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Academic Achievement and Course Taking Among Language Minority Youth in U.S. Schools: Effects of ESL Placement

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Abstract

The 1974 Lau decision requires that U.S. public schools ensure a meaningful education for students learning English. English as a Second Language (ESL) placement is an institutional response to the linguistic needs of these students; however, its academic implications remain largely unexplored. Using nationally representative data from the Educational Longitudinal Study (ELS), the effects of ESL placement on college preparatory course enrollment and academic achievement of language minority students are estimated, first with fixed effects regression models and then with multi-level propensity score matching techniques. While numerous school and individual level factors beyond language proficiency predict ESL placement, a significant negative estimated effect of ESL placement on science enrollment and cumulative GPA is consistently found. Perhaps more important, however, no positive effects of ESL placement on the achievement of language minority youth are found when accounting for English proficiency and other potential covariates.

Keywords

ESL; immigrant; language minority; policy; school context

Introduction

Since the early 1990's, K-12 schools across the United States have experienced vast demographic change due to an influx of immigrants and other language minority students. We define language minority students as those students who speak a language other than English in the home. The term language minority is inclusive of both competent biliterates

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and of limited English proficient (LEP) students, often referred to as English language learners (ELLs)[1]. As immigrant language minority students settle into their adopted communities, schools must provide programs and curricula to deal with the unique pedagogical needs of this growing population (Chapa & de la Rosa, 2004; Wortham, Murillo, & Hamann, 2002). As the language minority population has grown, educators have developed procedures and processes by which to identify students in need of linguistic services, a process with great variability (Ragan & Lesaux, 2006; Rivera, Vincent, Hafner, & LaCelle-Peterson, 1997). In fact, federal policies have long mandated the identification of ELL students within the language minority population, and provision of services for them (Lau v Nichols, 1974). Once identified for placement into language assistance programs, the most common of which is English as a second language (ESL), ELLs often enroll in ESL courses in addition to the academic coursework required for graduation.

In order to meet their linguistic needs (e.g., the need for instruction in and exposure to school-specific academic vocabulary in English, the need for modified instruction designed to simultaneously incorporate academic content and English vocabulary, etc.), secondary ELLs are placed in ESL and sheltered content area coursework designed to address their limited proficiency in English (Rivera et al., 1997; Zehler et al., 2003). In theory such course placement should result in improved achievement compared to other language minority students with comparable levels of English proficiency, not placed in ESL coursework. However, further research is necessary to better understand the effects of ESL placement; research which takes into account students' language proficiency and other potential covariates.

Additionally, students placed in ESL often demonstrate other attributes which may impact their academic performance (e.g., poverty, limited years in the U.S., immigrant status), making it difficult to disentangle these selection factors from an effect of ESL placement. This study attempts to address these issues, exploring the impact of ESL placement on language minority students' academic achievement, while taking into account not just language proficiency, but also prior achievement, individual background characteristics, and characteristics of the school, which may be related to academic achievement and placement into ESL courses.

Educational Policy and Language Services

Under the *Lau* decision (1974), the 9th U.S. district court ruled that schools were responsible for providing language minority students equal and comprehensible access to the academic curriculum. Recognizing that language minority students in U.S. schools must simultaneously learn English and content area academics in order to participate fully in either the U.S. workforce or in higher education, the court ruled that simply placing them alongside their native English-speaking classmates did not constitute an equality of educational opportunity. While *Lau* did not require schools to adopt any one specific

[1]Limited English proficient (LEP) status is a federal (U.S. Department of Education) term used to indicate a non-native English speaker in need of language support services. LEP status is determined largely at the local (school or district) level. Many states and schools use the term 'English language/EL' or 'English language learner/ELL', rather than LEP; to ensure consistency, this study will use the term ELL unless citing a source.

language assistance program, it did require that educators in schools identify students with limited English proficiency, and implement services designed to assist ELLs.

While the linguistic support services that schools may provide are not prescribed under Lau (1974), the most common services offered at the secondary level are language-based ESL coursework and sheltered and/or Specially Designed Academic Instruction in English (SDAIE) content area (e.g., math, science, social science) courses (Rivera et al., 1997; Zehler et al., 2003). SDAIE and sheltered content area courses are designed to cover the same curricular content as parallel courses for native English-speakers, but with pedagogical methods centered around the linguistic needs of ELLs (Chamot & O'Malley, 1996; Echevarria & Graves, 1998). While English acquisition and academic achievement are not mutually exclusive, research has documented educators' tendency to view English proficiency as a requirement precluding ELLs' entry into academically rigorous coursework (Callahan, 2005; Harklau, 1994b; Minicucci & Olsen, 1992). We posit that once a student is identified for ESL placement, this identification itself may shape her access to academic content and alter her subsequent achievement. The need to make room for ESL services within an already crowded high school graduation schedule may preclude access to the academic preparation necessary for college.

Identification for ESL Placement: Student and School Characteristics

In the decades following *Lau*, researchers and practitioners have noted variation in the procedures by which students are identified as ELLs (Abedi, Hofstetter, & Lord, 2004; Zehler et al., 2003). Students' identification for ESL services brings them to the attention of most administrators and educators due to federal requirements regarding the services they are to receive (Castañeda v. Pickard, 1981; Lau v Nichols, 1974). The recent No Child Left Behind Act ("NCLB," 2001) further strengthens federal mandates with requirements regarding annual assessment of both English proficiency and academic progress for ELLs. While language services are federally mandated, the procedures for identification, placement and program of services vary at the school and district level (Rivera et al., 1997; Zehler et al., 2003). The programs and services administrators choose to meet students' linguistic and academic needs often depend on the size and prevalence of the language minority population (Schwartz & Steifel, 2004; Cosentino de Cohen et al., 2005). In addition, the availability of teachers qualified to provide linguistic services may also vary, and in turn, may further limit placement options, especially in schools which enroll relatively few language minority students.

Abedi, Hofstetter, and Lord (2004) point to the lack of consensus on LEP identification guidelines across institutions as part of the problem in not only assessing, but also instructing ELLs. Typically, identification of language minority students begins with a home language survey, completed by the parents, indicating the use of a language other than English in the home (Mahoney & MacSwan, 2005). However, recognition of language minority status is just the first step in the LEP identification process. Following identification of a language other than English in the home, the student's level of English proficiency must then be measured with a state-approved language assessment tool, a test which varies from state to state (Ragan & Lesaux, 2006). The conflation of language

minority status, English proficiency and the tools used to measure proficiency in English suggest a need to clarify the ESL identification process.

Ragan and Lesaux (2006) found that the proportion of language minority students identified as ELLs varies across states; some states identify more language minority students as ELLs, and some states identify less. In other words, the same student may be identified as ELL and placed in ESL in one state, but not in another. Further complicating the issue, ELL status correlates highly with a number of non-language related factors, including poverty (Ragan & Lesaux, 2006) and exposure to substandard resources (Gándara, Rumberger, Maxwell-Jolly, & Callahan, 2003). ELL identification processes then vary not only across schools, districts and states[2], but also across the academic career of the individual student (Gándara & Merino, 1993; Linquanti, 2001; Ragan & Lesaux, 2006). The lack of a uniform definition of ELL is but one factor that may contribute to the lower educational achievement of language minority students (August & Hakuta, 1997). A clearer understanding of the factors that inform ELL identification will enable scholars in the field to better assess the effects of subsequent ESL placement.

Academic Preparation, Secondary Schools and Stratification

Stratification among students typically increases in high schools as some enroll in college preparatory coursework and others struggle to complete more basic high school graduation requirements (Schiller & Muller, 2000). For ESL students and others perceived to be at risk, educators may focus on graduation even when students themselves have higher educational expectations, inadvertently limiting access to academically rigorous courses (Callahan & Gándara, 2004; Schiller & Muller, 2000). Meanwhile, preparation for higher education remains the exclusive domain of the mainstream majority. While high school graduation is indeed a commendable goal, and is by no means without obstacles (Romo & Falbo, 1996; Schiller & Muller, 2003), an unwitting overemphasis on basic graduation requirements may come at the expense of academically challenging coursework.

Enrollment in the core content areas--math, science, and social science-- provides one measure of the rigor of a given student's course taking. Completion of advanced math coursework is an especially strong predictor of college enrollment (Adelman, 1999). Students enrolled in more advanced math and science coursework with greater access to academic content demonstrate greater gains in achievement than students placed in less advanced coursework (Schneider, Swanson, & Riegle-Crumb, 1998). In addition, exposure to a wider range of social science coursework, more AP and honors classes in particular, is indicative of greater academic rigor, beyond the base graduation requirements (Goodlad, 1984; Jenness, 1990; Thornton, 1994). Academic preparation in secondary school often determines a student's viability in higher education and in the professional world (Ingels, Curtin, Kaufman, Alt, & Chen, 2002). For ESL students in particular, access to math, science and social science curriculum may be a critical indicator of academic rigor.

[2]With the passage of the No Child Left Behind Act of 2001 (NCLB: 2001), states are beginning to adopt statewide English proficiency tests for both identification and assessment purposes. The results of the increase in internal consistency will not be measurable still for several years to come.

Language Minority Student Achievement

ELLs are frequently placed in lower level courses (Wang & Goldschmidt, 1999), which may ultimately affect achievement. This may be due to their ESL placement, or it may be because they have some other attribute that influences their course placement. The school's placement of the student in ESL may preclude simultaneous enrollment in ESL *and* advanced academic coursework. Classes that are offered infrequently across the school day (such as advanced math, certain foreign language courses, and band/orchestra) may produce scheduling constraints that shape the students' remaining class assignments (Riehl, Pallas & Natriello, 1999). ESL coursework may take the space in a student's schedule normally reserved for electives, an umbrella under which advanced science and social science courses often fall. Restricting curricular options not only hampers academic development, but also exposure to mainstream peers.

For language minority and ESL students, access to an academically challenging program has both academic and linguistic benefits (Lucas, Henze, & Donato, 1990; Roessingh, 2004; Walqui, 2000); indeed research suggests that one of the most efficient paths to English proficiency is via content area instruction (Chamot & O'Malley, 1996). While discrete instruction in English is of course a central facet of a program of linguistic support services, research suggests that to be most effective, English instruction must be integrated within an academic context (August & Shanahan, 2006; Lyster, 2007; Norris & Ortega, 2000). If ESL placement constrains students' exposure to academic content, the cumulative effects may be substantive and significant. Placement in ESL services need not preclude access to challenging academic content (e.g., college preparatory curriculum) as demonstrated by several highly effective programs (Roessingh, 2004). The powerful effect of curriculum differentiation on adolescent achievement (Hallinan & Kubitschek, 1999) suggests that systematically relegating ELLs to less challenging coursework will inhibit not only their English acquisition, but also their ability to integrate professionally and academically into mainstream society as young adults. ESL support services under *Lau* were initially conceived as a means to ensure academic parity and equity in curricular access (Lau, 1974); whether they do so at present remains an empirical question.

The effect of ESL placement on the achievement of language minority students merits serious exploration. The documented variation in ELL identification allows for the comparison of achievement between language minority students with comparable levels of English proficiency, both placed and not placed in ESL services. We hypothesize that students placed in ESL may receive academic preparation different from that of their peers not placed in ESL and that ESL placement may actually preclude, rather than ensure equity in curricular access. Further, we argue that as a result of schools' processes, ELL identification may function as a lasting label (De Jong, 2004; Linquanti, 2001; Mahoney & MacSwan, 2005), all but ensuring long-term educational effects for these students. Developed to ensure equitable access to academic content, in theory ESL placement should result in a boost in achievement for language minority students compared to language minority students with comparable levels of English proficiency who are not in ESL. However, to date, a dearth of research has explored the effect of ESL placement.

The Present Study

ESL placement is a critical component in the education and schooling of language minority ELL students. While *Lau* mandates that students' linguistic needs be met so that they may take advantage of the full academic curriculum offered in schools, it is also possible that in practice ESL placement functions to exclude them from those very courses. This may be especially evident among ELL students' college preparation.

Controlling for important individual and school level factors within fixed effects Hierarchical Linear Modeling (HLM) models, we first investigate the effects of ESL placement on five academic indicators related to college-going: college preparatory enrollment in 1) math, 2) science, and 3) social science; 4) cumulative GPA; and 5) math test scores. We then estimate the effect of ESL placement on these same outcomes employing a multi-level propensity score modeling technique introduced by Hong and Raudenbush (2006), intended to reflect a quasi-experimental design. We use these two approaches because of the challenges presented by the individual, social and academic variables associated with both ESL placement and student achievement, the small number of students placed in ESL, and the strong assumptions embedded within traditional linear regression techniques. We analyze new, nationally representative data from the Educational Longitudinal Study (*ELS*), the most recent high school longitudinal study conducted by the U.S. National Center for Education Statistics (NCES) (Ingels et al., 2007).

Our analyses begin with the estimation of the effects of ESL placement on our five college preparatory outcomes, before and after accounting for school characteristics, background characteristics, English language proficiency, parental involvement and prior achievement. These models allow us to understand the estimated effect of ESL placement on academic preparation after controlling for important confounding variables using traditional hierarchical linear regression techniques. We next use a multi-level propensity score matching technique, which is better designed to deal with the selection of students into ESL and the low rates of ESL placement in high school. Propensity score matching techniques ensure that estimates of the effects of ESL are based on the comparison of language minority ESL and non-ESL students who are similar on individual and school level selection factors.

Methods

Data

We use data from the Educational Longitudinal Study of 2002 (*ELS*), which provides individual, family, and school characteristics of a nationally representative sample of sophomores enrolled during the 2001–2002 school year. Over 15,000 sophomores nested in 752 public and private high schools were surveyed. *ELS* includes detailed information on the high schools these students attended throughout their secondary school career and the complete high school transcripts for more than 14,726 of these students, allowing analysts to examine the processes that influence high school achievement and preparation for college. The sophomore cohort was first surveyed in 2002 and then followed up two years later in 2004. In 2005, transcripts were collected from the high school last attended by these

students. These transcripts provide a detailed look into the academic achievement and course-taking patterns of this sophomore cohort.

Sample

Our sample consists of *ELS* sophomore cohort language minority students who were included in the base year survey and first follow-up transcript component, resulting in an analytic sample of 2,352 students in 523 schools. This represents 13.5% (weighted) of the sophomore cohort base year respondents included in the first follow-up transcript component (N=14,051). We define language minority based on students' responses to the question, *"Is English your native language (the first language you learned to speak when you were a child)?"* [BYSTLANG]. Those who report that English is not their native language are coded as language minority; all others are coded as native English speakers. Appendix A also shows a comparison of language minority students with transcript data to their non-language minority counterparts. Not surprisingly, the language minority population is more likely to be Latino or Asian and have lower levels of family resources such as parents' education and income.

While transcripts were collected for 91% of the base-year and first follow-up sample, including respondents who transferred to another high school or who dropped out, some limitations may arise from restricting the sample to those for whom a high school transcript was available. However, as shown in Appendix A, the sophomore cohort base year language minority students (N=2,595) and sophomore cohort transcript study language minority students (N=2,352) look very similar on important background characteristics related to both academic outcomes and ESL placement, including race and ethnicity, family resources, time of arrival in the U.S., English proficiency, native language use, and base year reading score.

All models are weighted with the cross-sectional transcript weight, which is designed to account for unequal probability of selection into the transcript study and participation in the survey (Ingels et al., 2007). *ELS* oversampled sub-groups with higher likelihoods of ESL placement, including Asian and Latino students. However, while the transcript sample weights are used to adjust for disproportionate probability of selection into the sample and survey non-response, sample selection issues in our analyses may still remain. The 2002 sophomore cohort sample excludes the small percentage of individuals who were deemed unable to complete the base year survey and assessment tests or were "questionnaire-incapable" due to limitations such as disability or lack of English language proficiency. It is probable that selection bias has made our language minority sample higher than average in terms of English proficiency and perhaps academic preparation. Thus, if ESL placement is most effective for the least English proficient students, our results may be biased towards showing a null or negative effect. However, if students with moderate to high English language proficiency benefit the most, then we may be underestimating any negative effects of ESL placement.

Variables

ESL placement—Our central variable of interest is a dichotomous indicator of ESL placement during high school (1 = yes). ESL placement is determined by high school

course-taking reported on student transcripts, as well as by a school report indicating whether or not a student was ever in a high school bilingual or ESL program. Exploratory analyses not shown indicate that the school report alone is insufficient to determine ESL placement; many students not identified as being placed in an ESL/bilingual program by the school report have ESL-identified coursework on their transcripts. We conceptualize ESL-identified coursework as those courses designed to meet the linguistic needs of ELL students, either through discrete language-based ESL instruction or via modified academic content area instruction (sheltered, SDAIE, primary language).

While the Classification System for Secondary Courses (CSSC) is used to code courses on transcripts, the *ELS* transcript data also include the course titles used by the schools as they appear on the transcripts. Although the CSSC codes identify groups of courses by subject and level (e.g., Algebra I, Organic Chemistry) they do not necessarily indicate whether a course is an ESL course in most cases. Relying solely on CSSC codes results in losing sheltered and SDAIE content courses, and other courses designed specifically for ELL students. Thus, we rely on specific course titles as well as the CSSC coding, and cross-reference both to designate a course as ESL (Muller, Pearson, Riegle-Crumb et al., 2007).

The process of identifying ESL courses requires searching for course titles based on key words/phrases known to indicate ESL-type courses in the course-level transcripts for each student. Key words include, but are not limited to the following indicators of services and terms specific to ELL students: *English language learner* (ELL, EL, LEP); *English as a second language* (ESL, ESOL, second language, language development, and English development); *Sheltered or SDAIE* (SHL, SHEL, SDAIE); and bilingual (BIL, BL). From a total of 638,967 unduplicated course records, we culled 3,494 ESL-identified courses taken by *ELS* respondents. High school courses developed to meet ELL students' linguistic needs fell into three mutually exclusive categories: 1) traditional language-based ESL coursework, accounting for 78.8% of the courses; 2) sheltered or SDAIE content area instruction in English, 17.7% of the courses; and 3) primary language-bilingual content area instruction, 3.5% of the courses.

Of the 2,352 ELS sophomore cohort language minority students with valid transcript data, we identified 415 (18%) with at least one ESL course on their transcript. In addition, we identified 78 students (3.3%) with the school report of ESL/bilingual placement but no ESL coursework listed on their transcript, resulting in a total of 493 ESL students (21%) in our sample of language minority students. Disaggregating by type of ESL course, we identified 388 of the 415 students with an ESL course on their transcript (93%) as having been placed in at least one language-based ESL course in high school. A smaller percentage of our sample, 167 of the 415 (40%), had a sheltered, SDAIE or bilingual content area course listed on their transcript.

Due to the relatively small numbers of course takers in each category, we combined the three categories. However, we recognize the substantive differences between these categories, both as researchers and as practitioners involved in ELL education. Consequently, we estimated two sets of models, one in which the ESL courses were combined into one measure and one in which language-based ESL coursework and SDAIE/

bilingual content area coursework were included as separate measures. Here, we present results estimating the effects of ESL placement as a combined measure and note the estimated effect sizes for the disaggregated measures of coursework, which are not shown. Results from these additional models are available upon request.

This study is designed to explore the effects of schools' treatment and processing of students identified for ESL placement, rather than the effects of actual classroom instruction. As such, we argue that ESL placement serves as a viable indicator of schools' labeling policies and processes. While we are unable to measure the length of time students have been in ESL programs in the U.S., models estimating the effect of ESL placement include a measure of age, grade in school upon arrival, length of residence, as well as a measure of generational status.

Academic preparation and achievement—Our dependent variables are: 1) college preparatory math enrollment, 2) college preparatory science enrollment, 3) college preparatory social science enrollment, 4) cumulative grade point average (GPA), and 5) twelfth grade math achievement test scores (Math IRT) (Ingels et al., 2007). We use the constructed math and science pipeline variables in *ELS* and the subject specific total course credit variables from student transcripts for our math and science college preparatory variables. Individuals are assigned a 1 on *college preparatory math* if they received one math credit higher than Algebra II and at minimum two other math credits; otherwise they receive a 0. Individuals are assigned a 1 on the *college preparatory science* if they received one science credit higher than General Biology and at minimum two other science credits; otherwise they receive a 0. Because social science courses are often taken as the core high school graduation requirements and therefore do not distinguish college-goers from others (Niemi & Smith, 2001), our indicator of college preparatory social science is honors and advanced social science coursework. These courses are composed mainly of college-bound students, although not all college-bound students take these courses. Here, students are assigned a 1 on *college preparatory social science* if they enrolled in one or more honors or AP social science classes; otherwise they receive a 0. *Cumulative GPA* is a continuous variable ranging from 0–4 representing the average grades received in all courses throughout high school. We use cumulative GPA rather than academic GPA in order to include all coursework designed specifically for ELLs, regardless of its college-preparatory status. End of high school *math achievement* is measured using 12^{th} grade math IRT scores.

Individual and family characteristics—Unless otherwise indicated, information for the following variables was taken from the base year survey. Race/ethnicity is coded into six mutually exclusive categories: White, Black or African American, American Indian or Alaskan Native, Asian, including Native Hawaiian or Pacific Islander, Multiracial, and Latino or Hispanic. The first five race categories exclude individuals of Latino or Hispanic origin. We further disaggregate the Latino category into Mexican and non-Mexican Latino, and further disaggregate the Asian category into Chinese, Filipino, Japanese, Korean, South Asian, and Southeast Asian to capture the diversity of immigrant groups and their experiences within the U.S. educational system.

We include several measures of language ability and language use including an index representing the student's self-reported English language ability, ranging from 1 (Not at all) to 4 (Very well), which takes the mean of four items indicating how well the respondent understands spoken English, speaks English, reads English, and writes English (alpha=.92). We also include an index ranging from 1 (Never) to 4 (Always or most of the time) representing the student's frequency of native language use, which takes the mean of four items indicating how often the respondent speaks the native language with her mother, father, siblings, and friends (alpha=.83.) Finally, we include an indicator of whether or not the respondent's parent uses a language other than English at home, and whether the parent questionnaire was completed in Spanish.

Parents' education was created using NCES constructed variables that indicate the highest level of education achieved by both the student's mother and father, based on parents' reports augmented with student's reports when necessary. Each variable includes eight categories ranging from 1) did not finish high school to 8) completed Ph.D., M.D., or other advanced degree. We take the maximum value of the both parents' highest level of education. NCES filled in missing values using logical imputation, a weighted sequential hot deck procedure, and a multiple imputation procedure based on eighteen variables, fourteen of which were key demographic and family background variables (see Ingels et al., 2007). A similar method was used by NCES to impute income, 10^{th} grade reading score, and language minority status. We include a dummy variable indicating that language minority status was imputed in all models because of its association with both ESL placement and academic performance. For missing values on variables not imputed by NCES, we use the multiple imputation option in HLM, which averages the estimates of five separately imputed data sets created using the ICE command in STATA. We ran models using multiple imputation as well as sample mean and mode substitution, and results were not substantively different. Appendix B lists measures with information about missing data and the number of cases imputed for each.

Family composition is measured with a dummy variable indicating a two biological parent family with all other categories as the reference. To measure yearly income, we recode the NCES constructed income variable into five categories based on the distribution of the students in our sample and the relationship between ESL placement and income categories, which range from 0= less than $10,000 to 4=greater than $75,000. We also control for number of family resources, which ranges from 0–9 and indicates the sum of the number of items the student reports having in the home, including a daily newspaper, regularly received magazine, access to the internet, DVD player, electric dishwasher, clothes dryer, computer, more than 50 books, and a room of the respondent's own. To measure age, we split the continuous date/month/year birth date variable into quartiles and include the lowest quartile as the reference category.

Measures of generational status are based on parent reported student place of birth, mother's place of birth, and father's place of birth. First generation students are those born in Puerto Rico[3] or a country outside of the U.S. We further disaggregate first generation by those who arrived five years or fewer and six years or more prior to the survey. Second generation students are those who were born in the United States but who have at least one parent who

was born in Puerto Rico or a country outside of the U.S. Third generation students are those born in the U.S., with both parents also born in the U.S. In addition, we control for whether or not the respondent was placed in 6th grade or higher upon arrival in the U.S.

Parental involvement—We include several measures of parental involvement that are taken from the parent survey, including how often the parent/spouse contacted the school about the respondent's academic performance since school opened in the fall, ranging from 1 (None) to 4 (More than four times); how often the parent contacted the school about the respondent's course selection, ranging from 1 (None) to 4 (More than four times); an index ranging from 1 (Never) to 3 (Often) measuring the extent to which parent/spouse provided advice about selecting courses or programs, college entrance exams, applying to college, and applying for jobs (alpha=.74). As an additional measure of socioeconomic status and parental investment in the respondent's schooling, we control for whether or not the parent is currently saving for the respondent's college education. Finally, we include an indicator of whether or not the student's family has rules regarding maintaining GPA.

Prior achievement—Constructed using transcript data, ninth grade math placement is a dichotomous variable indicating whether the student received credit in Algebra or higher math in ninth grade. This is an important indicator of being on track to meet the college preparatory math requirement, Algebra II or higher. Ninth grade cumulative GPA is taken from students' transcripts, and tenth grade reading scores (IRT) are taken from results obtained during the base year survey; math and reading are the only two content areas for which test score data are available in the *ELS* dataset (Ingels et al., 2007). We also control for parent's report of whether or not the student was retained before 9th grade and whether the respondent required base year test accommodations. We include the earliest available indicators for achievement categories: 9th grade for grades and course enrollment and 10th grade for standardized test scores. College aspirations ranges from 1–5 (1=don't plan to go to college, 5=plan to go to college right after high school).

School characteristics—Because the characteristics of the schools ESL and non-ESL students attend may vary and be associated with academic outcomes, we control for a variety of school characteristics at level-2. We include controls for school region (Midwest, West, South), locale (urban), student teacher ratio, and an index, ranging from 1 (Not at All) to 4 (A Lot), measuring how much of a hindrance aspects of the school environment have on students' learning (average of ten items: learning hindered by poor condition of building, poor heating/air/light, poor science labs, poor fine arts facilities, lack of space, poor library, lack of texts/supplies, too few computers, lack of multi-media, lack of discipline and safety (alpha=0.89). In addition, we control for the proportion of LEP-identified students within the school, the proportion of minority students, the proportion of Asian students, the proportion of students receiving free lunch, and the proportion of students in special education programs. Finally, we include a control for whether or not data available from school administrator reports and student transcripts show that the school offers a program designed

[3]Puerto Rican-born are included with foreign-born despite their status as U.S. citizens due to the fact that many schools (and other U.S. citizens) perceive them to be immigrants due to their language minority status and off-shore nativity.

for ELLs. We include the logit transformation of proportions in models to account for the non-normal distributions of these variables.

School region, locale, proportion free lunch, level of learning hindrances, proportion LEP, and proportion in special education are all taken from the base year school administrator survey. Proportion minority and student teacher ratio are taken from the ELS attached 2000–2001 CCD data. We construct the proportion of Asian students and the proportion of immigrant (1st and 2nd generation) students by aggregating individual data within schools. We construct a dummy variable indicating whether or not the school offers specially designed courses for ELLs using both school administrator and transcript data. A school is identified as offering ESL if the school administrator reports that any students within the school are enrolled in ESL/bilingual programs or if any student within the school has the school report of ESL/bilingual placement or any type of ESL coursework on their transcript. Similar to missing data at the individual level, we use the multiple imputation option in HLM, which averages the estimates of five separately imputed school level data sets created using the ICE command in STATA. Appendix B lists school level variables that have missing values and the number of cases imputed for each.

Table 1 displays means and standard deviations for the dependent and independent variables first for all language minority students and then broken down by ESL placement. The relatively lower levels of college preparatory enrollment for students placed in ESL addresses the relative academic disadvantage experienced by language minority students in ESL. Table 1 shows that among other risk factors, language minority students placed in ESL tend to be slightly older and have parents with lower levels of socioeconomic status (as measured by education, income, family resources, saving for college), are less likely to be living in intact families, and have lower levels of academic preparation than their non-ESL counterparts. Not surprisingly, language minority students placed in ESL are much more likely to have arrived in the U.S. five or fewer years prior to the survey and to have been placed in 6th grade or higher upon arrival.

Analytic Plan

We first estimate the effect of ESL placement on college preparation with a series of fixed effects multilevel models using HLM 6.04 software. These models provide information about the college preparation of language minority students placed in ESL relative to those not placed in ESL in high school. For each of our five outcomes, college preparation and academic achievement, we run three separate models which include progressively: 1) individual, family, and school characteristics, 2) 9th grade academic indicators, and 3) 10th grade reading score. All models are weighted with the cross-sectional transcript weight, which is designed to account for unequal probability of selection into the sample and participation in the survey (Ingels et al., 2007). *ELS* oversampled both Asian and Latino students, and certain subgroups, including Latinos, were less likely to be included in the transcript component. To estimate models of college preparatory enrollment (math, science and honors social science), which are dichotomous outcomes, we perform hierarchical logistic regression; to predict academic achievement (GPA and math test scores), we perform hierarchical linear regression.

The above models provide estimates of the effect of ESL placement on language minority students' achievement from a series of regression models with traditional statistical controls. In addition to these linear models, we employ a multilevel propensity score stratification technique developed by Hong and Raudenbush (2006) to better estimate the impact of ESL placement on college preparatory enrollment and academic achievement. This technique is well suited for dealing with potential selection bias into the treatment group (ESL placement) that may be related to pretreatment characteristics at the individual, family, and school levels. In addition, even in large samples, few high school students are placed in ESL, and most demonstrate a relatively low risk for ESL placement. Consequently, language minority students who do and do not take ESL may not be comparable on selection factors. Matching students on the propensity for placement into ESL ensures that the estimated effect of ESL placement is based on the comparison of treatment and non-treatment groups with equivalent risk (or propensity) for ESL placement (Rosenbaum and Rubin, 1983; Dehejia and Wahba, 1999), which cannot be done using standard regression techniques.

Predicting propensity for ESL placement—In addition, Hierarchical General Linear Modeling (HGLM) is limited in the number of pretreatment covariate controls allowed due to limited degrees of freedom and related standard error inflation. Propensity score matching essentially allows the analyst to create one index per student that captures multiple pretreatment factors. Drawing from preliminary bivariate analyses and from prior research exploring ESL placement, classrooms and students, we identified a number of factors which correlate with ESL placement and academic achievement. Using multi-level logistic regression, we predict a student's propensity to be placed in ESL with 52 covariates used in our initial linear models. We include not only individual level characteristics such as family background, individual and family language use, prior achievement and parent-school involvement, but also variables measuring school context. Appendix C details the variables included in the multi-level propensity score model, their coefficients and standard errors.

ELS data are limited in that there are no qualifiers for length of time in ESL program, an obvious concern for educators and researchers alike. To address this issue, the above models predicting ESL placement take into account generational status, and also indicate length of time and grade upon entry in U.S. schools for first generation students.

After predicting a propensity score for each student, we divided our sample into 11 strata based on the logit of this propensity score. The mean of the logit of the propensity score is not statistically different between the matched treatment and non-treatment groups within each stratum; the balance in the logit of the propensity score for ESL placement in ESL schools is shown in Appendix D. In addition, balance was achieved in each stratum for nearly all (96%) pretreatment covariates. After balancing (matching) the treatment and non-treatment groups on a variety of pretreatment factors, we then compare the means of our outcomes (college preparatory math, science, and social science; cumulative GPA and math IRT scores) within each propensity stratum to estimate the effect of ESL placement after matching. Appendix E displays the within-strata outcome differences by ESL placement for the 11 strata.

Finally, in order to understand the effects of ESL placement on academic outcomes among students nested within schools, we use two-level hierarchical models to estimate the average effect of ESL placement on our academic outcomes. For college preparatory math, science and honors social science coursework, we estimate hierarchical logistic models. For cumulative GPA and twelfth grade math achievement test scores, we estimate hierarchical linear models. All models include dummy indicators for 10 of the 11 propensity strata, which classify students at-risk of ESL placement, as well as the logit of the estimated propensity to be placed in ESL. Our propensity score analyses were run with and without the common support option, which deletes from analyses non-ESL students with no risk of ESL placement and ESL students with extremely low risk of ESL placement. Employing the common support option did not change our substantive findings.

Results

ESL Placement and Academic Outcomes

We first turn to results derived from our nested, hierarchical general linear regression models that address our primary research question: What are the effects of ESL placement on college preparatory enrollment and academic achievement among language minority students? In addition, we ascertain which factors account for any negative estimated effect of ESL placement on academic outcomes. The first model includes a variety of individual, family, and school characteristics, the second model includes 9^{th} grade measures of achievement, and the third model includes 10^{th} grade reading test scores. The three college preparatory course enrollment outcomes are shown in Table 2; the two academic achievement outcomes (test scores and grades) are shown in Table 3.

College preparatory course enrollment—Table 2 shows that language minority students placed in ESL are less likely than non-ESL language minority students to enroll in college preparatory coursework by the end of high school, as shown in Model 1 for each outcome. Specifically, language minority students placed in ESL are 49% (i.e., $1-\exp(-.68)$) less likely to enroll in college preparatory science coursework relative to language minority students not placed in ESL. In addition, those placed in ESL are 36% less likely and 56% less likely than their counterparts not placed in ESL to enroll in college preparatory math and social science coursework, respectively. These negative effects are found even after controlling for a variety of individual, family, and school background characteristics, including important covariates such as socioeconomic status, generational status, grade in school upon arrival to the U.S., English language ability, and native language usage.

In Model 2, which adds indicators of 9^{th} grade achievement, we find that the statistically significant negative estimated effect of ESL placement remains for college preparatory science and social science coursework. The statistically significant negative estimated effect of ESL placement on college preparatory math coursework is rendered insignificant once controls for 9^{th} grade achievement are added to the model. Finally, after controlling for 10^{th} grade reading score in Model 3, we still find a statistically significant negative effect of ESL placement on college preparatory science and social science coursework and no effect of ESL placement on college preparatory math course taking. After controlling for individual,

family, and school background characteristics, 9th grade achievement, and 10th grade reading scores, language minority students placed in ESL are 45% less likely to enroll in college preparatory science coursework and 48% less likely to enroll in college preparatory social science coursework than language minority students not placed in ESL.

In separate models not shown that disaggregate the ESL course placement variable, we find that students placed in language-based ESL coursework are 41% less likely than students not placed in any type of ESL course work to enroll in college preparatory science coursework, while students placed in SDAIE/bilingual content area coursework are only 1% less likely (not a statistically significant difference) than those not placed in any type of ESL to enroll in college preparatory science coursework. In addition, we find that students placed in language-based ESL coursework are 56% less likely to enroll in college preparatory social science coursework than those not placed in ESL, and students placed in SDAIE/bilingual content area coursework are only 48% less likely (not statistically significant) than non-ESL takers to enroll in college preparatory social science coursework.

Academic achievement—Table 3 presents models predicting two key achievement outcomes, 12th grade math test scores and GPA. Similar to the findings about course taking in Table 2, we find that language minority students placed in ESL earn lower grades and lower scores on the math achievement test in 12th grade compared to their counterparts not placed in ESL after controlling for important individual, family, and school characteristics. Language minority students placed in ESL earn .18 less of a grade point and almost four points lower on the 12th grade math achievement test than their counterparts not placed in ESL. We also find that this statistically significant negative estimated effect of ESL placement on grades persists after controlling for 9th grade achievement in Model 2, and 10th grade reading score in Model 3. After accounting for background characteristics, 9th grade achievement, and 10th grade reading scores, language minority students placed in ESL earn almost one-tenth less of a grade point than language minority students not placed in ESL. In separate models predicting grades that disaggregate the ESL course taking variable, we find the largest effect for language-based ESL coursework (.10 of a grade point) and a smaller effect for SDAIE/bilingual content area coursework (.06 of a grade point), although neither effect is statistically significant.

For math test scores, while the statistically significant negative estimated effect of ESL placement on math test scores persists in Model 2, the effect is rendered insignificant once reading test score is added in Model 3. In the next set of analyses we use a multi-level propensity score matching technique to test the robustness of these findings.

Multi-Level Propensity Score Matching: The Estimated Effect of ESL Placement

To estimate the effect of ESL placement on the academic achievement of language minority students using propensity score matching techniques, we begin by estimating which individual and school level factors predict placement into ESL programs (see Appendix C). In theory, language minority status and English proficiency level should be the primary, if not sole determinants of ESL placement; however, in practice, predicting ESL placement is much more complex (Ragan & Lesaux, 2006; Rivera et al., 1997). After predicting ESL

placement, obtaining a propensity score for each individual, and matching individuals on their likelihood of being placed in ESL, we next use multi-level propensity score modeling to estimate the effect of ESL placement on high school college preparatory course enrollment and achievement.

Predicting ESL placement—In the first step, predicting the likelihood of being placed in ESL, we are able to elaborate on the range of factors that predict ESL placement. Not surprisingly, language minority students with higher reading test scores and higher levels of self-reported English ability are less likely than other language minority students to be placed in ESL. In addition, language minority students who report using their native language more frequently, were placed in 6th grade or higher upon arrival in the U.S., and arrived in the U.S. five or fewer years prior are much more likely than other language minority students to be placed in ESL. Also, language minority students who are Filipino are less likely than their non-Hispanic white counterparts to be placed in ESL, and language minority students with greater socio-economic status, as measured by income and family resources, are less likely than other language minority students to be placed in ESL in high school. Finally, language minority students placed in Algebra I or higher in 9th grade are less likely to be placed in ESL than their counterparts placed in less than Algebra I (please see Appendix C for a full list of predictors). At the school level, students attending schools with larger proportions of Asians and larger proportions of students placed in special education are more likely to be placed in ESL.

The propensity score predicting ESL placement includes a number of significant covariates of ESL placement, both at the individual and school level. Subsequent analyses using this propensity score allow us to match students on their propensity to be placed in ESL, such that when comparing academic outcomes for students with comparable likelihoods for ESL placement we are, similar to an experimental design, better able to isolate any effect of ESL placement. Appendix D lists the eleven strata into which we divide our sample and indicates, within each stratum, the mean value of the logit of the propensity score for those placed and not placed in ESL. The mean of the logit of the propensity score for those placed and not placed in ESL is not statistically different within any of the eleven strata, and differences in the logit of the propensity score range from .89 to 7minus;.13. Appendix E shows within stratum differences in our achievement outcomes. For Math IRT, the average difference between those placed and not placed in ESL is −6.65, and the within stratum differences range from 11.60 to −22.26. For cumulative GPA, we see an average treatment effect of −.19 of a grade point, and the treatment effect within stratum ranges from .39 to −.77. For two average students matched on all other covariates, who receive grades in 12 semester courses per year, the student placed in ESL will receive one letter grade lower in 9 of his classes compared to his counterpart not placed in ESL. Appendix E also shows within-stratum differences for college preparatory math, science, and social science coursework. We next integrate these propensity strata as well as the logit of the propensity score into two-level hierarchical linear models to estimate the average ESL placement effect on language minority students.

Estimated Effects of ESL Placement on Academic Outcomes

Table 4 displays the results of our multi-level propensity score modeling techniques used to estimate the effects of ESL placement. In each model we include, at the individual level, the logit of the propensity score, ten dichotomous variables representing ten of the eleven stratification ranks, and a dichotomous indicator of ESL placement. At the school level, we control for whether or not the school reports having a program designed for ELLs. For each outcome, we report the coefficient, the standard error and the t-value for the ESL placement effect.

College preparatory course enrollment—The left-hand side of Table 4 shows the estimated effect of ESL placement on students' college preparatory math, science, and social science enrollment respectively. We find a significant negative estimated effect of the treatment, ESL placement, on college preparatory science enrollment, yet find no statistically significant effects of ESL placement on college preparatory math or social science course taking. Specifically, language minority students placed in ESL are 42% less likely than language minority students not placed in ESL to enroll in college preparatory science coursework. Given the consistent findings using traditional HGLM and propensity score modeling techniques, it appears that ESL coursework may constrain students' enrollment in advanced science coursework and does nothing to improve language minority students' likelihood of enrollment in college preparatory math or social science coursework.

Academic achievement—On the right-hand side of Table 4, we see that there is a statistically significant negative estimated effect of ESL placement on cumulative GPA, but not on 12^{th} grade Math IRT test scores. Thus, based on results obtained from propensity score matching techniques, language minority students placed in ESL earn, on average, almost two-tenths of a grade point less than language minority students not placed in ESL. The consistent negative estimated effect of ESL placement on grades in both traditional HLM and propensity score models suggests that ESL coursework may have a negative impact on cumulative end of high school GPA among language minority students. In addition, findings from both HLM and propensity score models suggest that ESL placement does not improve language minority students' math skills.

Discussion

Our initial fixed effects HGLM models (Tables 2 and 3), which control for both background characteristics and prior achievement, explain away some of the initial academic disadvantage ESL placement, yet nonetheless show a strong negative estimated effect of ESL on academic preparation. In addition, the strong explanatory power of prior achievement points to the role of schools' processes and procedures in shaping the academic trajectories of language minority students. In addition, multi-level propensity score stratification models point to the negative estimated effect of ESL placement on language minority students' preparation for college. Our findings suggest that disparities in language minority student achievement may be due in part to schools' placement of students into ESL and policies regarding ESL students' access to academic content.

Our descriptive findings mirror ethnographic work in the field which has documented what some scholars term the "ESL ghetto" a substandard academic – and often physical—primarily language-focused program within the larger high school context (Dillon, 2001; Harklau, 1994a; Olsen, 1997; Valenzuela, 1999). Under the auspices of ESL placement, when a students is identified as deficient in English, intentionally or not, her access to academic content is delayed until she is deemed sufficiently proficient in English (as measured by academic achievement in English as well as by her English language proficiency (Harklau, 1994b; Linquanti, 2001; MacSwan & Rolstad, 2003) to engage with the academic content: the same academic content in which she is now behind as she has had limited exposure while learning English.

As a policy, ESL placement so strongly determines the access, and therefore the achievement of language minority students that it calls into question the mechanisms with which schools place and process these students in accordance with the Lau decision (1974).

Predicting ESL Placement

Our propensity score model predicting ESL placement is designed to account for the variation in procedures and processes across schools that may affect ESL placement and academic outcomes, while also addressing status group stratification in achievement within schools. This allows us to focus on the estimated effect of ESL placement on students' academic preparation, net of individual and school characteristics. Schools' student body composition plays a role in ESL placement, though not necessarily in the manner we might have imagined. Students in poor, crowded, and urban schools are more likely to be identified for ESL placement. Indicators of the proportion of immigrant, minority and LEP students in the school all fail to predict ESL placement; rather, as the proportion of special education students and Asian students increases, so does a student's likelihood of ESL placement.

The relationship between special education programs and ESL placement merits further empirical examination. Schools with well-articulated special education programs may be more likely to comply with federal guidelines regarding language services as well. Or conversely, the prevalence of special education in a school may facilitate the placement of ESL students in lower level academic curriculum and less college preparatory coursework. Future research might explore whether this is also indicative of a relationship between ELL and special education status at the student level.

At the student level, family income negatively predicts ESL placement. Affluent parents have long advocated for their children's placement into and out of specific academic programs (Baker & Stevenson, 1986); ESL placement may be yet another manifestation of this trend. Together, these findings suggest that a specific segment of first generation language minority students, those with poor, single parent, comprise the bulk of ESL students, affirming the relationship between ESL placement and other risk factors.

Estimated Effects of ESL Placement

Our modeling allows us to stratify students by their propensity to be placed in ESL and thus single out ESL placement as the one key factor on which students will differ. The negative estimated effect of ESL placement on science enrollment then, points to the processes in

place across schools once a child is identified for ESL placement, net of the factors we have used to predict ESL placement. Thus, while ESL identification may ensure that students' linguistic needs are placed at the forefront, this may be inadvertently detrimental to their academic development. Specifically, we find no positive effects, no benefits to students of placement in ESL. If we follow the spirit of *Lau*, linguistic support services should ensure equity in academic access—for two students with the same propensity for ESL placement, the student placed in ESL services should experience a perceptible academic benefit in her coursework and in her achievement more generally. While we find only two consistently significant negative effects, we estimated no positive effects. Our results suggest that ESL programs, as they are currently implemented in our nation's high schools, are unlikely to have much positive impact on students' preparation for college.

While educators may ensure that ESL students graduate from high school, their transcripts and grades suggest they are prepared for little more. To ensure equity in academic access, placement in ESL services should demonstrate benefits in academic outcomes when compared to like students not placed in ESL services.

While prior research, primarily case studies and ethnographies, attests to the social and academic marginalization of students in ESL (Dillon, 2001; Harklau, 1994a; Olsen, 1997) it has never been clear whether this has been due to limited English proficiency, to academic tracking, or to a combination of the two. Our findings suggest that once schools label a student for ESL, access to college preparatory resources is reduced, or at the very least, not enhanced. While in all but science course taking and GPA the negative estimated effect of ESL placement was not significant, never was ESL placement beneficial.

Again, we reiterate that the effects of ESL placement discussed heretofore refer to the processing of students labeled as in need of ESL services, not to the pedagogy and instructional practices of the educators who have devoted time and energy to improving the achievement of the students they serve. In the present study, we do not claim to measure pedagogical practices and/or curricular content; further research is required to address these issues. In fact, literature exploring academically challenging linguistic support services exists, suggesting exemplary academic models of ESL services are possible (Chamot & O'Malley, 1996; Roessingh, 2004; Lyster, 2007). Rather, we suggest that certain processes fall into play once a student is identified for ESL placement. First, ESL coursework may take up a space in a schedule that might otherwise be filled with advanced and elective science and social science coursework, which may preclude students' access to more academically rigorous and engaging coursework. Students placed in less engaging coursework achieve at lower levels (Hallinan & Kubitschek, 1999; Hoffer, 1992), and our findings suggest this process may be at play for students placed in ESL. Schools' overarching goal for ELLs requires a shift from mere high school completion, to post-secondary preparation.

Policy Implications

By no means do we deny that language minority ELL students have specific linguistic and academic needs that must be addressed; rather we suggest that the present high school

process may not effectively ensure equity in academic access for these students. Understanding how to best serve ELL students in U.S. schools requires first, consistency in identification, placement, and exit procedures; and second, an evaluation of the treatment of students once identified for services. While ELL students' linguistic needs must be met due to ethical and legal precedents (Castañeda v. Pickard, 1981; Lau v Nichols, 1974; "NCLB," 2001), the current system of delivery of services warrants modification, especially at the secondary level. Our findings show that students placed in ESL coursework exit high school with significantly less academic content, even when accounting for English proficiency, prior achievement, generational status, ethnicity, parental education, years in U.S. schools, and school level factors. Although prior research suggests that academic and linguistic needs may be met simultaneously (August & Shanahan, 2007; Roessingh, 2004; Lyster, 2007), implementation of exemplar programs remains rare; further research is necessary to understand how to successfully implement ESL programs which ensure equity in academic access for ELLs.

Once a student is labeled ELL, first she must be placed into discrete linguistic services, e.g. ESL coursework. Later, she is placed in core academic curriculum with either mainstream or ELL-certified[4] teachers. Mainstream educators may object to the placement of ESL students in upper level academic classes as they do not feel equipped, or possibly do not care to address the student's linguistic needs. Alternately, she may be placed in one of the SDAIE or sheltered content courses offered at the school. With one to two periods of her schedule claimed by ESL, plus the minimum graduation requirements, and a preference for placement with ELL-certified teachers, there is little room left for electives including upper level science and social science coursework. Unintentionally, the school has translated her limited English proficient ELL status into limited academic aptitude. Her enrollment in engaging, challenging curriculum is placed on hold until she displays sufficient English proficiency. Trapped in a simplified curriculum, she has little opportunity to develop critical academic language, her engagement with school wanes and her grades suffer.

Research and practice indicate that the most efficient delivery of ESL services is via content area curriculum (August & Hakuta, 1997; Chamot & O'Malley, 1996; Crandall, Jaramillo, Olsen, & Peyton, 2002; Short, 2000). At present, little if any regulation exists to ensure that sheltered or SDAIE content is equal in rigor to parallel mainstream coursework. The most effective sheltered and SDAIE pedagogical practices actively engage students with the academic content, fostering critical inquiry and debate at all levels of English language proficiency (August & Shanahan, 2007; Lyster, 2007). Our findings combined with prior pedagogical research suggest that perhaps the path to improving language minority and ESL student achievement is via rigorous, rather than simplified, curriculum and instruction. The development and implementation of engaging, challenging SDAIE and sheltered curriculum could help to counter this dilemma and might result in a benefit of placement in ESL, meeting the spirit as well as the letter of *Lau.*

[4]Much like LEP identification, the requirements for LEP-certification for teachers vary from state to state, with differing degrees of rigor.

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Table 1

Weighted Individual-Level Descriptive Statistics by ESL Placement

	ESL Placement					
	Total		**ESL**		**No ESL**	
	N=2352		**N=493**		**N=1859**	
	Mean	***SD***	***Mean***	***SD***	***Mean***	***SD***
ESL Placement	0.23		1.00			
Language-Based ESL Coursework	0.18		0.77			
Bilingual/SDAIE Content Area Coursework	0.08		0.36			
School Report of ESL Placement	0.04		0.17			
College Preparatory Enrollment						
Math	0.30		0.20		0.33	
Science	0.39		0.27		0.43	
Social Science Honors	0.20		0.09		0.24	
Academic Achievement						
Cumulative GPA (0–4)	2.46	0.81	2.31	0.81	2.50	0.80
12th Grade Math IRT	43.06	16.58	37.83	16.22	44.47	16.29
Individual/Family						
Black	0.06		0.05		0.06	
Mexican	0.43		0.53		0.40	
Non-Mexican Latino	0.16		0.15		0.16	
Chinese	0.04		0.04		0.05	
Filipino	0.01		0.01		0.02	
Japanese	0.00		0.00		0.00	
Korean	0.03		0.03		0.03	
South Asian	0.03		0.03		0.03	
Southeast Asian	0.06		0.06		0.07	
Native American	0.01		0.00		0.02	
Multiracial	0.02		0.01		0.03	
Parents' Education (0–4)	1.71	1.36	1.50	1.34	1.77	1.34

	ESL Placement					
	Total		**ESL**		**No ESL**	
	N=2352		**N=493**		**N=1859**	
	Mean	***SD***	***Mean***	***SD***	***Mean***	***SD***
Income (0–4)	1.68	1.25	1.28	1.08	1.81	1.26
Number of Family Resources (0–9)	4.59	3.01	3.36	2.96	4.96	2.92
Parent's Saving for College	0.36		0.24		0.40	
Female	0.51		0.51		0.51	
Intact Family Structure	0.61		0.55		0.63	
First Generation						
Arrived in U.S. 5 or Fewer Years Prior	0.15		0.46		0.05	
Arrived in U.S. 6 or More Years Prior	0.24		0.19		0.26	
Second Generation	0.36		0.20		0.41	
Third Generation	0.12		0.01		0.15	
Placed in 6th Grade or Higher Upon U.S. Arrival	0.17		0.55		0.06	
Age						
Oldest Quartile	0.29		0.37		0.27	
Third Quartile	0.21		0.17		0.22	
Second Quartile	0.20		0.17		0.21	
Youngest Quartile	0.28		0.28		0.29	
College Aspirations (1–5)	4.54	0.91	4.51	1.00	4.55	0.89
Language						
Student Reported English Ability (1–4)	3.55	0.60	3.06	0.67	3.68	0.50
Student's Use of Native Language (1–4)	2.80	0.84	3.31	0.70	2.67	0.82
Parent Speaks Language other than English at Home	0.78		0.93		0.73	
Parent Questionnaire in Spanish	0.08		0.12		0.07	
Parental Involvement						
Parent Contacted School: Student's Performance (1–4)	1.45	0.74	1.48	0.76	1.44	0.74
Parent Contacted School: Student's Course Taking (1–4)	1.24	0.54	1.18	0.54	1.26	0.54
Parent Advice about School (1–3)	2.07	0.59	2.00	0.57	2.09	0.60

	ESL Placement					
	Total		**ESL**		**No ESL**	
	N=2352		**N=493**		**N=1859**	
	Mean	***SD***	***Mean***	***SD***	***Mean***	***SD***
Parent Has Rules about GPA	0.83		0.80		0.84	
Prior Achievement						
Retained before 9th Grade	0.14		0.13		0.15	
9th Grade High Math	0.62		0.50		0.65	
9th Grade GPA (0–4)	2.50	0.86	2.41	0.86	2.52	0.86
10th Grade Reading IRT	24.36	9.83	19.33	7.02	25.89	9.76
Base Year Test Accommodations	0.01		0.02		0.01	
Characteristics of Schools Attended						
Public	0.87		0.96		0.85	
Urban	0.44		0.49		0.43	
Suburban	0.49		0.44		0.50	
Northeast	0.16		0.12		0.17	
Midwest	0.15		0.12		0.16	
South	0.27		0.23		0.28	
West	0.42		0.53		0.39	
Student Teacher Ratio	19.55	5.97	20.20	3.95	19.35	6.45
Average Learning Hindrances (1–4)	1.82	0.60	1.88	0.56	1.81	0.61
Percent LEP	0.10	0.12	0.15	0.13	0.09	0.12
Proportion Minority	0.57	0.29	0.61	0.26	0.55	0.29
Proportion Asian	0.11	0.17	0.13	0.16	0.11	0.17
Proportion Immigrant	0.46	0.28	0.51	0.25	0.45	0.28
Proportion Receive Free Lunch	0.32	0.28	0.36	0.23	0.31	0.28
Proportion Special Education	0.10	0.09	0.11	0.10	0.09	0.08
School Offers ESL	0.79		1.00		0.74	

Source: *ELS* Base Year and First Follow-Up Transcript Component

Table 2

Two-Level Hierarchical Logistic Regression Predicting College Preparatory Course Enrollment

	Math			Science			Social Science		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
	Coef.	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**
ESL Placement	−.45(.22)*	−.37 (.24)	−.20 (.24)	−.68(.20)***	−.67(.23)**	−.60 (.23)**	−.81 (.28)**	−.84 (.32)**	−.65(.30)*
Black	−.34(.39)	.10 (.47)	.24 (.46)	−.05(.40)	.31(.42)	.35 (.42)	.17 (.46)	.66 (.54)	.83(.52)
Mexican	−.64(.32)*	−.54 (.38)	−.57 (.40)	−.46(.27)	−.33(.30)	−.34 (.30)	−.58 (.34)	−.33 (.39)	−.35(.39)
Non-Mexican Latino	−.83(.32)*	−.67 (.35)	−.73 (.37)*	−.82(.27)**	−.63(.31)*	−.65 (.31)*	−.58 (.37)	−.26 (.42)	−.34(.41)
Korean	1.12(.39)**	.87 (.46)	.74 (.48)	.90(.36)*	.70(.37)	.63 (.38)	1.40 (.43)***	1.22 (.44)**	1.03(.44)*
Japanese	1.90(.69)**	1.40 (.70)*	1.17 (.67)	.97(.72)	.49(.77)	.37 (.76)	1.06 (.70)	.69 (.75)	.32(.76)
Filipino	.08(.45)	−.30 (.59)	−.37 (.60)	.64(.44)	.51(.47)	.48 (.47)	.91 (.47)*	.89 (.46)*	.80(.47)
Chinese	1.41(.39)***	.79 (.44)	.69 (.45)	.32(.35)	−.19(.39)	−.26 (.39)	1.32 (.40)***	.72 (.43)	.55(.44)
South Asian	.40(.36)	.22 (.41)	.34 (.41)	.15(.31)	.03(.33)	.05 (.33)	−.09 (.42)	−.21 (.47)	−.07(.48)
Southeast Asian	.30(.35)	−.01 (.41)	.09 (.42)	.39(.31)	.23(.35)	.26 (.35)	.39 (.36)	.16 (.40)	.23(.40)
Native American	−.60(.70)	−.56 (.77)	−.58 (.75)	−.64(.54)	−.71(.52)	−.71 (.53)	.33 (.73)	.66 (.76)	.75(.69)
Multiracial	.78(.45)	.11 (.48)	−.07 (.48)	.75(.44)	.37(.45)	.29 (.45)	.33 (.57)	−.32 (.57)	−.47(.59)
Parents' Education	.13(.06)	−.01 (.07)	−.05 (.07)	.11(.06)	.02(.06)	.01 (.06)	.28 (.07)	.20 (.08)*	.15(.08)
Income	.01(.06)	.11 (.07)	.09 (.08)	−.09(.06)	−.05(.06)	−.06 (.06)	.01 (.07)	.06 (.07)	.03(.07)
Number of Family Resources	.05(.03)*	.02 (.03)	−.01 (.03)	.02(.03)	−.01(.03)	−.02 (.03)	.10 (.03)***	.08 (.03)**	.06(.03)
Female	.13(.13)	−.14 (.15)	−.06 (.15)	.27(.14)*	.12(.14)	.15 (.14)	.22 (.16)	−.10 (.16)	.05(.16)
Intact Family Structure	.36(.14)*	.17 (.15)	.16 (.15)	.56(.14)***	.45(.15)**	.45 (.15)**	.23 (.17)	−.01 (.17)	−.07(.18)
Arrived in U.S ≤ 5 Years Prior	.56(.40)	.01 (.50)	−.10 (.50)	.94(.38)*	.67(.40)	.63 (.40)	.61 (.57)	.07 (.64)	−.10(.65)
Arrived in U.S. ≥ 6 Years Prior	.69(.29)*	.44 (.35)	.35 (.35)	.52(.28)	.33(.31)	.28 (.31)	.62 (.36)	.30 (.36)	.14(.38)
Second Generation	.46(.28)	.11 (.32)	.07 (.31)	.35(.27)	.14(.29)	.11 (.29)	.58 (.36)	.24 (.37)	.18(.40)
Student Placed in 6th Grade+ upon Arrival in U.S.	.03(.29)	.03 (.36)	.12 (.35)	−.22(.30)	−.31(.32)	−.28 (.31)	−.47 (.43)	−.41 (.50)	−.28(.51)
Highest Age Quartile	−.73(.17)***	−.32 (.22)	−.33 (.21)	−.71(.17)***	−.22(.20)	−.21 (.20)	−.38 (.21)	−.08 (.26)	−.04(.26)

	Math			Science			Social Science		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
	Coef.	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**
College Aspirations	.26(.09)**	.11 (.10)	.11 (.10)	.23(.09)*	.12(.10)	.12 (.10)	.43 (.11)***	.31 (.11)**	.32(.11)**
Student Reported English Ability	0.28(.17)	.14 (.19)	−.09 (.20)	.17(.12)	.07(.14)	−.02 (.14)	.91 (.18)***	.95 (.19)***	.60(.20)**
Native Language Use	−.05(.10)	−.06 (.12)	−.04 (.12)	−.02(.11)	−.03(.12)	−.02 (.12)	−.01(.11)	.01 (.13)	.05 (.14)
Parent Speaks Non- English	.96(.22)*	.88 (.24)***	.82 (.24)***	.63(.22)**	.43(.26)	.39 (.26)	.67(.26)*	.52 (.27)	.49 (.28)
Parent Questionnaire in Spanish	.18(.27)	−.14 (.31)	−.21 (.30)	.64(.24)**	.55(.29)	.51 (.29)	.54(.28)*	.12 (.29)	−.03 (.30)
Parent Contacted School: Student's Performance	−.60(.12)***	−.19 (.13)	−.18 (.13)	−.37(.10)***	−.07(.11)	−.07 (.11)	−.34(.12)**	.12 (.12)	.10 (.13)
Parent Contacted School: Student's Course Taking	.25(.13)	.16 (.16)	.21 (.15)	.10(.14)	.02(.14)	.03 (.14)	.06(.14)	−.02 (.17)	.06 (.18)
Parent Advice about School	.24(.12)*	.21 (.13)	.22 (.13)	.12(.13)	.07(.12)	.08 (.12)	.18(.16)	.12 (.15)	.12 (.16)
Parent Saving for College	.07(.17)	.13 (.22)	.11 (.23)	.15(.16)	.16(.18)	.16 (.18)	.10(.18)	.13 (.19)	.14 (.19)
Parent Has Rules about GPA	−.17(.16)	−.11 (.20)	−.07 (.20)	−.21(.19)	−.22(.21)	−.21 (.21)	−.16(.24)	−.01 (.26)	.04 (.27)
9th Grade High Math		1.11 (.19)***	1.07 (.20)***		.64(.15)***	.61 (.15)***		.36 (.22)	.25 (.23)
9th Grade GPA		1.70 (.13)***	1.48 (.13)***		1.05(.12)***	.95 (.12)***		1.63 (.16)***	1.32 (.16)***
Base Year Test Accommodations		−1.08 (.59)	−1.60 (.79)*		−.60(.93)	−.69 (1.01)		−.90(1.01)	−1.04 (1.04)
Retained Before 10th Grade		−.65 (.31)*	−.53 (.32)		−.90(.24)***	−.86 (.24)***		.04.39	.20 (.38)
10th Grade Reading Score			.06 (.01)***			.03 (.01)**			.08 (.01)***
Intercept	−.65(.53)	−1.00 (.63)	−1.04 (.62)	.19(.62)	.13(.67)	.16 (.67)	−3.62(.73)***	−4.02 (.80)***	−4.13 (.83)***

* p≤.05;

** p≤.01;

*** p≤.001 (two-tailed tests)

Note: For brevity, coefficients for school level variables are not shown (region, locale, student teacher ratio, average learning hindrances, proportion free lunch, LEP, Asian, special education, and immigrant). Also, at the individual level, coefficients for age quartiles and language minority imputed are not shown.

Numbers in parentheses () are standard errors.

Source: *ELS* Base Year and First Follow-Up Transcript Component

Table 3

Two-Level Hierarchical Linear Regression Predicting Academic Achievement

	Math IRT			Cumulative GPA		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
	Coef.	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**
ESL Placement	−3.60 (1.17)**	−2.41 (1.05)*	−.10 (.85)	−.18 (.06)**	−.11 (.04)**	−.09 (.04)*
Black	−2.12 (1.92)	−.13 (1.72)	−.03 (1.50)	−.24 (.10)*	−.04 (.07)	−.04 (.07)
Mexican	−1.61 (1.46)	−.70 (1.30)	−1.51 (1.04)	−.25 (.08)***	−.10 (.04)*	−.10 (.05)*
Non-Mexican Latino	−4.25 (1.42)**	−2.79 (1.21)*	−3.85 (1.01)***	−.22 (.08)*	−.08 (.04)	−.08 (.04)*
Korean	14.48 (2.20)***	12.66 (1.85)***	9.99 (1.64)**	.31 (.11)***	.10 (.06)	.08 (.06)
Japanese	15.91 (3.36)***	12.78 (2.88)***	8.44 (2.64)**	.42 (.13)***	.13 (.08)	.10 (.09)
Filipino	1.97 (2.25)	.60 (2.15)	−.48 (1.65)	.09 (.13)	−.04 (.08)	−.05 (.08)
Chinese	15.34 (1.76)***	11.41 (1.59)***	8.76 (1.31)***	.42 (.10)***	.06 (.05)	.04 (.05)
South Asian	4.50 (1.76)*	3.36 (1.66)*	3.29 (1.38)*	.13 (.08)	.02 (.06)	.02 (.06)
Southeast Asian	3.00 (1.61)	1.56 (1.52)	1.16 (1.17)	.14 (.08)	−.01 (.05)	−.01 (.05)
Native American	−3.18 (3.11)	−2.03 (2.31)	−2.81 (2.10)	−.19 (.13)	−.08 (.12)	−.08 (.13)
Multiracial	6.75 (2.52)**	3.91 (2.04)	1.38 (1.62)	.25 (.12)*	.00 (.06)	−.02 (.06)
Parents' Education	1.11 (.33)***	.46 (.30)	.01 (.25)	.06 (.02)***	.02 (.01)	.02 (.01)
Income	.68 (.32)*	.86 (.29)**	.57 (.25)*	−.03 (.02)	.00 (.01)	−.01 (.01)
Number of Family Resources	.68 (.13)***	.45 (.12)***	.20 (.10)*	.02 (.01)***	.01 (.00)	.01 (.00)
Female	−2.98 (.71)***	−4.09 (.67)***	−3.57 (.55)***	.26 (.03)***	.13 (.02)***	.13 (.02)
Intact Family Structure	1.41 (.68)*	.58 (.61)	.48 (.54)	.10 (.04)*	.04 (.02)	.04 (.02)
Arrived in U.S. ≤ 5 Years Prior	6.18 (2.41)*	3.70 (2.19)	2.52 (1.98)	.31 (.11)***	.14 (.06)*	.13 (.06)*
Arrived in U.S. ≥ 6 Years Prior	4.66 (1.49)**	3.48 (1.39)*	1.98 (1.13)	.17 (.08)*	.09 (.05)	.08 (.05)
Second Generation	4.67 (1.45)**	3.60 (1.29)**	2.43 (1.07)*	.15 (.08)	.07 (.04)	.06 (.04)
Student Placed in 6th Grade+ upon Arrival in U.S.	.42 (1.89)	.01 (1.79)	.61 (1.59)	−.01 (.08)	−.04 (.06)	−.03 (.06)
Highest Age Quartile	−4.29 (.95)***	−2.16 (.89)*	−1.99 (.77)*	−.23 (.05)***	−.06 (.04)	−.05 (.04)

	Math IRT			Cumulative GPA		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
	Coef.	**Coef.**	**Coef.**	**Coef.**	**Coef.**	**Coef.**
College Aspirations	1.07 (.39)**	.27 (.40)	.11 (.33)	.07 (.02)*	.00 (.02)	.00 (.02)
Student Reported English Ability	3.33 (.63)***	2.69 (.61)***	.16 (.49)	.02 (.04)	.00 (.03)	−.02 (.03)
Native Language Use	.09 (.51)	−.13 (.49)	.28 (.37)	.02 (.03)	.02 (.02)	.03 (.02)
Parent Speaks Non-English	4.12 (1.08)***	2.52 (.99)*	1.68 (.86)*	.13 (.06)	−.02 (.04)	−.02 (.04)
Parent Questionnaire in Spanish	2.01 (1.30)	1.14 (1.14)	−.13 (.88)	.12 (.07)	.00 (.06)	−.01 (.06)
Parent Contacted School: Student's Performance	−2.73 (.51)***	−.77 (.51)	−.82 (.43)	−.25 (.03)***	−.06 (.02)**	−.06 (.02)**
Parent Contacted School: Student's Course Taking	0.33 (.81)	−.18 (.77)	.40 (.59)	.03 (.04)	−.03 (.02)	−.03 (.02)
Parent Advice about School	1.31 (.65)*	1.01 (.58)	.97 (.55)	.04 (.03)	.01 (.02)	.01 (.02)
Parent Saving for College	0.93 (.75)	1.00 (.68)	.73 (.58)	.04 (.04)	.01 (.03)	.01 (.03)
Parent Has Rules about GPA	−0.32 (.90)	−.20 (.81)	−.06 (.66)	−.09 (.05)*	−.04 (.03)	−.04 (.03)
9th Grade High Math		4.04 (.65)***	2.87 (.53)***		.03 (.03)***	.03 (.03)***
9th Grade GPA		6.86 (.43)	4.09 (.39)***		.69 (.02)	.67 (.02)
Base Year Test Accommodations		−2.78 (2.67)	−1.22 (1.74)		−.09 (.21)	−.10 (.22)
Retained Before 10th Grade		−3.84 (1.16)**	−2.11 (.99)*		−.05 (.05)	−.04 (.05)
10th Grade Reading Score			.76 (.04)***			.01 (.00)***
Intercept	40.21 (2.56)***	39.43 (2.37)***	40.91 (1.93)***	2.50 (.13)***	2.63 (.08)***	2.64 (.08)***

*p≤.05;

**p≤.01;

***p≤.001

Note: For brevity, coefficients for school level variables are not shown (region, locale, student teacher ratio, average learning hindrances, proportion free lunch, LEP, Asian, special education, and immigrant). Also, at the individual level, coefficients for age quartiles and language minority imputed are not shown.

Numbers in parentheses () are standard errors.

Source: *ELS* Base Year and First Follow-Up Transcript Component

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Table 4

Model-Based Estimation of ESL Placement Effect on Academic Outcomes among Language Minority Students

	College Preparatory Enrollment			***Academic Achievement***	
	Math ***N=2352***	**Science** ***N=2352***	**Social Science** ***N=2352***	**Math IRT Score** ***N=1950***	**Cumulative GPA** ***N=2349***
Fixed Effect					
Non-ESL Placement					
Student Intercept					
Coefficient	0.53	1.06	−1.90	50.33	3.03
SE	0.73	0.71	0.81	4.86	0.26
t	0.73	1.50	−2.35	10.36	11.77
ESL Placement Effect					
Coefficient	−0.21	−0.55	−0.40	−0.42	−0.18
SE	0.21	0.24	0.26	1.89	0.08
t	−1.03	−2.25	−1.54	−0.22	−2.35
Random Effect					
School Mean Intercept	(df=521)	(df=521)	(df=521)	(df=488)	(df=520)
Variance	1.03	0.94	1.54	64.35	0.12
X^2	912.53***	921.63***	932.41***	1278.91***	108.38***
Level-1 Effect					
Variance				154.90	0.51

* p≤.05;

** p≤.01;

*** p≤.001

Note: For brevity, coefficients representing ten of the eleven propensity strata, the logit of the propensity score, and ESL school are not shown.

Source: *ELS* Base Year and First Follow-Up Transcript Component

Appendix A

Comparison of Unweighted Means of Base Year and Transcript Study Language Minority Samples

	Base Year Sample Language Minority		Transcript Study Language Minority		Transcript Study Non-Language Minority	
	N=2595		N=2352		N=11699	
Variable	**Mean/ Proportion**	**SD**	**Mean/ Proportion**	**SD**	**Mean/ Proportion**	**SD**
Black	0.04		0.04		0.14	
Latino	0.43		0.43		0.09	
Mexican	0.29		0.30		0.06	
Non-Mexican Latino	0.15		0.13		0.03	
Asian	0.37		0.38		0.03	
Chinese	0.09		0.09		0.006	
Filipino	0.03		0.03		0.008	
Japanese	0.01		0.01		0.004	
Korean	0.06		0.06		0.007	
South Asian	0.06		0.06		0.005	
Southeast Asian	0.14		0.14		0.003	
Native American	0.02		0.02		0.01	
Multi-Racial	0.03		0.03		0.05	
Parents' Education	1.92	1.35	1.92	1.36	2.35	1.09
Income	1.81	1.25	1.81	1.25	2.52	1.27
Female	0.51		0.52		0.50	
Intact Family Structure	0.62		0.63		0.60	
First Generation	0.41		0.41		0.02	
Second Generation	0.35		0.36		0.09	
Third Generation	0.09		0.09		0.77	
College Aspirations	4.58	0.92	4.60	0.91	4.58	0.89
10th Grade Reading Score	25.81	9.76	25.99	9.83	30.90	9.52
Number of Family Resources	4.87	3.03	4.94	3.01	6.39	2.82
Placed in 6th Grade or Higher Upon Arrival	0.17		0.17		0.01	
Arrived in U.S. ≤ 5 Years Prior	0.14		0.14		0.00	

	Base Year Sample Language Minority		Transcript Study Language Minority		Transcript Study Non-Language Minority	
	N=2595		N=2352		N=11699	
Variable	**Mean/ Proportion**	**SD**	**Mean/ Proportion**	**SD**	**Mean/ Proportion**	**SD**
Student Reported English Ability	3.56	0.60	3.57	0.60	N/A	
Student's Use of Native Language Use	2.76	0.83	2.75	0.84	N/A	

Source: *ELS* Base Year and First Follow-Up Transcript Component

Appendix B

Individual and School Level Measures with Missing Values

	Respondents (N=2352)	
Variable	**N**	**%**
Parents' Education	131	6
Income	624	27
Age	17	1
Generational Status	336	14
College Aspirations	321	14
Grade Placed in School upon Arrival in U.S.	575	24
Language Minority	60	3
Student Reported English Ability	252	11
Student's Use of Native Language	266	11
Parent Speaks Language Other than English at Home	325	14
Parent Contacted School: Student's Performance	635	27
Parent Contacted School: Student's Course Taking	658	28
Parent Advice about Courses	575	24
Parent Interaction with School	559	24
Parent Saving for College	732	31
Parent Has Rules about GPA	619	26
Retained before 9th Grade	578	25
9th Grade GPA (0–4)	78	3
10th Grade Reading IRT	133	6
	Schools (N=523)	
	N	%
Student Teacher Ratio	104	20
Average Learning Hindrances	100	19
Percent LEP	33	6
Proportion Minority	98	19
Proportion Receiving Free Lunch	48	9
Proportion Special Education	34	7

Source: *ELS* Base Year and First Follow-Up Transcript Component

Appendix C

Two-Level Hierarchical Logistic Regression Predicting ESL Placement for Language Minority Students

	Coef.
School Characteristics	
Sector	
Public	0.89 (0.77)
Locale	
Urban	−0.22 (0.28)
Region (Northeast)	
Midwest	−0.66 (0.49)
South	0.50 (0.42)
West	0.01 (0.44)
Student Teacher Ratio	0.05 (0.04)
Average Learning Hindrances	0.01 (0.26)
Logit Proportion Free Lunch	−0.10 (0.08)
Logit Proportion LEP	0.09 (0.09)
Logit Proportion Minority	−0.08 (0.08)
Logit Proportion Special Education	0.28 (0.14)*
Logit Proportion Asian	0.15 (0.07)*
Logit Proportion Immigrant	0.15 (0.10)
N	543
Individual Characteristics	
Individual/Family	
Female	−0.07 (0.20)
Race/Ethnicity (White)	
Black	−0.92 (0.74)
Native American	−0.87 (1.80)
Multiracial	−0.09 (0.83)
Mexican	−0.10 (0.45)
Non-Mexican Latino	−0.84 (0.48)
Chinese	−0.58 (0.50)
Filipino	−2.72 (0.77)***
Japanese	0.31 (0.69)
Korean	−0.17 (0.47)
Southeast Asian	−0.48 (0.46)
South Asian	−0.38 (0.50)
Generational Status (3rd+)	
Arrived in U.S. ≤ 5 Years Prior	2.23 (0.74)**
Arrived in U.S. ≥ 6 Years Prior	0.93 (0.70)
Second Generation	0.57 (0.69)
Student Placed in 6th Grade or Higher Upon U.S. Arrival	1.44 (0.34)***

	Coef.
Age (Lowest Quartile)	
Highest Age Quartile	0.10 (0.28)
Third Age Quartile	−0.31 (0.30)
Second Age Quartile	0.07 (0.29)
Parent's Education	0.04 (0.08)
Income	−0.33 (0.10)***
Number of Family Resources	−0.07 (0.04)*
Intact Family Structure	−0.32 (0.20)
Parent Saving for College	−0.06 (0.23)
Language	
Student Reported English Ability	−0.87 (0.19)***
Student's Use of Native Language	0.45 (0.14)**
Parent Speaks Language other than English at Home	0.20 (0.40)
Parent Questionnaire in Spanish	0.11 (0.41)
Prior Achievement	
9th Grade High Math	−0.44 (0.23)*
10th Grade Reading IRT	−0.08 (0.02)***
9th Grade GPA	−0.01 (0.14)
Base Year Test Accommodations	0.02 (0.65)
Retained Before 10th Grade	−0.38 (0.38)
College Aspirations	0.08 (0.11)
Parent Involvement	
Parent Contacted School: Student's Performance	0.02 (0.13)
Parent Contacted School: Student's Course Taking	−0.19 (0.20)
Parent Advice about Courses	0.27 (0.21)
Parent Saving for College	−0.06 (0.23)
Parent Has Rules about GPA	−0.33 (0.29)
Intercept	−1.60 (1.01)
N	2352

* p<.05;

** p<.01;

*** p<.001 (two-tailed tests)

Note: Numbers in parentheses () are standard errors.

Source: *ELS* Base Year and First Follow-Up Transcript Component

Appendix D

Balance in Logit of the Propensity Score for ESL Placement

ESL Placement							
	Placement			No Placement			
Stratum	***N***	***M***	***SD***	***N***	***M***	***SD***	**Difference**
0	1	−5.17		469	−6.06	0.70	0.89
1	6	−4.03	0.22	465	−4.21	0.37	0.19
2	5	−2.98	0.06	230	−3.20	0.21	0.22
3	10	−2.43	0.09	225	−2.54	0.19	0.11
4	15	−1.94	0.14	142	−1.93	0.18	−0.01
5	10	−1.53	0.06	68	−1.52	0.08	−0.02
6	38	−0.97	0.17	120	−1.03	0.21	0.06
7	30	−0.43	0.11	48	−0.47	0.15	0.04
8	90	0.24	0.27	66	0.18	0.22	0.06
9	138	1.23	0.38	19	1.36	0.33	−0.13
10	150	3.26	1.14	7	2.98	0.68	0.28
Total	493	1.21	1.97	1859	−3.26	1.85	4.47

Source: *ELS* Base Year and First Follow-Up Transcript Component

Appendix E

Within-Stratum Differences in Achievement Outcomes among Language Minority Students

	ESL Placement		No ESL Placement		
Stratum	***N***	***Proportion***	***N***	***Proportion***	***Difference***
Math College Preparatory Enrollment					
0	1	1.00	469	0.50	0.50
1	6	0.00	465	0.38	−0.38
2	5	0.14	230	0.24	−0.10
3	10	0.39	225	0.28	0.10
4	15	0.37	142	0.26	0.11
5	10	0.08	68	0.12	−0.04
6	38	0.20	120	0.22	−0.02
7	30	0.17	48	0.35	−0.18
8	90	0.17	66	0.16	0.00
9	138	0.18	19	0.05	0.13
10	150	0.24	7	0.30	−0.06
Total	493	0.20	1859	0.33	−0.13
Science College Preparatory Enrollment					
0	1	1.00	469	0.58	0.42
1	6	0.52	465	0.45	0.07
2	5	0.73	230	0.40	0.33
3	10	0.36	225	0.39	−0.03
4	15	0.29	142	0.40	−0.11
5	10	0.05	68	0.22	−0.17
6	38	0.11	120	0.38	−0.27
7	30	0.27	48	0.32	−0.05
8	90	0.26	66	0.17	0.09
9	138	0.20	19	0.35	−0.15
10	150	0.35	7	0.57	−0.22

	ESL Placement		No ESL Placement		
Stratum	***N***	***Proportion***	***N***	***Proportion***	***Difference***
Total	493	0.27	1859	0.43	−0.16
Social Science College Preparatory Enrollment					
0	1	1.00	469	0.34	0.66
1	6	0.37	465	0.31	0.06
2	5	0.12	230	0.21	−0.09
3	10	0.13	225	0.19	−0.06
4	15	0.16	142	0.16	0.00
5	10	0.08	68	0.09	−0.01
6	38	0.07	120	0.18	−0.11
7	30	0.07	48	0.13	−0.06
8	90	0.12	66	0.10	0.02
9	138	0.10	19	0.05	0.05
10	150	0.06	7	0.16	−0.10
Total	493	0.09	1859	0.24	−0.15

	ESL Placement			No ESL Placement			
Stratum	***N***	***M***	**SD**	***N***	***M***	***SD***	***Difference***
Math IRT Scores							
0	1	64.16		469	52.56	13.06	11.60
1	6	24.95	2.77	465	47.21	14.97	−22.26
2	5	34.93	10.68	230	41.62	15.01	−6.69
3	10	40.25	19.87	225	41.76	14.29	−1.51
4	15	46.89	15.10	142	41.41	13.16	5.48
5	10	37.06	11.08	68	35.08	14.29	1.98
6	38	38.04	9.63	120	40.04	13.10	−2.00
7	30	36.46	16.11	48	40.64	14.87	−4.18
8	90	39.55	13.38	66	35.28	13.21	4.27
9	138	36.86	14.34	19	29.10	14.98	7.76

	ESL Placement			No ESL Placement			
Stratum	***N***	***M***	**SD**	***N***	***M***	***SD***	***Difference***
10	150	37.22	16.46	7	36.81	14.99	0.41
Total	493	37.83	14.75	1859	44.48	14.88	−6.65
			Cumulative GPA				
0	1	2.82		469	2.81	0.66	0.01
1	6	1.82	0.52	465	2.59	0.76	−0.77
2	5	2.03	0.47	230	2.33	0.8	−0.30
3	10	2.36	0.71	225	2.45	0.74	−0.09
4	15	1.90	0.99	142	2.47	0.73	−0.57
5	10	2.37	0.81	68	1.98	0.89	0.39
6	38	1.76	0.84	120	2.42	0.77	−0.66
7	30	2.47	0.57	48	2.30	1.24	0.17
8	90	2.29	0.79	66	2.26	0.72	0.03
9	138	2.35	0.81	19	2.05	0.79	0.30
10	150	2.43	0.90	7	2.98	0.77	−0.55
Total	493	2.31	0.84	1859	2.50	0.78	−0.19