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Earlier mastery of English predicts 5th Grade academic outcomes for low-income dual language learners in Miami, USA

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Abstract

Earlier acquisition of English is associated with better academic performance for dual language learners (DLLs), but large-scale, prospective, longitudinal studies examining how trajectories for English acquisition relate to school-based outcomes, accounting for relevant covariates, are rare. We explored how the grade in which DLLs ($N = 17{,}548$; 47% female; 80% free/reduced-price lunch; 86% Latino, 10% Black, and 4% White/Other) acquire English proficiency, defined by the school district, relates to academic outcomes (grade retention, GPA, reading and math test scores) in 5th grade, controlling for gender, ethnicity, poverty, and school readiness skills at age 4. Earlier acquisition of English, especially before 2nd grade, predicted better performance on each 5th grade outcome. Earlier proficiency in English was even more important for 5th grade outcomes for those with initially high cognitive skills, Latino/Hispanic DLLs (compared to Black DLLs), and those not in poverty. Implications for practice and research are discussed.

Research Article

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1. Introduction

Children from diverse linguistic and cultural backgrounds who speak a language at home other than the language of instruction in public schools face unique challenges in early education, as they are expected to learn academic content but attain proficiency in the instructional language at the same time (National Education Association [NEA], 2008). In the context of the United States, English is the predominant societal language and typically the only language of instruction found in public schools (except for relatively rare two-way language immersion programs). In the US, there are around five million "dual language learners" (DLLs) (National Center for Education Statistics [NCES], 2017), defined as students in the process of learning English in school who speak a language other than English at home (American Institutes for Research [AIR], 2014). The number of DLLs in U.S. public schools has increased considerably in recent years; currently, 32% of children under the age of eight are DLLs, and Spanish is the home language for the majority (59%) of DLLs in the U.S. (NEA, 2020; Park, O'Toole, & Katsiaficas, 2017). The burgeoning nature of this segment of students has prompted policymakers and researchers in the U.S. to address the needs of DLL children in schools, and to explore questions about relationships between academic outcomes and English proficiency.

It is of little surprise, given that English is the language of instruction in U.S. schools and that assessments given to students in schools are administered in English, that many studies show that at a single point in time, concurrent associations between English proficiency and academic performance for DLLs are strong and positive. Simply put, the better skills DLL students have with the English language, the better they do on all kinds of school performance measures in grades K-12 (Beal, Adams, & Cohen, 2010; Parker, Louie, & O'Dwyer, 2009; Stevens, Butler, & Castellon-Wellington, 2000). This can be seen in studies that look within DLLs using degree of proficiency as the independent variable (Ardasheva, Tretter, & Kinny, 2012; Beal et al., 2010; Guglielmi, 2008) and in studies that contrast DLLs with native English-speaking students (Carroll & Bailey, 2016; Halle, Hair, Wandner, McNamara, & Chien, 2012). These studies often include all DLLs currently in the school system, including those who may have only recently immigrated to the U.S. and have very little English proficiency. Although such studies make valuable contributions for a snapshot understanding of the relationship between English proficiency and academic performance, they are limited because they lack a longitudinal perspective and information about how long it took for individual DLLs to become proficient in English and whether that matters for DLL's academic achievement over time. Indeed, a report released by the National Academies Press (National Academies of Sciences, Engineering, and Medicine [NASEM], 2017) emphasized a need for more longitudinal studies to investigate how academic achievement varies from kindergarten to twelfth grade for DLLs with different starting points and levels of English proficiency (NASEM, 2017).

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The present prospective longitudinal study addresses this gap in the research by following a large group of young DLLs from age 4 through the completion of elementary school (5th grade) in a large, urban, ethnically diverse school system. Specifically, the current study investigates how earlier English language acquisition for DLLs (the grade in which the child is reclassified as English proficient by the school system) is related to authentic school-based measures of academic performance (grade point average, standardized test scores in reading and math, and retention in grade) in the important year of 5th grade.

English proficiency and later academic performance for DLLs

Although there are several studies showing positive associations between English proficiency and early literacy skills of DLLs and academic outcomes up to a year later (Davison, Hammer, & Lawrence, 2011; Ford, Invernizzi, & Huang, 2014; Peterson & Gillam, 2015), there are few studies that have examined outcomes across more than one year. It is important to investigate the predictive power of early English proficiency on outcomes at different time points throughout DLLs' academic trajectories because studies show that the age/grade at which proficiency is achieved matters for long-term academic outcomes (Halle et al., 2012; Kieffer, 2008).

A few longitudinal studies have used data from the Early Childhood Longitudinal Survey for the Kindergarten Class of 1998–1999 (ECLS-K). Halle et al. (2012) compared the academic trajectories of different groups of DLLs and non-DLLs from kindergarten to eighth grade. Whether research assistants deemed the child to be proficient enough in English to receive their assessment battery in English in either Kindergarten or not till 1st grade accounted for significant differences in later reading and math scores, controlling for child, family, school, teacher, and classroom characteristics (Halle et al., 2012). DLLs seen as English proficient in kindergarten had similar math and reading skills compared to native English speakers in kindergarten and later on, but those who were not proficient until the following year had notable gaps in both subject areas compared to their language-majority peers that persisted over time or only narrowed slightly by eighth grade (Halle et al., 2012). DLLs not deemed proficient enough to be assessed in English until the end of 1st grade had slower rates of growth in math over time, remaining below English-speaking students in school (Halle et al., 2012).

Kieffer (2008) also used ECLS-K data to examine English proficiency linked to later academic outcomes. The study compared growth trajectories in reading from kindergarten to 5th grade for native English-speakers ($n = 15{,}362$), DLLs who were English proficient in kindergarten ($n = 746$), and DLLs not proficient yet in kindergarten ($n = 1{,}134$). DLLs who entered school proficient in English had indistinguishable growth trajectories in reading compared to native English-speakers, but DLLs who became English proficient later lagged behind native English-speakers through 5th grade. In a follow-up study with a subsample of just Spanish-speaking DLLs, passing the English proficiency screener in kindergarten (vs. 1st grade) positively predicted long-term reading outcomes through 8th grade (Kieffer, 2012), controlling for SES.

Also using ECLS-K, Reardon and Galindo (2007) examined the role of English proficiency in kindergarten in predicting later math achievement for Hispanic (not necessarily DLL) students. Hispanic students with low English proficiency in kindergarten had lower math performance in kindergarten compared to both English-proficient Hispanic students and non-Hispanic, native English-speaking students; however they made more rapid gains in math from kindergarten to 5th grade than the other groups and caught up to their peers rather quickly (Reardon & Galindo, 2007). Importantly, other studies have found that former DLL students, those now proficient in English and presumably fully bilingual, outperform native English-speaking students in school (Ardasheva et al., 2012).

A critical limitation of the above ECLS-K studies, however, is that the measure of English proficiency used was simply the child's responses to a few oral English screener questions given to the child by the experimenters to determine whether the child's English skills were good enough to administer their battery of child assessments in English. Their measure simply contrasted those DLLs who were proficient in kindergarten vs. those proficient by the end of 1st grade, with no measure of English proficiency available after 1st grade. In the current study, we use the school district's comprehensive English assessment given to DLLs each year/grade to determine eligibility for and exit from English for Speakers of Other Languages (ESOL) services which is a much more ecologically valid and comprehensive measure. Also, we use the year/grade when DLLs acquired that critical threshold of English proficiency as our continuous longitudinally informed predictor of later academic skills at the end of elementary school (5th grade). Finally, we control for a wider range of covariates associated with both age of English acquisition and later academic performance, including incoming cognitive and school readiness skills, prior academic performance, gender, race/ethnicity, and poverty, to better pinpoint the effect of age/grade of English proficiency attainment and 5th grade academic performance.

Lesaux and Siegel (2007) found that early literacy skills (word reading, syntactic awareness, spelling, phonological processing, and working memory) strongly predicted later reading skills for DLLs from kindergarten to 4th grade. Despite DLL students demonstrating lower initial performance in kindergarten on literacy assessments than native English-speakers, there were no differences between the two groups by 4th grade, except DLLs scored higher on the spelling tasks. Growth trajectories in reading performance from kindergarten to 4th grade were almost indistinguishable between DLLs and non-DLLs. Indeed, others have found that early language skills for both monolingual English speakers and DLLs are strongly linked to later English reading skills in elementary school (LARRC, 2015; Murphy, LARRC, & Farquharson, 2016).

Overall, the results of prior studies indicate that earlier English language acquisition and later academic performance are related for DLLs. However, the amount of time it takes for DLLs to learn English (and importantly, to be classified as English proficient by school systems) can vary greatly. Most estimates of how long it takes for DLLs to attain full English proficiency range from four to seven years (Estrada & Wang, 2018), which may be related to both individual student-level differences and differences in the school systems' reclassification practices. There is some variation in skills levels DLLs must reach to be considered English proficient, as the standards can vary by state and school district. Federal and state laws dictate that schools must provide support for DLLs and reclassify them based on language assessments, but these performance standards are largely left up to individual states and districts to decide (Thompson, 2017). This often makes it difficult to compare results across studies. Therefore, longitudinal studies following the same sample of

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DLLs over time are essential to fully understand the impact of English acquisition on later academic performance. As most studies on the relationship between English proficiency and academic outcomes have not been longitudinal (Beal et al., 2010; Parker et al., 2009; Stevens et al., 2000) or only followed DLLs for one year (Davison et al., 2011; Ford et al., 2014; Peterson & Gillam, 2015), longitudinal research regarding academic outcomes for DLLs who achieve English proficiency at different time points is needed.

Factors that predict English proficiency

To understand how the grade at which students acquire English proficiency predicts later academic outcomes, it is necessary to control for a variety of other factors that are associated with both attaining English proficiency and later school performance. Although research has focused on English proficiency as a predictor variable for academic performance (Lesaux & Siegel, 2007; Reardon & Galindo, 2007), several studies have examined how quickly DLLs reach English proficiency as its own important outcome. Prior research has also found that factors such as disability status, ethnicity, family income, citizenship, and parental education predict English proficiency at kindergarten entry (Halle et al., 2012), but few studies have examined links between earlier English acquisition and academic outcomes while adequately controlling for relevant covariates.

Kim, Curby, and Winsler (2014) identified factors associated with earlier attainment of English proficiency among low-income, primarily Hispanic, language-minority children in Miami. In a longitudinal study following a large sample of DLLs from kindergarten through 5th grade, factors predicting faster attainment of English included higher initial English proficiency in kindergarten, not receiving free/reduced-price lunch, not being Hispanic or Black, strong cognitive, language, and socioemotional skills at age 4, and maternal education (Kim et al., 2014). Similarly, a study by Suárez-Orozco, Gaytán, Bang, Pakes, O'Connor, and Rhodes (2010) looking at longitudinal academic trajectories for DLL students reported several predictive factors related to reaching English proficiency faster, including being female, attending low-poverty schools, and having high academic engagement. Overall, studies that did control for other predictors of later academic success (i.e., disability status, gender, ethnicity, and socioeconomic status) suggest that English proficiency is uniquely related to later academic performance (Halle et al., 2012; Kieffer, 2012; Suárez-Orozco et al., 2010).

The present study

While prior studies have made valuable contributions to our understanding of DLLs' English acquisition and academic outcomes, supposedly nationally representative samples only get a relatively small group of DLLs and likely under-sample the large group of DLLs living in poverty. Almost 60% of DLLs under the age of eight in the US live in low-income households and 25% have parents with less than a high school education (compared to 43% and 6% respectively for all children – Park et al., 2017). Poverty is even more prevalent for specifically Hispanic DLLs since the national estimates include DLLs of Asian origin who tend to have more parental income and education (U.S. Department of Homeland Security [DHS] Office of Immigration Statistics, 2018).

The current student study followed a large ($N = 17{,}548$) and predominantly Hispanic group of DLLs largely in poverty from pre-K through 5th grade. Much of the prior research has used very limited measures of English proficiency (like the minimal screener used by ECLS-K research assistants to see if they could give child assessment batteries in English). The current study uses a comprehensive (oral, written) and ecologically valid English proficiency measure used by the school system each year to determine services for DLLs and exit from ESOL programs. There was one central research question – after controlling for important variables associated with achievement and English acquisition (gender, poverty status, ethnicity, and school readiness skills at age 4), how does the year/grade at which young DLLs acquire full English proficiency relate to academic outcomes (standardized reading and math test scores, grade point average, and being retained in grade) at the end of elementary school (5th grade)? Additionally, we examine, in an exploratory way, whether grade of acquired English proficiency matters more for 5th grade outcomes for certain subgroups of DLLs based on initial cognitive skills (high vs. low), race/ethnicity (Black vs. Hispanic), and poverty status (free/reduced-price lunch vs. not). Based on the findings in the literature discussed above, we hypothesized that DLLs who were classified as English proficient earlier would show more favorable academic outcomes in all areas compared to DLLs who reach proficiency later. Although we thought each year delay would matter for later outcomes (a linear effect), we expected nonlinear effects as well, such that the age/grade effect observed would be strongest in the early grades, given prior research (Halle et al., 2012; Kieffer, 2008). We did not have a priori hypotheses about our exploratory moderators; however, given strong associations generally between academic achievement and poverty, race/ethnicity, and cognitive skills (Ricciardi, Hartman, Manfra, Dinehart, Bleiker, & Winsler, 2021), it is possible that speed of English proficiency would explain less of the variance in academic outcomes for those low in initial cognitive skills, those in poverty, and Black students.[1]

Method

Participants

Background

The study used data from the Miami School Readiness Project (MSRP), which followed five cohorts of preschool children throughout elementary school (Winsler, Kim, & Richard, 2014; Winsler, Tran, Hartman, Madigan, Manfra, & Bleiker, 2008). Four-year-old children who were enrolled in public school pre-K programs, or those who received childcare subsidies to attend childcare in the community between 2002 to 2007, were followed longitudinally throughout elementary school (through 5th grade - AY 2012-2013). At age four, children were administered school readiness assessments tapping their cognitive, socioemotional, and motor skills (see below). School data, including assessments of English proficiency, were collected each year from kindergarten onwards, with consent and IRB approval from both the school system and the participating university.

Language/bilingual context

The DLLs in the current study can be thought of as experiencing Early Second Language Acquisition (ESLA, De Houwer, 2021), a form of sequential bilingualism, since they spoke another

[1]The moderation analyses emerged as a helpful suggestion from one of the blind reviewers.

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language (L1) at home, started attending primarily English (L2) preschool settings at age four, and then attended public schools in which English is the official language of instruction, all in a country where English is the main, societal language. However, unlike most cities in the U.S., where the larger sociolinguistic context typically supports only English as the lingua franca, Miami-Dade County, Florida, is home to many Cuban, Caribbean, and Central/South American immigrants, and there is strong sociolinguistic support for Spanish. Spanish is the primary language for 65% of the city's population (U.S. Census Bureau, 2017) and it is common to hear Spanish on the streets and in businesses. Thus, although the context might technically still be considered a subtractive bilingualism setting since English is the dominant language in the country, in Miami for Spanish L1 speakers, it is much less likely for students to lose their L1 skills over time than in other locations.

Sample

The sample of the present study included every child from the larger project identified as a DLL by the school system and who had completed enough English proficiency data to determine when they were declassified to exit ESOL ($N = 17{,}548$). Students are classified as DLLs if their parent indicated that they speak a language other than English at home and if they have a valid score from their school's English proficiency assessment from kindergarten to 5th grade (Kim et al., 2014). The sample consists of children who typically progressed throughout their schooling, children who repeated a grade once or twice, and children who skipped a grade. However, DLLs who had missing data (e.g., left the school system) for two or more consecutive years were not included.

The sample was evenly divided by gender (47.1% female) and most participants came from low-income backgrounds (79.7%), defined by receiving free or reduced-price lunch in 1st grade. Participants were 85.8% Hispanic/Latino, 10.4% Black, and 3.9% White/Asian/Other. We collapsed Asian and other/mixed students into the White category because of very small numbers, and because they were quite similar to the White group in terms of performance/scores on all outcomes and predictors. The home language for 74% of the DLLs was Spanish, with another 55 languages represented. The next most common other languages spoken at home included Haitian-Creole (7%), French (0.5%), Portuguese (0.4%), Chinese (0.3%), Arabic (0.2%), Urdu (0.1%), and Vietnamese (0.1%). We do not have data at the child level as to the type of bilingual education program models the DLLs were exposed to, but we know that programs varied greatly from school to school, from submersion programs with limited use of the home language in the classroom to one-way or two-way immersion programs that offered some support for L1. Finally, although we do not have child-level data on country of origin or years in the U.S., we note that all children were already in the U.S. attending pre-K programs at age 4, and know from other work in this community that about 50% of children are considered to be in an immigrant family, defined by at least one parent being born outside the U.S., and that the most common countries/regions of origin include Cuba, other Caribbean islands, Central America, and South America (De Feyter & Winsler, 2009).

Measures

English proficiency

The grade at which DLLs reached English proficiency was defined as when they reached ESOL level five. ESOL levels in the district are: Novice (Level 1), Low Intermediate (Level 2), High Intermediate (Level 3), Advanced (Level 4), and Independent (Level 5) (Miami-Dade County Public Schools [M-DCPS], 2018). DLLs get their ESOL levels assessed each year by an assessment of students' understanding of spoken English language, use of grammatical structure, pronunciation, vocabulary, and reading ability. DLLs are assessed every year until they reach level five, at which point they exit the ESOL program.

From 2003–2007, The Miami-Dade County Oral Language Proficiency Scale-Revised (M-DCOLPS-R) assessment was used to determine the ESOL level of DLL children (Florida Department of Education [FDOE], 2009). This test was administered on an individual basis by trained assessors each year. The M-DCOLPS-R contains 25 items, and ranges from a raw score of 0–25. For each correct answer, the participant received a point. The M-DCOLPS-R is reported to be a reliable and valid measure of English-language proficiency within this population: test-retest reliability from .80 to .94, and concurrent validity with the Idea Oral Language Proficiency Test (IPT I) from .72 to .81 (Abella, 1997; Abella, Urrita, & Schneiderman, 2005). Correct responses on test items indicated that the student exhibited both understanding and linguistic control of vocabulary, structure, and pronunciation. If a child received a score of four or lower, they were placed in ESOL level one. A score of 20 or higher corresponded with ESOL level five, indicating that the student possessed sufficient English proficiency to not require ESOL program services. In 3rd grade, to reach ESOL level five, DLLs must also place above the 32nd percentile on the Reading Comprehension and Language Mechanics Subparts of the Metropolitan Achievement Test (Florida Department of Education [FDOE], 2009).

In 2006, the school system changed their English proficiency assessment to the Comprehensive English Language Learning Assessment (CELLA) developed by the Educational Testing Service (AccountabilityWorks, 2015; FDOE, 2015). It was designed to provide evidence of program accountability, data for tracking the progress of DLLs over time, and information that determines if a DLL can exit the ESOL program (FDOE, 2015). The CELLA consists of subtests to assess listening, speaking, reading, and writing. Internal consistency for this assessment ranges from 0.89 to 0.91 (AccountabilityWorks, 2015). Just as with the previous assessment used, raw scores on the CELLA place students in an ESOL level ranging from one to five, with the highest level indicating that the child is considered English proficient and no longer receives ESOL services. The present study used the grade at which DLL students first reached ESOL level 5 as the measure of when the student attained English proficiency. Although the English proficiency assessment used to determine ESOL levels changed over time, the functional meaning of each ESOL level (1–5) remained constant.

A descriptive variable showing the grade at which each DLL reached ESOL level 5 was created, coded as 0 = kindergarten, 1 = 1st grade, 2 = 2nd grade, 3 = 3rd grade, 4 = 4th grade, 5 = 5th grade, and 6 = after 5th grade. However, given that we included students who were retained in grade at some point in the study, this specification for grade does not always represent the same number of years gone by. DLLs who did not progress through their schooling on time (were retained) were still coded as the grade they reached ESOL level 5 regardless of whether they repeated that grade. For example, a DLL student who repeated 1st grade and reached ESOL level 5 during their second time in 1st grade was still coded as a "1" for having attained this milestone

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in that grade, even though this student took one more year to reach proficiency compared to a non-retained student who reached level 5 in 1st grade.

We created another variable to represent time/years somewhat better for use in the regression models, in which .5s were used to indicate that the student had reached English proficiency during their second time in a grade. For instance, a student who was retained in 3rd grade and reached ESOL level 5 during their second time in 3rd grade was coded as a "3.5." The .5 thus indicates that the student reached English proficiency during their second time in a grade, or that they had been retained in a previous grade and thus had an extra year somewhere compared to others. This more time sensitive and continuous version of the variable showing the grade DLLs reached English proficiency was used for the regression analyses assessing how the timing of English language acquisition was related to 5th grade academic outcomes.

Preliminary analyses revealed that about 2,000 DLLs who had not yet reached English proficiency at the latest possible time point in the present study (5th grade) were struggling in their 5th-grade coursework and test scores, substantially lower compared to DLLs who gained proficiency at any earlier grade. According to school officials, DLL students not reaching the standard for English proficiency by 5th grade for children who started during pre-K likely struggle with other rather serious learning, language, reading, or other disabilities. In fact, the reason why they don't exit the ESOL program is that they continue to struggle to pass the standardized English reading test. Thus, DLLs who did not reach ESOL level 5 until 6th grade or later were excluded from the main regression analyses to limit the sample to more typical DLL English trajectories, preserve desired distributional properties, and have estimates not be biased by these outliers. However, they were kept in the preliminary analyses comparing mean differences in GPA, reading and math scores, and retention, as seen in the tables below.

Academic outcomes

Reading and math

Starting in 3rd grade, students in this state are administered the high-stakes, standardized Florida Comprehensive Assessment Test (FCAT). In three subsections (Word Study Skills, Sounds and Letters, and Sentence Reading), the reading subtest assesses phonemic awareness, decoding, phonics, vocabulary, and comprehension at age-appropriate levels (Florida Department of Education [FDOE], 2019). The math subtest is designed to assess number sense and operations, relationships and patterns, algebra, geometry and measurement, statistics and probability, computation and representation, estimation, mathematical reasoning, and problem solving (Pearson Assessments, 2011). The nationally normed standard scores range from 100–500. The average on these measures observed for our DLL sample here was somewhat higher (reading = 269.64, math = 286.43) than the average for the larger MSRP non-DLL sample (reading = 257.78, math = 271.46) (i.e., reading $t(30{,}512.42) = -17.23$, $p < .001$, $d = -.19$).

Grade point average

Schools provided data on students' teacher-assigned grades across all subject areas for each year starting in kindergarten. In every grade after kindergarten, we calculated an end-of-the-year grade point average (GPA) determined by the average of their grades received in all their subject areas (i.e., math, science, art, music, social studies, physical education, reading, writing, and language arts). Participants' end-of-the-year GPA in 5th grade was used as an outcome variable in the current study. Original grades were on a scale of 1 ('F') to 5 ('A'). The average GPA observed for our DLL sample here (4.12) was somewhat higher than that for the larger MSRP non-DLL sample (4.01; $t(29{,}943.26) = -17.27$, $p < .001$, $d = -.20$).

Retention

School records also provided data on which grade level students were placed in each year. A participant was deemed to have been retained if they repeated a grade. For example, students who advanced on time from 2nd to 3rd grade meet the criteria of having end-of-the-year grades in 2nd grade, appearing in 3rd grade the next year, and having grades at the end of 3rd grade. Children who were retained in 3rd grade, for example, completed 3rd grade, as indicated by having final grades, and then appeared in the same grade level again the next year and had end-of-the-year grades for both years in 3rd grade. We used ever being retained in 3rd, 4th, or 5th grade as an outcome (0 = no, 1 = yes). School district or national averages on retention rates are not available, but the 7.4% rate of retention between 3rd to 5th grade for our DLLs here was lower than that (9.3%) for the larger MSRP sample ($\chi^2(1) = 812.26$, $p < .001$).

Covariates

Cognitive skills at age 4

In the fall and spring of participants' pre-kindergarten year, children were administered The Learning Accomplishment Profile-Diagnostic (LAP-D; Nehring, Nehring, Bruni, & Randolph, 1992), a national norm-referenced developmental assessment. The LAP-D contains four domains – cognitive, language, fine motor, and gross motor – for which 4-year-old children were individually assessed by a trained assessor at the beginning and end of the year before they entered kindergarten. The assessment was administered in Spanish or English depending on the strongest language of the child as determined by their teacher and the bilingual assessor. The majority of participants had scores from both time points at which the LAP-D was administered. The current study used participants' scores on the cognitive subtest from the most recent time point available. Internal consistency reliability was demonstrated for this measure using this ethnically diverse sample (Winsler et al., 2008). Further, construct validity ranges from .64 to .86 when compared with the Battelle Developmental Inventory (Nehring et al., 1992). Age-standardized national percentile scores are reported (from T2 if available, T1 if not) to increase interpretability. Average cognitive scores for the DLLs (50th %ile) were four percentile points lower than that of the non-DLL peers in the larger MSRP (54th %ile), $t(23{,}440.42) = 11.65$, $p < .001$, $d = .15$).

Socioemotional and behavioral skills at age 4

At the same two time points that the children were administered the LAP-D, preschool teachers filled out the Devereux Early Childhood Assessment (DECA; LeBuffe & Naglieri, 1999), a nationally standardized socioemotional and behavioral assessment containing four subscales (initiative, attachment, self-control, and behavior concerns). The DECA contains 37 items in which parents and teachers rate the frequency of a certain behavior a child exhibited over the past four weeks on a scale of 0 (never) to 4 (very frequently). Scores on initiative, attachment,

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and self-control are combined to yield a "total socioemotional protective factors" (TPF) score in which larger scores indicate stronger child socioemotional skills. A 10-item subscale for behavior problems is scored separately, with larger numbers indicating more behavioral concerns. The DECA was available in Spanish and English, and we used scores from the most recent time administered. Internal consistency for this assessment ranges from .71 to .94, and test-retest reliability ranges from .55 to .94 (LeBuffe & Naglieri, 1999). Within this diverse sample, reliability was .94 for total protective factors and .81 for behavioral concerns and did not vary by rater or language of assessment (Crane, Mincic, & Winsler, 2011). National percentile scores are reported. The DLL sample here had fewer behavioral problems (45th percentile), $t(33{,}435) = 16.07$, $p < .001$, $d = .18$, and stronger socioemotional protective factors (58th percentile) than their non-DLL peers in the MSRP (50th and 57th percentile, respectively), $t(32{,}964.67) = -4.77$, $p < .001$, $d = -.05$.

Demographic variables

Demographic variables related to both grade of English proficiency and academic achievement (gender, poverty status, and ethnicity) were added as covariates in the regression analyses. Free/reduced-price lunch status was used to operationalize socioeconomic status, such that receiving free/reduced-price lunch in 1st grade (80% of the sample) indicated that the participant was from a lower-income background than those who did not. School records provided information on the gender and ethnicity of participants. Ethnicity had three categories Hispanic/Latino, African American/Black, and White/Asian/ mixed/other. "Asian," "mixed," and "others" had to be collapsed with the White group due to very small numbers. This is also justified because those groups were quite similar to the White group in terms of their performance/scores on outcomes and predictors.

Results

Preliminary descriptive analyses

We first report the N's and %'s of our DLL sample that reached the school district's threshold for English proficiency and exit from the ESOL program. Table 1 shows the grade level at which the DLLs exited ESOL services, including retained students who had an extra year to reach proficiency (indicated by exiting in a .5 year/grade). As seen in the Table, 29% of the DLLs were proficient by the end of kindergarten, while another 23% reached the threshold in 1st grade, and another 18% did so in 2nd grade. Only about 16% of the DLLs acquired English proficiency after 3rd grade, and only 11% had not done so by the end of elementary school.

Table 2 shows the unadjusted descriptive results (means, standard deviations, and percentages) on the 5th grade outcomes (GPA, math, reading, G3-G5 retention) as a function of the grade at which English proficiency was achieved. As seen in Table 2, there is generally a linear decrease in 5th grade GPA and test scores (and an increase in the percentage retained) for each year/grade later DLLs took to reach English proficiency. One-way, between-subject ANOVAs (X = grade got proficient treated categorically, Y = outcome) confirmed that raw differences in 5th grade outcomes did vary significantly as a function of the grade at which DLLs reached English proficiency (GPA = $F(6, 15{,}504) = 346.608$, $p = .001$; Math = $F(6, 15{,}385) = 491.46$, $p = .001$; Reading = $F(6, 15{,}404) = 531.01$, $p < .001$; Retention = $\chi^2(6, N = 14{,}289) = 616.66$, $p < .01$). For example, DLL students who reached English proficiency by the end of kindergarten had an average GPA of 4.33, a reading score of 288, and they were only 3% likely to be retained between 3rd and 5th grade. However, a DLL who reached English proficiency in 5th grade had a GPA average of 4.04, a reading score average of 251, and was 13% likely to be retained.

Table 1. Grade English Proficiency was Attained (N = 18,915)

Grade English Proficiency was Acquired	*n*	% of total
K (0)	5,084	29.0
K (.5)	76	0.4
Total K	5,160	29.4
G1 (1)	3,765	21.5
G1(1.5)	286	1.6
Total G1	4,051	23.1
G2 (2)	2,672	15.2
G2 (2.5)	437	2.5
Total G2	3,109	17.7
G3 (3)	2,289	13.0
G3 (3.5)	213	1.2
Total G3	2,502	14.2
G4 (4)	308	1.8
G4 (4.5)	54	0.3
Total G4	362	2.1
G5 (5)	243	1.4
G5 (5.5)	81	0.5
Total G5	324	1.9
G6+ (6)	2,040	11.6
Total	17,548	

Multivariate analyses

Multivariate models answered our central research question about whether the grade at which DLLs reached English proficiency was related to 5th grade academic performance over and above important covariates associated with both achievement and timing of English proficiency. Multiple regression analyses (and logistic regression for the dichotomous outcome of retention) were run in Mplus using full information maximum likelihood (FIML) to account for the occasional missing data on predictors. Because students were nested within 278 different elementary schools in 5th grade, we accounted for school-level clustering in the outcomes by using Type = COMPLEX in Mplus. Finally, in addition to analyzing the year/grade that the DLL acquired English proficiency in a linear fashion as the main predictor of interest, we also added the quadratic function (grade acquired English proficiency squared) to examine potential nonlinear effects of age/time/grade. Finally, we added interaction terms in a second step of the regression models, one at a time, to see if the effect of grade acquired proficiency on 5th grade outcomes was similar for a) those with varying cognitive skills at school entry (continuous LAPD-D

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Table 2. Descriptive Statistics of 5th Grade GPA, Math Scores, and Reading Scores, and Retention by Grade Acquired English Proficiency

Grade Acquired English Proficiency	GPA*** (*n* = 15,511)	Math*** (*n* = 15,392)	Reading*** (*n* = 15,411)	Retained G3-G5** (*n* = 14,289)
	M (SD)	*M (SD)*	*M (SD)*	*N (%)*
K	4.33 (.51)	302.49 (70.45)	288.18 (64.63)	138 (3.3%)
G1	4.18 (.53)	300.19 (68.45)	281.47 (60.69)	167 (5.1%)
G2	4.09 (.54)	306.31 (62.13)	281.37 (54.71)	176 (7.4%)
G3	4.13 (.52)	262.10 (55.30)	247.55 (45.36)	185 (8.2%)
G4	4.06 (.51)	280.54 (63.12)	259.14 (54.88)	21 (6.4%)
G5	4.04 (.53)	268.99 (64.43)	250.92 (50.18)	37 (13.2%)
After G5	3.68 (.55)	223.49 (42.52)	212.33 (30.64)	340 (21.8%)
Total	4.13 (.56)	285.80 (68.97)	268.67 (60.95)	1064 (7.4%)

Note: ** $p < .01$; *** $p < .001$

cognitive score), b) those in poverty vs. not, and c) Black compared to Hispanic/Latino DLLs (White/other students were excluded due to very small cell sizes).

GPA

Table 3 shows the results of multivariate models. A multiple regression model was calculated to predict DLLs' end-of-the-year 5th grade GPA controlling for gender, ethnicity, poverty status, and school readiness skills to examine the unique contribution of the grade at which the DLL acquired English proficiency (see Table 3). The model was significant and explained 23% of the variance in GPA. In terms of the covariates, boys, those in poverty, and both Black and Latino students (compared to White/other) received lower 5th grade GPAs. Latino students had somewhat higher GPAs compared to Black students. Preschool teacher ratings of DLL's behavioral concerns at age 4 were negatively associated with 5th GPA 7 years later, and both child cognitive skills and preschool teacher-perceived child social skills at age 4 were positively associated with GPA. Importantly, after controlling for these variables associated with both L2 acquisition and academic performance, DLL's GPA in 5th grade was significantly predicted by the grade at which they became proficient in English. For each additional year until English proficiency was acquired, 5th grade GPA decreased by .03 points. Standardized estimates indicated that the grade at which DLLs acquired English proficiency was about as strong a predictor of 5th grade GPA as was poverty status, a well-known and practically significant effect size on academic achievement. The quadratic version of the

Table 3. Multiple Regression Predicting 5th Grade Reading, Math, and GPA by the Grade the DLL Acquired English Proficiency

	Reading		Math		GPA	
	B	*SE(B)*	*B*	*SE(B)*	*B*	*SE(B)*
FRL	-8.38**	1.71	-5.28**	1.83	-.17**	.01
Male	-5.02**	.94	3.35**	1.03	-.18**	.01
Latino/Black	.59	2.06	.64	2.32	.18**	.02
Black/White	-8.36*	3.30	-11.58*	3.96	-.27**	.03
Latino/White	-4.95	3.91	-8.34*	3.34	-.08**	.02
DECA BC	-.06*	.03	-.02	.03	-.02**	.00
DECA TPF	.13**	.02	.12**	.03	.002**	.00
LAP-D Cog.	.29**	.03	.36**	.03	.004**	.00
Grade Acq. Eng. Proficiency[a]	-8.46**	.51	-7.38**	.57	-.03**	.004
Grade Acq. Eng. Proficiency^2	-1.19**	.28	-2.26**	.32	.005+	.003
Grade Acq. Eng. Prof. × FRL[b]	3.63**	1.14	3.53**	1.33	.009	.008
Grade Acq. Eng. Prof. × Black/Latino[b]	5.61**	1.33	5.81**	1.42	.007	.013
Grade Acq. Eng. Prof. × LAP-D Cog.[b]	-.04*	.02	-.05*	.02	-.001	.00

+$p = .07$. *$p < .05$, **$p < .01$

Notes: FRL = Free or Reduced-Price Lunch; DECA = Devereux Early Childhood Assessment; TPF = Total Protective Factors; BC = Behavior Concerns; LAP-D = Learning Accomplishment Profile-Diagnostic

The third contrast for ethnicity was done by changing the reference group and re-running model

[a]linear effect for grade here is from the model before the quadratic term was added

[b]interaction terms were run in separate models; for Black/Latino interaction White/other students were excluded

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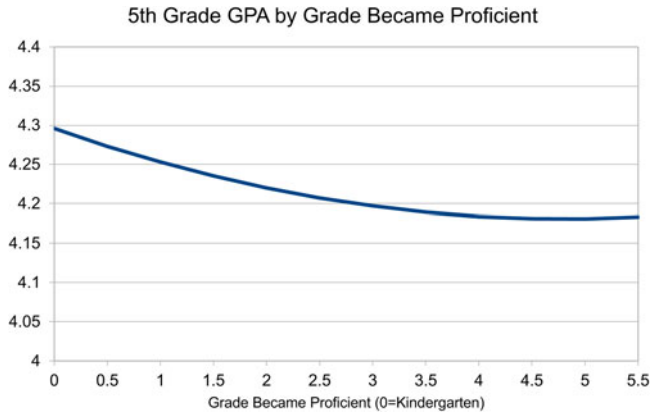

Fig. 1. 5th Grade GPA as a Function of Grade the DLL Reached English Proficiency (plotted predicted Ys from the regression estimates with covariates and quadratic term included)

predictor (grade achieved squared) was marginally significant. As seen in Figure 1, where regression predicted values are plotted with all covariates and both the linear and quadratic estimates included, 5th grade GPA decreases fairly linearly for each grade delay in reaching English proficiency, with slightly stronger slopes apparent during the earlier grades.

Moderation

The additional models run with interaction terms added for poverty status, ethnicity, and initial cognitive skills for GPA were each nonsignificant, as seen in the bottom of Table 3. The effect of grade to attain English proficiency on 5th grade GPA was the same for all students.

Reading

An identical regression model was conducted to predict DLLs' reading scores in 5th grade controlling for gender, ethnicity, poverty status, and school readiness (see Table 3). The model was significant and explained 10% of the variance in reading scores. The same demographic and school readiness variables related to GPA performance predicted 5th grade reading performance as well. Importantly, and as hypothesized, controlling for other variables, reading scores in 5th grade were lower by more than 8.5 points with each passing grade until English proficiency was reached. Examination of the standardized estimates revealed that grade of English proficiency receipt was the strongest predictor of later (English) reading scores, followed by cognitive skills at age 4 and poverty. For reading, there also was a significant (and negative) quadratic effect of age/grade, as seen in Table 3 and visually in Figure 2. As seen in Figure 2, the effect of another year of delay in reaching English proficiency becomes slightly stronger later, from 3rd to 5th grade.

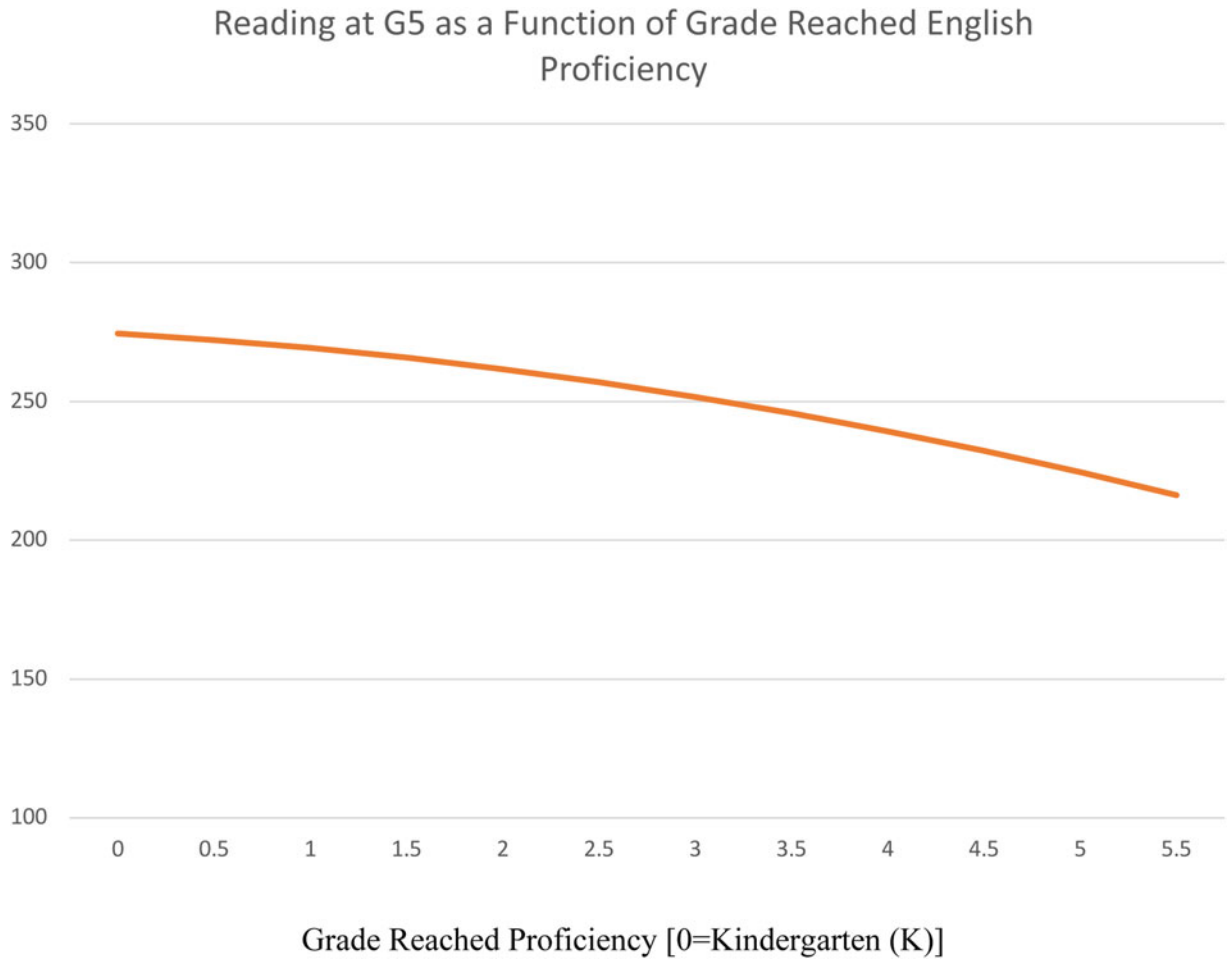

Fig. 2. 5th Grade Reading Test Scores as a Function of Grade the DLL Reached English Proficiency (plotted predicted Ys from the regression estimates with covariates and quadratic term included)

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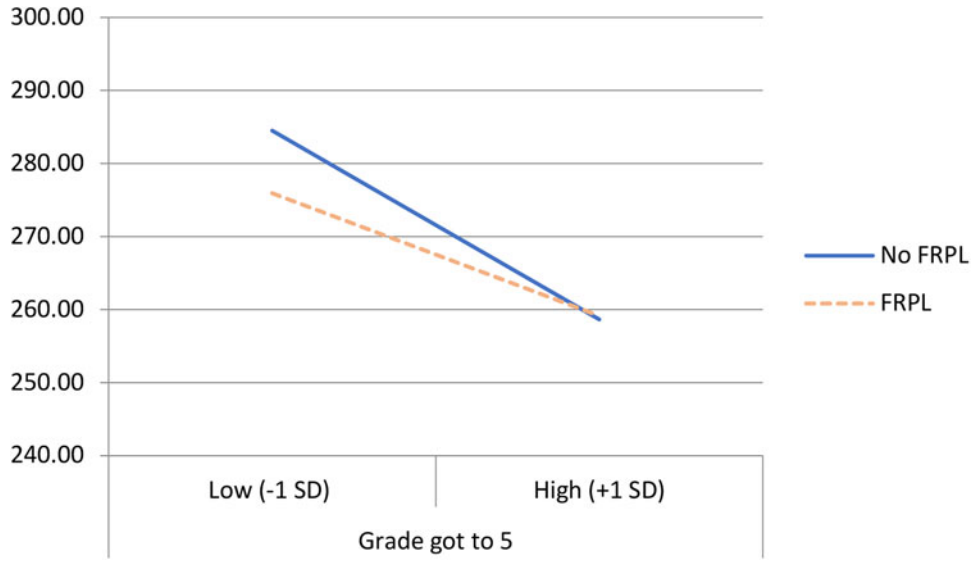

Fig. 3. 5th Grade Math Scores by Grade Reached English Proficiency for Those in Poverty (FRPL) and Not

Moderation

The additional models run with interaction terms added for poverty status, ethnicity, and initial cognitive skills for reading were each significant, as seen at the bottom of Table 3. Interaction graphs were examined to interpret the significant moderation effects. Speed of attaining English proficiency was even more important (steeper slopes) for DLLs who were not in poverty, who were Hispanic/Latino (compared to Black), and those with initially high cognitive skills at school entry. Figures 3 and 4 show this effect for math scores in 5th grade; however, the same patterns were found for reading.

Math

The same regression model was used to predict DLLs' math scores in 5th grade and was significant, explaining 8% of the variance (see Table 3). The effects for gender, poverty status, and social and cognitive skills upon school entry were the same as above – however, for math, preschool behavior problems were unrelated to performance. Black and Latino students received slightly lower math scores compared to White/other students but were not different from each other. Again, the grade at which English proficiency was obtained was significantly related to DLL's math skills in 5th grade. Each grade/year later that it took to become proficient was linked to a 7.4-point reduction in math scores (so 4 grades later would lead to almost a 30-point difference in math scores). Standardized estimates indicated that the grade at which DLLs acquired English proficiency was the strongest predictor of later scores in math, followed by cognitive skills at age 4. For math, there also was a significant (and negative) quadratic effect of age/grade, as seen in the bottom of Table 3. Similar to the pattern for reading discussed above and shown in Figure 2, the age/grade effect was slightly stronger for the latter years/grades 3–5.

Moderation

The models run with interaction terms added for poverty status, ethnicity, and initial cognitive skills for math were each significant. As was found for reading, speed of attaining English

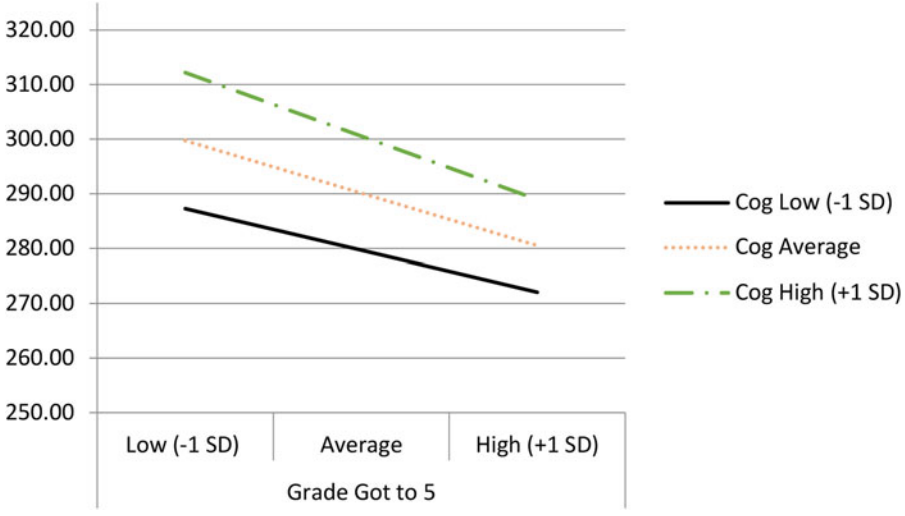

Fig. 4. 5th Grade Math Scores by Grade Reached English Proficiency for Those Low, Average, and High Cognitive Skills at School Entry

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proficiency was even more important (steeper slopes) for DLLs who were not in poverty, who were Hispanic/Latino (compared to Black), and those with initially high cognitive skills at school entry. Figures 3 and 4 show this effect for math scores in 5th grade.

Retention. Finally, a similar multivariate (logistic) regression was run to see whether the grade at which English proficiency was acquired predicted DLLs repeating a grade from 3rd to 5th grade (see Table 4). Boys and DLLs in poverty were more likely to be retained, and Hispanic students were less likely to be retained than Black students controlling for other factors. Preschool teacher reports of social skills and child cognitive skills at age 4 were linked to less odds of being retained later at the end of elementary school. Every percentile point increase in socioemotional skills at age 4 was related to a 1% decrease in the odds of being retained, meaning that a 20-percentile point increase on this measure would be related to a 20% decrease in the odds of being retained. Finally, and of most interest, with everything else controlled, the grade at which English proficiency was acquired was linked to the odds of DLLs getting retained in grades 3–5. Every grade delay in becoming English proficient was linked to a 20% increase in the odds of retention later. So, other things being equal, a DLL who became proficient in 3rd grade would have 80% greater odds of being retained (4 x .197) compared to a DLL proficient in kindergarten. For the retention outcome, the quadratic function for grade was also significant but this time in the positive direction, meaning that delays in becoming proficient were more strongly linked to 5th grade retention in the earlier years of elementary school.

Moderation

Models run with interaction terms added showed that only race/ethnicity moderated the effect of grade getting proficiency on retention in 3rd through 5th grade. Grade of achieving English proficiency was related to being retained in late elementary school for Hispanic DLLs ($B = .212$, $p < .001$) but was not related to retention for Black DLLs ($B = .054$, $p = .48$).

Table 4. Logistic Regression Predicting Retention in G3-G5

Variable	Retention Odds Ratio (*SE*)
FRL	1.58** (.114)
Male	1.38** (.067)
Hispanic/Latino vs. Black	.747* (.139)
Black vs. White/Other	1.28 (.224)
Hispanic vs. White/Other	.894 (.208)
DECA Teacher BC	1.003 (.002)
DECA Teacher TPF	.990** (.002)
LAP-D Cognitive	.982** (.002)
Grade Acquired Eng. Prof.[a]	1.197** (.035)
Grade Acquired Eng. Prof.[2]	1.047* (.022)
Grade Acq. Eng. Prof. × FRL[b]	.990 (.094)
Grade Acq. Eng. Prof. × Black/Latino[b]	.809** (.080)
Grade Acq. Eng. Prof. × LAP-D Cog.[b]	.999 (.002)

*$p < .05$, **$p < .01$

Notes: FRL = Free or Reduced-Price Lunch; DECA = Devereux Early Childhood Assessment; TPF = Total Protective Factors; BC = Behavior Concerns; LAP-D = Learning Accomplishment Profile-Diagnostic

The third contrast for ethnicity was done by changing the reference group and re-running model

[a]linear effect for grade here is from the model before the quadratic term was added

[b]interaction terms were run in separate models; for Black/Latino interaction, White/other students were excluded

Discussion

The goal of this prospective longitudinal study of DLLs was to examine how the timing of acquisition of English was related to 5th-grade academic performance for a large and diverse group of DLLs, controlling for numerous factors that predict both timing of English acquisition and academic performance (poverty status, gender, ethnicity, and school readiness). The general finding was that earlier is better, that each year of delay matters, and that DLLs who acquire English proficiency later are more likely to struggle academically at the end of elementary school. DLL students who reached the school district's standard for English proficiency earlier had better 5th-grade outcomes. For each additional year/grade until English was acquired, DLLs' math/reading test scores and GPA in 5th grade decreased, and the odds of being retained in grades 3–5 increased., Our findings align with prior research that has found that earlier English language acquisition in the U.S. context is related to better later academic outcomes for DLLs (Halle et al., 2012; Kieffer, 2012; Suárez-Orozco et al., 2010). However, the current work represents a significant source of replication and extension because, unlike the prior work using ECLS-K data using research assistants' screening of proficiency in only kindergarten and 1st grade (Kieffer, 2008; Kieffer, 2012; Reardon & Galindo, 2007), we used a more comprehensive and ecologically valid measure of English proficiency – namely, the grade at which the schools deemed the DLL to be proficient to exit ESOL services based on the comprehensive English proficiency assessment administered to the child every year. We also controlled for important covariates associated with both English acquisition and academic performance to more closely pinpoint the specific effect of grade of English proficiency attainment on achievement.

Some studies that compare DLLs to native English-speaking students find that DLL students with lower initial English proficiency do eventually catch up to their native English-speaking peers in math (Reardon & Galindo, 2007) and literacy/reading skills by 5th grade (Kieffer, 2008; Lesaux & Siegel, 2007). Our study shows that this is likely only true for those DLLs who gain English skills relatively early in elementary school. DLLs who are delayed in reaching proficiency continue to struggle in school (Halle et al., 2012). When DLLs are able to gain English relatively early, they actually tend to outperform non-DLL students (Ardasheva et al., 2012). These trends fall in line with Cummins' (1979) threshold hypothesis which predicts that upon reaching adequate proficiency in the language of schooling, DLLs no longer experience academic disadvantages.

We found some evidence of nonlinear associations between the timing of English proficiency attainment for DLLs and 5th grade academic performance. For reading and math standardized test scores, becoming proficient in English and exiting ESOL services was particularly important (i.e., steeper slopes) in the latter grades of 3rd through 5th, whereas for GPA and being retained, reaching English proficiency in the earlier grades, K-2nd, seemed to matter more. The required high-stakes tests given in this school system take place in 3rd, 4th, and 5th grade. Thus, it makes sense that it would be during those contemporaneous grades that the classification of English proficiency for DLLs would be

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particularly important and related to their performance on such exams. Teacher-assigned, end-of-year grades (GPA) and decisions about students repeating a grade (retention) are broader measures of student behavior and performance in the classroom. For these metrics of performance, earlier acquisition of English for DLLs between kindergarten and 2nd grade appears to be particularly important, as mastery of English is likely important and cumulative over time for facilitating full engagement and participation in classroom and homework activities.

We added grade retention as a novel academic outcome related to the timing of English acquisition for DLLs. This outcome was added because much research reports that grade retention does not help students, but rather negatively impacts student achievement, motivation, and success, and should be avoided if possible (Diris, 2017; Hughes, West, Kim, & Bauer, 2018; Kretschmann, Vock, Lüdtke, Jansen, & Gronostaj, 2019). We found that delayed English acquisition was linked to increased probability of DLL students being retained between 3rd and 5th grade. Part of this could be due to the mandatory retention policy in place at the time in this state, in that in 3rd grade, students are required to pass the high-stakes, standardized, reading test to advance to 4th grade. Clearly, early English skills are critical for DLL's performance on such tests. Special services, accommodations, and exceptions from these policies may be needed for DLLs who are struggling with standardized tests to not prevent DLLs from advancing throughout their later schooling. School systems and states like the present one that require students to pass the high-stakes 3rd-grade reading test for promotion to 4th grade should reconsider this policy, given mounting evidence that such promotional gates are systematically detrimental for certain disenfranchised groups, such as children of color, DLLs, those with disabilities, and those in poverty (Tavassolie & Winsler, 2019).

Although earlier acquisition of English was important for all DLLs in the current study, we also explored the novel question of potential moderating factors at play, or subgroup differences, in the relationship between grade of proficiency attainment and 5th grade school performance. We found that earlier acquisition of English proficiency was even more predictive of 5th grade academic outcomes for more initially advantaged DLLs, those without the disenfranchising risk factors of experiencing poverty, having lower cognitive skills at school entry, or being Black. Although being Black, per se, is not a "risk factor," systemic racism, segregation, and the educational inequalities and discrimination experienced among minoritized groups are risk factors for educational achievement and other outcomes (Jones, Truman, Elam-Evans, Jones, Jones, Jiles, Rumisha, & Perry, 2008; McKown, 2013; National Black Child Development Institute, 2013; Reardon, 2016). Indeed, strong links between poverty, race/ethnicity, and cognitive school readiness with academic achievement are well documented (Reardon, 2016; Ricciardi et al., 2021; Tavassolie & Winsler, 2019), which would appear to leave less room for speed of English acquisition to predict 5th grade academic achievement for DLLs. The combination of strong cognitive skills at school entry and relatively early mastery of the English language of instruction are important for the achievement of DLLs.

Implications

Given that earlier English proficiency was found to predict better academic outcomes in 5th grade for DLLs, future research should explore factors related to faster English language acquisition. Previous work has found that SES, ethnicity, cognitive skills at age 4, and socioemotional/behavioral skills at age 4 predict the rate of English acquisition for DLL students (Kim et al., 2014). More empirical work is needed to explore how malleable factors, specifically in school contexts, can help DLLs attain English proficiency faster. For instance, socioemotional and behavioral interventions for DLL students struggling at school entry could help with L2 acquisition. DLL students who participate in social learning interventions have higher scores on reading, writing, and listening assessments than those who do not participate in such interventions (Zhang, Anderson, & Nguyen-Jahiel, 2013). Indeed, controlling for other factors, better socioemotional skills, and fewer behavioral problems for DLLs at age 4 predict faster English language acquisition by the end of kindergarten (Winsler et al., 2014). As the present study found that DLLs who attained English proficiency early on performed better in 5th grade than those who attained proficiency later, factors such as socioemotional/behavioral skills that help DLL students reach English proficiency earlier should be further explored.

Children's L1 competence is also a critical factor to consider, both as a predictor of English acquisition but also as an outcome in and of itself. DLL students with stronger Spanish (L1) competence are more likely to have acquired full English proficiency by the end of kindergarten than DLL students with lower competence in their L1 (Winsler et al., 2014). This finding, taken together with the finding that attaining English proficiency by the end of kindergarten predicts better later academic outcomes, indicates that implementing programs designed to enhance children's L1 competence before and during kindergarten might help them succeed academically, especially since L1 competence only helps the learning of L2 (Cummins, 1981). However, the challenge is to balance the desire for English proficiency with the rewards and benefits of L1 language development and maintenance (Agirdag, 2014; August, Shanahan, & Escamilla, 2009). Having strong L1 and L2 skills has numerous benefits in DLLs' academic trajectories beyond elementary school, such as a lower likelihood of dropping out of school (August et al., 2009), a higher chance of attending a 4-year university (Santibañez & Zárate, 2014), and higher salaries in the workplace (Agirdag, 2014). Unfortunately, we did not have measures of DLL's L1 skills. Future longitudinal research should track both English and L1 development for DLLs.

Another malleable factor related to how quickly DLLs attain English proficiency is the type of 'bilingual' education program they were enrolled in while in elementary school and how much support is provided for L1 maintenance (Serafini, Rozell, & Winsler, 2020; Steele, Slater, Zamarro, Miller, Li, Burkhauser, & Bacon, 2017). Studies examining later academic outcomes for DLLs based on the type of language program DLLs were enrolled in find that bilingual education models are the most efficient for promoting later academic achievement (Center for Research on Education, Diversity & Excellence, [CREDE], 2003; Marian, Shook, & Schroeder, 2013; Serafini et al., 2020). Serafini et al. (2020) found that, after controlling for many variables associated with achievement and L2 acquisition timing, truly bilingual education models were associated with acquiring English faster compared to monolingual submersion models. Specifically, two-way immersion models have been reported to be associated with faster English acquisition when they support home language and culture, and integrate both language majority and minority learners (Agirdag, 2014; August et al., 2009; CREDE, 2003; Lindholm & Aclan, 1991). Steele et al. (2017) reported that, by sixth grade,

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DLLs in language immersion programs were less likely to remain classified as DLLs compared to students enrolled in monolingual programs.

A final malleable factor that must be considered is individual district/school policies and practices used for determining ESOL exit for DLLs. As discussed earlier, there is considerable variability across school districts in the threshold needed to exit ESOL programs, and sometimes DLL students who are ready based on their skills to exit ESOL and enter the full, regular curriculum are made to remain in ESOL programs due to school bureaucratic processes, poor oversight, or economic/political incentives (Thompson, 2017). Public schools in the U.S. receive part of their state and federal funding based on the number of DLL students they serve (Freemire, Evans, & Syverson, 2020). Delays in advancement out of ESOL sometimes include having DLL students repeat a grade, even though research has shown grade retention has negative impacts on academic achievement, and DLLs are overrepresented in the group of retained students (Diris, 2017; García-Pérez, Hidalgo-Hidalgo, & Robles-Zurita, 2014). Delays in exiting ESOL when DLLs are ready to do so are associated with negative academic effects later on, including increased high school dropout (Kim, 2011). Thus, the current study has an important practical implication for school systems as well, which is that the earlier DLLs reach the threshold for English proficiency and exit from ESOL programs, the better it is for their long-term educational outcomes. The U.S. has federal guidance to states as to best practices for assessing, exiting from ESOL programs, and then supporting DLLs post-transition, but it remains a challenge to ensure that all school systems and states are in compliance with these guidelines (US Department of Education, 2016).

The present longitudinal study has multiple strengths, such as a measure of English proficiency that was ecologically valid administered every grade to DLLs until they reached proficiency, a large sample of ethnically diverse DLLs (not all Latino), and the use of authentic school system outcomes including retention, GPA, and high-stakes test performance. Additionally, we utilized within-DLL comparisons rather than comparing DLLs to native English-speaking students and included numerous control variables associated with both L2 development and academic performance. Despite this, there are limitations to take into account. First, unfortunately, we did not have information at the child level about which specific types of ESOL programs and services the DLLs were receiving. Second, the sample does not include all DLLs in the school district, only those who were enrolled in public school pre-k programs or low-income students who received childcare subsidies to attend childcare in the community at age four, which limits generalizability. Third, we did not have information about the home language environment and the quality and quantity of language input in multiple languages. Clearly, parental education, language complexity, and language input to young DLLs matter as well, not only for bilingual language development but also for DLLs' academic performance in school (Bialystok, 2007; Bohman, Bedore, Peña, Mendez-Perez, & Gillam, 2010; Dahm & De Angelis, 2018; Gilkerson, Richards, Warren, Kimbrough Oller, Russo, & Vohr, 2018). Finally, although not so much a limitation but more a fact to remember when comparing the results here to other studies is that the sample here included only DLLs who were present in the U.S. and attended ECE programs at age 4. Studies examining the academic performance of DLLs often include DLLs who arrived as immigrants only within the last year or so with very limited English proficiency (Agirdag, 2014; Glick & White, 2003; Tillman, Guo, & Harris, 2006), which will yield different (cross-sectional) associations between English proficiency and academic performance for DLLs.

In conclusion, the present study provides strong evidence that earlier English language acquisition is related to later academic success of DLLs. Educators should strive for DLLs to attain English proficiency early on by giving them extra supports and using empirically supported bilingual pedagogy, keeping in mind the key role that some degree of home language support in schools plays in determining when DLLs reach English proficiency (Serafini et al., 2020; Steele et al., 2017). It is also important for schools to continue to monitor and support DLLs after they have reclassified to make sure that former DLLs have the skills needed to be academically successful in later grades (US Department of Education, 2016). The DLL student population in the U.S. is growing, so further developing our understanding of the factors that support English language acquisition is key to promoting academic success for these students.

Data Availability Statement. Data from this study are not available due to their proprietary nature and restrictions on our data sharing agreement with the public school system.

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