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## Predictors and Outcomes of Early vs. Later English Language Proficiency Among English Language Learners

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### Abstract

The development of English language learners (ELLs) was explored from kindergarten through eighth grade within a nationally representative sample of first-time kindergartners ( $N = 19,890$ ). Growth curve analyses indicated that, compared to native English speakers, ELLs were rated by teachers more favorably on approaches to learning, self control, and externalizing behaviors in kindergarten and generally continued to grow in a positive direction on these social/behavioral outcomes at a steeper rate compared to their native English-speaking peers, holding other factors constant. Differences in reading and math achievement between ELLs and native English speakers varied based on the grade at which English proficiency is attained. Specifically, ELLs who were proficient in English by kindergarten entry kept pace with native English speakers in both reading and math initially and over time; ELLs who were proficient by first grade had modest gaps in reading and math achievement compared to native English speakers that closed narrowly or persisted over time; and ELLs who were not proficient by first grade had the largest initial gaps in reading and math achievement compared to native speakers but the gap narrowed over time in reading and grew over time in math. Among those whose home language is not English, acquiring English proficiency by kindergarten entry was associated with better cognitive and behavioral outcomes through eighth grade compared to taking longer to achieve proficiency. Multinomial regression analyses indicated that child, family, and school characteristics predict achieving English proficiency by kindergarten entry compared to achieving proficiency later. Results are discussed in terms of policies and practices that can support ELL children's growth and development.

### Keywords

English language learners; English proficiency; school readiness; developmental trajectories

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English language learners (ELLs) can be defined as individuals in an English-speaking environment whose native language is not English. As noted in Espinosa (2007), other common terms for ELL students are *linguistic minority students* or *linguistically diverse students*. More recently, the term *dual language learner* has been used to describe young language-learning children who are learning to speak their home language as well as at least one other language at the same time (Castro, Espinosa, & Paez, 2011). ELL children are an important, and the fastest growing, segment of the student population in the United States

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(Wolf et al., 2008). The ELL student population has increased by more than 60% within a 10-year period (1994-2005), whereas the total growth in the K-12 student population within the same 10-year period was only 2% (Wolf et al., 2008). During the 2003-2004 school year, an estimated 5.5 million ELL students enrolled in United States' schools (Lazarin, 2006). According to the U.S. Census Bureau's 2007 American Community Survey, one in five school-age children (21%) spoke a language other than English at home; of these, almost one in four (24%) had difficulty speaking English (Federal Interagency Forum on Child and Family Statistics, 2009). In 2007, 6% of school-age children lived in families that are considered "linguistically isolated," meaning that no person age fourteen and older is fluent in English (Federal Interagency Forum on Child and Family Statistics, 2009).

Although English is not their native language, English language learners are not all limited in their proficiency of spoken and written English. For example, many children from immigrant families are proficient in English (Capps et al., 2005; Federal Interagency Forum on Child and Family Statistics, 2006; Shin & Bruno, 2003). However, consistent with the overall increase in ELL children in the U.S., the number of "limited English proficient" (LEP) students has also shown an increase over the past two decades (Collier, 1995; National Center for Education Statistics, 2003, 2004a). For example, in 2001-2002, approximately 3.8 million children in the nation's public schools were estimated to be limited in English proficiency (National Center for Education Statistics, 2003), compared to approximately 2 million in 1993-1994 (National Center for Education Statistics, 2004a). More recent estimates from the 2003-2004 school year indicate that the percentage of children in U.S. schools who were not proficient in English was 11%, and 51% of all schools reported serving LEP students during this time period (Strizek, Pittsonberger, Riordan, Lyter, & Orlofsky, 2006).

Improving the English language and literacy skills of all children, but especially ELL children, is a major concern for educational policy makers, as reflected in federal initiatives such as *Good Start, Grow Smart* and the No Child Left Behind Act, as well as state- and local-level early learning initiatives and instructional policies (Abedi, 2007; Child Care Bureau, n.d.; U.S. Department of Education, 2002). Consequently, it is important to understand what factors might support the development of young English language learners, including the development of English proficiency.

This paper presents a study focused on the development of ELL elementary school students. The study compares the developmental trajectories of ELL students and their native English-speaking peers in a nationally-representative, longitudinal sample of first-time kindergartners, focusing specifically on cognitive and behavioral outcomes from kindergarten through eighth grade. The study also explores whether there are differential developmental trajectories on cognitive and behavioral outcomes through eighth grade among ELL students based on the grade at which English proficiency is achieved during elementary school. In addition, this study also explores the factors that predict English proficiency among children whose home language is not English. The findings from this study may inform policy and practice in the early education of ELL children.

## Characteristics of the ELL Population

The population of English language learners is linguistically, culturally, and socially diverse. The most widely spoken foreign language in the United States in 2000 was Spanish, followed in order by Chinese, French, German, and Tagalog (Shin & Bruno, 2003). Nevertheless, Spanish appears to be the most dominant language spoken by ELL students in U.S. schools. In addition, 71% of all ELL elementary school children were identified as Latino as of the year 2000 (Capps et al., 2005).

Dual language learning in the early years has many benefits. Being a fluent multilingual speaker opens up opportunities that are not available to monolinguals, especially in the increasingly global economy. In addition, maintaining one's home language while learning a second language helps to support cultural identity and boost both self-concept and metalinguistic abilities (Bialystock, 2001; Espinosa, 2006; Oller & Jarmulowicz, 2007). In fact, ELL children in bilingual preschool programs learn English faster than their peers who stay at home while at the same time maintain their native language, which has psychosocial and academic benefits (Espinosa, 2007; Rodriguez, Diaz, Duran, & Espinosa, 1995; Winsler, Diaz, Espinosa, & Rodriguez, 1999).

Young ELL children tend to lag behind monolinguals in academic tasks (Oller & Jarmulowicz, 2007) and are at-risk for losing fluency in their home language, which is linked to poor academic outcomes (Genesee, Paradis, & Crago, 2004; Slavin & Cheung, 2005). ELL children may be at greater risk for low academic achievement not only due to language difficulties, but also because of family circumstances. Some of the most severe problems facing ELL children are poverty, low parental education, and, among those who are children of immigrants, issues related to their parents' legal status (Capps et al., 2005; Dinan, 2006). In the year 2000, 68% of ELL elementary school students were considered low-income, and 35% had parents with less than a high school degree (Capps et al., 2005; The Urban Institute, 2006). Of the various ethnic groups that comprise the ELL student population, Latino children face the most severe challenges in that they are the most likely to live in poverty and to have the least-educated parents (Capps et al., 2005; Larsen, 2004; Lopez & Cole, 1999). Perhaps not surprisingly, children who speak Spanish at home comprise the largest proportion of LEP students (76% in the year 2000) (Capps et al., 2005). It is therefore important to control for family factors such as income and parent education, as well as school factors such as proportion of LEP students, in order to determine the effects of ELL status on child outcomes.

There are individual differences in the rate of second-language acquisition among ELL children (Tabors & Snow, 2002). Factors that may influence second language acquisition include personality characteristics, immigrant status, socioeconomic status, how well the child has developed oral and written language skills in the first language, unique features of the second language, and the degree to which the first and second language differ (Genesee, Geva, Dressler, & Kamil, 2006). In addition, the number of years in the United States and the degree to which the home and school environments are similar with regard to their language and literacy experiences may also play a role (Francis & Rivera, 2007; Rueda, August, & Goldberg, 2006). Thus, second-language learning is a product of complex interactions between family and child characteristics as well as school policies, and classroom and teacher characteristics (Garcia & Jensen, 2007). Because of these complex relationships, research should examine the nature of within-group variability in language and literacy outcomes for ELL students based on home and school characteristics.

## School Readiness among English Language Learners

Regardless of home language or level of English language proficiency, children who grow up in low-income households and children whose parents have low levels of education are at a greater risk for low academic achievement (Dinan, 2006; Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Lopez & Cole, 1999; National Center for Education Statistics, 2002a, 2004b; The Urban Institute, 2006). ELL children are among those at greater risk for reading and math difficulties in elementary and middle school, high school dropout, and low college attendance (Committee on the Prevention of Reading Difficulties in Young Children, 1998; Espinosa, 2007; Fitzgerald, 1993; Snow, Burns, & Griffin, 1998). Current research is insufficient to predict the effect of ELL status on behavioral outcomes. However,

there is some evidence to suggest that children whose home language is not English tend to have a developmental profile at kindergarten entry that is characterized by strengths in the social-emotional domain (Hair et al., 2006). Because of the high rates of socioeconomic disadvantage among ELL children, it is important to disentangle the effects of English language proficiency from other potential influences on academic and behavioral outcomes among ELL children (Espinosa, 2010).

## English Proficiency among ELL Children

The term “language proficiency” has been defined in different ways by different researchers. Many distinguish between the skills that govern oral fluency from those associated with successful functioning in an academic environment. For example, Cummins (2000) uses the terms Basic Interpersonal Communication Skills and Cognitive Academic Language Proficiency to distinguish these two aspects of language proficiency (see also Hakuta, Butler, & Witt, 2000 for a similar dichotomous distinction). Other researchers, such as MacSwan and Pray (2005), view proficiency as encompassing all aspects of language development, including phonology (pronunciation), morphology (word formation), the principles of oral discourse including semantics (word meanings), the rules that govern syntax (word order), and pragmatics (the social uses of language). Bailey (2007) presents a more comprehensive conceptualization of academic English language (AEL) that goes beyond linguistic features to include the language skills students need to access instruction in school and to address the linguistic demands of the academic content presented in classroom settings. Assessments of academic English language proficiency would encompass tests of listening, speaking, reading and writing. Bailey and Butler (2007) argue that tests that measure academic English would be expected to be much better predictors of academic achievement for ELLs than tests that merely measure oral language comprehension within social settings. Because of the variables available in the national dataset used for this study, the definition of English language proficiency is limited to those oral language skills that permit effective communication in and comprehension of English. This was assessed by the use of an oral language assessment administered directly to the child that measured children’s listening comprehension, vocabulary, and command of expressive language (National Center for Education Statistics, 2002b). While the narrower definition of English proficiency of this study is a limitation, the study has an off-setting advantage of permitting analysis of ELL children’s development over time in a nationally representative sample of young children.

There is considerable variability in the time it takes to achieve English language proficiency among early elementary school ELL children, ranging from 1 to 6.5 years; the average length of time it takes ELL children to become proficient in English is about three years (MacSwan & Pray, 2005). Across several studies, researchers have found that ELL children do not achieve parity with native-born speakers on measures of English language proficiency even after two years of English instruction in elementary school (Cummins, 1980; Hakuta et al., 2000; MacSwan & Pray, 2005). Some studies measure English language proficiency as a purely linguistic construct that is independent of academic achievement (MacSwan & Pray, 2005), while other studies use indicators that overlap substantially with academic achievement (Cummins, 1980; Hakuta et al., 2000).

## Predictors of English Proficiency

Considering the many challenges that ELL students face, as well as the importance of English proficiency in terms of academic success, it is important to understand what factors in the home and school environments might support the overall development of ELL children as well as the acquisition of English language proficiency among these children.

Some of the factors outside of the school environment that researchers have identified as influencing the grade at which English proficiency is achieved include family socioeconomic status, parental education, neighborhood factors, the experience of discrimination, reasons for immigration (voluntary versus involuntary), social-emotional factors, length of exposure to English, and acculturation or motivation/aspiration (Bialystock & Hakuta, 1994; Krashen & Brown, 2005; MacSwan & Pray, 2005; Portes & Hao, 1998; Thomas, 2004). Some of the educational factors associated with the grade at which English language is acquired include participation in early care and education programs, parental involvement in school, teacher attitudes and characteristics, the number of limited English proficient students in the school, and exposure to well-designed bilingual education programs (Fitzgerald, 1993; Klingner, 2006; Winsler et al., 1999).

### **Individual and family factors influencing English proficiency**

Researchers have found that children from low-income backgrounds, children from large families, and children whose parents are not married are less likely to be proficient in English (Durham, 2006). Amount of exposure to English influences English language proficiency as well. Foreign-born ELL children who have been in the United States for ten years or more have better English proficiency than their peers with fewer than nine years of U.S. residency, but they also are more likely to lose their ability to speak their native language (Portes & Hao, 1998). Similarly, internationally-adopted children have better English proficiency the longer their accumulated exposure to English (Roberts et al., 2005). In addition, internationally-adopted children acquire English more quickly the younger their initial age of adoption, after accounting for total accumulated exposure to English (Roberts et al., 2005). Among early elementary-school age children (i.e., kindergarten through third grade), younger ELL children tend to need more time to acquire all linguistic aspects of the English language and rules of discourse compared to older ELL children (MacSwan & Pray, 2005); however, this finding may reflect the additional exposure to English that older ELL children may have had.

Krashen and Brown (2005) found that children with high levels of self-confidence and high levels of motivation are more likely to become proficient in English, whereas children with low self-esteem and children who generally do not feel good about themselves struggle with acquiring English. This has important implications for the way educators may choose to interact with ELL students and structure their classroom environment.

There is research evidence – albeit based mostly on elementary school samples – to suggest that parents of ELL children have high academic expectations for their children and can be successful in supporting their children’s literacy development; however, schools do not always adequately access this resource (Goldenberg, Rueda, & August, 2006). Family engagement in early care and education settings may play a role in the rate of English acquisition and also positively affect other developmental domains (Hernandez, Denton, & Macartney, 2007; Lopez & Cole, 1999; Naughton, 2004), or the association may be spurious, instead reflecting self-selection factors. More research is needed on the role of parent involvement for ELLs, especially within early childhood settings and early elementary school, taking into consideration the efforts that these settings make to support family engagement and the degree of alignment between home and school supports for ELL children’s language acquisition (Rueda et al., 2006).

### **Educational factors influencing English proficiency**

One of the educational factors that may influence the time it takes children to become proficient in English is participation in early care and education programs. Researchers have found that ELL children, and Latino children in particular, are less likely to be enrolled in

formal preschool programs than their peers (Capps et al., 2005; Espinosa, 2007; Matthews & Ewen, 2006; Naughton, 2004; The Urban Institute, 2006). Some have suggested that the low rate of preschool enrollment among Latino children is due to cultural preferences, while others argue that it is a reflection of socioeconomic disadvantage and lack of access to affordable center-based care (Espinosa, 2007; Hernandez et al., 2007).

The classroom and school characteristics of the early elementary school years may play an important role in ELL children's acquisition of English language proficiency (August & Hakuta, 1997). Previous research suggests that ELL students with limited English proficiency may be more likely than other children to have teachers with fewer years of teaching experience and to attend schools with a greater percentage of low-income children and fewer resources (e.g., Cosentino de Cohen, Deterding, & Chu Clewell, 2005; Denton, 2005; Moss & Puma, 1995). All of these factors may influence the educational outcomes of ELL students, including the acquisition of English language proficiency.

In addition to examining the general educational characteristics potentially linked to improved outcomes for all children, such as teachers' level of education or years of experience (Arreaga-Mayer & Perdomo-Rivera, 1996; Rueda & Garcia, 1996), it would be important to examine specific language and instructional services and resources available to ELL children within classrooms and schools. Castro, Espinosa, and Paez (2011) have identified several elements of high-quality early care and education that support dual language learners, including: (1) Creating an organized and supportive early childhood environment; (2) Positive educator-child interactions; (3) Increased opportunities for peer interactions; (4) Strategic use of the child's first language; (5) Explicit vocabulary instruction; (6) Ongoing and frequent assessment of the child's first and second language development and other developmental domains; (7) Small group and one-on-one activities; (8) Structural program characteristics; (9) Educator knowledge and skill; and (10) Family engagement. Clearly, some of these program characteristics would benefit any child, but when delivered in combination, it is argued that they provide comprehensive high-quality supports for ELL children. To date, there is little research linking features of the early care and education environment to ELL children's long-term educational outcomes.

The aim of this study is to assess the developmental trajectories of ELL students and their native English-speaking peers in a nationally-representative, longitudinal sample of first-time kindergartners, focusing specifically on cognitive and behavioral outcomes from kindergarten through eighth grade. A previous analysis of a nationally-representative sample of first-time kindergartners revealed that children whose home language was not English were most often characterized as possessing health and socio-emotional strengths at kindergarten entry, while at the same time exhibiting limitations in language and literacy skills (Hair et al., 2006). Children with this profile of socio-emotional and health strengths but language and cognitive limitations at kindergarten entry performed as well as children who had a profile of cognitive, language, social-emotional, and health strengths on behavioral and health outcomes at the end of first grade; however, they were still performing lower on academic outcomes at the end of first grade compared to children with a profile of comprehensive developmental strengths. This study builds on this previous work by looking at developmental trajectories of ELL children in comparison to their native English-speaking peers from kindergarten through eighth grade. To our knowledge, no other studies have examined this question before with a nationally representative sample. Based on previous research, we hypothesize that ELL children will have initial scores on academic assessments that are lower than their native English-speaking peers in kindergarten, and may show slower growth through eighth grade compared to their English-speaking classmates on academic skills. Further, based on the same previous research, we hypothesize that there will

be no difference between ELLs and native English language speakers in behavioral outcomes through eighth grade.

Another innovation of this study is that it will explore how the timing of acquisition of English proficiency among ELL students may affect outcomes through eighth grade. We hypothesize that cognitive and behavioral development through eighth grade will be better for children who are proficient in English by kindergarten entry compared to children who achieve English proficiency later in elementary school (e.g., end of first grade or later).

A final set of analyses will help us to understand the factors that distinguish between achieving English proficiency by kindergarten entry versus achieving proficiency later in schooling among children whose home language is not English. Based on the literature reviewed above, we hypothesize that individual and family-level factors, including child age, poverty status, parents' marital status, parents' level of education, as well as activities in the home that support academic outcomes, such as parental involvement in school and participation in cognitively stimulating activities, will influence the grade at which English language proficiency is achieved among a nationally-representative sample of first-time kindergartners who are English language learners. Furthermore, we expect that educational factors including participation in early care and education programs prior to school entry, availability of services that accommodate ELL children and families within the school, percentage of limited English proficient students in the school, and teacher experience will predict the grade at which English proficiency is achieved among a national sample of ELL children.

## Method

### Sample

The Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K) provided data for all the analyses. The ECLS-K dataset is a large, nationally-representative dataset of approximately 22,000 U.S. children who were enrolled in kindergarten in the fall of 1998 (National Center for Education Statistics, 2002b). The ECLS-K is sponsored by the National Center for Education Statistics (NCES) and provides a wealth of data on children's development from multiple sources, including direct child assessments, parent and teacher interviews, and children's self-report in later rounds (National Center for Education Statistics, 2002b).

The sample used in this study was limited to first-time kindergartners in both public and private schools (approximately 19,000 children), among which was a sub-sample of ELL first-time kindergartners, comprising approximately 2,700 children within the full sample. Parents' report of the primary language spoken in the home was used to identify the ELL sub-sample; those whose home language was not English comprised this group.

### Measures

Appendix A lists the constructs, data sources, and system of coding that were used in the models tested. Below is a description of some of the key measures included in the models.

**English proficiency**—The ECLS-K Oral Language Development Screener (OLDS) was administered to all children whose school records indicated that their home language was not English, and the purpose was to determine if the child had sufficient English language skills to be assessed using the full English language battery of assessments in the ECLS-K. This screening test was derived from the Pre-LAS 2000 (Duncan & De Avila, 1985-1987), and evaluated children's listening comprehension, vocabulary, and command of expressive

language (National Center for Education Statistics, 2002b). Children who received a score of at least 37 out of a possible total score of 60 were considered to be English proficient and thus receive the full battery of child assessments in English (National Center for Education Statistics, 2002c). The cut-off score was determined based on results of national norming sample for Pre-LAS 2000 (Duncan & De Avila, 1986). Pre-LAS 2000 is an English proficiency measure consisting of six scales from which three sub-scales were selected to create OLDS (Duncan & De Avila, 1985-1987). The OLDS screener was first administered to all ELL children at the fall of kindergarten, and thereafter was only administered to children who did not pass the screener at the previous administration (i.e., if a child passed the screener in the fall of kindergarten, he or she would not be screened again in the spring). The OLDS screener was not administered to any children past the spring of first grade data collection because so few students did not receive a passing score on the OLDS by the spring of first grade. For the purposes of the present study, receiving a passing score on the OLDS was used as a marker of English proficiency, and the timing of passing the OLDS was used as a measure of grade at which English proficiency was achieved. Because the OLDS was a screening instrument, further assessment would be necessary to determine *extent* of ELL children's English language proficiency in greater depth. Extent of proficiency was not a focus of the present study.

ELL children's English proficiency status was divided into three categories based on the timing of acquisition: passing the OLDS screener by kindergarten entry ( $n = 1,290$ ), passing the OLDS screener after kindergarten entry but determined proficient by first grade ( $n = 980$ ), and *not* passing the OLDS screener by the spring of first grade ( $n = 410$ ).

**Child demographic characteristics**—Child-level demographic characteristics included age by kindergarten entry, gender, race/ethnicity, citizenship status, and disability status. All of these variables, with the exception of child's citizenship status, were collected at the fall of kindergarten and derived from parent interview data. Data on child's citizenship status was only available at the spring of kindergarten.

**Family demographic characteristics**—Family demographic characteristics included family structure; whether the child's mother was born in the U.S.; the highest education level among both parents; number of siblings; and income-to-needs ratio. Each of these variables was measured at the fall of kindergarten and could therefore provide an accurate portrayal of the demographic characteristics of the child's home life at the beginning of elementary school.

**Home environment characteristics**—A continuous measure of parents' report of cognitively stimulating activities in the home at kindergarten entry was included in analyses. The cognitive stimulation measure was created by summing seven variables that measured how often parents read a book, told a story, sung, built things, taught about nature, helped with art, and played games with their child.

Additional home environment measures were available at the spring of kindergarten from the parent interview. These covariates included a continuous measure of the child's participation in ethnic and cultural heritage activities on a scale from 0 to 12, with higher values indicating greater participation in racial, ethnic, and religious socialization activities; number of extracurricular activities (such as scout groups or sports teams) from 0 to 3 (top-coded at 3); whether the family routinely eats meals together; whether the child has a set bedtime; an index score of parent's report of their involvement in the child's school, on a scale from 0 to 6, with higher values indicating greater involvement; an index score of parent's report of barriers to school involvement (such as lacking transportation or being unable to get time off of work) on a scale from 0 to 7, with higher values indicating more



barriers; and a measure indicating whether the parent felt that language created a barrier to involvement in their child's school activities.

**Child care**—Attendance in early care and education prior to school entry was included in this study. The variable included in analyses indicated whether a child attended any type of nonparental care in the year before kindergarten. Nonparental care was further classified for analyses as center-based care (including centers, Head Start, and nursery school) and home-based care (including family child care homes, a nanny or babysitter, or care by an adult relative or friend).

**School characteristics**—Demographic characteristics of the elementary school included school type (private or public school); school size; the percent of LEP students in the school; and a measure indicating whether the majority of the school population was low-income (defined using a combination of receipt of Title 1 funding and the percentage of children receiving free or reduced lunch). These school characteristics were collected at the spring of kindergarten from school administrator reports. The vast majority of children (92%) remained at the same school over the course of the kindergarten year (National Center for Education Statistics, 2001).

Additional school characteristics, including school services available to students and families, were collected at the spring of kindergarten from school administrator reports. These variables included whether the school provided notes to parents in languages other than English; a continuous scale of the number of services offered to all families (e.g. adult literacy training; kindergarten orientation), and a continuous scale of the number of services offered specifically to ELL families (e.g. meetings are held in a non-English language).

**Teacher characteristics**—The characteristics of the child's kindergarten teacher included teacher's years of experience teaching at this grade level (less than 3 years; 3-6 years; greater than 6 years); whether the teacher had 5 or more years of experience teaching English as a Second Language (ESL) or bilingual classes; and whether the teacher had completed the median number of courses for each of the following topics: child development (3 courses), elementary education (6 courses), and early childhood education (6 courses). These characteristics were assessed at the spring of kindergarten and were derived from teacher self-reports.

**Classroom characteristics**—Children's kindergarten classroom characteristics (both general classroom characteristics as well as certain classroom resources that may assist ELL students) were included in analyses. The general classroom characteristics included a continuous measure of class size; whether the child was in full-day kindergarten; and whether reading was taught on a daily basis in the classroom. The specialized classroom characteristics included hours per day that a paid ESL aide was available in the classroom, on a scale from 1 ("0 hours or no aide") to 4 ("5 or more hours"); whether the child participated in either reading tutoring or pull-out reading; whether the child received either pull-out or in-class ESL instruction; and the how often the child had access to non-English books (never, 1-3 times per month, 1-4 times per week, or daily). Each of these characteristics was assessed at the spring of kindergarten and was derived from teacher survey data.

**Child outcomes**—The dependent variables for this study included multiple cognitive and behavioral outcomes measured at up to six time points from kindergarten entry through the spring of eighth grade. Cognitive outcomes were derived from direct assessment of reading and mathematics skills that used Item Response Theory (IRT) (National Center for Education Statistics, 2002b). IRT-scaled scores allow for comparisons of students' reading

and math ability across the entire sample, even though students were administered different subsets of items. In kindergarten and first grade, reading assessments in English were only administered to children who demonstrated sufficient English proficiency as determined by the OLDS. By third grade, virtually all children in the ECLS-K were administered the reading and math assessments in English.

Behavioral outcomes were defined as externalizing behaviors, self control, and approaches to learning, and were derived from teacher-reports to an adapted version of Gresham and Elliott's "Elementary Scale A ("How Often?") of the Social Skills Rating System (Gresham & Elliott, 1990; Meisels, Atkins-Burnett, & Nicholson, 1996). To assess children's externalizing behaviors, teachers completed a 5-item scale that asked the frequency with which a child exhibited problem behaviors (such as fighting, impulsivity, or arguing). Teachers rated student self-control using a 4-item scale that asked about children's ability to exhibit self control (e.g. control his/her temper or respond appropriately to peer pressure). Teachers were also asked to assess a child's "approach to learning" using a six-item scale that focused on the child's attentiveness, task persistence, eagerness to learn, learning independence, flexibility, and organization. These behavioral measures were administered from kindergarten through fifth grade.

### Data Analysis

In all of the analyses, we adjusted for the complex sample design of the ECLS-K. *M plus* adjusts the analyses for the stratification (C17SCSTR), the primary sampling unit (C17SCPSU), and allows for weighting for the longitudinal sample (C1\_7FCO). In the examination of statistical significance, a threshold of  $p < .01$  was used as a minimum for reporting significant differences.

We employed latent growth curve (LGC) methodology (Bollen & Curran, 2006; Duncan, Duncan, Strycker, Li, & Alpert, 1999; Meredith & Tisak, 1990; Muthén & Khoo, 1998) to determine the children's initial status at kindergarten entry (intercept) and growth through eighth grade (slope) based on English proficiency status. For the reading models only, the intercept was set at spring of kindergarten due to the fact that many ELL children lacked a fall kindergarten reading score. Children whose home language was English were used as the reference group in the full sample, and children who achieved proficiency by kindergarten entry were used as a reference group in our models for the ELL sub-sample. In the unconditional models, we included language proficiency only as a predictor of the developmental outcomes. In the multivariate models, child, family, home, child care, school, teacher, and classroom characteristics were also included in the analyses. To test for multicollinearity, we examined the variance inflation factor (VIF) for values greater than 5.0 (O'Brien, 2007). The VIF indicates how much the variance of the regression coefficient is being inflated due to multicollinearity in the model. Analyses indicated that multicollinearity was not evident among our set of covariates.

The data were analyzed using LGC modeling within a structural equation framework in *Mplus* Version 5.21 (Muthén & Muthén, 1998-2008). Within LGC, the observed variables for reading, math, approaches to learning, self-control, and externalizing were measured at each of the time periods between the fall of kindergarten and the spring of eighth grade are represented by the common latent factors of the intercept and linear slope. The intercept is a constant for any given individual across time; therefore, the factor loadings of observed measures are set at 1 for each measurement point. The linear slope factor, in turn, describes individual differences in the constant rate of change across data collection waves. The method shows the estimated effects of the covariates on both the intercept and slope.

To examine predictors of early versus later English proficiency, a multinomial regression model was run using *Mplus* software. The model included child demographic characteristics, family and home characteristics, school characteristics, teacher characteristics and classroom characteristics, as described above. Our reference group for the multinomial regression model was proficient at kindergarten entry.

### Missing Data

Growth curve analyses used *Mplus*' full-information maximum likelihood (FIML) algorithm to accommodate missing rounds of child outcome data for each model. FIML is the preferred method for the treatment of missing at random data in structural equation modeling because it uses all available data and produces more accurate parameter estimates and fit indices than other treatments such as pairwise or listwise deletion of cases (Arbuckle, 1996; Enders, 2001; Enders & Bandalos, 2001). We also examined models using different assumptions about missing data. Specifically, we ran selected analyses using pattern-mixture modeling and the Roy Latent Class Dropout model (Muthén, Asparouhov, Hunter, & Leuchter, 2010) that test for non-ignorable missing data. In both cases, similar estimates and standard errors were generated as with the FIML approach, suggesting that the missing data in the sample were missing at random.

## Results

### Sample Characteristics

Table 1 presents the characteristics of the full sample and the ELL sub-sample. As noted in this table, 87 percent of the full sample was comprised of native English speakers. Although there are similarities in the demographics of the full sample and the ELL sub-sample (e.g., about half of each sample was female, and were approximately 5 and a half years old at fall of kindergarten), the ELL sample tended to have a higher percentage of parents with less than a high school degree, have a lower income-to-needs ratio for family income, and a higher percentage of children who were immigrants than the full sample. The ELL sample also tended to have a higher proportion of children who were in parental care the year prior to kindergarten compared to the full sample. It should be noted that the largest proportion of ELL children in the ELCS-K dataset were Latinos of Mexican heritage, and Mexican Latinos tended to be of lower income than Latinos from other origins, such as Cuba (Reardon & Galindo, 2006). Therefore, when interpreting the findings from the ECLS-K, it is important to remember that the income distribution of the sample of ELL children is likely more representative of a low-income population.

In the ELL sample, 48 percent were proficient in English at kindergarten entry, 37 percent were proficient by first grade, and 15 percent were not English proficient by spring of first grade.

### Home Language Predicting Cognitive Outcomes Through Eighth Grade

**Unconditional models**—In the unconditional models, initial reading scores as well as growth in reading over time when compared to native English speaking peers varied for ELL students based on the grade at which English proficiency was achieved. Specifically, ELL students who were proficient in English by kindergarten entry had reading scores in the spring of kindergarten similar to those of students whose home language was English ( $\beta = -0.05$ , ns) but the rate of increase in reading achievement from kindergarten to eighth grade was slower for ELL students who were proficient in English by the time they entered kindergarten than for native English speakers ( $\beta = -0.64$ ,  $p < .01$ ). The difference in rate of growth between these two groups is indicated by the significant, negative parameter estimate that connotes a less steep increase in growth over time for ELL students who were proficient

by kindergarten entry as compared to their native English-speaking peers. ELL students who were proficient by first grade began kindergarten with moderately lower reading skills compared to students whose home language was English ( $\beta = -7.089, p < .001$ ) and had less steep growth (i.e., slower growth) in reading skills through eighth grade ( $\beta = -2.70, p < .001$ ), suggesting that the gap in reading scores was growing over time. ELL students who did not achieve English proficiency by the spring of first grade scored considerably lower on the reading assessment at the spring of kindergarten than students whose home language was English ( $\beta = -53.28, p < .001$ ), but they had a relatively steeper growth trajectory through eighth grade ( $\beta = 5.82, p < .001$ ), suggesting that there was some modest “catch up” in reading skills for the initially lowest-performing ELL group.

The initial status and rates of growth over time of the different English proficiency groups compared to native English speakers are reflected in the differences evident in students’ reading performance in eighth grade. ELL students who were proficient in English by kindergarten entry had similar reading scores in eighth grade ( $M = 172, SD = 25.9$ ) to students whose home language was English ( $M = 173, SD = 26.5$ ), but ELL students who were proficient later had substantially lower eighth-grade reading scores (proficient by first grade:  $M = 156, SD = 29.6$ ; not English proficient by the spring of first grade:  $M = 139, SD = 27.9$ ).

Students whose home language was not English scored lower on the math assessment at kindergarten entry than students whose home language was English and varied in their growth in math skills over time based on the grade at which English proficiency was achieved. Specifically, ELL students who were proficient in English by kindergarten entry started out lower on math skills in kindergarten compared to native English speakers ( $\beta = -1.61, p < .001$ ) but had a steeper growth trajectory through eighth grade ( $\beta = 0.65, p < .001$ ), suggesting modest catch up to their native English-speaking peers. ELL students who were proficient by first grade also had initially lower math skills in kindergarten compared to native English speakers ( $\beta = -7.04, p < .001$ ) but there were no differences in rate of change in math scores over time between these two groups ( $\beta = -0.01, ns$ ), indicating that the math performance of ELL students who became English proficient by first grade remained lower over time compared to their peers whose home language was English. ELL students who were not English proficient by the spring of first grade also started with significantly lower math scores compared to native English speakers ( $\beta = -8.93, p < .001$ ) and had a slower rate of growth in math achievement ( $\beta = -2.75, p < .001$ ), suggesting that the gap in math achievement between native English speakers and ELL who do not achieve English proficiency by first grade may grow over time.

Examination of the absolute levels of performance on the math assessment in eighth grade indicate that ELL students who achieved English proficiency later had lower math scores in eighth grade (proficient by first grade:  $M = 134, SD = 23.6$ ; not English proficient by the spring of first grade:  $M = 122, SD = 23.6$ ) than ELL students who were proficient by kindergarten entry ( $M = 144, SD = 22.7$ ) or students whose home language was English ( $M = 143, SD = 21.4$ ).

**Multivariate models**—Results of the multivariate models are presented in Table 2. When child, family, home, child care, teacher, classroom, and school-level covariates were included in the models, it was found that ELL students varied in their initial status and growth in reading compared to native English speakers based on the grade at which English proficiency was achieved. Specifically, ELL students who were proficient in English by kindergarten entry had reading scores in the spring of kindergarten on par with their native English-speaking peers ( $\beta = -0.31, ns$ ) and had a moderately steeper growth trajectory from kindergarten to eighth grade ( $\beta = 0.90, p < .01$ ), suggesting that they were keeping up with and/or surpassing their native English-speaking peers in reading over time. ELL students

proficient in English by the spring of first grade had lower reading scores in spring of kindergarten than their native English-speaking peers ( $\beta = -4.24, p < .001$ ) and there was no difference in the rates of growth over time between the two groups ( $\beta = 0.31, ns$ ), suggesting that an initial gap in reading achievement between these two groups persisted over time. ELL students not proficient in English by spring of first grade had substantially lower reading scores in the spring of kindergarten compared to their native English-speaking peers ( $\beta = -45.71, p < .001$ ) but had a significantly steeper growth trajectory from spring of kindergarten to spring of eighth grade ( $\beta = 10.44, p < .001$ ), suggesting some narrowing of the achievement gap in reading over time between this ELL group and native English speakers.

Similarly, models of math performance that included the full set of covariates found differences in ELL students' initial math performance and growth in math skills compared to native English speakers based on English proficiency status. ELL students who were proficient in English by kindergarten entry had math scores in kindergarten comparable to their native English-speaking peers ( $\beta = -0.03, ns$ ) and had a faster rate of growth in math skills from kindergarten to eighth grade ( $\beta = 0.75, p < .001$ ), suggesting that this group of ELL students generally kept pace with or surpassed their native English-speaking peers over time. ELL students who were English proficient by spring of first grade had, on average, Math IRT scores 2.59 points lower in the spring of kindergarten than students whose home language was English ( $\beta = -2.59, p < .001$ ) but had a steeper rate of growth over time ( $\beta = 0.62, p < .001$ ), suggesting modest catch up in math skills over time. In contrast, ELL students who were not English proficient by the spring of first grade had lower math scores than native English speakers in kindergarten ( $\beta = -1.96, p < .001$ ) and had a significantly slower (i.e., less steep) rate of growth in math over time ( $\beta = -1.30, p < .001$ ), suggesting that this group of ELL students' math performance remained lower over time compared to their peers whose home language was English, and the gap in math achievement grew over time.

**ELL first-time kindergartner models**—In comparable multivariate analyses of the ELL first-time kindergartner sample ( $n = 2,670$ ) using students who were proficient at kindergarten entry as the reference group, similar results were found for the cognitive outcomes (see Table 3). Students who were proficient by first grade scored lower on reading at the spring of kindergarten than students who were proficient at kindergarten entry ( $\beta = -3.53, p < .001$ ) and had a less steep growth trajectory between kindergarten and eighth grade ( $\beta = -1.27, p < .001$ ), suggesting persistent and widening disparities in reading achievement over time between these two ELL groups. Students who were not English proficient by the spring of first grade had much lower reading scores in spring of kindergarten ( $\beta = -30.19, p < .001$ ) but also had a steeper growth trajectory between kindergarten and eighth grade on reading ( $\beta = 3.46, p < .01$ ) compared to students who were English proficient at kindergarten entry, suggesting that the gap in reading achievement was closing somewhat over time.

Similarly, ELL students who were proficient in English by first grade scored lower on math at the spring of kindergarten ( $\beta = -2.65, p < .001$ ) and had a less steep growth trajectory in math skills between kindergarten and eighth grade ( $\beta = -2.29, p < .001$ ) compared to students who were proficient at kindergarten entry, suggesting a widening of the gap in math performance between these two groups of ELL students. Students who were not English proficient by the spring of first grade also had lower math scores in the spring of kindergarten: ( $\beta = -2.40, p < .001$ ) but had comparable growth through eighth grade ( $\beta = -0.31, ns$ ) compared to their peers who were proficient in English by kindergarten, suggesting a persistent but not widening gap in math performance between these two groups. Collectively, these findings indicate differential development in reading and math achievement among ELL students based on the grade at which English proficiency was achieved.

## Home Language Predicting Behavioral Outcomes Through Fifth Grade

**Unconditional models**—In the unconditional models, students whose home language was not English scored slightly lower on approaches to learning at kindergarten entry (proficient by kindergarten entry:  $\beta = -0.05$ ,  $p < .05$ ; proficient by first grade:  $\beta = -0.07$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $\beta = -0.30$ ,  $p < .001$ ) than students whose home language was English. However, ELL students also had a slightly steeper rate of growth on approaches to learning measures between kindergarten and fifth grade than students whose home language was English (proficient by kindergarten entry:  $\beta = 0.04$ ,  $p < .001$ ; proficient by first grade:  $\beta = 0.07$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $\beta = 0.07$ ,  $p < .001$ ), suggesting that ELL students may approach or slightly exceed native English speakers in teacher ratings of approaches to learning over time.

Students who were proficient by kindergarten entry scored slightly more favorably (i.e., lower) on externalizing behaviors at kindergarten entry than students whose home language was English ( $\beta = -0.12$ ,  $p < .001$ ), but the two groups had the same rate of growth in externalizing behaviors over time ( $\beta = -0.004$ , ns) indicating persistent but not widening disparities over time between these two groups. ELL students who were English proficient by first grade also started out kindergarten with slightly more favorable (i.e., lower) externalizing ratings than native English speakers ( $\beta = -0.10$ ,  $p < .001$ ), but they also had a slightly less steep rate of growth on externalizing behaviors between kindergarten and fifth grade compared to students whose home language was English ( $\beta = -0.03$ ,  $p < .001$ ), suggesting that the disparities in externalizing scores widen slightly over time for these two groups, with the ELL students being rated by teachers more favorably initially and over time. ELL students who were not proficient in English by spring of first grade did not differ from their native English-speaking peers on ratings of externalizing behaviors at kindergarten entry ( $\beta = -0.04$ , ns), nor in rate of growth in externalizing behaviors over time ( $\beta = 0.004$ , ns). Collectively, these findings suggest that all ELL students who become proficient in first grade or earlier tend to receive lower externalizing ratings by teachers over time than native English speakers.

ELL students did not differ substantially on self-control at kindergarten entry compared to students whose home language was English (proficient by kindergarten entry:  $\beta = 0.03$ , ns; proficient by first grade:  $\beta = -0.02$ , ns; not English proficient by the spring of first grade:  $\beta = -0.07$ ,  $p < .05$ ). However, ELL students who were proficient in English at kindergarten entry or by first grade had a significantly steeper growth trajectory on self-control between kindergarten and fifth grade compared to students whose home language was English (proficient by kindergarten entry:  $\beta = 0.03$ ,  $p < .001$ ; proficient by first grade:  $\beta = 0.06$ ,  $p < .001$ ), indicating a slightly more favorable teacher ratings on self-control over time compared to native English speakers.

In terms of absolute levels of performance on the behavioral outcomes in fifth grade, differences between groups were modest. ELL students who were proficient in English by kindergarten or first grade had slightly better behavioral outcomes than students whose home language was English, whereas ELL students who were not proficient in English by the end of first grade had the least favorable behavioral outcomes in fifth grade. Specifically, on a scale of 1 to 4, teachers rated students whose home language was English as high on self-control ( $M = 3.22$ ,  $SD = 0.6$ ) and approaches to learning ( $M = 3.07$ ,  $SD = 0.7$ ) but relatively low on externalizing behaviors ( $M = 1.65$ ,  $SD = 0.6$ ) in fifth grade. Compared to these native English speakers, teachers rated ELL students who were proficient in English by kindergarten and first grade as slightly higher on self-control (proficient by kindergarten:  $M = 3.31$ ,  $SD = 0.6$ ; proficient by first grade:  $M = 3.32$ ,  $SD = 0.5$ ) and approaches to learning (proficient by kindergarten:  $M = 3.14$ ,  $SD = 0.7$ ; proficient by first grade:  $M = 3.12$ ,  $SD = 0.7$ ) and lower on externalizing behaviors (proficient by kindergarten:  $M = 1.56$ ,  $SD = 0.6$ ;

proficient by first grade:  $M=1.51$ ,  $SD=0.5$ ) in fifth grade. In contrast, ELL students who were not proficient in English by the end of first grade were rated by teachers at the end of fifth grade as lower on self-control ( $M=3.11$ ,  $SD=0.6$ ) and approaches to learning ( $M=2.88$ ,  $SD=0.7$ ) but higher on externalizing behaviors ( $M=1.66$ ,  $SD=0.6$ ) than all other groups.

**Multivariate models**—Results of the multivariate models are presented in Table 2. Controlling for a host of child, family and school covariates, ELL students who were proficient in English at kindergarten entry were found to score significantly higher on approaches to learning ( $\beta= 0.06$ ,  $p<.01$ ) and lower on externalizing behaviors ( $\beta= -0.06$ ,  $p<.01$ ) at kindergarten entry than students whose home language was English. There was no difference in the rate growth between kindergarten and fifth grade for students who were English proficient at kindergarten entry and students whose home language was English, indicating that ELL students who became proficient in English early continued to perform at higher levels on behavioral outcomes over time compared to their native English-speaking peers. As an example, ELL students who were proficient by kindergarten entry on average were rated higher in approaches to learning by their fifth-grade teachers ( $M=3.14$ ) than were their native English-speaking peers ( $M=3.07$ ).

ELL students who were English proficient by the spring of first grade did not differ from students whose home was English on externalizing behaviors, self-control or approaches to learning at kindergarten entry net of the effects of child, family, home, child care, teacher, classroom, and school-level covariates; however they had a more favorable rate of growth between kindergarten and fifth grade on all three behavioral outcomes than students whose home language was English (externalizing:  $\beta= -0.05$ ,  $p<.001$ ; self-control:  $\beta= 0.05$ ,  $p<.001$ ; approaches to learning:  $\beta= 0.05$ ,  $p<.001$ ). Again, this suggests that despite starting out at comparable levels in kindergarten on behavioral measures, ELL students who became proficient in English by first grade slightly surpass their native English-speaking peers on behavioral outcomes by fifth grade, even after controlling for other factors. Indeed, examination of the absolute levels of performance on behavioral outcomes in fifth grade confirms this pattern (see information on behavioral outcomes in fifth grade reported above).

ELL students who were not proficient in English by the spring of first grade did not differ from native English speakers on initial levels of externalizing behavior or ratings of self control in kindergarten, nor did they differ from native English speakers on their rate of growth in these behavioral outcomes over time (see Table 2). However, ELL students who were not proficient in English by the spring of first grade did score lower on approaches to learning in kindergarten compared to students whose home language was English ( $\beta= -0.11$ ,  $p<.01$ ), and they had a faster rate of growth between kindergarten and fifth grade than students whose home language was English ( $\beta= 0.07$ ,  $p<.01$ ), suggesting a slight narrowing of the disparity on this behavioral indicator over time. Nevertheless, examination of the absolute levels of performance on approaches to learning in fifth grade indicates that ELL students who were not proficient in English by spring of first grade were still rated lower ( $M=2.88$ ) than native English-speaking peers ( $M=3.07$ ) by their teachers.

In sum, the multivariate growth curve analyses examining behavioral outcomes over time indicate a slight advantage in teacher ratings of ELL students over native English-speaking students, especially for ELL students who become proficient in English in first grade or earlier.

**ELL first-time kindergartner models**—In comparable multivariate analyses of the ELL first-time kindergartner sample ( $n=2,670$ ) using students who were proficient at kindergarten entry as the reference group, results indicated only a few differences between ELL groups (see Table 3). Specifically, ELL students who were English proficient by the spring of first

grade did not differ from students who were proficient by kindergarten entry on initial ratings of externalizing behaviors ( $\beta = 0.05$ , ns) but they did have a significantly negative growth trajectory in externalizing over time ( $\beta = -0.04$ ,  $p < .001$ ), indicating that teachers were slightly more favorable in their ratings of ELL students who become proficient in English in first grade compared to those who become proficient earlier on this particular behavioral indicator. The opposite pattern was evident for approaches to learning: ELL students who were proficient in English by spring of first grade scored slightly lower on approaches to learning at kindergarten entry ( $\beta = -0.08$ ,  $p < .01$ ) compared to students who were proficient in English at kindergarten entry, and there was no difference between these two ELL groups in the rate of growth through fifth grade, indicating that the slight disparity in ratings on approaches to learning favoring ELL students who become proficient in English earlier persisted over time.

ELL students who were not proficient in English by spring of first grade did not differ from their peers who were proficient in English by kindergarten entry on initial levels of externalizing behaviors ( $\beta = -0.08$ , ns), nor did they differ in rate of growth in externalizing behaviors over time ( $\beta = -0.01$ , ns). However, ELL students who were not proficient in English by the spring of first grade scored lower on approaches to learning at kindergarten entry ( $\beta = -0.24$ ,  $p < .001$ ) compared to students who were proficient at kindergarten entry, and there was no difference in rate of growth over time ( $\beta = 0.04$ , ns) suggesting that the slight disparity in approaches to learning favoring ELL students who become proficient in English by kindergarten entry persisted over time.

There were no differences in initial levels or rates of growth over time in self control across the three ELL groups.

### Predicting English Proficiency

Our final set of analyses aimed to determine which factors are associated with the timing of English proficiency among ELL students. To the extent that these factors are malleable, they may indicate important points of intervention and support for English language learners. Odds ratios from multinomial regression analyses predicting English proficiency are presented in Table 4. Compared to those students who were proficient at kindergarten entry, students who gained proficiency by the spring of first grade or were not proficient by the spring of first grade were younger (proficient by first grade:  $OR = 0.63$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 0.38$ ,  $p < .001$ ), more likely to be Mexican (proficient by first grade:  $OR = 2.21$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 10.46$ ,  $p < .001$ ) or Asian (proficient by first grade:  $OR = 1.63$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 5.75$ ,  $p < .001$ ), less likely to be a citizen (proficient by first grade:  $OR = 0.58$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 0.49$ ,  $p < .001$ ), more likely to have parents with lower education (proficient by first grade:  $OR = 0.86$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 0.77$ ,  $p < .001$ ), and likely to have more siblings (proficient by first grade:  $OR = 1.18$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 1.15$ ,  $p < .001$ ).

Both groups of students (those who were proficient by the spring of first grade and those who were not) were more likely than students who were proficient at kindergarten entry to be from larger schools (proficient by first grade:  $OR = 1.25$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 1.26$ ,  $p < .001$ ), to attend private schools (proficient by first grade:  $OR = 1.65$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 2.78$ ,  $p < .001$ ), and to have more than 25% of the enrolled student population be LEP students (proficient by first grade:  $OR = 1.99$ ,  $p < .001$ ; not English proficient by the spring of first grade:  $OR = 5.61$ ,  $p < .001$ ). In addition, these two groups were less likely than students who were proficient at kindergarten entry to attend schools that send home school-parent notices



that were in English only (proficient by first grade:  $OR = 0.57, p < .001$ ; not English proficient by the spring of first grade:  $OR = 0.40, p < .001$ ), and more likely to receive pull-out tutoring or in-class ESL lessons (proficient by first grade:  $OR = 1.53, p < .001$ ; not English proficient by the spring of first grade:  $OR = 1.68, p < .01$ ).

Compared to students who were proficient in English at kindergarten entry, students who were proficient by the spring of first grade were more likely to be immigrants ( $OR = 2.39, p < .001$ ), were more likely to have parents who reported that language was a barrier to school involvement ( $OR = 1.45, p < .01$ ), were less likely to have teachers who have completed more than the median coursework in early childhood development (proficient by first grade:  $OR = 0.70, p < .01$ ), were more likely to be in classrooms where reading was taught daily ( $OR = 1.81, p < .01$ ), and were more likely to be in classrooms with more hours of ESL aides ( $OR = 1.25, p < .001$ ).

In addition, compared to students who were proficient at kindergarten entry, students who were not proficient by the spring of first grade were more likely to be of other Hispanic origin ( $OR = 6.91, p < .001$ ), more likely to be disabled ( $OR = 3.12, p < .01$ ), less likely to be from a higher-income family ( $OR = 0.70, p < .001$ ), less likely to have participated in cultural heritage activities ( $OR = 0.90, p < .001$ ), more likely to have participated in home-based care ( $OR = 1.63, p < .001$ ) or parental care ( $OR = 2.37, p < .01$ ) compared to center-based care in the year prior to kindergarten, less likely to have a teacher with more than six years of teaching experience ( $OR = 0.80, p < .01$ ), and more likely to be in classrooms that have non-English books available ( $OR = 2.55, p < .001$ ).

## Discussion

Collectively, the results of this study indicate that there is variability in the developmental trajectories of English language learners based on the grade at which they achieve proficiency in oral English language usage. Differences in developmental trajectories emerge for both cognitive and social/behavioral outcomes when compared to native English speakers as well as when ELL students are compared amongst themselves based on the timing of English proficiency. Furthermore, this study revealed that specific family and school predictors are associated with early versus later acquisition of English proficiency.

Holding other factors constant, ELL children who are proficient in English at kindergarten entry perform as well as or better than their English-speaking peers on measures of socio-emotional and behavioral development, reading, and math as they start kindergarten, and grow at the same or faster rates in these areas as native English-speaking peers. This suggests that ELL who are proficient in oral English language at kindergarten entry keep pace with or surpass their native English-speaking peers in both cognitive and social/behavioral outcomes over elementary school. ELL students who become proficient in English by the spring of first grade have an initial gap in reading achievement compared to native English speakers that persists over time, but the initial gap in math achievement appears to close somewhat over time. In terms of social/behavioral outcomes, ELL students who are proficient in English by first grade start out at comparable levels as their native English-speaking peers but grow slightly faster in these skills over time, even after controlling for other factors. ELL children who do not become proficient in English by the spring of first grade have substantially worse reading, math, and approaches to learning outcomes, both initially and through fifth and eighth grade, compared to their native English-speaking peers, net of child, family, teacher, classroom, and school covariates.

In analyses of the full sample as well as the ELL sub-sample, both the unconditional and conditional models revealed an apparent gradient of timing of proficiency, indicating that

ELL students who achieve proficiency by kindergarten entry generally fare better than their peers who achieve proficiency by spring of the first grade, and ELL students who do not achieve proficiency by spring of first grade fare the worst, particularly on reading, math, and approaches to learning outcomes. These findings reinforce the difficulty of insuring that all children, including ELL children, reach on-grade-level performance by third grade, as current educational policy aims to achieve. It is therefore critical to identify what factors best support ELL children's development, especially those children with lower levels of English proficiency.

Findings indicate child and family demographic characteristics are strong predictors of proficiency status, and also predict outcomes over time. Older ELL children and more advantaged children are more likely to be proficient in English by the start of kindergarten than their younger and more disadvantaged peers. Age at school entry and disability status are also related to child behavioral and academic outcomes at kindergarten entry and over time, as are parent education and family income. These findings are consistent with previous research indicating that family income and parental education are some of the strongest predictors of child outcomes (Fryer & Levitt, in review; Lee & Burkham, 2002). However, it is still noteworthy that English proficiency status distinguishes ELL children's outcomes even when accounting for these other factors. In addition to child age, family income, and parental education, family activities and routines, such as participation in cultural heritage activities and parents' perception of language as a barrier to school involvement are associated with the likelihood of being proficient in English among ELL students. Specifically, ELL students who are proficient in English by kindergarten are less likely than those who become proficient by first grade to have parents who report that English is a barrier to school involvement; ELLs who are proficient by kindergarten are also more likely than ELLs who do not become proficient by first grade to participate in cultural heritage activities. While *barriers to parental involvement in school* have been noted in previous research as important factors in ELL students' educational success, *participation in family activities* has received less attention. The association between participation in cultural heritage activities and better English proficiency outcomes for ELL students is worth exploring in further detail, and verification of these findings by replicating analyses with other ELL samples would be important.

Exposure to center-based care in the year prior to kindergarten was associated with a higher likelihood of English proficiency by kindergarten entry compared to those who were not proficient by the spring of first grade. This finding corroborates previous studies that emphasize the important role of early care and education in the school readiness of ELL children (Espinosa, 2007). Participation in center-based care may expose children to more academic English language experiences compared to the exposure they receive at home. However, the ECLS-K data set does not permit an exploration of the specific qualities of the nonparental care environments that may be contributing more directly to the acquisition of English language proficiency, such as amount of English language spoken in the classroom, type of educational instruction used (e.g., bilingual versus English immersion), and the quality of the caregiver-child interactions. It should be emphasized that exclusive use of the dominant language in nonparental care settings may put ELL children at risk for loss of their home language, and along with it loss of cultural identity (Espinosa, 2010; Genesee et al., 2004). In order to promote the acquisition of English along with the preservation of the ELL child's home language, practices that support both languages are recommended in early care and education settings (Castro et al., 2011; Espinosa, 2010; Garcia & Jensen, 2007).

Several classroom-level characteristics were associated with achieving English proficiency by first grade or later: a higher likelihood of reading being taught daily, more hours of an ESL aide in the classroom, a higher likelihood of availability of non-English books, and a

higher likelihood of receiving pull-out tutoring or in-class ESL lessons. These findings suggest that the longer it takes to achieve English proficiency, the more likely it is that ELL students will continue to receive supports such as ESL aides in the classroom, pull-out tutoring, in-class ESL lessons, and non-English books. However, these supports might be counterbalanced by relatively fewer resources at the schools in which ELL students tend to be enrolled (Crosnoe, 2005; Han, 2010). As others have found with Latino and Mexican immigrant subgroups, we found that ELL students who do not achieve English proficiency by kindergarten are more likely than those who do achieve proficiency by kindergarten to be in large schools with high proportions of LEP students and teachers with fewer years of teaching experience. More research is warranted to investigate the associations between the specific supports offered to (and needed by) ELL students and their academic outcomes, including the timing of their English language proficiency.

### **Policy Implications and Suggestions for Future Research**

Recent educational policies at the federal and state levels have emphasized the early acquisition of English language and literacy skills as important for achieving readiness for school, on-grade-level academic performance by third grade, and college- and career-readiness (Abedi, 2007; U.S. Department of Education, 2010). State early learning guidelines regarding what children should know and be able to do by school entry, as well as mandatory standardized testing in English starting in third grade, pose challenges, particularly for those students whose native language is not English and the schools that serve them. These challenges are acknowledged in the reauthorization plans for the Elementary and Secondary Education Act (ESEA), also known as the No Child Left Behind Act. Recommendations for the reauthorization of ESEA include specific school-based supports for ELL students, professional development of all teachers who serve ELL students, better identification of ELL students, and the development and adoption of statewide English language proficiency standards for English learners that are aligned to reflect the academic language necessary to master the state's content standards (U.S. Department of Education, 2010).

Many of the key predictors of proficiency among ELL children noted in this study are factors that are not easily manipulated by public policy or program interventions (i.e., children's age, race/ethnicity, citizenship, disability status, family income, and parental education level). However, several home and classroom characteristics that predicted English proficiency among ELL students, both by spring of first grade and later, are strong candidates for intervention, and pose possibilities for future research, including family activities and classroom supports for ELL students.

### **Importance of Early Care and Education for ELL Children's School Readiness**

Results from this study indicate that attending center-based care in the year prior to kindergarten entry was associated with a higher likelihood of English proficiency by kindergarten entry compared to proficiency not being achieved by the spring of first grade among ELL students. One of the limitations of the current study (and the ECLS-K data set) is that there is not much detail available about the child care experiences of children in the study, and what information is available is reported retrospectively by the parent.

It would be important to know the qualities of the child care arrangements to which ELL children are exposed prior to school entry, including the overall quality of the program, whether and what type of curriculum is used, and what languages are used for interacting with children. Although we know from prior research that participation in high-quality preschool programs may be particularly important for the cognitive and language development of ELL children (Gormley, Gayer, Phillips, & Dawson, 2005; Hernandez et al.,

2007), more information is needed regarding the type and quality of nonparental care that ELL children receive prior to school entry to determine its relation to English proficiency for these students and to their overall development.

Recent research is helping to identify the specific features of early care and education settings that support ELL children's development. The National Literacy Panel on Language Minority Children and Youth suggests that a key step in promoting the literacy skills of ELL children is providing intentional instruction in phonological and phonemic awareness, phonics, fluency, vocabulary, and text comprehension, collectively considered the key components of reading by the National Reading Panel. Also important is supporting the oral language skills of young ELLs, including expressive vocabulary and listening comprehension (August & Shanahan, 2006; National Reading Panel, 2000). In addition, Castro et al. (2011) identify several features of the classroom environment and classroom practices that appear to be critical for optimal development of ELL children, particularly for supporting both the home and the dominant language. Specifically, they mention the use of research-based curricula, instructional practices that support both the first and second language and literacy development of the dual language learner, intentionally incorporating elements of the child's home language and culture into the curriculum, building on the child's prior knowledge to support the learning of new concepts, and maintaining a classroom environment that supports and values bilingualism. Indeed, early care and education programs that support the child's native language while exposing the child to English are likely best able to help the child achieve proficiency in his/her native language as well as English (August & Shanahan, 2006; Barnett, Yarosz, Thomas, Jung, & Blanco, 2007; MacSwan & Pray, 2005; Tabors, Paez, & Lopez, 2003). However, there may be differential effects based on the type of bilingual education offered. This is an area ripe for future research.

### **Importance of a Stimulating Home Environment for English Language Proficiency**

Results of this study suggest that a child's participation in cultural heritage activities at home may actually facilitate English language learning. Future analyses may explore whether there are racial/ethnic differences in the amount or type of cultural heritage activities in which ELL families engage, and the strength of association between family practices/customs and English proficiency among different racial/ethnic groups within the ELL population.

### **Barriers to Parental Involvement in School Among ELL Families**

Schools need to design policies and practices that will effectively engage parents of ELL children (Hernandez et al., 2007). Some of the biggest challenges to engaging families of ELL children include the lack of bilingual staff, differences in communication styles, and differences in the school's and families' expectations about children's development and learning (Castro et al., 2011). The findings from this study suggest that schools would be wise to think broadly about the many factors that may pose difficulties for parental involvement, including the obvious language barrier. The capacity to communicate with linguistically diverse families is clearly a critical part of engaging families (Kagan & Garcia, 1991). However, schools need to do more than send notes home in the home language. Better alignment between parents' and educators' expectations with regard to the role of home and school in supporting children's educational development also seems important. At least one recent professional development intervention with K-12 teachers was effective in encouraging teachers to engage families of ELL students in new ways and to alter their instructional practices to make stronger connections to students' background knowledge (Chen, Kyle, & McIntyre, 2007). In general, we need to know much more about both perceived and real barriers to school involvement among families of ELL children.

## School and Classroom Characteristics That Influence English Proficiency And Later Outcomes

Given that schools are increasingly serving ELL students, it becomes important to inquire whether U.S. schools are adequately prepared to educate children from diverse cultural and linguistic backgrounds. As the current set of analyses attest, ELL students tend to be in schools with high proportions of limited English proficient students. There is also a trend for schools serving large numbers of ELL students to have larger class sizes and principals and teachers who lack experience (Cosentino de Cohen et al., 2005; Dinan, 2006). Thus, the children who have the greatest need for academically strong schools and educators often receive their education in schools that provide them with the least optimal conditions. Indeed, LEP students tend to attend academically low-performing schools (Espinosa & Ochoa, 1986), and children from Mexican immigrant families have been found to experience more disadvantaged school contexts (e.g., larger school size, lower teacher experience, and higher proportions of minority students and students in poverty) than their White, African American, Asian American, and other Latino peers (Crosnoe, 2005).

This study examined the school-level supports offered to ELL students. Although we found that provision of supports such as in-class and pull-out reading and ESL tutoring were more likely to be offered to those ELL students who lagged behind in their English proficiency, we still need a better understanding of how ESL resources are provided to ELL students within schools. For example, in schools with high concentrations of LEP students, do the non-English books provided in schools match the home language of the ELL students in the school? Are there resources available to translate all important correspondence into the parents' native language? These are research questions that may be best addressed with more local, qualitative studies than by an analysis of large, national survey data.

One goal for the field should be to improve professional development of early childhood and elementary school educators regarding the optimal development of (and educational support for) English language learners. It is important for teachers of ELL students to possess cultural sensitivity and to have an understanding of second language learning, as those teachers have been found to be more effective in teaching ELL children (Fitzgerald, 1993). In addition, there is a concern that there are not enough well-prepared bilingual educators (Coppola, 2005; Matthews & Ewen, 2006), or high-quality bilingual programs, to serve ELL students. The use of the child's home language for instruction not only can benefit children's academic outcomes but also can improve the social climate of the classroom. In one recent study, the more Spanish that children heard in their preschool classroom the higher the teachers' ratings of Spanish-speaking children's frustration tolerance, assertiveness, task orientation, and peer social skills; the amount of Spanish spoken in the classroom was also related to ratings of closeness in teacher-child relationships and reduction in observed peer aggression toward the Spanish-speaking children (Chang et al., 2007). In addition to the use of the child's home language, teachers can encourage more positive peer interactions between students by initiating small group or one-on-one activities that provide a less threatening venue for learning for ELL students than do large-group activities (Castro et al., 2011). Further analyses of the ECLS-K data might examine the relationship between instructional practices, such as proportion of whole group and small group instruction and the outcomes of ELL students.

### Children's Proficiency in Their Native Language

A limitation of this study is that we do not know ELL children's level of proficiency in their home language. Research indicates that maintaining one's home language (with the ultimate goal of achieving bilingual fluency) is beneficial from an academic as well as a social and cultural perspective (Espinosa, 2006, 2010). There is consensus among researchers who

study bilingual education and language acquisition that instruction in a child's native language does not delay the acquisition of English (Tran, 2007). In addition, fluency in one's native language is associated with high levels of long-term academic achievement among non-native English speakers (Genesee et al., 2004).

A study with school-age children found that children in bilingual programs learned English faster than children who attended programs where English was the only instructional language (MacSwan & Pray, 2005). Being in a bilingual program also helped these children progress academically because they were able to master the academic content in a language that they understood. There is also some suggestive evidence that bilingual children may not only perform better academically than their peers educated in English-only environments, but they may also benefit from staying connected to their native culture and may be able to communicate with a much larger number of people (Golash-Boza, 2005).

A natural follow-up to the current study would be to investigate the cognitive and behavioral outcomes of ELL students taking into account not only their proficiency in English but also their proficiency in their native language. However, in order to study proficiency in ELL children's native language(s), researchers and practitioners would need better measurement tools, especially for languages other than Spanish. Another avenue for future research would be to investigate the effects of bilingual programs (both early care and education programs and elementary school programs) on long-term outcomes for ELL students. Some work in this area has begun, but more research is needed.

### Measurement Issues

The field could also benefit from better tools to assess English language proficiency among English language learners. Currently, there are measurement issues regarding the ways in which English proficiency is sometimes assessed (Bailey, 2007; Espinosa & Lopez, 2007, August; Wolf et al., 2008). Parent reports of their children's proficiency in English are unreliable because parents may not be able to accurately judge their children's level of proficiency (Mushi, 2002). On the other hand, many English language assessment tools have been critiqued for measuring academic achievement rather than English proficiency, revealed in the fact that even students who are native English speakers frequently fail these assessments (MacSwan & Pray, 2005). Furthermore, oral language screening tools, such as the OLDS used in the present study, do not permit evaluations of the *level* of English language proficiency among ELL students. Once this language screener is "passed," there is no further assessment to determine whether "slippage" in proficiency occurs over time. One way of measuring ELL children's full language proficiency is to administer comparable language assessments in both the child's home language and in English. Ongoing assessments in both the home language and English can thereby help to establish the changes over time in level of proficiency in both languages. Another innovative way of measuring ELL children's language proficiency is to develop assessment items simultaneously in both the child's home language and in English and then to conduct "conceptual scoring" of the assessment, which involves accepting the child's correct responses in whichever language they are given. Scoring assessments across the two languages helps to determine what concepts are known overall, regardless of the language in which they are known (Oller, Pearson, & Cobo-Lewis, 2007). However, conceptual scoring does not permit an evaluation of a child's proficiency in each language separately (Espinosa & Lopez, 2007, August). Clearly, more work is needed in the arena of measurement of language proficiency. Best practice would suggest using measures that permit assessment of the level of language proficiency in English as well as the home language, and continued assessment over time.

## The Complex Relationship Between English Proficiency And Academic Achievement

Finally, it is important to note that, although English proficiency is seen as an important prerequisite to academic success, the relationship between English proficiency and academic achievement is complex. Specifically, limited English proficiency does not necessarily go hand in hand with low academic achievement, and English fluency does not always predict high academic achievement. Researchers have found that socioeconomic status can often buffer the effects of limited English proficiency. ELL children from families with high socioeconomic status can perform academically as well as, if not better than, native English speakers from lower socioeconomic backgrounds (Krashen & Brown, 2005). Indeed, in the present study, we found that ELL children from more advantaged economic backgrounds gained proficiency faster than their less advantaged peers. More studies like the one presented here, that take into account multiple predictors of English language proficiency and academic outcomes, can help to unpack the complex relationship between English language proficiency and child adjustment. Such research is needed in order to better inform public policy and educational policy and practice to advance English language learners' future success.

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## Appendix A. Constructs and Data Sources of the Measures Used in this Study

Construct	Data Source	Round of Data Collection	Variables and Coding Used
<b>Proficiency Status</b>			
Home language is English	1 parent-report item	Fall K	Parent-report of primary language spoken at home is English
Proficient at kindergarten entry	1 parent-report item and 1 child assessment item	Fall K	Parent-report of primary language spoken at home is not English and child passed OLDS at Fall K with score of 37+
Not English proficient by spring of first grade	1 parent-report item and 2 child assessment items	Fall K and Spring 1st	Parent-report of primary language spoken at home is not English and child failed OLDS at Fall K and Spring 1st with score between 0 and 36
<b>Elementary School Behavioral Outcomes</b>			
Externalizing Behaviors	5 teacher-report items	Fall K and Spring K, 1st, 3rd, and 5th	Teacher ratings of child's externalizing problem behaviors (e.g., frequency child disturbs ongoing activities)
Self-Control	5 teacher-report items	Fall K and Spring K, 1st,	Teacher ratings of child's self-control (e.g., respecting property rights)

Construct	Data Source	Round of Data Collection	Variables and Coding Used
		3rd, and 5th	
Approaches to Learning	5 teacher-report items	Fall K and Spring K, 1st, 3rd, and 5th	Teacher ratings of child's approaches to learning (e.g., persists in completing tasks)
<b>Elementary School Cognitive Outcomes</b>			
Math IRT Score	6 child assessment items	Fall K and Spring K, 1st, 3rd, 5th and 8th	Child's IRT math scale scores (e.g., count/number/shape, relative size)
Reading IRT Score	6 child assessment items	Fall K and Spring K, 1st, 3rd, 5th and 8th	Child's IRT reading scale scores (e.g., letter recognition, beginning sounds)
<b>Home Environment Characteristics</b>			
<i>Family Activities</i>			
Child participates in cognitively stimulating activities at kindergarten entry	7 parent-report items	Fall K	Cognitive stimulation scale (0-21); How often do parents do the following with children: Read books, tell stories, sing songs, do arts/crafts, play games/puzzles, discuss nature/science projects, and build/play with construction toys?
Child participates in cultural heritage activities	3 parent-report items	Spring K	Racial, ethnic, and religious socialization scale (0-12); How often do parents do the following with children: Discuss ethnic or racial heritage, discuss family religion, and participate in cultural events?
Child has lessons/extracurricular activities	6 parent-report items	Spring K	Index of child's extracurricular lessons/activities (0-6); Includes dance lessons, athletic activities, organized clubs, music lessons, art classes, and organized performing arts programs
<i>Child Routines</i>			
Child routinely eats meals with family	2 parent-report items	Spring K	Number of days per week child eats breakfast and/or dinner at a regular time; "Routinely" is coded as 5 or more days per week
Child has a regular bedtime	1 parent-report item	Spring K	Regular bedtime coded as child goes to bed at about the same time each night
<i>Parental involvement in child's school</i>			



Construct	Data Source	Round of Data Collection	Variables and Coding Used
Parent is involved in activities at school	6 parent-report items	Spring K	Since beginning of school year, have parents: Attended an open house, PTA meeting, parent-teacher conference, school event, or volunteered at school, or participated in fundraising
Parent experiences barriers to school involvement	7 parent-report items	Spring K	Index of barriers to school involvement include: Inconvenient meeting times, lack of child care, unable to get off work, safety problems, not feeling welcome by school, transportation problems, and lack of interesting things to be involved in
Language is barrier to school involvement	1 parent-report item	Spring K	Parent speaks language other than English and school meetings are conducted only in English
<b>Child Care in the year prior to kindergarten</b>			
Parental care	8 parent-report items	Fall K	In the year prior to K, child was cared for by a parent or did not receive regular nonparental care
Center-based care	8 parent-report items	Fall K	In the year prior to K, child attended center-based care, including Head Start, child care center, or nursery school
Home-based care	8 parent-report items	Fall K	In the year prior to K, child attended home-based care (including family child care homes, a nanny or babysitter, or care by an adult relative or friend)
<b>School Characteristics</b>			
<i>Student body</i>			
Percentage of LEP Students	1 school composite item	Spring K	Percent of minority students (e.g., Hispanic, American Indian, Alaskan Native, Asian, Black, African-American, Native Hawaiian, or Other Pacific Islander) coded into 5 categories: 0-9%, 10-24%, 25-49%, 50-74%, and 75+%
School's population is >50% low income	3 school administrator items	Spring K	Concentration of low income children based on percentage of students eligible for free or reduced price lunch in school; If data were missing, other data on the operation of Title 1 school-wide programs were used

Construct	Data Source	Round of Data Collection	Variables and Coding Used
<i>School services</i>			
Services specifically for LM families	5 school administrator items	Spring K	Index of school services for language minority families include: Availability of translators, translations of written communications, home visits, outreach workers who assist with first-time enrollment, and non-English parent meetings
Services for all families at kindergarten	5 school administrator items	Spring K	Index of school services for all families include: Availability of parenting education programs, adult literacy/basic education programs, family literacy programs, health/social services, and orientation programs for new families
School-parent notices are in English only	1 parent-report item	Spring K	Teacher sends home notes or newsletters in the primary language used by the family
<b>Teacher Characteristics</b>			
Teacher completed median coursework in EC Development	3 teacher-report items	Fall K	Teacher completed at least 6 college courses in early childhood education and elementary education, and at least 3 courses in child development
Teacher has 6+ years experience teaching at grade level	1 teacher-report item	Fall K	Teacher has taught kindergarten (including transitional/readiness kindergarten and transitional/pre-1st grade) for at least 6 years
<b>Classroom Characteristics</b>			
Class-size	1 teacher-report item	Fall K	Total class enrollment at kindergarten
Child attended full-day kindergarten	1 school composite item	Spring K	Kindergarten program lasts all day
Reading is taught daily	1 teacher-report item	Spring K	Reading and language arts are taught daily (vs. less than every day) in kindergarten, whether as a whole class, in small groups, or with individual children
Hours of ESL aide in classroom	1 teacher-report item	Spring K	Number of hours per day a paid ESL or bilingual aide works directly with children on instructional tasks
0 hours/No ESL aide			
1-2 hours per day			

Construct	Data Source	Round of Data Collection	Variables and Coding Used
3-4 hours per day 5+ hours per day			
Non-English books are available	1 teacher-report item	Spring K	Books and other written materials in children's first language (for non-English speakers) are used 1 to 3 times a month, 1 to 4 times a week, or daily (vs. never used/not available)
Child receives pull-out tutoring or 2 teacher-report items in-class ESL lesson or pull-out for reading		Spring K	Child receives instruction in a pull-out English as a Second Language (ESL) program and/or works on ESL lessons in class

Source: Early Childhood Longitudinal Study - Kindergarten Cohort 1998-1999 (ECLS-K)

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### Research Highlights

Growth curve analyses were conducted on first-time kindergartners (N = 19,890) within the Early Childhood Longitudinal Study – Kindergarten Class of 1998-99 (ECLS-K).

Differences in reading and math achievement between English language learners (ELLs) and native English speakers were found to vary based on the grade at which English proficiency was attained.

While more modest, differences were also evident in social and behavioral outcomes both in kindergarten and over time, with ELLs generally having more favorable social/behavioral outcomes than native English speakers.

Among ELL students, acquiring English proficiency by kindergarten entry was associated with better cognitive and behavioral outcomes through eighth grade compared to taking longer to achieve proficiency.

Multinomial regression analyses revealed child, family, and school characteristics predict achieving English proficiency by kindergarten entry compared to achieving proficiency later.



**Table 1**

Average Characteristics of First-time Kindergarten Children in the ECLS-K

	Full Sample	English Language Learner Sample
Sample Size	<i>N</i> = 19,890	<i>N</i> = 2,670
	% or Mean ( <i>SD</i> )	% or Mean ( <i>SD</i> )
<i>Proficiency Status</i>		
Home language is English	86.6%	--
Proficient at kindergarten entry	6.5%	48.2%
Proficient by spring of first grade	4.9%	36.6%
Not English proficient by spring of first grade	2.0%	15.2%
<i>Child Demographic Characteristics</i>		
Age at kindergarten entry	5.70 (0.37)	5.64 (0.36)
Gender		
Female	48.9%	49.0%
Race		
White	56.0%	6.6%
Mexican	7.4%	30.8%
Hispanic Other	10.6%	31.5%
Asian	6.3%	27.9%
Black, Other	19.7%	3.2%
Immigrant Status		
Immigrant	23.0%	94.1%
Citizenship		
Child is a citizen	98.0%	88.0%
Disability Status		
Child is disabled	11.7%	5.2%
<i>Family Demographic Characteristics</i>		
Parental education level		
Less than high school	9.9%	30.0%
High school diploma/GED	26.1%	26.6%
Vocational degree/some college	32.4%	20.1%
College graduate or higher	31.7%	23.3%
Family Structure		
Two parent	76.2%	82.9%
Single parent or other type	23.8%	17.1%
Number of siblings	1.46 (1.18)	1.73 (1.54)
Family Income		
Income-to-needs ratio	3.03 (3.18)	1.88 (2.23)
<i>Home Environment Characteristics</i>		
Family Activities		

	Full Sample	English Language Learner Sample
Sample Size	<i>N</i> = 19,890	<i>N</i> = 2,670
	% or Mean ( <i>SD</i> )	% or Mean ( <i>SD</i> )
Child participates in cognitively stimulating activities at kindergarten entry	12.07 (3.65)	10.70 (3.95)
Child participates in cultural heritage activities	5.83 (2.68)	6.79 (2.79)
Child has lessons/extracurricular activities	1.00 (1.01)	.47 (0.81)
<i>Child Routines</i>		
Child routinely eats meals with family	94.6%	92.6%
Child has a regular bedtime	89.2%	78.7%
<i>Parental involvement in child's school</i>		
Parent is involved in activities at school	3.67 (1.58)	2.83 (1.54)
Parent experiences barriers to school involvement	1.38 (1.18)	1.65 (1.38)
Language is barrier to school involvement	4.6%	22.3%
<i>Child Care</i>		
Center-based care	69.86%	55.67%
Parental Care	18.27%	30.41%
Home-based care	11.87%	13.92%
<i>School Characteristics</i>		
<i>School Size</i>		
Less than 150 students	7.4%	2.6%
150-299 students	20.0%	12.4%
300-499 students	27.3%	19.4%
500-749 students	28.6%	34.0%
750+ students	16.7%	31.6%
<i>School type</i>		
Public School	77.9%	87.8%
Private School	22.1%	12.2%
<i>Student body</i>		
Percentage of LEP Students	33.13 (34.78)	59.74 (36.41)
School's population is >50% low income	37.1%	55.1%
<i>School services</i>		
Services specifically for LM families	2.80 (1.54)	3.37 (1.35)
Services for all families at kindergarten	2.02 (1.31)	2.48 (1.40)
School-parent notices are in English only	92.7%	52.2%
<i>Teacher Characteristics</i>		
Teacher completed median coursework	36.2%	34.6%

	Full Sample	English Language Learner Sample
<b>Sample Size</b>	<b><i>N</i> = 19,890</b>	<b><i>N</i> = 2,670</b>
	<b>% or Mean (<i>SD</i>)</b>	<b>% or Mean (<i>SD</i>)</b>
in EC Development		
Teacher has 6+ years experience teaching at grade level	55.0%	47.1%
<i>Classroom Characteristics</i>		
Class-size	20.57 (5.16)	21.56 (5.10)
Child attended full-day kindergarten	56.2%	47.4%
Reading is taught daily	95.8%	95.3%
Hours of ESL aide in classroom		
0 hours/No ESL aide	92.5%	76.2%
1-2 hours per day	5.9%	16.9%
3-4 hours per day	1.2%	4.9%
5+ hours per day	0.4%	2.0%
Non-English books are available	61.5%	60.0%
Child receives pull-out tutoring or in-class ESL lesson or pull-out for reading	20.0%	65.7%

Source: Early Childhood Longitudinal Study - Kindergarten Cohort 1998-1999 (ECLS-K)



	Elementary School Behavioral Outcomes <sup>b</sup>				Elementary School Cognitive Outcomes <sup>b</sup>					
	Externalizing Behaviors		Self-Control		Approaches to Learning		Math IRT Score		Reading IRT Score	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept, N = 19,890										
Disability Status										
Child is disabled	0.15	0.02 **	-0.16	0.02 **	-0.28	0.02 **	-3.22	0.19 **	-4.16	0.29 **
<i>Family Demographic Characteristics</i>										
Parental education level	-0.03	0.01 **	0.04	0.01 **	0.07	0.01 **	1.95	0.07 **	2.69	0.12 **
Family Structure										
Two parent	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Single parent or other type	-0.12	0.01 **	0.13	0.01 **	0.12	0.01 **	0.89	0.13 **	1.29	0.21 **
Number of siblings	-0.04	0.00 **	0.02	0.00 **	-0.01	0.00	-0.36	0.05 **	-1.05	0.08 **
Family Income										
Income-to-needs ratio	0.00	0.00 **	0.00	0.00	0.01	0.00 **	0.34	0.03 **	0.36	0.05 **
<i>Home Environment Characteristics</i>										
Family Activities										
Child participates in cognitively stimulating activities at kindergarten entry	-0.01	0.00 **	0.01	0.00 **	0.01	0.00 **	0.05	0.02	0.07	0.03
Child participates in cultural heritage activities	0.00	0.00	-0.01	0.00 *	0.00	0.00	-0.07	0.02 *	-0.03	0.04
Child has lessons/extracurricular activities	0.00	0.01	0.01	0.01	0.03	0.01 **	1.02	0.07 **	1.03	0.11 **
Child Routines										
Child routinely eats meals with family	0.01	0.01	-0.01	0.01	-0.01	0.01	0.10	0.10	0.55	0.15 **
Child has a regular	-0.01	0.02	0.04	0.02 *	0.06	0.02 *	1.01	0.17 **	1.02	0.28 **

	Elementary School Behavioral Outcomes <sup>b</sup>				Elementary School Cognitive Outcomes <sup>b</sup>					
	Externalizing Behaviors		Self-Control		Approaches to Learning		Math IRT Score		Reading IRT Score	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept, N = 19,890										
bedtime										
Parental involvement in child's school	-0.03	0.00 **	0.03	0.00 **	0.03	0.00 **	0.46	0.04 **	0.48	0.07 **
Parent is involved in activities at school										
Parent experiences barriers to school involvement	0.02	0.00 **	-0.02	0.00 **	-0.03	0.00 **	-0.37	0.05 **	-0.44	0.08 **
<i>Child Care in the year prior to kindergarten</i>										
Center-based care	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Parental care	-0.12	0.01 **	0.08	0.01 **	0.00	0.01	-1.11	0.15 **	-1.02	0.25 **
Home-based care	-0.15	0.01 **	-0.09	0.01 **	0.01	0.02	-1.06	0.17 **	-1.21	0.28 **
Slope, N = 19,890										
<i>Proficiency Status</i>										
Home language is English	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Proficient at kindergarten entry	-0.01	0.01	0.02	0.01	0.02	0.01	0.75	0.15 **	0.90	0.26 *
Proficient by spring of first grade	-0.05	0.01 **	0.05	0.01 *	0.05	0.02 *	0.62	0.17 **	0.31	0.30
Not English proficient by spring of first grade	-0.03	0.02	-0.01	0.02	0.07	0.02 *	-1.30	0.27 **	10.44	1.37 **
<i>Child Demographic Characteristics</i>										
Age at kindergarten entry	0.01	0.01	-0.03	0.01 **	-0.08	0.01 **	-0.49	0.09 *	-0.48	0.17 *
Gender										

	Elementary School Behavioral Outcomes <sup>b</sup>				Elementary School Cognitive Outcomes <sup>b</sup>					
	Externalizing Behaviors		Self-Control		Approaches to Learning		Math IRT Score		Reading IRT Score	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept, N = 19,890										
Female	0.00	0.00	0.01	0.01	0.03	0.01	-0.85	0.06 ***	0.62	0.12 **
Race										
White, Black, Other	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Mexican	0.01	0.01	-0.01	0.01	-0.01	0.01	0.50	0.13 **	0.44	0.23
Hispanic Other	-0.01	0.01	0.01	0.01	0.02	0.01	-0.14	0.11	-0.07	0.21
Asian	-0.02	0.01	0.04	0.01 *	0.05	0.01 **	0.74	0.14 **	-0.51	0.26
Immigrant Status										
Immigrant	0.00	0.01	0.02	0.01	0.01	0.01	0.46	0.11 **	0.39	0.19
Citizenship										
Child is a citizen	0.00	0.02	0.00	0.02	-0.02	0.02	-0.47	0.24	-1.20	0.45 *
Disability Status										
Child is disabled	-0.03	0.01 **	0.03	0.01 **	0.03	0.01 **	-1.21	0.11 **	-2.23	0.20 **
<i>Family Demographic Characteristics</i>										
Parental education level	-0.01	0.00 **	0.01	0.00	0.01	0.00 *	0.86	0.04 **	1.38	0.07 **
Family Structure										
Two parent	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Single parent or other type	-0.01	0.01	0.00	0.01	0.00	0.01	0.48	0.08 **	0.50	0.15 *
Number of siblings	0.01	0.00 **	0.00	0.00	0.00	0.00	-0.05	0.03	-0.27	0.05 **
Family Income										
Income-to-needs ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.01 **	0.09	0.02 **
<i>Home Environment Characteristics</i>										

	Elementary School Behavioral Outcomes <sup>b</sup>				Elementary School Cognitive Outcomes <sup>b</sup>					
	Externalizing Behaviors		Self-Control		Approaches to Learning		Math IRT Score		Reading IRT Score	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
<b>Intercept, N = 19,890</b>										
<b>Family Activities</b>										
Child participates in cognitively stimulating activities at kindergarten entry	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02
Child participates in cultural heritage activities	0.00	0.00	0.00	0.00	0.00	0.00	-0.07	0.01**	-0.02	0.02
Child has lessons/extracurricular activities	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.03**	0.15	0.06
<b>Child Routines</b>										
Child routinely eats meals with family	-0.01	0.00	0.00	0.00	0.00	0.01	0.12	0.05	0.10	0.10
Child has a regular bedtime	0.01	0.01	-0.01	0.01	0.00	0.01	0.55	0.10**	0.77	0.18**
<b>Parental involvement in child's school</b>										
Parent is involved in activities at school	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.02**	0.31	0.04**
Parent experiences barriers to school involvement	0.00	0.00	0.00	0.00	0.00	0.00	-0.08	0.03*	-0.13	0.05*
<b>Child Care in the year prior to kindergarten</b>										
Center-based care	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Parental care	0.01	0.01	-0.01	0.01	0.02	0.01	-0.04	0.08	-0.03	0.16
Home-based	0.04	0.01**	-0.02	0.01	-0.01	0.01	-0.02	0.09	0.03	0.17
<b>School Characteristics</b>										
School Size	-0.01	0.00**	0.01	0.00*	0.00	0.00	0.05	0.03	0.08	0.05
School type	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Public School	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.



	Elementary School Behavioral Outcomes <sup>b</sup>				Elementary School Cognitive Outcomes <sup>b</sup>					
	Externalizing Behaviors		Self-Control		Approaches to Learning		Math IRT Score		Reading IRT Score	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept, N = 19,890										
Private School	-0.01	0.00	0.00	0.01	0.01	0.01	-0.67	0.08	0.44	0.15 *
Student body										
Percentage of LEP Students	0.00	0.00 **	0.00	0.00 **	0.00	0.00	-0.01	0.00 **	-0.03	0.00 **
School's population is >50% low income	-0.01	0.00 *	0.01	0.01	0.00	0.01	0.35	0.08 **	0.97	0.15 **
School services										
Services for all families at kindergarten	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	-0.02	0.05
<i>Teacher Characteristics</i>										
Teacher completed median coursework in EC Development	0.00	0.00	-0.01	0.00	0.00	0.01	0.05	0.07	-0.07	0.13
Teacher has 6+ years experience teaching at grade level	0.00	0.00	0.01	0.00 *	0.01	0.00	0.10	0.06	0.38	0.11 *
<i>Classroom Characteristics</i>										
Class-size	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.04	0.01 *
Child attended full-day kindergarten	0.00	0.00	-0.01	0.00 *	-0.01	0.00	0.01	0.06	-0.55	0.12 **
Reading is taught daily	-0.01	0.01	0.00	0.01	0.01	0.01	-0.04	0.14	0.16	0.27

SE = Standard Error

\* p<.01

\*\* p<.001

Note:

<sup>a</sup> Unless otherwise noted, all home environment, school, teacher and classroom characteristics are measured at the spring of kindergarten.

<sup>b</sup> Elementary School Behavioral Outcomes are measured until 5<sup>th</sup> grade, whereas the Elementary School Cognitive Outcomes are measured until 8<sup>th</sup> grade.

Source: Early Childhood Longitudinal Study - Kindergarten Cohort 1998-1999 (ECLS-K)

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Latent Growth Models for the Timing of Language Proficiency as a Predictor of Behavioral and Cognitive Outcomes for English Language Learners from Kindergarten to 5<sup>th</sup> and 8<sup>th</sup> Grade, Controlling for Child, Family, School, Teacher, and Classroom Characteristics<sup>a</sup>

**Table 3**

	Elementary School Behavioral Outcomes <sup>b</sup>						Elementary School Cognitive Outcomes <sup>b</sup>					
	Externalizing Behaviors		Self-Control		Approaches to Learning		Math IRT Score		Reading IRT Score			
	Beta	SE	Beta	SE	Beta	SE	Beta	SE	Beta	SE	Beta	SE
Intercept, N = 2,670												
<i>Proficiency Status</i>												
Proficient at kindergarten entry	ref.		ref.		ref.		ref.		ref.		ref.	
Proficient by spring of first grade	0.05	0.03	-0.04	0.03	-0.08	0.03	0.03	0.03	-2.65	0.32	-3.54	0.62
Not English proficient by spring of first grade	0.08	0.04	-0.05	0.04	-0.24	0.04	0.04	0.04	-2.40	0.40	-30.19	3.78
Slope, N = 2,670												
<i>Proficiency Status</i>												
Proficient at kindergarten entry	ref.		ref.		ref.		ref.		ref.		ref.	
Proficient by spring of first grade	-0.04	0.01	0.02	0.01	0.03	0.02	0.03	0.02	-0.31	0.19	-1.27	0.32
Not English proficient by spring of first grade	-0.01	0.02	-0.04	0.02	0.04	0.03	0.04	0.03	-2.29	0.29	3.46	1.24

SE = Standard Error

\* p<.01

\*\* p<.001

Note:

<sup>a</sup>This table does not report coefficients of covariates other than differences among language proficiency groups. However, all covariates noted in Table 2 were included in these models.

<sup>b</sup>Elementary School Behavioral Outcomes are measured until 5<sup>th</sup> grade, whereas the Elementary School Cognitive Outcomes are measured until 8<sup>th</sup> grade.

Source: Early Childhood Longitudinal Study - Kindergarten Cohort 1998-1999 (ECLS-K)

**Table 4**

## Multinomial Regression Model Predicting to English Proficiency

English Language Learner Sample			
Sample Size	N = 2,670		
	English Proficient at Kindergarten Entry	English Proficient by Spring of First Grade	Not English Proficient by Spring of First Grade
	OR	OR	OR
<i>Child Demographic Characteristics</i>			
Age at kindergarten entry	ref.	0.63 *	0.38 **
Gender			
Female	ref.	1.13	1.01
Race			
White, Black, Other	ref.	ref.	ref.
Mexican	ref.	2.21 **	10.46 **
Hispanic Other	ref.	1.29	6.91 *
Asian	ref.	1.63	5.75 *
Immigrant Status			
Immigrant	ref.	2.39 *	3.79
Citizenship			
Child is a citizen	ref.	0.58 **	0.49 *
Disability Status			
Child is disabled	ref.	1.22	3.12 **
<i>Family Demographic Characteristics</i>			
Parental education level	ref.	0.86 *	0.77 **
Family Structure			
Two parent	ref.	ref.	ref.
Single parent or other type	ref.	0.99	1.22
Number of siblings	ref.	1.18 **	1.15
Family Income			
Income-to-needs ratio	ref.	0.95	0.70
<i>Home Environment Characteristics</i>			
Family Activities			
Child participates in cognitively stimulating activities at kindergarten entry	ref.	0.99	1.00
Child participates in cultural heritage activities	ref.	1.00	0.90 **
Child has lessons/extracurricular activities	ref.	0.94	0.85

English Language Learner Sample			
Sample Size	N = 2,670		
	English Proficient at Kindergarten Entry	English Proficient by Spring of First Grade	Not English Proficient by Spring of First Grade
	OR	OR	OR
<i>Child Routines</i>			
Child routinely eats meals with family	ref.	1.08	0.82
Child has a regular bedtime	ref.	1.05	0.68
<i>Parental involvement in child's school</i>			
Parent is involved in activities at school	ref.	0.93	0.92
Parent experiences barriers to school involvement	ref.	0.96	1.85
Language is barrier to school involvement	ref.	1.45 *	1.18
<i>Child Care in the year prior to kindergarten</i>			
Center-based care	ref.	ref.	ref.
Parental care	ref.	1.21	2.37 **
Home-based care	ref.	1.39	1.63
<i>School Characteristics</i>			
School Size	ref.	1.25 **	1.26 *
<i>School type</i>			
Public School	ref.	ref.	ref.
Private School	ref.	1.65	2.78 *
<i>Student body</i>			
Percentage of LEP Students >25%	ref.	1.99 **	5.61 **
School's population is >50% low income	ref.	1.31	1.36
<i>School services</i>			
Services specifically for LM families	ref.	0.88	0.83
Services for all families at kindergarten	ref.	0.96	1.00
School-parent notices are in English only	ref.	0.57 **	0.40 **
<i>Teacher Characteristics</i>			
Teacher completed median coursework in EC Development	ref.	0.70 *	0.73
Teacher has 6+ years experience teaching at grade level	ref.	0.92	0.80
<i>Classroom Characteristics</i>			

English Language Learner Sample			
Sample Size	N = 2,670		
	English Proficient at Kindergarten Entry	English Proficient by Spring of First Grade	Not English Proficient by Spring of First Grade
	OR	OR	OR
Class-size	ref.	0.98	1.00
Child attended full-day kindergarten	ref.	1.32	1.51
Reading is taught daily	ref.	1.81	1.52
Hours of ESL aide in classroom	ref.	1.25 *	1.03
Availability of non-English books	ref.	1.21	2.55 **
Child receives pull-out tutoring or in-class ESL lesson or pull-out for reading	ref.	1.53 **	1.68

OR = Odds Ratio

\*  $p < .01$

\*\*  $p < .001$

Source: Early Childhood Longitudinal Study - Kindergarten Cohort 1998-1999 (ECLS-K)