Testing, Time Limits, and English Learners:
Does Age of School Entry Affect How Quickly Students Can Learn English?

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Abstract

The No Child Left Behind Act requires schools to begin testing new English Learners (EL) in English language arts within three years after they enter school and holds schools accountable for their performance on these exams. Yet very little empirical work has examined exactly how long it takes EL students to become proficient in English and how the time to proficiency varies for different types of students. Linguistic theorists suggest, for instance, that the age at which students begin learning a second language may substantially influence their probability of obtaining proficiency quickly. Using panel data on English Learners (EL) in New York City public schools, I examine how long it takes students to become minimally-proficient in English and how the time to and probability of proficiency differs for students by their age of school entry. Specifically, I follow four entry cohorts of ELs and use discrete-time survival analysis to model variations in the rate at which different age groups acquire proficiency. I find that approximately half of the students become proficient within three years after school entry but that age of entry lowers the speed with which children can become proficient. Age of entry differences are robust to controls for differences in other student characteristic and the schools they attend. The results suggest that federal, state, and local policies regarding the testing of EL students in academic English should consider more flexible time limits.

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1. Introduction

Policymakers and educators have long struggled with how best to help newcomers to the United States learn English quickly and fully. The pressure to achieve this goal has increased substantially in the last decade with the rise in the English Learner (EL) population and new federal mandates that govern the testing of EL students. In 2004, approximately 11 % of the student population were designated EL, an increase of over 60 percent since 1994 (NCELA, 2006). Public schools are also now held accountable for the performance of their EL students on standardized reading and math exams. The 2001 federal No Child Left Behind Act (NCLB) requires EL students to take standardized tests in English reading/language arts within three years after they enter the school system.[1] Districts and schools that fail to demonstrate gains for EL students on these exams after the three-year time limit risk penalties that range from permitting parents to transfer to alternative schools to removing personnel or closing the school.

Several advocates and educators have complained about the new federal requirements, claiming that they ignore the variation in the speed with which some students learn English (Zehr, 2007). Indeed, the policy was implemented despite a surprising shortage of research on precisely how long it takes young EL students to become proficient and how the trajectory varies by the age at which students enter school. Most of the research on time to proficiency relies on now-dated, small samples of students, often in one or two schools or classrooms, and does not include

[1]United States. PUBLIC LAW 107–110—JAN. 8, 2002 115 STAT. 1425. Title I, Part A, Section 1111 (b) (3) (C) (ix-x) and Section 1111 (b) (6-7); U.S. Department of Education. (2007). "Assessment and Accountability for Recently Arrived and Former Limited English Proficient (LEP) Students." Non-Regulatory Guidance. Office of Elementary and Secondary Education: Washington, D.C.

repeat observations over many years. As a result, a review of the research requested by Congress of the Government Accountability Office in the same year that NCLB was passed concluded that "No clear consensus exists on the length of time children with limited English proficiency need to become proficient in English" (U.S. GAO, 2001: 7).

This study takes advantage of rich panel data on large samples of EL students who enter the New York City public school system between the ages of 5 and 10 to generate reliable time to proficiency estimates of how long it takes the average EL student to become minimally-proficient in English. The study also examines how age of entry into the public school system alters the time to proficiency trajectories. The effect of age on the ability to learn a second language is a question that psycholinguists have been asking for a long time with somewhat inconclusive answers. While this paper aims to contribute to that debate, its primary aim is to inform education policy makers about the heterogeneity in the EL population and, in particular, to focus on a group that may face biological constraints on language learning.

The study uses data on four entry cohorts of students (entering between 1996 and 1999) at multiple entry ages and uses discrete time survival analysis to estimate the probability that students reach English proficiency in each year following their entry into school. It further examines differences in these probabilities by age of entry into the school system. A final analysis examines whether age of entry creates differences in the likelihood of obtaining proficiency, controlling for other student and school characteristics that may drive rates of English language acquisition. The analysis suggests that the plurality of students reach proficiency in the first year following entry into the public school system: between 25 and 30 % of new EL entrants are proficient within one year after school entry, with slight variation by the year in which they entered. In addition, over 50 % of the entering EL students are proficient within three years after they enter, suggesting that the time limits on exemptions are appropriate for a slim majority of EL students. Yet the probability of becoming proficient and the speed with which proficiency is acquired are reduced by the age at which students enter the school system. Age of entry effects are robust to controls for school and other student characteristics, including the students' level of English proficiency upon entry, lending support to the theory that age-related biological or cognitive influences hinder older children's ability to learn new languages quickly. The results suggest that while the current policy that sets time limits on exemption from taking exams in English may be appropriate for the median EL student, it may disproportionately penalize older-entering EL students who are unable to become proficient as quickly as younger-entrants. The policy may also disadvantage schools that serve large shares of older-entering EL students.

2. Theory and Past Research on Time to Proficiency and Age of Entry Effects

There are a number of reasons why age of entry into the public school system (a proxy for the age at which formal learning begins) might matter to the rate at which children acquire English proficiency and the ultimate level of proficiency that they can obtain. This section groups the various theories into three broad categories (developmental, socio-demographic, and schooling), reviews the existing empirical work on time to proficiency and age of onset effects, and details the contributions of this study to the existing literature.

2.1 Theory on Age of Entry Effects on Time to Proficiency

The effect of age of onset on second language acquisition is a topic of extensive research among linguistic theorists, who search for biological, cognitive, and maturational explanations for language acquisition. The Critical Period Hypothesis (CPH), for instance, posits that the ability to become fully proficient in a second language (often measured by the ability to speak without an accent or follow grammatical rules) is influenced by the developmental period in which exposure to the language begins. Much of this research finds a negative correlation between the age at which learning begins and the ability to become a native-like speaker. There is, however, extensive debate among linguistic theorists as to the validity of the CPH, including whether the age of onset effects are asymmetric or linear, and whether the age effects are due to neurological, maturational, or cognitive factors (for reviews of this research, see Birdsong, 1999 and Singleton and Ryan, 2004). The theoretical work on how age of onset affects the *rate* at which a young learner can become minimally-proficient in a new language is relatively less developed. Conventional wisdom and some CPH theorists posit that older-entrants will be slower learners. Alternatively, some speculate that older learners may be able to pick up the basics of the new language more quickly than younger learners because they are more proficient in their first language. That is, older youth may never obtain native-like proficiency in their second language, but their advanced language skills upon onset may permit them to become at least orally proficient more quickly than younger children (Collier, 1987).

An alternative explanation for age of entry differences in the probability of obtaining minimum proficiency and the rate at which it is obtained could be that ELs who emigrate at a given age may differ on non-developmental factors that drive the rate of second language acquisition. Studies of immigrant youth in the U.S., for example, typically find that levels of English proficiency are higher among youth whose parents are college educated and earn higher incomes (Portes and Schauffler, 1994; Bialystock and Hakuta 1994; Hakuta, Butler, and Witt, 2000). Large racial and ethnic differences in English proficiency and other school and labor market outcomes have also been widely documented, with Latino immigrants generally faring worse than others (e.g. Hirschman, 2001; Van Hook and Fix, 2000). Students who have underlying disabilities or who begin their schooling with a relatively low level of English proficiency can also be expected to have a harder time obtaining proficiency quickly than students without these disadvantages. If age of entry correlates with any of these attributes—student demographics, parental human capital, disabilities, initial proficiency level, as examples—then the developmental effect of age of entry might be biased in models that fail to control for these attributes.

A third set of possibilities affecting time to proficiency includes the quality of the schools and English language programs that older and younger students attend and differences in the institutional capabilities of teaching English to different age groups. Several studies have documented high rates of across-school segregation between EL and fully English proficient students as well as disparities in the qualifications of the teachers and the quality of the schools attended by these two groups (e.g. Gándara, Rumberger, Maxwell, and Callahan, 2003; Gershberg, Danenberg, and Sanchez, 2004; Van Hook and Fix, 2000; Rumberger 2003). National surveys also indicate that older ELs are less likely than younger ELs to receive any type of English language services (Van Hook and Fix, 2000). Though many studies document differences in the relative effectiveness of English language services, particularly distinguishing between those that permit instruction in students' native language and those that do not, the evidence regarding the relative effectiveness of the two approaches is mixed (see Francis, Lesaux, and August (2006) for a recent review of this literature). If older-EL students enter lower quality schools or receive lower quality English instruction than younger-EL students, then their rate of English acquisition will be slower and their likelihood of becoming proficient will be lower.

2.2 Empirical Research on Time to Proficiency and Age of Entry Effects Among Children

A review of the literature surfaced only a handful of studies of North American language learners with a large enough sample size to generate reliable estimates of how long it takes students to become minimally-proficient in English (Collier, 1987; Cummins, 1981; Hakuta, Butler, and Witt, 2000). Though these studies help to generate hypotheses for the current study, most of them use samples of students from Canada or students in the U.S. during the 1970s and 1980s, or focus only on measures of academic English proficiency. Studies that use academic measures of English proficiency (for instance, performance on English language arts exams) are unable to determine whether a low score indicates limited English proficiency or limited knowledge of the content area. In exception, there is one recent large scale study that uses both oral and academic measures of English to generate estimates of time to proficiency. Hakuta et al. (2000) study the English acquisition of cross sections of students in San Francisco/Bay Area elementary and middle school grades in 1998 (a sample of approximately 1,800 students), all of whom entered school in kindergarten. The study finds that 90% of the students reached oral English proficiency within five years of school entry, with most students requiring between two and five years to reach oral proficiency. Students with less-educated parents and in higher-poverty schools took a longer time to reach proficiency than students with more highly-educated parents. The study makes significant advances over the earlier studies that failed to observe students at multiple points or relied on small, dated, or non-U.S. samples. Yet the estimates need to be replicated in other large samples of students and in other jurisdictions. In addition, the field requires more analyses of how the time to proficiency varies for different groups of students.

Research on how age of entry affects the rate at which young children learn English is particularly important and yet fairly limited. There is a growing body of empirical work that relies on samples of adult immigrants (for example, using Census data) to retrospectively correlate their English proficiency level with the age at which they emigrated. As reviewed by Stevens (1999) and Hakuta et al. (2000), these cross-sectional studies fail to isolate the effect of age of entry on proficiency from the effect of years in the U.S. (or exposure to English) because age of entry and length of time are perfectly inversely correlated. Some of the newer studies use multiple cross sections of adults (from two waves of the Census, for example), which does allow for a distinction to be made between the effect of age of entry and length of time in the U.S. (Stevens, unpublished). However, these studies can only shed light on the effect of age of entry on ultimate proficiency, not on the rate at which a certain level of proficiency is achieved. Such time to proficiency estimates can only be obtained from panel data that observes students' English abilities in each year after entry.

Many of the panel studies that examine the rate of acquisition rely on small, single age-cohort samples that prevent across-cohort comparisons (e.g. Snow and Hoefnagel-Höhle, 1978; MacSwan and Pray, 2005). In addition, the handful of large-sample studies that examine the effect of age of onset on rate of acquisition tend to use measures of academic English proficiency instead of measures of oral proficiency and focus on only one or two language groups (Collier, 1987; Cummins, 1981; Ramsey and Wright, 1974). The results from these few studies suggest that among pre-school and elementary school-age children (approximately under the age of 10), students who are slightly older (8-11) gain academic proficiency more quickly than students who are slightly younger (5-7).

2.3 Major Contributions of this Study

To summarize, the research to date indicates that elementary school age students reach oral proficiency in two to five years and age of entry may increase the speed with which students become minimally proficient. The prior studies are limited in ways that this study is able to overcome. First, with panel data and discrete-time survival analyses, I can isolate the effect of age of entry from length of residency on English acquisition. More specifically, I can compare the likelihood of becoming proficient in each year following entry into the school system as well as the median time to proficiency for each age of entry group. Second, I am able to control for a host of student-level attributes that may correlate with age of entry and proficiency, including family poverty, home language, race, gender, disability, and precise English ability upon school entry. By including these student characteristics in models of proficiency, I am also able to shed light on their relative influence. Third, with data on the schools that students attend, I can control for differences in the quality of schools attended by older and young EL students that may influence time to proficiency. Fourth, I use panel data on the census of entering EL students over multiple years and at multiple ages, which eliminates possible biases due to sampling error, lack of sufficient sample sizes for examining subgroups of students, and limited generalizability due to atypical cohorts. Finally, I use a measure of oral proficiency, which has rarely been used in the prior explorations of this topic and which is highly-relevant to the design of education policy regarding EL students. The data are described in the following section.

3. Methods

3.1 Data Sources and Variables

Using administrative records on all students in the 1st through 8th grades in New York City public schools in each of the years 1996 through 2004, I assembled four panel datasets of EL students who were new entrants from 1996 through 1999. Students are observed for a minimum of three years and a maximum of eight years depending upon the year that they entered and their age upon entry. For instance, students who entered as 5 year-olds in 1996 (when they were in the first grade) are observed through 2003 (when they reached the eighth grade). Students who entered as 10 year-olds in 1996 (when they were in the fifth grade) are observed through 1999 (when they reached the eighth grade). The analysis focuses on the 8,976 students who entered the school system in 1997, and provides summary information on students in the other entry years for simplicity of presentation.

Two categories of students are excluded from the analysis. The first are students who exited the school system the year after entry and who did not reenter by the time data collection ended because these students' EL status could not be determined**:** 7.6% % in 1996 to 4.8% in 1999 are excluded for this reason. The second are students with missing race/ethnicity data: 0.15% % in 1996 to 0.20% in 1999 are excluded for this reason.

The data contain information on students' socio-demographic characteristics and their receipt of part-time special education services for mild or moderate disabilities. Demographic variables include gender, race/ethnicity (white- not of Hispanic origin, black- not of Hispanic origin, Asian or Pacific Islander, and other), nativity status, age, and the language that is most frequently spoken in the home as determined through a home language survey. The one measure of socio-economic status is whether the student is eligible for the free or reduced-price lunch program. Students from families with incomes at or below 130 % of the federal poverty are eligible for free school meals while students in homes between 130 % and 185 % of the poverty level are eligible for reduced-price school meals. Each student is also linked to the schools they attend and the characteristics of their schools, such as the per-pupil expenditures, enrollment, the percentage of teachers with master's degrees, and the percent of teachers with more than two years teaching in the school.

Also included in each year are students' scores on the Language Assessment Battery (LAB), a test of their proficiency in speaking, listening, reading, and writing English. Students from homes where a language other than English is primarily spoken and students whose native language is not English are required to take the LAB. Students who score at or below the 40th percentile on the LAB are designated as EL and eligible for English language instruction. Students are retested each spring until they score above the 40th percentile. Those scoring above the 40th percentile are considered to have the ability to comprehend and speak English better than 40 % of the normed population, which includes both native speakers of English and native speakers of other languages.

Table 1 provides a glimpse at the characteristics of the 1997 EL new entrants overall and by age of entry. The first column shows that the average student scores in the 8th percentile on the LAB (which reaches a maximum of 40) and the majority EL students are poor, foreign-born, Hispanic, and from homes where the most frequently spoken language is Spanish.
Moving across the columns, there is a notable decrease in initial English proficiency level by age of entry, ranging from a LAB score of 11.37 among 5 year old entrants to 4.69 among 10 year old entrants. Comparisons across columns also reveal differences in other student characteristics by age of entry: the older entrants tend to have higher shares of foreign-born, Asian, and white students and lower shares of Hispanic and part-time special education students than younger entrants. Correspondingly, older entrants are more likely to speak Chinese, Russian, and Bengalese at home than younger entrants. These age of entry differences are consistent with other research on New York City public school students, which shows that foreign-born students tend to enter the school system at older ages than native-born, and that they are disproportionately Asian and white (Ellen, O'Regan, and Conger, forthcoming).

(Table 1 here)

The bottom part of the table shows the characteristics of the 699 schools attended by the average EL entrant, and the average EL entrant in each age group. In 1997, the average elementary school student attended a school with enrollment of 1,034 students, spending of $7,250 per pupil, 69.4% of teachers with more than 5 years of experience, and 89.2% of teachers with master's degrees (not shown in table). As shown at the bottom of the first column of Table 1, the typical EL student attended a very similar type of school. In addition, looking across the columns reveals very modest differences in the size, expenditures, and teacher characteristics of the schools attended by EL entrants in each age group. Ten year-old entrants attend slightly larger schools and schools with slightly higher levels of per pupil expenditures and "experienced" teachers than younger entrants, but there are few other differences. Taken together, these relatively small differences in student and school attributes by age of entry suggest that controlling for these characteristics in models of time to proficiency is unlikely to dramatically alter age of entry effects.

3.2 *Estimation Strategy*

As in most studies that examine the duration until an event, this one relies on time-censored data. Specifically, students' English proficiency status cannot be determined after the last year that they have been observed, such that those students who are not proficient by this year are considered right-censored observations. Estimates of the average time to proficiency would likely be biased using standard analytic techniques. To generate meaningful estimates, I employ a discrete-time survival model where the primary independent variable is time.

The data are first organized hierarchically in student-years, where the number of years observed for each student is equal to the number of years that it took them to obtain proficiency, or to the end of the data collection year for those who did not obtain proficiency. The baseline hazard model for each cohort examines the probability of exit from EL status in each year following entry using a logit estimation. The model for the 1997 entrants, for example, takes the following form:

(1) $\text{logit}(E_{it}) = \boldsymbol{Y}_t\alpha + \varepsilon_i$

where E_{it} equals one if student i exited EL status (achieved English proficiency) in year t. The variables Y_1 through Y_7 are indicator variables representing each year the student was retested over the following seven years and the parameters $\boldsymbol{\alpha_1}$ through $\boldsymbol{\alpha_7}$ are the probability of reaching English proficiency in each of these years provided that proficiency was not reached in the previous year. These parameters capture the hazard function (or, in this case, the exit from EL function) for this cohort of students. The model yields at least two important pieces of information. First, the coefficients on each year can be converted into hazard estimates, generating the probability of exit from EL status in each year following entry. With these probabilities, the model reveals whether there is a critical number of years after entry at which the probability of becoming proficient sufficiently drops. Second, estimates of the parameters can be substituted back into the equation to produce an estimated median number of years in EL status if at least 50 % of the students reach proficiency before the last year they are observed.

This model is estimated for all students entering in a given year and separately by the age at which they enter so that the rate of exit in each year following entry can be compared across age of entry cohorts. One key advantage of this approach is that it isolates the effect of age of entry from the effect of time in the school system on the likelihood of obtaining proficiency because time in the system is essentially held constant (for instance, the difference in the exit rate one year after school entry between 6 and 7 year-old entrants). In order to determine whether differences in the hazard rates for each age of entry group are statistically significantly different, confidence intervals around each hazard rate are presented. An alternative approach to testing the statistical significance of age of entry differences would be to estimate combined models that interact each age of entry indicator with each year indicator. The results from these two methods are the same, so I report the confidence intervals because they provide more information: interval estimates of each hazard rate and enough information to test hypotheses about differences in hazard rates between age of entry groups.

To isolate the effect of age of entry on the probability of obtaining proficiency controlling for other determinants of English acquisition, I then estimate a model with sets of covariates added to the right-hand side as follows:

$$(2)\ \text{logit}\,(E_{ijt}) = \boldsymbol{A}_{it}\,\beta + \boldsymbol{Y}_{it}\alpha + \boldsymbol{S}_i\,\eta + \nu_j + \text{L}_\text{i}\gamma_I + \varepsilon_{ijt}$$

where E_{ijt} equals one if student *i* from school *j* exited EL status (achieved English proficiency) in year *t*. $\boldsymbol{A}_i$ is a vector of indicator variables representing the age the student entered the school system; $\boldsymbol{Y}$ is a vector of indicator variables representing each year the student was retested, with corresponding parameters $\boldsymbol{\alpha_1}$ through $\boldsymbol{\alpha_7}$ that capture the probability of reaching English proficiency in each of these years provided that proficiency was not reached in the previous year; $\boldsymbol{S}_i$ is a vector of other student characteristics (female, eligible for free or reduced-price lunch, race/ethnicity, foreign-born, language most frequently spoken at home, and receipt of part-time special education services); ν_j is a vector of indicator variables capturing the student's elementary school upon entry; L is the student's LAB score in the year she entered the school system; and ε_i is an error term.

This fully-specified model aims to establish the extent to which age of entry effects are driven by developmental differences in students' ability to learn English versus other student and school characteristics. The year indicators (*Y*) control for differences between students in the number of years they were observed and the rate they acquired proficiency. With the addition of $\boldsymbol{S}_i$, v_j, and L_i, the estimated coefficients on the grade of entry variables indicate the effect of age of entry independent of the demographic and economic characteristics of the students, their underlying disabilities, the schools they attend, and their level of English proficiency upon entry. If the model still shows adjusted age of entry differences, they can be more confidently attributed to cognitive, maturational, or biological factors that influence the probability of obtaining proficiency.

3.3 Sensitivity Analyses

Sensitivity analyses are estimated to address four concerns. The first is that the exact time to proficiency cannot be determined for a sub-sample of students who exit the school system as EL and return proficient more than one year later. The percentage of students in each cohort that exited as EL and returned more than one year later as proficient ranges from a high of 3.33% among 1996 entrants to a low of 0.92%among 2000 entrants**.** For the primary analyses, I assign to these students the maximum number of years that it could have taken them to become proficient and in a sensitivity analysis, I assign the minimum number of years it could have taken them. For instance, consider a student who entered in 1997 and who has the following record: not observed in 1998, not observed in 1999, observed in 2000 and recorded as English proficient in that year. This student's minimum possible time to proficiency is one year (assuming she became proficient in 1998) and her maximum time to proficiency is three years (assuming she became proficient in 2000).

A second sensitivity analysis is conducted to determine whether entering the school fixed effects as time-varying affects the estimates of age of entry on time to proficiency. The primary model controls for the school that students attended upon entry into the school system. Ideally, the model would control for each school that the student attended while observed, since some students transferred to different schools. However, for the small percentage of students who exited as EL and reentered as proficient, the school they attended in the years that they were not in the school system cannot be entered into the model. To maximize the sample size, I keep these students and control only for the school they attended in their first year. To check for the sensitivity of this decision, I restrict the model to students who are observed in each year and enter the school fixed effects in each year (as time-varying variables).

The third concern is that the data do not indicate whether students received formal English language instruction—for instance, from private schools or English language day care centers—prior to their entry into the public school system. Time to proficiency estimates may be biased downward by this omission. Age of entry effects might also be biased. The most likely scenario is that 5 and 6-year old entrants are more likely to have received prior instruction than students who enter at older, non-traditional, entry points (indicating that they may be new to the U.S.). Prior research on immigrant children under the age of six finds that most are cared for by their parents and relatives prior to entering public school system so the magnitude of these possible biases is likely to be small (Capps, Fix, Ost, Reardon-Anderson, and Passel, 2004; Magnuson, Lahaie, and Waldfogel, 2006). In addition, the data include a variable that identifies foreign-born students that have entered any U.S. public school within the last three years and comparisons reveal that the majority of foreign-born (more than 93% in each age group) who are recent to the city's school system are also recent to any U.S. school system. Nevertheless, I conduct an additional sensitivity analysis by restricting the analysis only to these "recent immigrants" to ensure that time to proficiency and age of entry effects are picking up first time exposure to formal English language instruction.

A final analysis addresses a change of measurement in the time series. Beginning in school year 2002-03 (referred to in the paper as 2003), the New York City Department of Education changed the procedure for identifying students who become proficient in English. Prior to 2003, the LAB was used to identify students for services, monitor their progress in each year, and determine their eligibility for exit from EL status. In 2003 and 2004, the LAB was used to determine eligibility only for new entrants into the school system and a different test, the New York State English as a Second Language Test (NYSESLAT), was administered to determine continued eligibility for previously-tested students. The values on the NYSESLAT include beginner, intermediate, advanced, and proficient, where only students who receive a proficient on the exam are considered to have exited EL status. Obtaining a value of proficient on the NYSESLAT is much more difficult than scoring above the 40^{th} percentile on the LAB so that estimates of exit from EL status drop significantly in 2003 when using the NYSELAT. There is, unfortunately, no combination of scores on the NYESLAT (e.g. proficient and advanced) that can be equated to an above 40^{th} percentile on the LAB. If the change in measures somehow uniquely disadvantages a particular age group, then age of entry effects will be biased by this measurement shift. To address this problem, I first estimate all models using the New York City definition of English proficient on the NYSELAT (receiving a value of proficient) and discuss these results in the text. I then re-estimate the fully-specified model using a more generous definition of English proficiency on the NYSELAT (receiving a value of proficient or advanced) and discuss the robustness of the age of entry effects to this alternative definition.

4. Results

4.1 How Long Does it Take the Average Student to Become Proficient?

The first analysis provides point and interval estimates of the probability of reaching proficiency in each year following school entry by year of entry (see Table 2). For each entry cohort, the probability of exit from EL status is highest for students one year after they enter the public school system. Among 1996 entrants, for instance, roughly 24% of students become proficient in the first year, roughly 18% of those who were not proficient by the end of the first year become proficient in the second year, and so on. The likelihood of exit in this first year increases across the year of entry cohorts, with the largest jump between 1996 and 1997 entrants, reaching a probability of 0.303 for 1999 entrants. This gradual change may reflect differences in instruction provided to EL students over time or to differences in the initial proficiency level of the entering cohorts; however, the latter possibility is less likely since the initial proficiency level increased only slightly from 7.51 among 1996 entrants to 8.18 among 1999 entrants.

After the first year following school entry, the exit rate from EL status hovers at around 0.18 to 0.25, with relatively small differences across year of entry cohorts and by year after school entry. For instance, in 1996, exit rates range from 0.178 to 0.220 from the second to the sixth year after entry but most of the differences are not statistically different as indicated by overlapping interval estimates. The same is true of exit rates in 1997, which range between 0.194 and 0.202 from the second to the fifth year after entry. The last two years for each entry cohort are italicized to remind the reader of the measurement change that occurred in 2003. As explained in Section 3.3 (Sensitivity Analyses), the measure used to determine exit from EL status made exit from EL status more difficult in 2003, which explains the large decreases in the probability of exit in this year.

The bottom of the table provides the median survival time and the percent of students who are censored. The 1996 median is 3.03, indicating that almost half of the students became proficient within three years after entry. Approximately 39% of the 1996 entrants did not become proficient by the last observation year and are considered censored. Reflecting the higher rates of exit in the first year for later-entering cohorts, the median survival time decreases by year of entry reaching a low of 2.19 for the 1999 entrants.

(Table 2 here)

4.2 Does Age of Entry Affect Time to Proficiency?

The previous analysis showed the hazard profile and median time to proficiency for the average EL student. Table 3 provides the baseline hazard profile for students in the 1997 entry cohort by their age upon entry into the school system. The table shows a large decrease in the probability of proficiency one year after entry as students' age increases, from 0.413 among 5-year old entrants to 0.139 among 10-year old entrants. The confidence intervals reveal that 8, 9, and 10 year-olds have statistically equivalent exit rates in the first year while all other age of entry differences are statistically significant from one another.[2]

For 5 and 6 year old entrants, the probability of becoming proficient decreases dramatically after the first year, for instance, from 0.413 to 0.214 for 5-year old entrants. But the decrease is much smaller, and sometimes nonexistent, for the older entrants; for instance, among 10-year old entrants, the decrease from 0.139 to 0.154 is statistically insignificant. There are also no clear patterns in the exit rates over time for each age group: some are statistically equivalent, some decrease slightly, and some increase slightly. However, looking across the

[2] The higher probability of attaining proficiency one year after school entry for 5 and 6 year olds does not appear to be explained by the fact that younger entrants may have been in the U.S. longer than older entrants. When the analysis is restricted to recent immigrants only (foreign-born students who have been in the U.S. for less than three years), the estimated probability of attaining proficiency by age of entry are very similar to those reported in the table: 0.403, 0.331, 0.242, 0.232, 0.198 and 0.133 for 5 to 10 year-old entrants respectively**.**

columns within each row reveals that the probability of exit in each year decrease slightly with age of entry (again, the last two years are italicized to indicate the change in the measure used to determine proficiency). Reflecting the lower rates of exit in the first year and to some extent later years, the median times to proficiency increase consistently with age of entry at a low of 1.69 for the 5-year old entrants to a high of 3.87 for the 10-year old entrants.

(Table 3 here)

4.3 Does Age of Entry Affect Proficiency Holding Other Influences Constant?

As described in the Section 2.1 (Theory on Age of Entry Effects on Time to Proficiency), the age differences observed in Table 3 may be driven by differences in the characteristics of the students and the schools they attend. To examine these possibilities, I estimate several models of English proficiency beginning with unadjusted age of entry effects and introducing several sets of covariates (see Table 4). The coefficients in the table represent a change in the probability of proficiency associated with a one-unit increase in the independent variable. The first column of Table 4 provides the age of entry effects, when only year indicators are included in the model to allow for differences in the time to proficiency and adjust for censored observations. Consistent with the trend observed in Table 3, the coefficients indicate that the older children are when they enter the system, the lower their likelihood of becoming proficient in English. Age 6 entrants, for instance, have a probability of reaching proficiency that is 2 percentage-points lower than age 5 entrants. As age of entry increases by one year, the probability of becoming proficient falls by roughly 2 to 3 points.

Introducing socio-demographic and disability characteristics to the model has almost no effect on the age of entry coefficients (see Column 2 of Table 4). This is understandable given the modest differences revealed in the background characteristics of students by their age of entry that were shown in Table 1. Given the shortage of research on what drives the speed with which young learners pick up English, it is important to interpret the estimates on the covariates in this model. The results suggest that, conditional on other controls, students who are female, never poor, native-born, white, and not receiving special education services for mild or moderate disabilities are more likely to become proficient than other children. Students whose parents predominantly speak Russian or Korean at home are also more likely to become proficient than those who speak other languages at home, including English. Children from homes where Spanish or Haitian is the primary language are least likely to obtain proficiency. Though the language-at-home effects are larger when the race/ethnicity indicators are not included in the model, it is notable that the race/ethnic variables do not wipe out the effect of the language spoken at home (models without race/ethnicity are not shown in the table).

All of the effects in column 2 of Table 3 may be picking up the effects of unobserved attributes on students proficiency, such as parental education and more precise measures of parental income or wealth. The third specification aims to remove some of this bias by controlling for the student's LAB score in her year of entry, which likely correlates with some of these unobserved attributes. Correspondingly, the estimated coefficients on the age of entry variables capture the extent to which age of entry affects the probability of becoming proficient independent of initial proficiency level and all inputs to this initial level. The difference between 5 and 6 year old entrants is unaffected by this control, but all other estimated coefficients are reduced by 30 to 60%.

The final specification controls for elementary school fixed effects (see column 4 of Table 4). The resulting estimated parameters on the age of entry variables capture the within-school difference in age of entry effects and controls for all across-school variation in factors such as the quality of English language instruction, additional services, and peers. The estimated coefficients on age variables 8, 9, and 10 in Column 4 are larger than the coefficients in Column 3, with the estimated differences in proficiency rates for 10 year-olds and 5-year olds reaching a high of 15 percentage-points. This increase in the negative effect of age on proficiency, conditional on school, suggests that across school sorting serves to minimize age differences in time to proficiency estimates. Note that the school fixed effects do not necessarily control for differences in the type of English language program students receive since multiple programs are often offered within the same school.

(Table 4 here)

To demonstrate that the findings for 1997 are not atypical, Table 5 provides the fully-adjusted age of entry effects for all entry cohorts. All models include the variables shown in Column 4 of Table 4 with one exception: data on free lunch eligibility and receipt of part-time special education were not available for the 1996 cohort. Interestingly, despite fewer controls, several of the age effects are slightly smaller in 1996 than the effects in other years. Though there are differences in the magnitude of the age of entry effects across the years, the general story holds: entering late lowers the likelihood of becoming proficient in English for all entry cohorts. The adjusted penalty of increasing age by one year ranges from 1 to 7 percentage-points depending upon the year of entry and the initial age of entry.

(Table 5 here)

A final table provides four sensitivity analyses (see Table 6). The age of entry effects from the original fully-specified model from Column 4 of Table 4 are provided again in Column 1 of Table 6. Column 2 of Table 6 provides estimates of the same model but adjusts for the fact that I could not identify the precise number of years to proficiency for students who exited the school system the year after entry and returned proficient in a later year. The original model uses the maximum possible number of years while the alternative model estimated in Column 2 of Table 4 uses the minimum possible number of years. Column 3 of Table 6 adjusts for the fact that, for some students, age of entry into the New York City schools system may not equal their age of entry into the U.S. and may not signal their first exposure to formal English language instruction. This model is therefore restricted to recent immigrants, students who are foreign-born and new to any U.S. school system within the previous three years. Column 4 in Table 6 adjusts for the fact that the measurement of EL status changed in 2003, and I define exit from EL status differently on the new measure than the definition that is used for the original model. Column 5 in Table 6 allows enters the school fixed effects as time-varying since some students transferred schools during the years they were observed.

Each alternative specification changes the estimated coefficients on the age of entry variables from between zero and 4 percentage-points. The largest changes occur in the model allows school fixed effects to vary over time (Alt -2); the effect of age 9 increases from -0.10 to -0.14 and the effect of age 10 increases from -0.15 to -0.19 moving from the original model to the time-varying school fixed effects model. However, the effect of a one-year increase in age (that is, the difference in the estimated coefficients on each proximate age variable) changes by only 2 percentage-points with each specification suggesting that the age of entry effects are largely robust.

(Table 6 here)

5. Conclusions and Policy Implications

There is wide consensus that young English Learners need to gain proficiency quickly in order to perform well in school, and ultimately in the labor market and society (e.g. Bleakely and Chin, 2004; Grenier, 1984; White and Kaufman, 1997; Rumberger and Larson, 1998). There is also solid evidence that most English learners who enter the U.S. as children eventually become proficient in English (Carliner, 2000; Portes and Schauffler, 1994). The question posed in this paper is how quickly they acquire English and whether the age at which learning begins alters the trajectory of learning and the likelihood of obtaining proficiency.

The results suggest that approximately half of all young EL students reach a minimum proficiency level in English within three years after entry. The half who take longer to become proficient tend to be students who enter at an older age. The negative effect of age of school entry on the rate at which English proficiency is acquired, and the likelihood that proficiency is acquired at all, is partially explained by the fact that older students tend to enter the school system with lower levels of proficiency. Yet the age of entry effect is remarkably unaltered by adjustments for students' social and demographic characteristics or the schools they attend.

The results speak directly to the federal No Child Left Behind Act, which places a three year time limit on exemptions from standardized exams for new EL students. For the majority of students, this one-size-fits-all policy may be fair, assuming that a minimum level of English proficiency is sufficient to take an exam of academic proficiency. Yet for students who enter at older ages and who may be biologically or cognitively constrained in their ability to learn English, irrespective of their families' human capital or the schools they attend, this policy may put them at a disadvantage. It also puts schools that receive large numbers of older EL students at a disadvantage relative to schools that receive predominantly young EL students. The results suggest that proposals regarding reforms of NCLB consider age-specific time limits on exemptions from standardized test-taking for EL students.

The study also calls for further research in a number of areas. Though the time to proficiency estimates and age of entry effects were unaltered by controls for schools, they may vary across schools and programs within schools. Clearly, some schools, programs, or teachers may do a better job than others at promoting English language proficiency, either because of the type of English language services they provide (e.g. bilingual education, English-as-a Second-Language training, or dual language) or because of the quality of the staff, the students, and other school investments. In future research, I plan to examine this variation and to inform school programs and state policies regarding time limits on the number of years that students can be instructed in their native languages.

In addition, New York City is an ideal locale for this research given that it is a major port of entry for immigrants to the U.S. and the largest school district in the country. However, New York City EL students, and the district policies regarding EL students, may uniquely affect their time to proficiency and age of entry variation. For instance, New York City has a substantially active advocacy community on behalf of immigrants and English learners, which may attract a selected group of immigrants or educators. Further research using students in other large districts or states, including emerging immigrant communities, and studies of high-school age entrants, are necessary to determine whether these findings are representative of the nation.

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Table 1
Characteristics of English Learner Entrants into New York City Elementary Schools by Age, 1997

		Age of Entry					
	All	5	6	7	8	9	10
LAB Score upon entry	7.96	11.37	10.36	7.16	6.73	5.58	4.69
Student Characteristics							
Free lunch 1997	0.877	0.882	0.887	0.877	0.881	0.862	0.866
Reduced lunch 1997	0.046	0.042	0.041	0.049	0.048	0.053	0.044
Female	0.479	0.487	0.474	0.487	0.494	0.458	0.472
Foreign-born	0.707	0.448	0.552	0.791	0.814	0.859	0.901
Hispanic	0.572	0.667	0.659	0.550	0.549	0.474	0.468
Black	0.060	0.059	0.050	0.066	0.063	0.061	0.070
Asian	0.225	0.184	0.167	0.223	0.230	0.280	0.303
White	0.143	0.090	0.124	0.161	0.159	0.185	0.158
Spanish at home	0.552	0.634	0.631	0.532	0.537	0.461	0.460
Chinese at home	0.051	0.037	0.039	0.041	0.055	0.072	0.070
Russian at home	0.076	0.044	0.059	0.086	0.091	0.098	0.092
Bengalese at home	0.038	0.039	0.032	0.032	0.032	0.049	0.045
Haitian at home	0.017	0.017	0.016	0.021	0.017	0.011	0.024
Korean at home	0.013	0.012	0.010	0.016	0.012	0.010	0.018
English at home	0.043	0.067	0.051	0.042	0.032	0.035	0.026
Other non-English language at home	0.210	0.150	0.163	0.230	0.224	0.263	0.266
Part-time special educ. In 1997 (PTSE)	0.021	0.026	0.027	0.021	0.026	0.015	0.008
School Characteristics							
Enrollment	1,075	1,070	1,062	1,053	1,086	1,053	1,136
Total per pupil expenditures	$6,993	$6,969	$7,007	$6,953	$6,932	$6,970	$7,126
Proportion of teachers with more than 5 years experience	0.683	0.673	0.680	0.683	0.682	0.684	0.699
Proportion of teachers with master's degrees	0.898	0.892	0.894	0.900	0.900	0.901	0.901
Number of Observations	8,976	1,511	2,097	1,400	1,323	1,336	1,309
Proportion of Sample	1.00	0.168	0.233	0.156	0.147	0.149	0.156

Notes: School refers to the 699 schools upon entry into elementary school system.

Table 2

Probability (95% Confidence Interval) of English Proficiency in Each year After School Entry by Year of Entry

	Year of Entry			
	1996	1997	1998	1999
Probability of reaching proficiency in year after entry:				
1st year	0.244 (0.235-0.252)	0.273 (0.264-0.282)	0.283 (0.272-0.293)	0.303 (0.293-0.314)
2nd year	0.178 (0.169-0.187)	0.205 (0.195-0.215)	0.233 (0.221-0.245)	0.247 (0.235-0.259)
3rd year	0.190 (0.180-0.201)	0.187 (0.176-0.199)	0.222 (0.209-0.237)	0.254 (0.240-0.269)
4th Year	0.181 (0.168-0.194)	0.220 (0.206-0.236)	0.250 (0.233-0.269)	*0.061* *(0.051-0.073)*
5th year	0.183 (0.167-0.200)	0.242 (0.223-0.263)	0.081 (0.067-0.098)	0.172 (0.152-0.194)
6th year	0.220 (0.198-0.243)	*0.102* *(0.084-0.123)*	*0.153* *(0.129-0.181)*	NA
7th year	*0.122* [a] *(0.099-0.148)*	*0.176* *(0.146-0.210)*	NA	NA
8th year	*0.177* *(0.134-0.228)*	NA	NA	NA
Estimated median years to proficiency	3.03	2.72	2.41	2.19
Estimated proportion who did not reach proficiency by end last year observed (censored)	0.392	0.314	0.352	0.380
Number of students (person-years)	9,919 (29,658)	8,976 (25,754)	7,394 (20,028)	7,417 (18,613)

Notes: i) Italics represent a change in measurement that occurred in 2003. See section 3.3 for details. ii) NA indicates that students were not followed long enough to produce estimates in those years.

Table 3
Probability (95% Confidence Interval) of English Proficiency in Each Year after School Entry by Age, 1997 Entrants

	Age of Entry					
	5	6	7	8	9	10
Probability of reaching proficiency in year after entry:						
1st year	0.413 (0.388-0.438)	0.354 (0.334-0.375)	0.238 (0.216-0.261)	0.231 (0.209-0.255)	0.197 (0.176-0.219)	0.139 (0.121-0.159)
2nd year	0.214 (0.188-0.243)	0.227 (0.205-0.251)	0.259 (0.233-0.289)	0.212 (0.188-0.239)	0.157 (0.136-0.181)	0.154 (0.134-0.178)
3rd year	0.187 (0.159-0.219)	0.205 (0.180-0.232)	0.199 (0.172-0.230)	0.172 (0.146-0.201)	0.174 (0.150-0.202)	0.177 (0.147-0.213)
4th Year	0.280 (0.243-0.320)	0.251 (0.221-0.284)	0.205 (0.174-0.240)	0.155 (0.127-0.186)	0.206 (0.170-0.248)	0.212 (0.147-0.297)
5th year	0.226 (0.189-0.272)	0.239 (0.204-0.277)	0.231 (0.194-0.273)	0.263 (0.218-0.313)	0.250 (0.177-0.340)	0.529 (0.303-0.745)
6th year	*0.081* *(0.053-0.121)*	*0.105* *(0.078-0.141)*	*0.096* *(0.063-0.142)*	*0.163* *(0.097-0.260)*	*0.150* *(0.089-0.532)*	NA
7th year	*0.187* *(0.140-0.245)*	*0.153* *(0.117-0.211)*	*0.211* *(0.133-0.316)*	*0.105* *(0.027-0.337)*	NA	NA
Median years to proficiency	1.69	2.00	2.57	3.02	3.51	3.78
Proportion who did not reach proficiency by end last year observed (censored)	0.022	0.038	0.034	0.052	0.073	0.093
Number of students (person-years)	1,511 (4,367)	2,097 (6,204)	1,400 (4,459)	1,323 (4,025)	1,336 (3,682)	1,309 (3,017)

Notes: i) Italics represent a change in measurement that occurred in 2003. See section 3.3 for details. ii) NA indicates that students were not followed long enough to produce estimates in those years.

Table 4
Marginal Effects (Standard Errors) from Logistic Regressions of English Proficiency, 1997 Entrants

	(1)	(2)	(3)	(4)
Age 6	-0.02**	-0.02*	-0.01*	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Age 7	-0.05***	-0.05***	-0.02**	-0.03*
	(0.01)	(0.01)	(0.01)	(0.02)
Age 8	-0.07***	-0.07***	-0.04***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.02)
Age 9	-0.09***	-0.10***	-0.06***	-0.10***
	(0.01)	(0.01)	(0.01)	(0.02)
Age 10	-0.12***	-0.12***	-0.08***	-0.15***
	(0.01)	(0.01)	(0.01)	(0.02)
Free lunch in 1997		-0.13***	-0.09***	-0.07**
		(0.02)	(0.02)	(0.03)
Reduced lunch in 1997		-0.02	0.01	0.01
		(0.02)	(0.02)	(0.04)
Female		0.01**	0.01*	0.02**
		(0.00)	(0.01)	(0.01)
Foreign-born		-0.05***	0.01*	0.01
		(0.01)	(0.01)	(0.01)
Spanish at home		-0.04**	-0.01	-0.00
		(0.02)	(0.02)	(0.03)
Chinese at home		0.00	0.00	-0.01
		(0.02)	(0.03)	(0.04)
Russian at home		0.09***	0.07**	0.10**
		(0.03)	(0.03)	(0.05)
Bengalese at home		0.04*	0.03	0.04
		(0.03)	(0.03)	(0.04)
Haitian at home		-0.05***	-0.07***	-0.10
		(0.02)	(0.02)	(0.07)
Korean at home		0.10**	0.07	0.04
		(0.05)	(0.05)	(0.07)
Other non-English at home		-0.01	-0.01	-0.03
		(0.02)	(0.02)	(0.03)
Hispanic		-0.11***	-0.11***	-0.11**
		(0.03)	(0.03)	(0.04)
Asian		-0.05***	-0.04***	-0.06**
		(0.02)	(0.01)	(0.03)
Black		-0.04***	-0.05***	-0.00*
		(0.02)	(0.02)	(0.04)
PTSE in 1997		-0.07***	-0.07***	-0.18***
		(0.01)	(0.01)	(0.03)
LAB score in 1997			0.01***	0.02***
			(0.00)	(0.00)
Observations	25,754	25,754	25,754	25,400
Log Pseudo Likelihood	-13457.77	-13032.16	-12248.73	-10649.04
School Fixed Effects	No	No	No	Yes

Notes: i) All models include indicators for year and whether meal code data is non-missing in 1997. ii) * p<0.01 ** p<0.05 *** p<0.001.

Table 5
Marginal Effects (Standard Errors) on Age of Entry Indicators from Fully-Specified Logistic Regressions of English Proficiency by Year of Entry

	Year of Entry			
	1996	1997	1998	1999
Age of Entry				
6	-0.01	-0.02	-0.02	-0.01
	(0.01)	(0.01)	(0.02)	(0.02)
7	-0.03*	-0.03*	-0.05***	-0.06***
	(0.01)	(0.02)	(0.02)	(0.02)
8	-0.06***	-0.06***	-0.06***	-0.10***
	(0.02)	(0.02)	(0.02)	(0.02)
9	-0.07***	-0.10***	-0.09***	-0.13***
	(0.02)	(0.02)	(0.02)	(0.02)
10	-0.11***	-0.15***	-0.16***	-0.16***
	(0.02)	(0.02)	(0.02)	(0.02)
Observations	29,256	25,400	19,637	18,231
Log Pseudo Likelihood	-11654.20	-10649.04	-8212.51	-7540.14

Notes: i) All models include indicators for year and whether meal code data is non-missing in each year. ii) * p<0.01 ** p<0.05 *** p<0.001.

Table 6
Robustness Checks, 1997 Entrants, Marginal Effects, Fully Specified Regression

	Original	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Age 6	-0.02	-0.01	-0.02	-0.04*	-0.01
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)
Age 7	-0.03*	-0.02	-0.05**	-0.04**	-0.03*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Age 8	-0.06***	-0.06***	-0.08***	-0.08***	-0.06***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Age 9	-0.10***	-0.10***	-0.14***	-0.11***	-0.09***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age 10	-0.15***	-0.14***	-0.19***	-0.16***	-0.12***
	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)
Free lunch in 1997	-0.07**	-0.10***	-0.12***	-0.08**	-0.08**
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Reduced lunch in 1997	0.01	0.01	-0.02	0.01	0.00
	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)
Female	0.02**	0.02**	0.01	0.01	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Foreign-born	0.01	0.02	0.01	0.06*	0.02
	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)
Spanish at home	-0.00	-0.01	-0.00	-0.08	-0.03
	(0.03)	(0.03)	(0.04)	(0.05)	(0.03)
Chinese at home	-0.01	-0.02	0.00	-0.05	-0.02
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
Russian at home	0.10**	0.10*	0.07	0.04	0.09*
	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)
Bengalese at home	0.04	0.02	0.04	0.01	0.02
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
Haitian at home	-0.10	-0.12**	-0.21***	-0.16*	-0.07
	(0.07)	(0.05)	(0.07)	(0.08)	(0.05)
Korean at home	0.04	0.00	0.01	-0.00	0.02
	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)
Other non-English at home	-0.03	-0.05	0.03	-0.08*	-0.04
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)
Hispanic	-0.11**	-0.08**	-0.12***	-0.08	-0.08**
	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)
Asian	-0.06**	-0.05**	-0.07**	-0.08*	-0.09*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Black	-0.00*	0.00	-0.01	-0.02	-0.00
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
PTSE in 1997	-0.18***	-0.15***	-0.24***	-0.26***	-0.13***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.02)
LAB score in 1997	0.02***	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	25,400	24,547	20,789	18,409	25,132
Log Pseudo Likelihood	-10649.04	-10717.03	-8432.82	-7335.36	-10940.82
School Fixed Effects	Yes	Yes	Yes	Yes	Yes

Notes: i) Alternative 1 uses the minimum possible number of years to proficiency for those who exited and returned as proficient in a later year. Alternative 2 estimates a fixed effects model where the school varies over time. Alternative 3 restricts the sample to recent immigrants only. Alternative 4 adjusts for the fact that the measurement of EL status changed in 2003. ii) All models include indicators for year and whether meal code data is non-missing in 1997. iii) * p<0.01 ** p<0.05 *** p<0.001.