children's Spanish vocabulary abilities, as mothers of females in this sample were more likely to speak Spanish to their daughters.

METHOD

Participants

Seventy-two children and their mothers participated in the study, which was part of a larger investigation of bilingual children's language and literacy development. The children and mothers were recruited from Head Start Centers located in an urban area of central Pennsylvania. To participate, the children had to be eligible to attend Head Start financially for 2 years; pass the Denver II (Frankenburg, Dodds, Archer, Shapiro, & Bresnick, 1992), a developmental screening; have no teacher or parent concerns about their development; pass a hearing screening administered by a Head Start nurse; and have a mother who spoke a Puerto Rican dialect of Spanish.

At the beginning of this study, the children averaged 4 years 1 month of age (SD = 4.1 months). Thirty-one were male and 44 were female. All of the children were spoken to in Spanish by their mothers and/or family members from birth. Approximately one third of children were not communicated to in English at home until they entered Head Start. The children's mothers averaged 26 years 6 months of age (SD = 5.69 years). The mothers had

11.35 years of education (*SD* = 1.8 years), on average, and 53% reported working outside the home.

All the children attended English Immersion Head Start classrooms, where the teachers used English as the primary language of instruction. Children who had no or limited knowledge of English were typically assigned to classrooms in which either the teacher or the classroom assistant spoke Spanish. Informal observations revealed that Spanish was spoken infrequently to children, and its usage decreased as the school year progressed. When the children went to kindergarten, instruction was provided in English, as English literacy was the goal of the school district. Spanish language and literacy development was not the focus of the Head Start or kindergarten classrooms.

Measures and Procedures

Children's English and Spanish vocabularies were assessed in the fall and spring of each year, and their emergent literacy abilities were evaluated beginning in the spring of their 1st year in Head Start and in the fall and spring of their 2nd year in Head Start and kindergarten. Trained data collectors who were female and were fluent in either English or Spanish assessed the children in the two languages, respectively. Testing occurred over two sessions, which were counterbalanced for language. During one session, children's abilities were assessed in English, and during the other session, their abilities were tested in Spanish. It should be noted that the three tests that were used were not standardized on bilingual children; however, no tests developed for use with bilingual children existed at the time the study was conducted. The test results were used to describe children's development and were not employed for diagnostic purposes.

Peabody Picture Vocabulary Test–III (PPVT–III)—The PPVT–III (Dunn & Dunn, 1997) was used to assess the children's receptive vocabulary in English. The PPVT–III was designed for use with individuals ages 2½ to 90 years of age. The test consists of 204 items. During the administration, children were instructed to point to the picture, from a choice of four, which corresponded to the targeted word. The median internal reliability coefficient for the PPVT–III is .95.

Test de vocabulário en imágenes Peabody—The Test de vocabulário en imágenes Peabody (TVIP; Dunn, Padilla, Lugo, & Dunn, 1986) was employed to document the children's receptive vocabulary in Spanish. The test, which consists of 125 items, was developed for use with children who range in age from 2 years 6 months to 17 years 11 months. Similar to the PPVT–III, children were asked to point to the picture that was named when given a choice of four pictures. The test was standardized on Mexican and Puerto Rican samples. The median internal reliability coefficient is .93.

Test of Early Reading Ability–2 (TERA–2)—The children's overall emerging literacy abilities were assessed through the TERA–2 (Reid, Hresko, & Hammill, 1991). The TERA–2 contains 42 items that tap knowledge of print awareness, contextual meaning, knowledge of the alphabet and its functions, and print conventions. The median internal consistency coefficient is .91.

The children's emergent literacy abilities were assessed in English for two reasons. First, Spanish literacy abilities were not the target of instruction in either Head Start or kindergarten. Second, a standardized measure of emergent literacy did not exist in Spanish at the time the data were collected.

Language Usage Questionnaire—In addition to the testing of children, trained bilingual data collectors completed home visits with the mothers in the middle of each school year. During the home visits, the data collectors completed a series of questionnaires with the mothers in the language of the mothers' choosing. To account for differences in the mothers' literacy levels, the home visitors read each of the questions to the mothers.

Data for this study came from the Language Usage Questionnaire, which contained questions about a number of topics related to family members' usage of Spanish and English. Specific to this investigation, mothers were asked to report the language(s) they used when talking to their children. The response options provided to the mothers were (a) all Spanish, (b) more Spanish than English, (c) equal amounts of Spanish and English, (d) more English than Spanish, and (e) all English. These response options were consistent with other studies conducted by the National Institutes of Health–National Institute of Child Health and Human Development Developing English Literacy in Spanish Speakers (http://www.cal.org/delss/) research network. To effectively model the impact of language usage on children's outcomes, the five response categories were reduced to three, which allowed for a minimum of 10 responses per category for each measurement occasion. Thus, the final three categories were (a) More or All Spanish, (b) Equal Amounts of Spanish and English, and (c) More or All English.

Analyses

Growth curve models were used to assess the influence of mother-to-child language and children's gender on children's English and Spanish receptive language and English early literacy reading skills over five time points beginning with the end of the children's 1st year in Head Start and ending with the children's last year in kindergarten. The growth curves, based on children's raw scores, were fit to the three outcome measures (PPVT–III, TVIP, and TERA–2) using linear mixed effect models (e.g., Pinheiro & Bates, 2000; Singer, 1998). Growth curves have appeared elsewhere in the extant literature and been shown useful for modeling child development (cf. Compton, 2000; Foorman, Francis, Mehta, Schatschneider, & Fletcher, 1997; Hammer, Lawrence & Miccio, 2007, 2008; Speece, Ritchey, Cooper, Roth, & Schatschneider, 2004; Torgesen et al., 1999).

When conducting the analyses, all available data on the participants were used to address the research questions. This analytic method allowed unbiased parameter estimation, which assumes that the missing data mechanism functioned in a way that made conditional missing values unrelated to unobserved outcomes. This mechanism is called missing at random (cf. Schafer, 1997); given the design of the study, missing at random was considered plausible. An analytic method known as direct maximum likelihood was applied to address the issue of missing data.

In addition, comparisons were made between the performances of children who had data at all time points and children who had data that were missing on one or more occasions to determine if the groups differed. No differences were found between the scores of children with complete and incomplete datasets on the three outcome measures at the beginning of the study: PPVT–III, $F(1, 68) = 0.067$, $p = .797$; TVIP, $F(1, 72) = 2.71$, $p = .104$; and TERA–2, $F(1, 73) = 0.035$, $p = .853$.

An important issue to consider when using linear mixed effect models is how to determine the statistical significance of the parameter estimates. A common approach is to calculate the test statistic by dividing the parameter estimate by its standard error and then compare the test statistic to a reference distribution, a t distribution. However, the issue at hand is how to determine what degrees of freedom should be applied to evaluate the statistic, as the denominator degrees of freedom come from a penalized function of the residual and may

vary with the parameter being estimated. Because of this discrepancy, an alternative method to determining a parameter's statistical significance was used to determine the distribution of the parameter estimates, that is, Markov Chain Monte Carlo statistical methods. Significance was determined by computing confidence intervals around parameter estimates instead of using *p* values. All confidence intervals reported were 95% confidence intervals. An estimate was considered significant if the corresponding confidence interval did not contain zero, which indicated that the true value was unlikely to support the null hypothesis.

For this investigation, gender was included as a predictor variable in all models as a time-invariant covariate. A second predictor variable, mother-to-child language usage, was incorporated into the models as a lagged, time-varying covariate. Thus, mother-to-child language usage lagged each outcome measurement by 3 or 9 months (see Figure 1). The assumption was the mothers' language usage would impact children's later (as opposed to prior) language and emergent literacy development. For example, mother-to-child language reported in the middle of the children's 1st year in Head Start was thought to affect children's outcomes in the spring of that year and the fall of the next year.

By employing mother-to-child language in this fashion, it was possible to assess how changes in mother-to-child language usage affected changes in the outcome measures (Singer & Willett, 2003). Specifically, the intercept of the following models included mother-to-child language usage of More to All Spanish. The predictor variables of mother-to-child language Equal Amounts of Spanish and English and More or All English were then added to the model to test whether change in language usage impacted the change in outcomes.

RESULTS

To support the growth curve analyses that were performed, descriptive statistics for the dependent and independent variables are presented followed by the correlations among the variables. This is followed by a presentation of the growth curve models that were used to examine the impact of maternal language usage and children's gender on children's language and emergent literacy outcomes.

Descriptive Statistics

Vocabulary and emergent literacy abilities—Table 1 displays the means and standard deviations for children's raw and standard scores on the English and Spanish receptive vocabulary tests (PPVT–III and TVIP), and the English early literacy measure (TERA–2), during 2 years in Head Start and kindergarten. The measurement occasions for PPVT–III, TVIP, and TERA–2 included one time point at the end of children's 1st year in Head Start, the fall and spring of their 2nd year in Head Start, and the fall and spring of kindergarten. Because raw scores were used to model the developmental trajectories of the children in this sample, the discussion of the descriptive statistics focuses on children's raw scores. Standard scores are provided in Table 1 to aid in the interpretation of the raw scores.

In general, children's raw scores in English and Spanish receptive vocabulary and English early literacy increased across each time point with one exception. During the kindergarten year, children's Spanish receptive vocabulary scores decreased between the fall and spring measurement occasions; however, this difference was not significant ($p > .05$).

As shown in Table 1, the total number of participants decreased from the beginning of the study to the end of kindergarten. Although efforts were made to retain all participants in the study, a proportion of the families moved out of the area or could not be located.

Unfortunately, loss of participants is a common event in longitudinal studies of families from low-income backgrounds.

Mother-to-child language usage—The distribution of mother-to-child language usage by years is shown in Figure 2. As can be seen, the percentage of mothers speaking more or all English to their children increased over the 3 years and the percentage of mothers who used more or all Spanish decreased between the 1st and 2nd years of Head Start and maintained in kindergarten. The percentage speaking equal amounts of Spanish and English increased slightly in the children's 2nd year in Head Start and decreased in kindergarten as the percentage of mothers speaking to their children in more or all English increased.

Differences in maternal language usage based on the children's gender were observed. Although the proportion of mothers using more or all English increased over the 3 years for both male and female participants, a significantly larger proportion of mothers of boys used more or all English than mothers of girls over time ($p \leq .05$). By the children's kindergarten year, more than 60% of mothers of boys reported using more or all English as opposed to 30% of mothers of daughters. In contrast, larger proportions of girls were exposed to more or all Spanish by their mothers than boys during the children's 2 years in Head Start and the children's time in kindergarten ($p \leq .05$). In fact, more than 40% of mothers spoke more or all Spanish to their female children as compared to 5% of mothers of male children.

Correlations

Correlations were calculated to determine the relationship between children's English and Spanish receptive vocabulary and English early reading abilities and mother-to-child language usage (see Tables 2–4). In general, children's scores on the PPVT–III and mother-to-child language usage were positively correlated ($r = .28–.41$). This result demonstrates that use of English at home was associated with increases in children's English vocabulary scores. There was one exception to this. Mother-to-child language usage in kindergarten was not significantly correlated with children's PPVT–III scores at the last measurement occasion, the spring of kindergarten. It may be that children had received sufficient exposure to English at school that language usage in the home no longer was associated with children's vocabulary outcomes.

Children's Spanish receptive vocabulary (TVIP) and mother-to-child language usage was negatively correlated but significant during children's second year of Head Start ($r = -.25$ to $-.36$) and the spring of kindergarten ($r = -.40$ to $-.45$). Thus, usage of English in the home was negatively associated with Spanish vocabulary knowledge at most time points.

Mother-to-child language usage and children's English early literacy abilities (TERA–2) were positively correlated only during the spring of kindergarten ($r = .34–.43$). The lack of significant associations earlier in children's development may be due to the nature of the content of the TERA–2. As described earlier, the TERA–2 measures children's emergent literacy abilities. It may that many of the concepts tested through the early test items are not specific to a particular language (e.g., in one item, the child is required to name the logo for McDonald's). As a result, children can carry over their knowledge of emergent literacy concepts acquired in Spanish to English tasks, such as those required by the TERA–2. As the test progresses, items may be more specific to knowledge acquired about literacy in English.

The Effects of Maternal Language Usage and Children's Gender on Children's Development

English receptive vocabulary—Table 5 displays the confidence intervals for the parameter estimates from the English receptive vocabulary model as measured by the PPVT–III. The results revealed that the children exhibited a positive linear-rate-of change ($\beta = 11.32$, $p < .05$) in their English receptive vocabulary abilities during 2 years in Head Start and in kindergarten (see Figure 3). The children's gender and mother-to-child language did not have a significant impact on children's English receptive vocabulary. Thus, changes in mother-to-child language to equal amounts of Spanish and English and more or all English did not affect children's vocabulary growth.

Spanish receptive vocabulary—The parameter estimates for Spanish vocabulary as measured by the TVIP are provided in Table 5. The linear rate-of-change of children's Spanish receptive vocabulary was positive ($\beta = 5.89$, $p < .05$).

In addition, results indicated that changes in mother-to-child language usage had a significant impact on children's Spanish vocabulary outcomes. More specifically, as mother-to-child language usage moved toward more or all English, children's TVIP scores were observed to change at a slower rate ($\beta = -1.86$, $p < .05$; see Figure 4). The children's gender, however, did not affect development.

English early literacy—Similar to the results of the PPVT–III and TVIP, a positive linear-rate-of-change was observed ($\beta = 1.49$, $p < .05$) in the children's English emergent literacy abilities (see Table 5). In addition, an acceleration term was found to be significant ($\beta = 0.76$, $p < .05$), suggesting that children's early literacy abilities in English increased at an ever-increasing rate between their 1st year in Head Start and kindergarten (see Figure 5). Effects of the children's gender and mother-to-child language usage were not observed.

DISCUSSION

Previous research has examined the effects of the home language on the language and literacy outcomes of children in first grade and beyond. The purpose of this investigation was to determine the impact of mothers' language usage to their preschool bilingual children and the effect of gender on children's Spanish and English receptive vocabulary development and emergent literacy abilities measured in English.

Mothers' Language Usage

In general, the percentage of mothers who reported using mostly English when talking to their children increased over the 3-year period, which included 2 years in Head Start and kindergarten. This is consistent with existing research that has documented changes in individuals' language usage upon arrival in the United States (cf. Portes & Rumbaut, 2001; Veltman, 1988; Zentella, 1997). Although we did not interview mothers' about the reason(s) for their language choices, it is likely that their choice of language was influenced by the broader community and the education system that their children were attending. Recall that all the children attended English immersion programs in Head Start and kindergarten. Mothers may have received the message that English was necessary for their children's success in school, and as a result, increased their usage of English (Li, 2007; Pacini-Ketchabaw & Armstong de Almeida, 2006; Schecter & Bayley, 2004).

Differences in language usage were observed, however, based on the gender of the child. Over the 3 years, larger proportions of mothers spoke to their sons using more or all English in comparison to mothers of daughters, who were more likely to speak more or all Spanish

to them. By the kindergarten year, more than 60% of mothers of boys spoke mostly English to their children as opposed to 30% of mothers of girls. In contrast, more than 40% of mothers of girls spoke mostly Spanish to their children, whereas only 5% of mothers of boys reported doing so. This demonstrates how early differential patterns of socialization, which have been documented in the literature (cf. Arriagada, 2005; Zentella, 1997; Zuniga, 2004), emerge in Puerto Rican families. Because of this gender difference, the effect of gender was included in this study of language usage and children's language and literacy development.

The Impact of Maternal Use of English on Children's Outcomes

As would be expected, the children's English vocabulary and emergent literacy abilities increased during their 2 years in Head Start and kindergarten; however, changes in maternal language usage to equal amounts of Spanish and English or more or all English did not affect children's English vocabulary and emergent literacy development. This is consistent with the findings of Gutiérrez-Clellen and Kreiter (2003) and Duursma et al. (2007), who found that use of English in the home did not impact children's developing language abilities, and the findings of Dolson (1985), Duursma et al. (2007), and Kennedy and Park (1994), who found that the usage of the children's second language in the home did not impact their literacy outcomes in that language. Because the children who participated in this study were immersed in English instruction during preschool and kindergarten, it is hypothesized that they received sufficient exposure to English that maternal usage of English did not impact their development of English.

Changes in maternal language usage to more or all English, on the other hand, had a negative impact on children's development of Spanish vocabulary. Specifically, children whose mothers increased their usage of English experienced slower rates of vocabulary growth than children whose mothers spoke more Spanish than English or all Spanish to them at home.

The Impact of Maternal Use of Spanish on Children's Outcomes

Given that maternal usage of more or all Spanish was the referent for the analyses, statements about the impact of maternal usage of Spanish can be made. Consistent with the findings related to mothers' usage of English to their children, maternal usage of Spanish in the home over time did not impact children's developing English vocabulary and English emergent literacy abilities. This finding should minimize the concerns of those who believe that maternal usage of Spanish is harmful to children's developing abilities in English.

Maternal usage of Spanish, however, promoted children's developing Spanish vocabulary. Children whose mothers spoke more or all Spanish acquired their Spanish vocabulary at a faster rate than children whose mothers spoke more English than Spanish or all English. Equal amounts of Spanish and English used by mothers also did not have an impact. This finding complements the work of Gutiérrez-Clellen and Kreiter (2003) and Duursma et al. (2007), who concluded that use of Spanish in the home was necessary to promote children's developing language abilities in Spanish. Given that the children in our investigation did not receive instruction in Spanish during Head Start or kindergarten, usage of Spanish at home was necessary to promote the children's Spanish vocabulary development over time.

The Effect of Gender

Despite differences in the language usage of mothers of daughters and mothers of sons, gender did not impact children's developing Spanish or English vocabulary or their emergent literacy skills. At least two reasons may account for this lack of an effect. First, regardless of the children's gender, a large percentage of mothers reported using increasingly more English over the 3-year period. Thus, gender did not affect children's

developmental trajectories. Second, all children attended Head Start and kindergarten classrooms in which they were immersed in English. It may be that English immersion negated any potential gender effect on developing vocabulary or literacy skills. As a result, the English "advantage" that boys may have experienced because of their higher exposure to English at home is erased over the 3-year period, as girls and boys progressed through an educational system that promoted English language development. Both girls and boys spent a considerable amount of their day in English speaking environments and spent increasingly less time in Spanish speaking contexts over the course of the study.

Future Directions

Additional studies are needed that replicate the findings of this investigation and that investigate the impact of maternal language usage on the development of bilingual preschoolers who receive dual language instruction or instruction in their home language. The impact of maternal language usage may differ in these educational settings. In addition, investigations are needed to examine the impact of other family members' language usage on children's language and emergent literacy development. Given the sample size for this study, it was not possible to include other family members in the analysis (such as fathers and siblings), because there was not sufficient power to do so. Related to this, approximately half of the children did not have regular contact with their fathers; therefore, a larger sample would be needed to examine the impact of fathers' language usage on children's outcomes, given the large amount of missing data that occurs due to lack of fathers' presence. One might argue that a composite score could be calculated for mothers and fathers, and additional family members. In this case, highly detailed data would be needed to quantify the amount of time that children spend time with key members of their family. Such data could then be used to weight the contributions of family members who have regular contact with the children.

Implications

The results of investigation provide evidence that maternal usage of Spanish at home does not have a negative impact of children's developing English vocabulary and emergent literacy abilities when attending English immersion Head Start programs. Thus, use of Spanish need not be viewed as a threat to children's developing English abilities, particularly when children attend school in English. Therefore, it is recommended that educational personnel refrain from instructing Spanish-speaking mothers to speak only English to their children. This is particularly true when mothers have a minimal command of English. When mothers have limited knowledge of English, they have a reduced ability to produce well-formed language models in English. Also, the complexity of their language is reduced. As a result, their children are then exposed to impoverished language. However, if mothers continue to speak to their children in their native language, they are able to produce well-formed and rich language models for their children. Thus, children's developing language abilities are fostered. Based on Cummins's (1979) interdependence hypothesis, development of an underlying proficiency with language is important, as children are able to apply what they know in one language to learn a second.

This investigation also showed that maternal usage of English impedes the trajectories of children's Spanish vocabulary development. Therefore, if mothers are encouraged to abandon their native language, children's Spanish language development will not be fostered when children attend English immersion programs. Although some may not view this as important, significant cognitive and academic benefits of bilingualism have been documented in the literature. For example, individuals who are proficient in two languages have better metalinguistic and phonological awareness, increased sensitivity to semantic relationships, enhanced creativity and higher academic outcomes (cf. Bialystok, 1986, 1988,

1992, 1997; Hakuta & Díaz, 1985). In addition, bilingual immigrant children living in the United States have higher educational aspirations, higher self-esteem, and lower rates of depression and better relationships with their parents as compared to immigrant children who are not proficient in their two languages (Portes & Rumbaut, 2001). Therefore, children who acquire two languages have the potential to experience the benefits of being bilingual.

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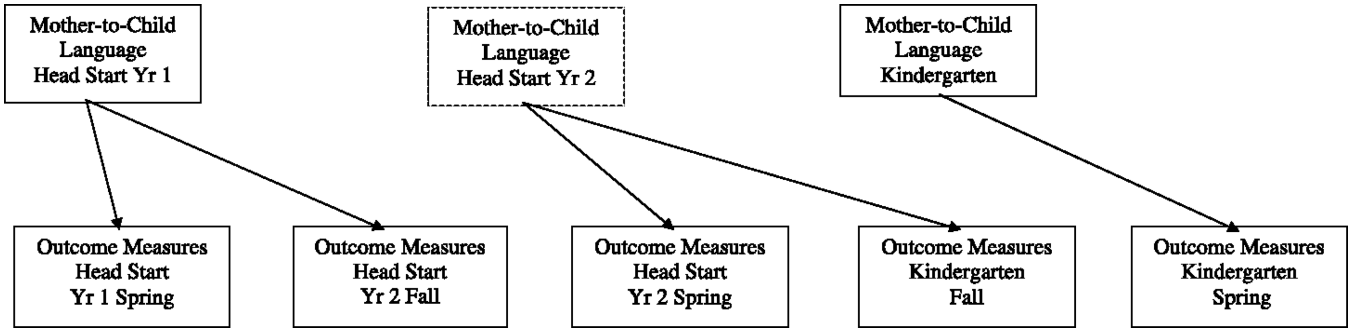

FIGURE 1.
Modeling strategy.

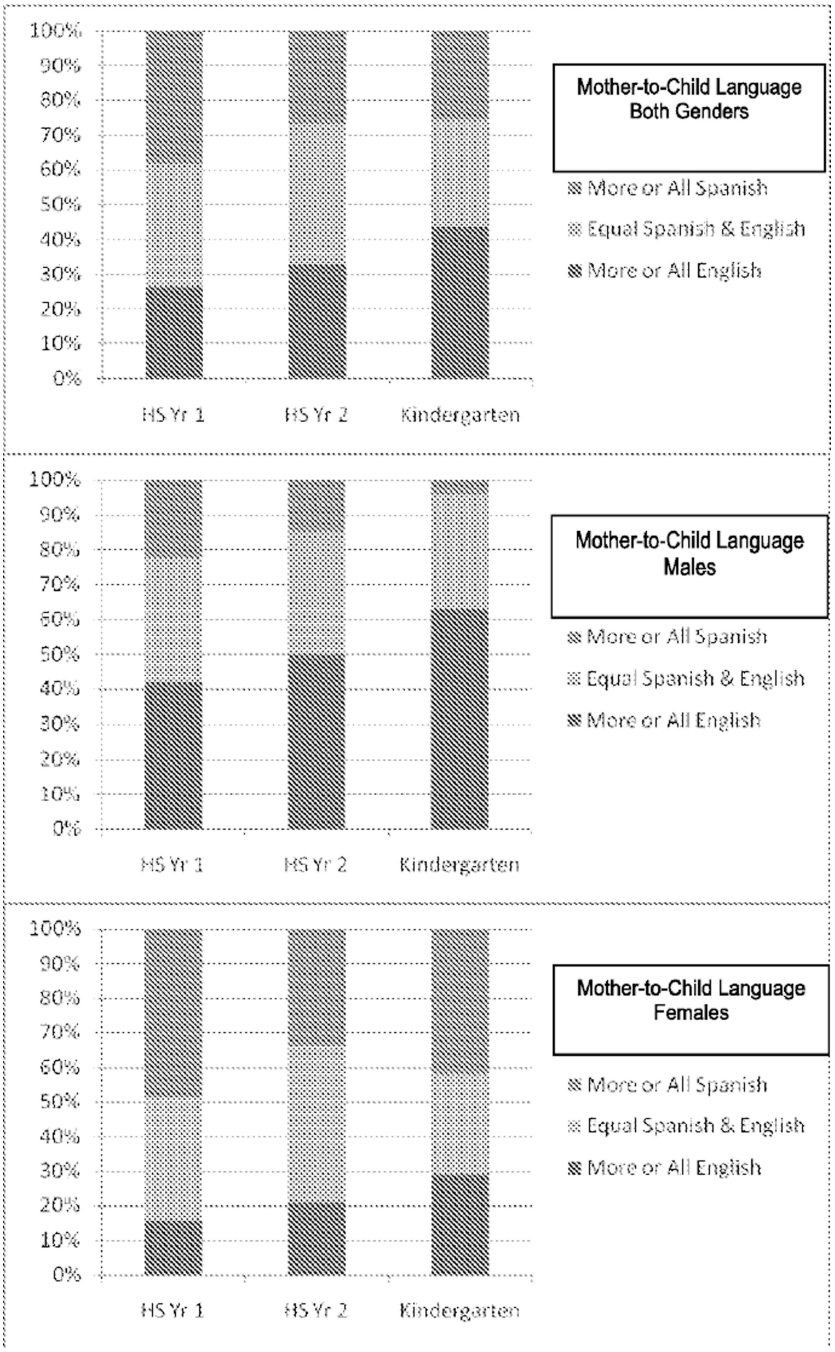

FIGURE 2.
Mother-to-child language usage over 3 years. *Note.* HS = Head Start.

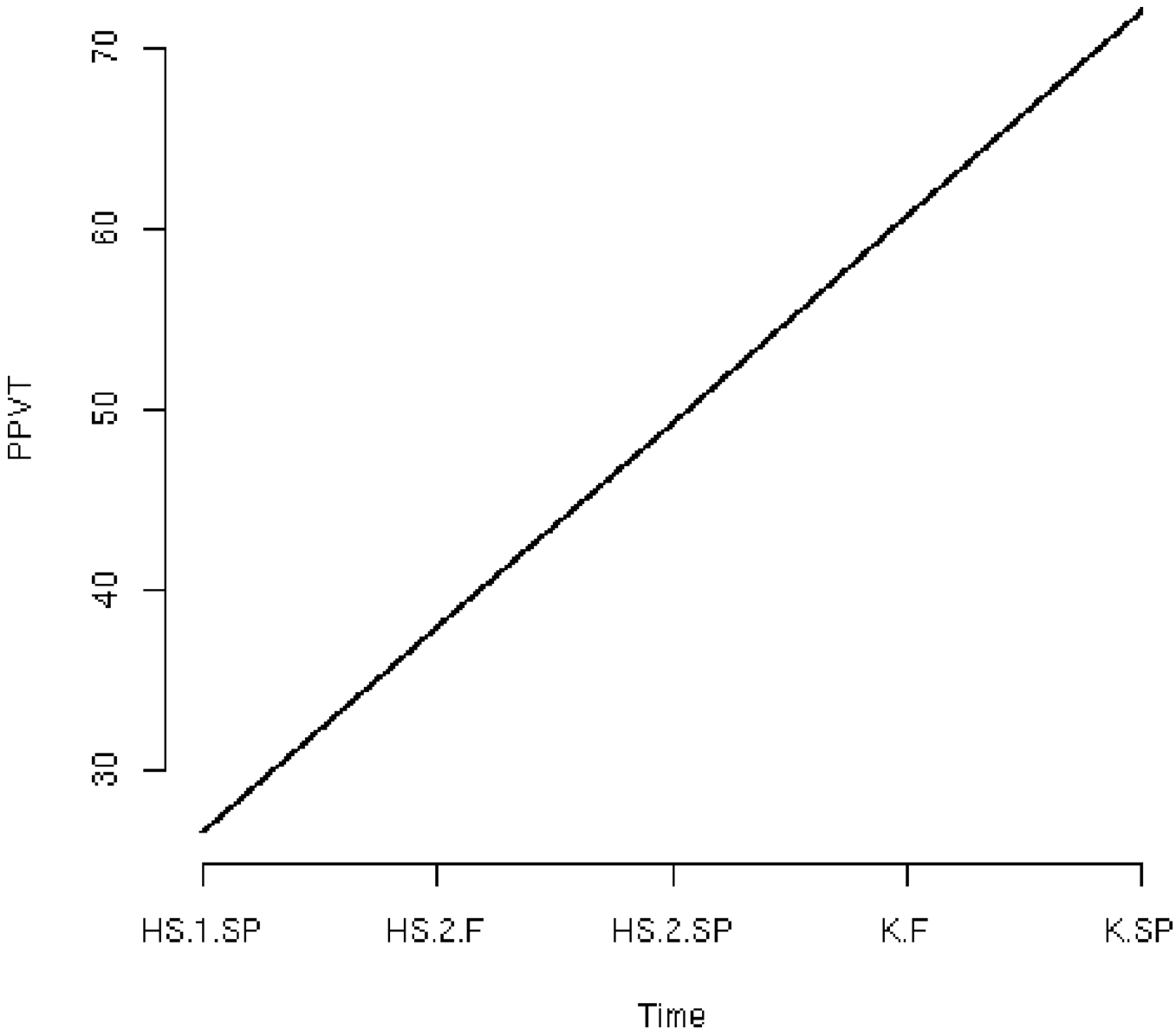

FIGURE 3.
Growth trajectory for Peabody Picture Vocabulary Test–III (PPVT–III). *Note.* HS = Head Start; K = kindergarten; SP = Spring; F = Fall.

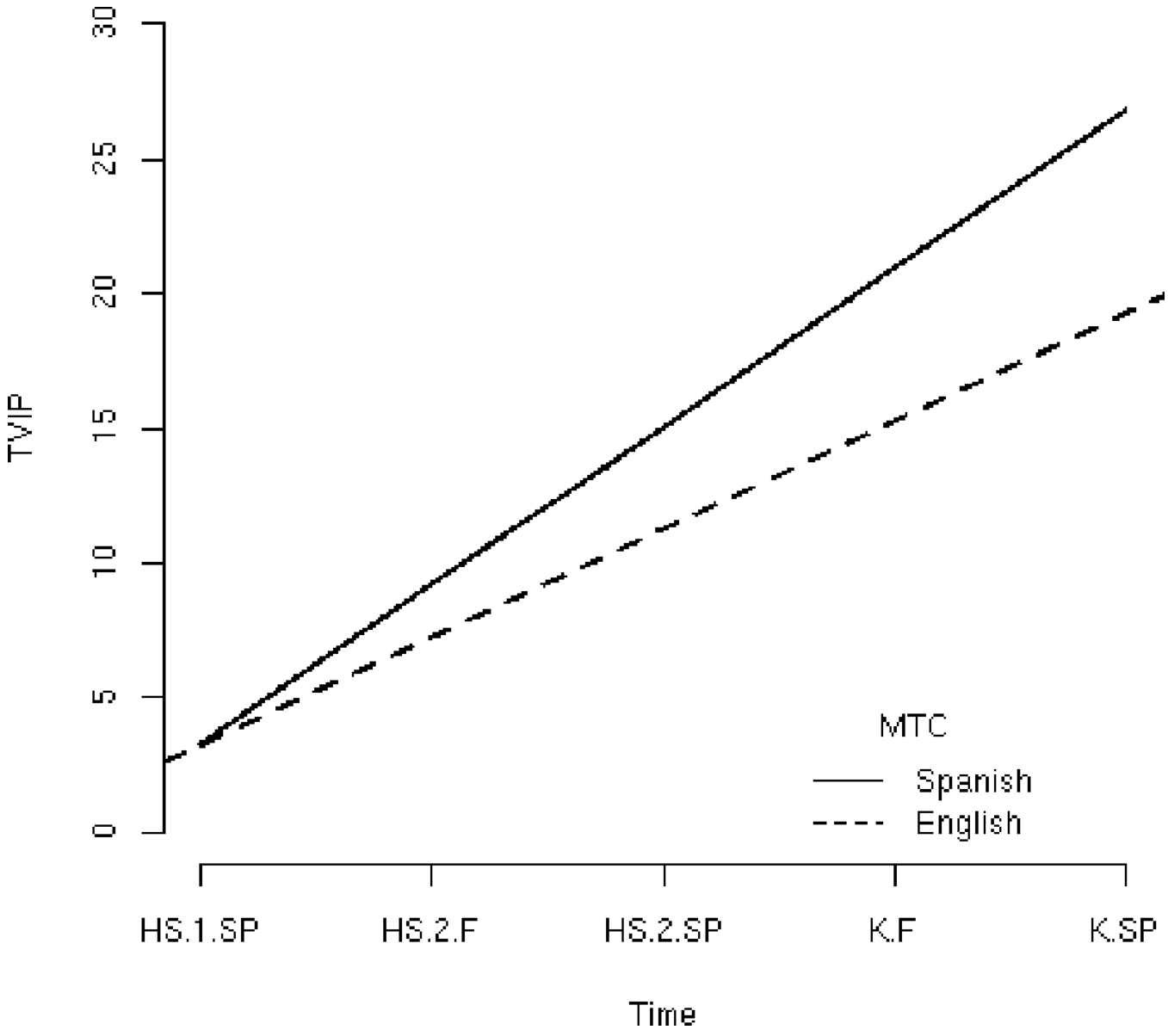

FIGURE 4.
Growth trajectory for Test de vocabulário en imágenes Peabody (TVIP). *Note.* MTC = mother-to-child language; HS = Head Start; K = kindergarten; SP = Spring; F = Fall.

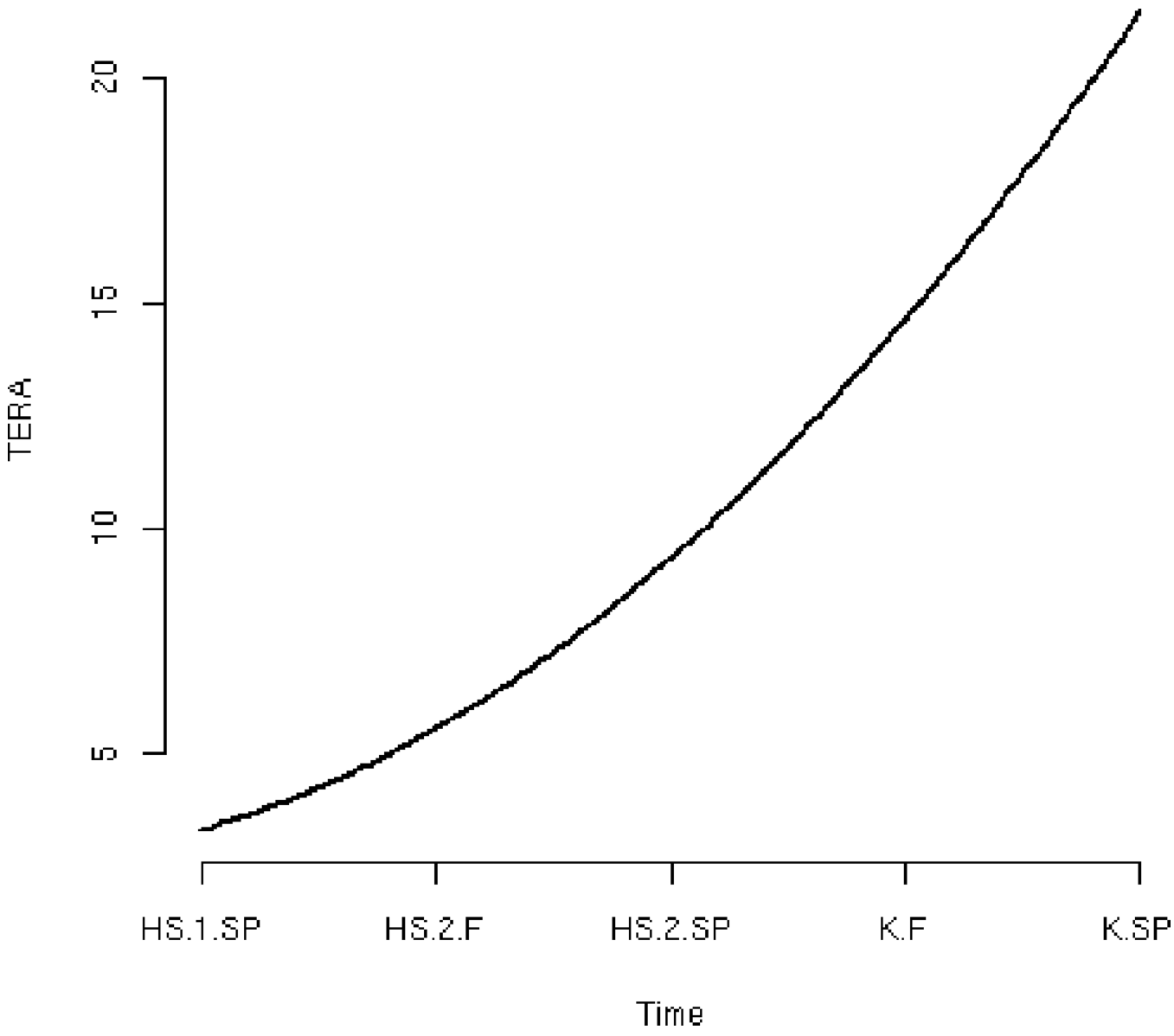

FIGURE 5.
Growth trajectory of Test of Early Reading Ability–2 (TERA–2). Note. HS = Head Start; K = kindergarten; SP = Spring; F = Fall.

TABLE 1

Descriptive Statistics

	Raw Scores: M (SD)	Standard Scores: M (SD)	Valid N
PPVT–III			
Head Start Yr 1 spring	24.4 (14.7)	73.4 (16.3)	73
Head Start Yr 2 fall	35.2 (15.2)	78.1 (14.4)	66
Head Start Yr 2 spring	47.4 (15.1)	84.5 (12.5)	63
Kindergarten fall	62.7 (16.6)	87.7 (14.7)	53
Kindergarten spring	67.2 (12.2)	86.8 (11.2)	47
TVIP			
Head Start Yr 1 spring	6.7 (7.0)	77.7 (11.5)	72
Head Start Yr 2 fall	10.2 (9.5)	73.4 (14.5)	66
Head Start Yr 2 spring	11.4 (11.8)	72.4 (16.6)	62
Kindergarten fall	28.4 (14.2)	82.8 (15.1)	56
Kindergarten spring	23.3 (17.0)	85.0 (13.3)	54
TERA–2			
Head Start Yr 1 spring	3.6 (2.3)	88.6 (11.0)	67
Head Start Yr 2 fall	4.5 (3.1)	79.9 (11.6)	61
Head Start Yr 2 spring	7.6 (4.2)	82.6 (11.6)	60
Kindergarten fall	18.9 (5.7)	97.8 (12.8)	53
Kindergarten spring	22.9 (5.8)	96.7 (14.5)	47

Note. PPVT–III = Peabody Picture Vocabulary Test–III; Yr = year; TVIP = Test de vocabulário en imágenes Peabody; TERA–2 = Test of Early Reading Ability–2.

TABLE 2

English Receptive Vocabulary and Mother-to-Child Language Usage Correlations

	PPVT–III HS Yr 1 Spring	PPVT–III HS Yr 2 Fall	PPVT–III HS Yr 2 Spring	PPVT–III K Fall	PPVT–III K Spring
PPVT–III HS Yr 2 Fall	0.68*				
PPVT–III HS Yr 2 Spring	0.62*	0.75*			
PPVT–III K Fall	0.65*	0.66*	0.58*		
PPVT–III K Spring	0.68*	0.48*	0.52*	0.58*	
Mtc HS Yr 1	0.36*	0.37*	0.28*	0.34*	0.38*
Mtc HS Yr 2	0.36*	0.37*	0.28*	0.34*	0.38*
Mtc K	0.41*	0.41*	0.32*	0.38*	0.21

Note. PPVT–III = Peabody Picture Vocabulary Test–III; HS = Head Start; Yr = year; K = kindergarten; Mtc = mother-to-child language usage.

*$p < .05$.

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TABLE 3

Spanish Receptive Vocabulary and Mother-to-Child Language Usage Correlations

	TVIP HS Yr 1 Spring	TVIP HS Yr 2 Fall	TVIP HS Yr 2 Spring	TVIP K Fall	TVIP K Spring
TVIP HS Yr 2 Fall	0.67*				
TVIP HS Yr 2 Spring	0.60*	0.64*			
TVIP K Fall	0.58*	0.51*	0.60*		
TVIP K Spring	0.64*	0.66*	0.71*	0.50*	
Mtc HS Yr 1	−0.22	−0.36*	−0.30*	−0.22	−0.45*
Mtc HS Yr 2	−0.22	−0.36*	−0.30*	−0.22	−0.45*
Mtc K	−0.22	−0.25*	−0.25*	−0.17	−0.40*

Note. TVIP = Test de vocabulário en imágenes Peabody; HS = Head Start; Yr = year; K = kindergarten; Mtc = mother-to-child language.

* $p < .05$.

TABLE 4

English Early Literacy and Mother-to-Child Language Usage Correlations

	TERA–2 HS Yr 1 Spring	TERA–2 HS Yr 2 Fall	TERA–2 HS Yr 2 Spring	TERA–2 K Fall	TERA–2 K Spring
TERA–2 HS Yr 2 Fall	0.34*				
TERA–2 HS Yr 2 Spring	0.38*	0.23			
TERA–2 K Fall	0.38*	0.24	0.44*		
TERA–2 K Spring	0.53*	0.38*	0.38*	0.51*	
Mtc HS Yr 1	0.17	0.17	−0.05	0.23	0.43*
Mtc HS Yr 2	0.17	0.17	−0.05	0.23	0.43*
Mtc K	0.11	0.01	0.01	0.16	0.34*

Note. TERA–2 = Test of Early Reading Ability–2; HS = Head Start; Yr = year; K = kindergarten; Mtc = mother-to-child language.

* $p < .05$.

TABLE 5

Parameter Estimates for the PPVT-III, TVIP, and TERA-2

	2.5%	50%	97.5%
PPVT–III			
Intercept	21.8	26.73	31.5
Linear rate-of-change (Slope)	10.0	11.32	12.6
Gender	−9.7	−3.52	2.6
Mother-to-child language: Equal	−1.4	0.11	1.7
Mother-to-child language: More or all English	−1.4	0.33	1.9
TVIP			
Intercept	−0.40	3.27	6.83
Linear rate-of-change (Slope)	4.73	5.89	7.11
Gender	−0.59	3.89	8.39
Mother-to-child language: Equal	−2.27	−0.82	0.57
Mother-to-child language: More or all English	−3.38	−1.86	−0.46
TERA–2			
Intercept	1.92	3.34	4.67
Linear rate-of-change (Slope)	−0.34	1.49	3.27
Acceleration	0.27	0.76	1.25
Gender	−1.70	−0.31	1.10
Mother-to-child language: Equal	−3.34	−1.21	0.97
Mother-to-child language: More or all English	−3.21	−0.91	1.47

Note. PPVT–III = Peabody Picture Vocabulary Test–III; Yr = year; TVIP = Test de vocabulário en imágenes Peabody; TERA–2 = Test of Early Reading Ability–2.