Academic Achievement of Legal Immigrants' Children: The Roles of Parents' Pre- and Post-migration Characteristics in Origin-Group Differences

Suet-ling Pong and
Penn State University/The Chinese University of Hong Kong, 310G Rackley Building, PA 16802, pong@pop.psu.edu

Nancy S. Landale
Penn State University, 601 Oswald Tower, PA 16802, nsl3@psu.edu

Abstract

Using data from the New Immigrant Survey, a study based on a nationally representative sample of legal immigrants, the present study extends prior research on the academic outcomes of immigrants' children by examining the roles of pre- and post-migration parent characteristics and the home environment. An analysis of 2,147 children ages 6-12 shows that parents' pre-migration education is more strongly associated with children's academic achievement than any other pre- or post-migration attribute. Pre-migration parental attributes account for the test score disadvantage of Mexican-origin children of legal immigrants, relative to their non-Latino counterparts. The findings reveal continuities and discontinuities in parental SES and demonstrate that what parents bring to the United States and their experiences after arrival influence children's academic achievement.

INTRODUCTION

Over the last several decades, immigration has given rise to important demographic, economic, and cultural changes in the United States. The full impact of these changes is unclear, with both immediate and long-term consequences being hotly debated. Over the long term, the repercussions of recent trends in immigration will depend on how the children of immigrants are incorporated into U.S. society. The sheer number of these children warrants our attention: In 2007, 24% of U.S. children were foreign-born or native-born children of immigrants (Clark, Glick, & Bures, 2009). Among them, 10.8 million were ages 5 to 17, accounting for 20% of the total school-age population (Camarota, 2007). Having immigrant parents was even more common among Hispanic and Asian children: 64% of Hispanic youth and 89% of Asian youth had at least one foreign-born parent (Clark, et al., 2009).

The life chances of the offspring of recent immigrants are tied to their parents' arrival at a time of rising inequality due to a concentration of employment in low-paid menial service jobs and high-skilled occupations that require post-secondary credentials (Portes & Zhou, 1993). Given this bifurcation of job opportunities, education has become critical to labor market success. Many immigrant parents have low education and are employed at the bottom of the hourglass economy. While this predicts low cognitive or academic achievement among their children, some immigrants have resources that are not fully reflected in their socioeconomic position but nonetheless enhance their children's educational outcomes.

The goal of this paper is to extend our knowledge of the academic outcomes of children of immigrants by widening the lens through which their parents' characteristics and experiences are examined. A theoretical and empirical challenge faced by scholars of immigration is to separate what immigrants arrive with from how they adapt and assimilate after immigration and settlement. In the absence of information on pre-migration characteristics, it is difficult if not impossible to understand the unique role of post-migration circumstances in the outcomes of immigrants and their children. Using the first nationally representative study of legal immigrants to include extensive information on pre-migration characteristics, we consider whether parents' attributes *before* migration are important for children's academic achievement in addition to parents' attributes *after* migration and settlement. Our findings indicate that immigrant parents' pre-migration education is more strongly associated with children's test scores than any other pre- or post-migration parental attribute. Furthermore, pre-migration parental attributes fully account for the test score disadvantage of Mexican-origin children of legal immigrants, relative to non-Latino children of legal immigrants. Our findings also show that parents' post-migration employment is strongly associated with their children's scores on academic achievement tests.

SES, Cognitive Skills and Schooling: Anomalies among Children of Immigrants

Family background, measured by socioeconomic status (SES), is a primary focus of research on children's cognitive development and schooling. In general, there are strong positive associations between SES and cognitive and educational outcomes, but the role of SES among children in immigrant families is less clear. Two loosely connected but seemingly contradictory stories are commonly told. The first emphasizes the negative impact of immigrant families' low SES on their children's educational performance. About half of the children of immigrants reside in low-income families, and one-third of those who live in poverty have parents without a high school degree (Capps, Fix, Murray, Passel, & Herwantoro, 2005). Low SES is particularly problematic for Latinos, especially Mexicans, and the children of Latino immigrants are the most educationally disadvantaged (Suárez-Orozco, Gaytán, & Kim, 2010). Because they lack the cultural and material resources of the middle class, children of immigrants are "overlooked and underserved" (Ruiz-de-Velasco, Fix, & Chu Clewell, 2000) by U.S. schools, which often struggle with high dropout or school failure rates. This is the story of immigrant failure.

There are also accounts of an "immigrant paradox" wherein children escape the fates that are predicted by their low SES. Research has found that both foreign-born and native-born youth with immigrant parents show better academic, behavioral, emotional, and health outcomes than youth with native-born parents (Garcia Coll & Marks, forthcoming). This is paradoxical because the superior outcomes of the children of immigrants counter what would be predicted, given their lower SES. Corroborating the paradox, one recent study found a weaker association between SES and student GPA among immigrants' children than among natives' children (Pong & Hao, 2007). The extraordinary school achievement of children of immigrants in the face of low SES often forms the backbone of immigrant success stories.

Clearly there are more anomalies in the SES-achievement relationship among immigrants' children than among natives' children. One piece of this puzzle may be the occupational downgrading that frequently occurs with immigration. Immigrant parents' post-migration occupations may not fully reflect their knowledge and skills, and thus SES may be a weak predictor of children's academic outcomes. To the extent that pre-migration SES is not mirrored in post-migration SES, it may play an additional role in children's achievement.

Pre-migration SES

Scholars of immigration have long recognized that unequal origins give rise to unequal outcomes. Place of origin has been considered a proxy for immigrants' pre-migration SES, in part because immigrants from poor countries are likely to have fewer years of schooling than immigrants from rich countries. Likewise, countries with high levels of education are more likely to export their excess supply of technical and professional workers overseas than are countries with low levels of education. In fact, parents' country or region of origin is a consistent and strong predictor of educational and occupational attainment among immigrants' children, over and above their parents' post-migration SES (Fernandez-Kelly & Portes, 2008).

Feliciano's (2005a, 2005b) research provides support for the importance of pre-migration SES, measured by the educational standing of a group of adult immigrants relative to that of the same age group in the home country. This "relative group status" partially explained the attainment of some college among Latino and Asian children of immigrants, and Feliciano emphasized the role of selective migration from origin countries in accounting for this pattern. While Feliciano's work in this area is innovative, her studies did not address the question of interest here—the comparative influence of parents' pre- and post-migration characteristics on children's outcomes. Because she used an aggregate measure of relative group status, her work suggests that overall levels of migration selectivity may matter to children of immigrants' outcomes; however, her individual-level analyses did not also measure or control for the pre- or post-migration SES of particular children's parents. Given the substantial variations in pre- and post-migration SES *within* origin groups, we extend this line of inquiry by examining the usefulness of *individual-level* pre-migration parental characteristics for understanding the association between country or region of origin and children's academic achievement. To assess SES, we use recently developed global measures for international comparisons and survey questions that were designed to capture parents' characteristics immediately prior to the time of immigration. To our knowledge, no prior quantitative research on child development has investigated pre-migration and post-migration parental characteristics as separate predictors.

SES, the Home Environment, and Children's Academic Achievement

Past research has found significant differences in children's cognitive achievement by home background before children begin kindergarten (Lee & Burkam, 2002). Parental responsiveness and discipline, and access to stimulating materials and experiences are key aspects of the home environment, with the latter especially important for cognitive development. Significant differences have been found in the cognitive home environment by poverty status (Bradley, Corwyn, McAdoo, & Garcia Coll, 2001; Guo & Harris, 2000). Poor children learn less than non-poor children in part because their homes are not stimulating and their parents do not provide discipline, instruction, or motivation to achieve. The physical environment also matters. Understanding the home environments of immigrant families is important because they may be linked to children's academic achievement and help explain the relationships between immigrants' pre- and post-migration SES and children's academic achievement.

While not the focus of most research on social stratification, the home environment may partially explain the longstanding finding that family SES plays a central role in children's educational attainment (Blau & Duncan, 1967; Sewell & Hauser, 1975). Most past research defined family SES as consisting of three components: parental occupation, parental education, and family income (Sirin, 2005). Summarizing over 100 studies, White (1982) found all positive correlations of about .30 between children's academic outcomes and parents' occupation, education, and income, with any combination of indicators working

better than one. Sirin's (2005) meta-analytic review also reported an effect size of about .30 for the association between family SES and academic achievement at the student level, and about .38 when the SES data were collected directly from parents.

A key indicator of family SES—parental education—is often conceptualized as human capital, or the knowledge and skills that enhance earning power in the labor market. Becker (1994) distinguished two kinds of human capital, specific and general. Specific human capital consists of skills learned on the job in specific occupations, while general human capital is the cognitive knowledge and practical skills that can be used in varied settings. Education is a form of general human capital, which is less likely to become obsolete and is often preferred by employers over specific human capital (Bills, 2003). Parents who have a high level of general human capital tend to invest more in children's cognitive development. Not surprisingly, parental education is by far the most consistent predictor of children's academic performance in international studies (Schiller, Khmelkov, & Wang, 2002).

In immigrant families, these relationships may be complicated by discontinuities in SES. Most immigrants come to the United States for economic reasons. In 2005, employment-based immigration made up 22%, the second largest type of legal immigration after family reunification (Batalova, 2010). Although immigrants can find work, or those who succeed in finding work stay, their specific human capital is often lost or devalued in the host country. Akresh (2006) found widespread occupational downgrading among new U.S. immigrants, but it is unclear if occupational downgrading occurs among all immigrants or affects all immigrant families in the same way. Knowledge is also limited regarding the relationship between pre- and post-migration parental education. Education received abroad is often devalued in the U.S. labor market, resulting in a mismatch between education and occupational status, but little is known about which immigrants pursue more education after settlement in the United States.

An immigrant's ultimate occupational destination is influenced by the resources he or she had before arriving in the host country. If post-migration attributes reflect pre-migration attributes, the standard practice of ignoring pre-migration attributes is appropriate. On the other hand, post-migration SES may inadequately capture the resources immigrants bring to bear on the outcomes of their children. Pre-migration attributes of parents may play an additional role. Our research directly examines the relationship between pre- and post-migration SES and their influence on children's home environments and academic achievement.

Language and Culture

Another important factor in children's academic achievement is parents' English-language proficiency. Parents who have difficulty with the English language are less likely to adopt strategies that contribute to academic achievement, such as reading at home, watching educational television, going to the library, or visiting museums. In addition, Latino families in which parents speak only Spanish at home participate less in literacy activities with their young children, regardless of the mother's education or household income (Schneider, Martinez, & Owens, 2006). Given the limited English of many Latino immigrants, Latino children often have difficulties throughout their school careers. In 2000, Spanish speakers made up 76% of all pre-k to 5th grade children with limited English proficiency, and most (59%) were U.S.-born children with immigrant parents (Capps, et al., 2005).

Bilingualism is associated with children's academic achievement (Hakuta & Diaz, 1985). However, Xie and Mouw (1999) found that bilingualism is a proxy for parents' English ability, which is the driving force behind the relationship. Many high SES immigrants are proficient in English and familiar with the American culture when they arrive in the United

States. Their children have little difficulty adjusting to U.S. society. In contrast, other immigrants have to learn a new language and culture. English proficiency develops hand-in-hand with sociolinguistic and cultural experiences that can be transmitted to children. Proficiency in the host country's language promotes children's literacy in many countries (Schnepf, 2007).

Group differences

Group differences in academic performance have been widely reported. One consistent finding is that children of immigrants from Latin America, especially Mexico, have worse academic outcomes than children in other groups (e.g., Fernandez-Kelly & Portes, 2008). Whereas Asian immigrants are considered the "model minority" (Kao, 1995) and immigrant Blacks outperform native Blacks (Thomas, 2009), foreign-born Latino students often struggle in school and their native-born counterparts allegedly have values that are antithetical to school achievement (Matute-Bianchi, 1991). Explanations for such differences have focused on SES and English proficiency, but even after accounting for those and other background factors, a significant Mexican disadvantage in education persists (Glick & Hohmann-Marriott, 2007; Harris, Jamison, & Trujillo, 2008; Reardon & Galindo, 2009). Some scholars have warned of Mexican youths' downward assimilation and future educational risk (Portes & Zhou, 1993).

Although differences in children's achievement by their nativity (foreign born versus U.S. born) or generational status (defined by cross-classifying the nativity of parents and child) are not the primary focus here, such differences are not consistent across studies. Favorable outcomes of foreign-born students over native students have been widely noted for cognitive performance (Schnepf, 2007; Schwartz & Stiefel, 2006), educational attainment (Rong & Brown, 2001), school enrollment (Hirschman, 2001), and persistence in school (Perreira, Harris, & Lee, 2006), but differences between foreign-born students and U.S.-born students with foreign-born parents vary. Some researchers found that foreign-born students and U.S.-born students with immigrant parents have similar academic outcomes (Kao & Tienda, 1995; Fuligni, 1997), but others showed that foreign-born children perform more poorly than U.S.-born children with immigrant parents (Kaufman, Chavez, & Lauen, 1998; Landale, Oropesa, & Llanes, 1998). Young children's nativity is likely to be less important than parental nativity in determining academic outcomes, since young children can pick up a new language quickly.

In summary, using a new data source—the New Immigrant Survey—and focusing on pre-migration as well as post-migration parent characteristics and the home environment, we take a fresh approach to understanding the academic achievement of children of immigrants. We pay special attention to comparisons between children of Latin American immigrants and children in other origin groups because of their socioeconomic and educational disadvantage. Five research questions are addressed in an analysis restricted to the children of legal immigrants: (1) Is pre-migration parental SES (education, work status, and occupational status) replicated in post-migration parental SES? (2) Do pre-migration parental characteristics (SES and English language proficiency) significantly predict the cognitive stimulation provided in children's homes, over and above post-migration parental characteristics? (3) Do pre-migration characteristics of immigrant parents significantly predict children's academic achievement, over and above post-migration parental characteristics? (4) Can variations in children's test scores by parents' country or region of origin be explained by the pre- or post-migration characteristics of their parents, or both? (5) Does the cognitive stimulation provided at home mediate the relationships between parental characteristics and children's academic achievement?

METHOD

This study used data from the publicly-available version of the New Immigrant Survey (NIS), a longitudinal study of new legal immigrants to the United States (Jasso, Massey, Rosenzweig, & Smith, 2005). The NIS is based on a nationally representative sample of adult immigrants admitted to legal permanent residence between May and November 2003. Information on the children in the households of the sampled adults is included in the study. The NIS also collects information on foreign-born children of U.S. citizens and adopted orphans. However, because the parents of these two groups of children are all U.S. citizens, we excluded them from our analysis. The NIS is unique in being the first nationally representative prospective study of immigrants that measures baseline attributes as close as possible to the time of arrival. Nonetheless, some NIS adults and their children lived in the United States for a considerable time before the first interview, and many children were born in the United States. An additional strength of the data set is that it provides extensive information on pre-migration SES and experiences for immigrants. Such information is not currently available in any other study.

A total of 3,856 NIS children were eligible to take the Woodcock Johnson III tests (WJ) that we used to measure academic achievement. Two of the tests were given to children aged 3-12 and two were given to those aged 6-12. We restricted our study to children ages 6-12, resulting in an analytic sample of 2,147 offspring of NIS sample adults. Multiple imputation (Rubin, 1987) was used to impute missing data on both independent and dependent variables. In contrast to other methods of dealing with missing data (e.g., case deletion or mean substitution), multiple imputation maintains the original relationships among variables (neither attenuating nor inflating them) as well as the overall variability. Before imputation, the percentage of cases with missing data was low for most variables (2% or less). A few variables had missing data for more than 20% of cases: WJ test scores (22%), English at arrival (24%), and pre-migration occupation (27%). Post-migration occupation had missing data for 11% of cases.

Variables

Our outcome variables come from the Woodcock Johnson III assessment in four areas: word identification, passage comprehension, applied problems, and calculation. These tests are widely used in national studies (e.g., Panel Study of Income Dynamics) and provide measures of academic achievement. Only the raw scores of the WJ tests are available in the NIS. The four tests have a minimum score of zero but different maximum scores. We standardized them for comparisons across models. All scores are age-adjusted in the multivariate analysis.

An unusual feature of the WJ tests in the NIS is that children whose parents were from a Spanish-speaking country and whose first language was Spanish were selected to participate in a language experiment to assess potential bias in the tests due to limited English proficiency. These children were randomly assigned to take the test in English or Spanish. Of the 1,200 children who participated in the experiment and completed the tests, 627 were randomly assigned to take the English form and 573 were randomly assigned to take the Spanish form. The English and Spanish test items were made comparable under the supervision of a team of professional certified Spanish translators (Schrank et al., 2005). A recent analysis of this experimental data did not find widespread bias due to test language. Akresh and Akresh (forthcoming) reported that the mean scores for passage comprehension and calculation tests were *higher* for Latino children who took the tests in English than for those who took the tests in Spanish. For the applied problems test there was *no significant difference* in average test scores based on test language. Only on the word identification test were Latino children who took the test in English at a disadvantage. This is to be expected

because the word identification test assesses children's recognition of individual words in isolation, a task that requires explicit knowledge of the language of administration. Because mastery of the English language is crucial for learning in other areas, we also report results for this test.

In addition to the 627 Latino-origin children who took the tests in English as part of the language experiment, 1,704 non-Latino children were also tested in English. We used these test scores as our outcome variables. For the 573 children in the language experiment who completed a comparable test in Spanish, we used an equating method to estimate what their scores would have been if they had been given the tests in English. Equating is a statistical procedure used to "adjust scores on test forms so that scores on the forms can be used interchangeably" (p.2 in Kolen & Brennan, 2004). This equating problem is equivalent to administering somewhat different test forms to similar populations (e.g., high school graduates) in different years. Since the two Latino-origin groups in the language experiment were randomly drawn, they can be considered two similar groups. We applied the "equipercentile" method for random groups to convert the Spanish scores to comparable English scores (discussed below). Thus, the WJ test scores essentially measure academic achievement in English.

Cognitive Home Environment

The NIS includes items that together comprise the Home Observation Measurement of the Environment-Short Form (HOME-SF), a shortened version of the HOME inventory (Caldwell and Bradley 1984) that consists mainly of maternal reports about the child's home environment. The questions that make up the HOME-SF vary according to the child's age, with four age groups recognized: less than three; three through five; six through nine; and ten and older. The HOME-SF consists of two subscales, one of which reflects cognitive stimulation in the home. This subscale is based on items that are related to a child's cognitive environment, including the amount of reading materials at home, parental discipline and involvement, and the physical environment of the child's home. Previous studies have demonstrated the construct validity and reliability of the HOME-SF and its subscales (Center for Human Resource Research 1993). Using the standard procedure for scoring the HOME scale, all of the individual items were dichotomized. The total raw score is a simple sum of the dichotomized individual item scores. The raw score varies by age group because the number of items used differs by age. We calculated a cognitive home environment score that is comparable for all age groups by creating standardized scores from the weighted total raw scores.

Immigrant parents' pre- and post-migration SES was measured with three variables: education, work status, and the ISEI of occupations. *Pre- and post-migration education* are the number of years of schooling the immigrant parent completed before coming to the United States and the years of schooling obtained in the United States, respectively. For families with two immigrant parents, we used the education of the parent with highest total number of completed years. For families with only one immigrant parent, we used the education of that parent.

Pre- and post-migration occupations are represented by the International Socio-Economic Index (ISEI) score. Because of the significance of SES in social stratification research, scholars have put much effort into creating SES indices for occupations that can be used for comparative international studies. The most widely used is the ISEI constructed by Ganzeboom and colleagues (Ganzeboom, de Graaf, & Treiman, 1992; Ganzeboom & Treiman, 1996). The major advantage of the ISEI is that it allows for international comparisons based on a single indicator. Ganzeboom and his colleagues used the optimal scaling technique to construct the ISEI of occupation unit groups to maximize the indirect

effect of education on income through occupation, while minimizing the direct effect of education on income, net of occupation (with both effects net of age). Constructed for the discrete categories in the International Standard Classification of Occupations (ISCO), the ISEI is a continuous socioeconomic measure that ranges from 16 (e.g., dishwashers) to 90 (e.g., judges).

The NIS adults reported the last job they held before coming to the United States, as well as their job at the time of the 2003 interview. Occupational codes in the NIS are 4-digit codes based on the 2003 Census occupational classification system. We converted these codes to ISCO codes by matching occupational titles. After matching, we used the conversion table provided by Ganzeboom and Treiman (1996, Appendix A) to obtain the ISEI values for each ISCO code.

Pre-migration ISEI is the occupational status of the parent's last job before arriving in the United States, and post-migration ISEI is the occupational status of the parent's U.S. job at the time of the 2003 interview. In households with two immigrant parents, we used the ISEI of the parent who had the higher ISEI for both pre- and post-migration. Missing pre- or post-migration ISEI was imputed using (among other variables) the ISEI of the parent's first job (after age 16) in the home country and the ISEI of the parent's first job in the United States. The ISEI represents, in part, parents' job skills—the specific human capital that can be transmitted to children. Individuals who choose not to work do not have a complete absence of specific human capital. This is especially true for immigrant women, who are more likely than immigrant men to be out of the labor force. Thus, we imputed missing ISEI for non-workers as well as workers.

Pre- and post-migration work statuses indicate whether one or both parents worked before and after arrival in the United States, respectively. Gainful employment brings financial capital that can be turned into useful educational resources for children.

Self-reported English at arrival. Immigrant parents' English proficiency prior to coming to the United States, another pre-migration attribute, is a dummy variable constructed from a number of items from parents' responses. Parents were coded as proficient in English at arrival if they rated their ability to speak English as "very well" or "well" at the time of the interview and satisfy one of the following conditions: spoke English at home (with their parents) when they were age 10, never spoke any language other than English, regularly read a newspaper or magazine in English in their home country, or were educated in English before arrival in the United States. The use of multiple items, some of which refer to specific behaviors, may minimize the self-report bias that is sometimes present in single subjective assessments of English-language proficiency (MacIntyre, Noels, Clements, 1997).

The child's demographic characteristics were measured using three variables: if he or she was *born in the United States*, if he or she had *one parent who was born in the United States* (the reference group had two foreign-born parents), and if his or her country of origin was *Mexico* or *another Latin American country*. Information about the country of birth of foreign-born children (about half of the child sample) is not available. We used the country of birth of the child's mother. The reference group includes non-Latino-origins of Europe (15%), Africa (8%), and Asia (25%). We combined these three groups because they had test scores not significantly different from each other, and because our primary focus is the disadvantage of Latino-origin groups. The specific countries of origin of the Asians include: India (4.8%), the Philippines (3.6%), Vietnam (2.8%), China (2.2%), and Korea (2.1%). Ukraine, Poland and Russia are the largest origin countries within Europe (1.6%, 1.2%, and 1.1% respectively), whereas Nigeria and Ethiopia are the largest origin countries within Africa (0.7% and 0.4%, respectively). All other countries were aggregated into regional

groupings in the NIS data. In preliminary analyses that included children of African immigrants as a separate category, the multivariate results for all other variables did not differ from those in the present analysis.

Children with Mexican mothers make up more than one-fifth of the sample (22.2%). Children with non-Mexican Latino mothers make up 28% of the sample. Their countries of origin are El Salvador (10.1%), Guatemala (4.5%), Cuba (1.6%), Dominican Republic (1.6%), Peru (1.2%), Colombia (0.9%), and other Latin America and the Caribbean (5.6%).

We also included a measure of the number of years the immigrant parents had spent in the United States. All else equal, one might expect the academic outcomes of children whose parents had more U.S. exposure to be better than those of newer immigrant parents because exposure is associated with greater familiarity with U.S. institutions, including schools, and greater ability to access resources. Years in the United States were calculated from a migration history that provided the beginning and end dates for each move across national boundaries. We selected only U.S. moves and summed the number of months spent in the United States, which were then converted into years or fractions of a year.

Data Analysis

Equating—In the language experiment, some Spanish-speaking children were randomly assigned to take the WJ tests in Spanish. To make these children's scores comparable to those they would have had if they had taken the test in English, we equated the Spanish scores to the English scores using the *equipercentile equating* method. This procedure identifies scores on one test form that have the same percentile ranks as scores on the other test form for two random samples (Kolen & Brennan, 2004). For each Spanish score, there is an English score with the same percentile rank. One concern about estimating equipercentile equivalents is that sampling errors may lead to imprecise estimates. This problem can be overcome by using the polynomial log-linear model to pre-smooth the test score distributions (Kolen & Brennan, 2004). We used the RG Equate Macintosh Program, which is downloadable for public use from the website of the Center for Advanced Studies in Measurement and Assessment at the College of Education, The University of Iowa (http://www.education.uiowa.edu/casma/computer_programs.htm).

Our purpose in using the equipercentile method was to ensure that the test scores of Latino children were comparable across the Spanish and English groups. This allowed us to combine the children who took the Spanish and English versions in subsequent analyses. The NIS data are well-suited to the equipercentile method because the two samples of test takers in the language experiment were randomly drawn. Differences between them are statistically insignificant on most observed characteristics (Akresh & Akresh, forthcoming). Thus the two groups are similar except for the language of the test and it is reasonable to assume that those assigned the Spanish tests would have had similar test scores to those assigned the English tests.

Multivariate Analysis—To examine how immigrant parents' pre-migration attributes are associated with the academic achievement of their children, we estimated ordinary least squares (OLS) regression models for the cognitive home environment as well as each of the WJ tests. These models investigate whether pre- and post-migration parent characteristics are associated with the cognitive home environment and with test scores, and whether these parental characteristics account for differences in the dependent variables by country or region of origin. The results for parental variables shed light on whether parents' pre-migration characteristics are important for children's outcomes above and beyond parents' post-migration characteristics. Finally, we investigated whether any influence of parental pre- and post-migration attributes on children's academic achievement is mediated through

the cognitive environment of the child's home. All of our statistical models included the proper weights and corrected for design effects. We used the statistical software STATA to combine the five imputed datasets to calculate statistics for univariate, bivariate, and multivariate analyses.

RESULTS

Descriptive Statistics for Children and Parents

Table 1 presents descriptive statistics for child and parent characteristics. We focus first on the test scores. All test scores were standardized to have a mean of zero and a standard deviation of one. Academic disadvantage among Mexican children is evident: they scored significantly lower than any other racial-ethnic group on every test.

Although all children were from immigrant families, about half were themselves U.S. born. Among Mexican- and other Latino-origin children, 81 and 67%, respectively, were U.S. born, while only 17% of non-Latino-origin children were U.S.-born. Only 7% of the children in our sample had a native-born parent; most had two immigrant parents.

Pre- and post-migration SES, indicated by work status, ISEI, and education, reveal interesting patterns. Consistent with previous research (Akresh, 2006), there is occupational downgrading across the board. Post-migration ISEI is 8 points lower than pre-migration ISEI on the ISEI scale of 16-88. This is equivalent to changing occupation from an electrical or electronic engineer (ISEI=68) to a physical therapist (ISEI=60), or from a garment worker (ISEI=24) to a housekeeper or cleaner (ISEI=16). Occupational downgrading is consistent across origin groups. Mexican parents were downgraded by about 7 points and other Latino groups were downgraded by about 9 points. Both before and after migration the non-Latino-origin parents had higher occupational status than Mexican and other Latino parents. There is no post-migration difference between the Mexican and other Latino immigrant parents (both had ISEI scores of about 36).

The most interesting finding regarding work status is that, while only 69% of Mexican children had parents who worked prior to immigration, all Mexican children (100%) had at least one working parent after immigration. The non-Mexican Latino parents had work patterns that were similar to those of Mexican parents, but they did not reach full employment. Non-Latino parents had lower levels of post-migration work than Latino parents.

On average immigrants had about 11 years of education at arrival, and obtained a little more than one addition year of education after arrival. There is significant variation in education across groups, with Mexican parents arriving with the least education (a little less than 9 years), non-Latino parents arriving with the most (about 14 years), and other Latino-origin parents in between (11 years). The additional education received in the United States does not vary significantly across groups. Thus, the educational differences found among immigrant parents primarily reflect pre-migration differences.

About 22% of the parents were proficient in English before immigration, but there are significant variations by origin group. Mexican-origin parents are the least likely to have been proficient (9%), followed by other Latino-origin parents (18%) and non-Latino parents (33%). There are also significant differences between origin groups in years of residence in the United States prior to obtaining legal status. Mexican parents had stayed longer before legalization (13 years) than non-Mexican Latinos (11 years) and non-Latino immigrants (4 years). According to Hayes and Hill (2008), many of the NIS legal immigrants were initially undocumented migrants.

Concerning differences in cognitive stimulation in the home, Mexican-origin children had the least stimulating home environments. This is consistent with the lower ISEI and lower education of Mexican immigrant parents. The other Latino-origin children also have lower scores on the home environment scale, as compared with non-Latino-origin children.

Table 1 begins to shed light on our first research question: Is pre-migration parental SES (education, work status, and occupational status) replicated in post-migration parental SES? In the aggregate, there is occupational downgrading and increased employment between the pre-migration and post-migration periods. However, Table 2 more directly answers the question by presenting a correlation matrix that includes all pre- and post-migration parent characteristics.

Table 2 shows that the indicators of parental SES—ISEI, education, and work status—are positively correlated *within* the pre- or post-migration time periods. However, positive correlations are not necessarily found *across* the pre- and post-migration measures. There is a strong positive correlation between pre- and post-migration ISEI (r=.49, p<.01), but pre- and post-migration work statuses have a weak negative correlation (r=-.08, p<.01). The correlation between pre- and post-migration education is also negative and the magnitude is substantial (r=−.37, p<.01). An exploratory analysis shows that about 26% of the parents in our sample increased their education after immigration, with the amount of U.S. education depending partly on age at arrival. One quarter of the immigrant parents arrived in the United States before they reached age 22. These individuals tended to have less pre-migration education than other immigrant parents, and 35% of them continued schooling in the United States. In contrast, only 19% of those who arrived between ages 31-37, and 12% of those who arrived when they were older than age 37 continued their schooling.

Overall, the answer to our first research question regarding whether pre-migration SES is replicated in post-migration SES is mixed due to the multi-dimensional nature of SES. Immigrant parents' pre-migration ISEI is roughly reproduced in the United States, but employment status and additional education obtained are not.

Pre-migration Parental Attributes and the Cognitive Home Environment

The results in Table 3 address our second research question: Do pre-migration parental characteristics significantly predict the cognitive stimulation provided in children's homes, over and above post-migration parental characteristics? Our analysis is based on OLS regressions with the cognitive home environment as the dependent variable. Model 1 includes only child characteristics and shows that U.S.-born children experienced more cognitive stimulation in the home than foreign-born children. Mexican- and other Latino-origin children experienced less cognitive stimulation at home than other children. In model 2 we added post-migration parental attributes; this attenuated but did not eliminate the disadvantage of Mexican and other Latino children. The only post-migration attribute that is related significantly to the cognitive home environment is ISEI. In model 3, however, three the four pre-migration parental characteristics significantly predict the cognitive home environment. When both pre- and post-migration attributes are included (model 4), parental education and English proficiency at arrival—and education in the United States and ISEI after arrival—are significant predictors of the cognitive home environment. What is important about these results is the long-lasting impact of parental characteristics at arrival, even net of parental attributes much later in time.

In short, the answer to the second research question is affirmative. Some pre-migration parental characteristics predict the cognitive stimulation in children's homes, over and above post-migration parental attributes.

Predicting Children's WJ Scores

Table 4 shows OLS regression results from models predicting WJ test scores with only children's characteristics. U.S.-born children scored higher than did foreign-born children in reading comprehension and applied problems. They also did marginally better on word identification (p<.10), but they were not advantaged in calculation. In contrast, an achievement gap by origin is apparent in all test areas. Mexican-origin children have the lowest test scores, and other Latino students have lower test scores than do non-Latinos.

Tables 5 and 6 add parental characteristics to these models in order to address our third and fourth research questions: Do pre-migration characteristics of immigrant parents significantly predict children's academic achievement, over and above post-migration parental characteristics? Can variations in children's test scores by parents' country or region of origin be explained by the pre- or post-migration characteristics of their parents, or both?

In Table 5 we contrast models in which post-migration parental attributes (model 1 and model 2 in Panel A) and pre-migration parental attributes (model 3 and model 4 in Panel B) were separately added to the previous statistical model. Model 1 shows that post-migration ISEI and work status significantly predict children's test scores. The effect size of an increase in 10 post-migration ISEI units is about 10% of a standard deviation of a test score, which is substantively small. By contrast, post-migration work status significantly increases 3 out of 4 test scores by 41 to 57% of a standard deviation. Post-migration parental SES (ISEI, education, and work-status) as a whole accounts for a small amount of the nativity gap in comprehension and applied problems - .08 and .04 of a standard deviation of test scores, respectively. This was calculated by comparing coefficients in model 1 with corresponding coefficients in Table 4. Controlling for post-migration parental SES, non-Mexican Latino groups are no longer disadvantaged at the .05 level of statistical significance. However, there is a persistent Mexican disadvantage relative to non-Latino children. After taking into account the number of years parents resided in the United States in model 2, no nativity gaps remain, but the Mexican disadvantage persists across all tests.

As seen in models 3 and 4, pre-migration parental education is a highly significant predictor of children's academic achievement, as is parental English proficiency at arrival. Judging from the R-squared statistics in model 1 and model 3, pre-migration parental SES plays as important a role as post-migration parental SES in explaining test score differences. The disadvantages of Latino-origin children, including Mexican-origin children, are largely eliminated after pre-migration SES is taken into account. However, the nativity gap persists in three out of four tests. Adding parents' English proficiency at arrival to model 3 did not change the nativity gaps or the coefficients for education at arrival, the latter pattern suggesting that the influence of pre-migration SES is independent of the English proficiency of parents. By and large, post-migration characteristics explain differences by the children's nativity, but pre-migration characteristics account for differences by origin.

It appears from Table 5 that individual variables within the SES construct operate differently depending on whether they were measured before or after migration. Test scores are significantly associated with underlined pre-migration parental education (panel B) and with underlined post-migration ISEI and work (panel A). However, drawing conclusions about the relative importance of pre- and post-migration SES based on Table 5 would be premature due to the complex relationships between the pre- and post-migration SES variables. Therefore, we next considered both sets of variables simultaneously. Model 1 in Table 6 for each test shows that all differences by nativity and origin are explained by the pre- and post-migration characteristics combined, highlighting the need to consider both sets of variables to account

for the well-documented differences in academic achievement among children of immigrants.

Among the pre-migration characteristics, parents' education is the most consistent predictor of children's later academic achievement. In addition, after controlling for pre-migration education, significant positive associations between post-migration education and both word identification and reading comprehension emerged. As previously mentioned there is a negative (-.37; p. < .01) correlation between parents' pre- and post-migration years of education, reflecting the fact that immigrants who arrive with little education tend to obtain more schooling in the United States. The positive association between parents' post-migration education and children's achievement became apparent once their lower pre-migration education was taken into account. In terms of the standardized coefficient (beta), the effect size is larger for pre-migration than post-migration education. An increase of a standard deviation of post-migration education raises test scores by 5-21% of a standard deviation ((.01 or .04)*5.19/1); while an increase of a standard deviation of pre-migration education raises test scores by 14-27% of a standard deviation ((.02 or .04)*6.79/1). When pre- and post-migration education are combined in model 1 (results not shown), the size and significance of the coefficient for the total amount of parental education are similar to the size and significance of pre-migration education alone.

Comparing pre- and post-migration work status, post-migration status is a more consistent and significant predictor of children's test scores than pre-migration status. Parents' current work is more likely to impact a child's lifestyle and standard of living than parents' work in the past. In addition, employment in the United States is likely to generate social capital, thereby helping parents navigate the school system. Although the coefficients for post-migration work status appear large for three out of four tests, the effect sizes in terms of the beta are less than those of pre-migration parental education. An increase of a standard deviation in post-migration work status raises test scores by 2-15% of a standard deviation ((.06 or .52)*.28/1).

Based on Tables 5 and 6, the answers to our third and fourth research questions are positive. Pre-migration characteristics of immigrant parents are important in explaining test score differences, over and above post-migration characteristics. Further, pre-migration characteristics account fully for differences in children's test scores by country or region of origin.

The Mediating Role of Home Environment

Model 2 in Table 6 addresses our final research question: Does the cognitive stimulation provided at home mediate the relationships between parental characteristics and children's academic achievement? After taking into account the cognitive home environment, the R-squared statistics increase marginally by 1-2% and the parameter estimates are somewhat smaller. The estimate for post-migration ISEI is no longer statistically significant at the .05 level for two tests. Post-migration education also becomes insignificant for the word identification score. The implication is that the level of cognitive stimulation in the home accounts for a relatively small portion of the influence of pre- and post-migration characteristics on test scores.

DISCUSSION

Immigrant groups arrive in the United States with different socioeconomic backgrounds and levels of English language proficiency. Past research has not fully considered how these pre-migration resources shape the outcomes of children in the next generation. This study reveals the roles played by several pre-migration characteristics of immigrant parents in

children's academic achievement, as measured by the Woodcock Johnson III tests. First, pre-migration SES contributes significantly to post-migration SES, albeit in different directions for different indicators. Parents' pre-migration education is significantly and negatively correlated with the attainment of additional education subsequent to immigration. Pre- and post-migration work statuses are also negatively correlated. Most parents who were not employed before migration find jobs in the United States. Occupational downgrading appears across the board, but the *relative* occupational status of immigrant parents before migration is by and large reproduced after migration. At the same time, the distance between the top and bottom occupational status shrinks substantially, with the standard deviation reduced by half. Taken together, immigrant parents' resources (educational attainment, work status, and occupational status) are more equally distributed after migration than they were before - the rich get poorer, while the poorest find jobs and the less educated obtain more schooling. It appears that social stratification among the immigrant families we studied would have been greater had these families not made the move to the United States. This equalizing effect of immigration suggests that post-migration SES does not fully capture the advantages or disadvantages that immigrant parents bring to the home environment and to the outcomes of their children.

Second, the level of cognitive stimulation in the immigrant home is significantly related to parents' pre-migration education and English skills, over and above their post-migration SES. The association between cognitive stimulation in the home and pre-migration occupational status is mediated primarily through post-migration occupational status. The low levels of pre- and post-migration SES and English proficiency among immigrant parents from Latin America (other than Mexico) partly explain why they are less able than non-Latino immigrants to provide homes with a high level of cognitive stimulation.

Third, the amount of test score variance explained by pre-migration parental attributes is similar to the amount explained by post-migration parental attributes. Adding measures of pre-migration SES to models predicting test scores with post-migration SES characteristics explains only a few more percentage points in the test score variances. Thus, from the perspective of improving the variance explained (i.e., R-squared), one does not miss much by leaving out pre-migration parental characteristics. At the same time, pre-migration education is more strongly associated with children's academic achievement than any other parental attribute. Separation of pre- and post-migration education also reveals the importance of post-migration parental education to children's scores on two English-related tests. Previous studies predicting outcomes of immigrants' children typically used parents' highest level of education. Although the total amount of parental education is as good a predictor as parents' pre-migration education, the use of the overall measure obscures the association between parents' education obtained after immigration and children's academic achievement.

Fourth, consistent with past research using national samples of young children (Glick & Hohmann-Marriott, 2007; Reardon & Galindo, 2009), our study shows that Latino children have lower academic achievement than non-Latino children, with Mexican children having the lowest achievement scores. Unlike past research, we are able to account for the Mexican test score disadvantage with a few variables. Pre-migration parental characteristics alone completely explain the Mexican disadvantage; post-migration parental attributes do not. This is not to say that post-migration attributes do not matter. They do explain some variations in test scores for all children of immigrants regardless of their race or ethnicity.

Racial and ethnic diversity is an enduring finding in research on educational outcomes of children of all ages (Glick & Hohmann-Marriott, 2007; Kao & Thompson, 2003). Behind pan-ethnic diversity, there are specific country-of-origin differences. These racial-ethnic and

country-of-origin differences remain robust despite rigorous statistical control of a range of post-migration family, school, and neighborhood factors (Reardon & Galindo, 2009; Glick & Hohmann-Marriott, 2007; Pong & Hao, 2007). Feliciano used a group-level measure of immigrant parents' education relative to the average education in the origin country to account for the Asian-White and Latino-White gap in college attainment among 1.5 generation persons aged 20-40 in the United States. Group-level relative educational status also completely accounted for the Asian-White gap in college attainment among second-generation persons in the same 20-40 age group (Feliciano, 2005a, 2006). Our results extend Feliciano's approach by using individual-level pre-migration and post-migration parental characteristics to explain national-origin gaps in children's academic achievement. Future research should evaluate the relative merit of the group-level and individual-level measures of pre-migration SES.

The NIS data permitted us to go further than previous investigations by comparing the influence of post-migration characteristics with that of pre-migration characteristics. The NIS sample is, however, limited by the absence of children of native parents. This is not an important limitation for our study, given our focus on pre-migration parental characteristics, which by definition are relevant only for immigrant parents. However, it is important to reiterate that the NIS study was restricted to legal immigrants. Thus, the findings of our study are generalizable only to the children of legal immigrants.

Fifth, cognitive stimulation at home does not explain the associations between children's academic achievement, on the one hand, and pre- or post-migration parental SES and English language proficiency, on the other. Nonetheless, inclusion of the cognitive home score does attenuate some of the relationships. It is possible that pre- and post-migration parental resources are passed on to children primarily through extra-familial channels, such as the school. Immigrant families' pre-migration resources are likely to play a major role in where immigrants settle in the United States, the kinds of economic activities that are available to them, and the quality of the schools their children attend. Crosnoe (2005) found that young Mexican children who come from poor families disproportionately experience problematic school contexts. Family background partly explained Mexican children's problematic school contexts, which in turn were associated with their low academic achievement. School quality might exacerbate differences in academic achievement among immigrants' children, even when their post-migration home backgrounds were relatively similar.

Our research reveals important continuity between immigrants' resources at their origins and destinations. Even after the transformative event of immigration, family social privilege or disadvantage often persists and is transmitted to subsequent generations. The continuity does not rest so much on specific job skills, as occupational downgrading affects immigrants across the board, but on general human capital, indicated by years of schooling (Ross & Mirowsky, 1999). Even though the quality of schooling varies within and across countries, general human capital acquired from formal schooling abroad has as much impact on children's cognitive home environments as formal schooling acquired in the United States. Pre-migration education may have a low value in the U.S. labor market, but it pays off well in terms of children's academic achievement. Post-migration education, on the other hand, is only associated with children's achievement on English-related tests. These findings suggest that immigrant parents' success in obtaining additional education in the United States will contribute to their children's academic achievement, especially when their formal schooling prior to immigration is relatively low.

An important policy implication of our findings is that adult literacy programs that aim to increase Mexican parents' education would have clear payoffs for their children. Mexican

parents arrive with relatively low educational attainment. An additional year of schooling in the United States would be expected to significantly increase children's test scores in word identification and comprehension. Presumably, this would contribute to better educational outcomes, thereby enabling Mexican-origin children to break the cycle of poverty when they reach adulthood. Also potentially important are programs that increase employment among immigrant parents; however, since all Mexican immigrant parents in the NIS are employed, it is unlikely that such programs would increase their children's academic achievement.

Previous studies have reported the existence of an oppositional culture among minority adolescents, including second-generation Mexicans. This culture is believed to be a key source of U.S.-born Mexican youths' school failure (Matute-Bianchi, 1991). Our study, by contrast, demonstrates that the meager resources brought by Mexican immigrant parents explain why young Mexican children fall behind in academic achievement, relative to children in other ethnic groups. Academic disadvantage is cumulative. It is likely that by the time Mexican students enter high school, they are so far behind their non-Mexican peers that they lose hope for their future, which further leads to negative attitudes and anti-school behaviors. Policies that target Mexican children's schooling should start early in pre-school or elementary school. Previous research found that students from schools defined as failing under the No Child Left Behind legislation benefit from supplemental educational services (U.S. Department of Education, 2007). Participation in school-sponsored extra-curricular activities has positive effects on students' academic achievement by promoting positive non-cognitive traits (Feldman & Matjasko, 2005). Therefore, we recommend after-school tutoring and school-based extra-curricular activities during elementary school for all low SES children, of whom Mexican children make up the largest percentage. Additionally, teachers should be trained to understand that Mexican children's relatively low academic achievement is due mainly to the disadvantages associated with their immigrant background, not to ethnic culture or genetic factors.

Acknowledgments

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Table 1

Sample Means of Child and Parental Characteristics by Origin and Nativity Groups

	All		Latin American Origin		Non-Latino Origin
	M	**SD**	**Mexico**	**Other Latino**	**Origin**
Test Scores					
Word	(All test scores have a mean of 0 and a standard deviation of 1)		−0.28 ***,b	0.02	0.07
Comprehension			−0.27 ***,b	−0.02	0.10
Applied Problems			−0.22 ***,b	0.03	0.06
Calculate			−0.23 ***,b	0.02	0.04
Child Demographic Characteristics					
Age	8.90	(2.31)	8.62 *,b	9.15 *	8.95
US-born	0.51	(.68)	0.81 ***,b	0.67 **	0.17
One US parent	0.07	(.39)	0.07	0.04 *	0.03
Latino origin - Mexico	0.27	(.68)	1.00	0.00	0.00
Latino origin - other	0.31	(.66)	0.00	1.00	0.00
Other origin	0.43	(.72)	0.00	0.00	1.00
Parental Characteristics - premigration					
Premigration ISEI	49.23	(68.85)	42.96 ***,a	46.80 **	56.00
Premigration work	0.75	(.72)	0.69 **	0.70 **	0.85
Education at arrival	11.30	(6.79)	8.77 ***,b	10.70 **	13.55
English at arrival	0.22	(.61)	0.09 ***,b	0.18 **	0.33
Parental Characteristics - postmigration					
Postmigration ISEI	41.09	(34.02)	36.15 **	36.90 **	47.50
Postmigration work	0.95	(.28)	1.00 **,b	0.97 **	0.89
Education in U.S.	1.31	(5.19)	1.54	1.47	1.08
Years in U.S.	8.70	(10.81)	12.98 ***,b	10.86 **	3.88

	All		Latin American Origin		Non-Latino
	M	SD	Mexico	Other Latino	Origin
Cognitive HOME	99.59	(19.76)	95.75[**],[b]	98.72[**]	102.91
Observations	2147		477	603	1038

Note: The non-Latin origin group do not include U.S.-origin (N=29).

All statistics are based on 5 imputed datasets.

[**]
p<.01

[*]
p<.05. Reference group is non-Latin American origin.

[a]
p<.05

[b]
p<.01 for difference between Mexico and Other Latin America.

Table 2

Correlation Analysis of All Independent Variables

	1	2	3	4	5	6	7	8
1 Premigration ISEI	1.00							
2 Premigration work	.22**	1.00						
3 Education at arrival	.51**	.17**	1.00					
4 English at arrival	.23**	.01	.30**	1.00				
5 Postmigration ISEI	.49**	.10**	.29**	.33**	1.00			
6 Postmigration work	−.07**	−.08**	−.09**	.04	.03	1.00		
7 Education in U.S.	.01	−.05	−.37**	.07**	.17**	.09**	1.00	
8 Years in U.S.	−.22**	−.19**	−.35**	−.03	−.10*	.27**	.22**	1.00
9 Cognitive HOME	.27**	.10**	.33**	.08**	.37**	.02	.08**	−.02

**
p<.01.

Table 3

Regression Analysis of Cognitive Stimulation at Home

	Model 1	Model 2	Model 3	Model 4
<u>Child Characteristics</u>				
US-born	3.1 **	1.14	3.73 **	1.68
One U.S. parent	2.45	1.29	3.55	2.5
Latino origin - Mexico	−8.7 **	−6.27 **	−4.33 **	−3.21 *
Latino origin - other	−5.22 **	−2.94 *	−2.42	−1.41
<u>Post-migration parental attributes</u>				
Education in U.S.		0.16		0.65 **
Postmigration ISEI		0.25 **		0.16 **
Postmigration work		0.22		−0.08
# years in U.S.		0.16		0.16
<u>Pre-migration parental attributes</u>				
Education at arrival			0.39 **	0.67 **
Premigration ISEI			0.1 **	0.02
Premigration work			1.94	2.17
English at arrival			6.42 **	4.51 **
R-square	0.050	0.135	0.141	0.192

N=2,147. Regressions are done on 5 imputed datasets and are corrected for design effects.

**
p<.01,

*
p<.05

Table 4

Regressing Test Scores on Child Characteristics

	Word Identification	Comprehension	Applied Problems	Calculation
<u>Nativity of Child and Parent</u>				
US-born	0.12	0.24 [**]	0.21 [**]	0.05
One U.S. parent	−0.07	−0.11	−0.09	−0.13
<u>Origin (ref: origin in Africa/Asia/Europe):</u>				
Latino origin - Mexico	−0.31 [**]	−0.33 [**]	−0.30 [**]	−0.26 [**]
Latino origin - other	−0.14 [*]	−0.18 [*]	−0.16 [*]	−0.19 [**]
R-square	0.022	0.018	0.016	0.030

N=2,147. Regressions are run on 5 imputed datasets and are corrected for design effects.

All tests are age-adjusted.

[**] p<.01,

[*] p<.05.

Table 5

Regression Analysis of the Relationship Between Test Scores and (Separately) Pre- and Post-migration Characteristics

	Word Identification		Comprehension		Applied Problems		Calculatation	
(Panel A)	M.1	M.2	M.1	M.2	M.1	M.2	M.1	M.2
Child Characteristics								
US-born	0.07	0.01	0.16 *	-0.03	0.17 *	0.05	0.04	-0.01
One U.S. parent	-0.13	-0.14	-0.13	-0.15	-0.17	-0.18	-0.16	-0.16
Latino origin - Mexico	-0.23 *	-0.25 *	-0.26 *	-0.32 *	-0.26 *	-0.30 *	-0.19 *	-0.20 *
Latino origin - other	-0.05	-0.06	-0.11	-0.15	-0.11	-0.14	-0.12	-0.13 *
Post-migration parental attributes								
SES								
Education in U.S.	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Post-migration ISEI	0.01 **	0.01 **	0.01 **	0.01 **	0.01 **	0.01 *	0.01 **	0.01 **
Post-migration work	0.43 **	0.41 **	0.53 **	0.50 **	0.57 **	0.52 **	0.07	0.06
# years in U.S.		0.01		0.01 *		0.02 **		0.00
R-square	0.342	0.343	0.287	0.291	0.272	0.279	0.526	0.526
(Panel B)	M.3	M.4	M.3	M.4	M.3	M.4	M.3	M.4
Child Characteristics								
US-born	0.18 **	0.15 *	0.27 **	0.25 **	0.29 **	0.25 **	0.09	0.08
One U.S. parent	0.00	-0.05	0.00	-0.03	-0.05	-0.01	-0.06	-0.08
Mexico	-0.16	-0.09	-0.17	-0.13	-0.20	-0.13	-0.16	-0.14
Other Latin Am	-0.05	0.00	-0.07	-0.04	-0.11	-0.06	-0.12 *	-0.11
Pre-migration parental attributes								
SES								
Education at arrival	0.03 **	0.03 **	0.03 **	0.02 *	0.02 **	0.02 *	0.02 *	0.02 *
Pre-migration ISEI	0.00	0.00	0.00	0.00	0.00	0.00	0.004 **	0.004 **
Pre-migration work	0.01	0.02	0.05	0.07	0.18 *	0.19 **	0.05	0.05
English at arrival		0.32 **		0.36 **		0.19 *		0.09

	Word Identification	Comprehension	Applied Problems	Calculatation
R-square	0.337	0.353	0.269	0.289	0.269	0.275	0.529	0.531

N=2,147. Regressions are run on 5 imputed datasets and are corrected for design effects.

All test scores are age-adjusted.

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p<.01,

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p<.05.

Table 6

Regression Analysis of the Relationship Between Test Scores and Pre- and Post-migration Characteristics (Combined)

	Word Identification		Comprehension		Applied Problems		Calculatation	
	M.1	M.2	M.1	M.2	M.1	M.2	M.1	M.2
Child Characteristics								
US-born	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
One U.S. parent	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Latino origin - Mexico	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Latino origin - other	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Post-migration parental attributes								
Education in U.S.	0.03 *	0.02	0.04 **	0.03 *	0.02	0.02	0.01	0.01
Postmigration ISEI	0.004 *	0.00	0.00	0.00	0.00	0.00	0.003 *	0.00
Postmigration work	0.39 **	0.39 **	0.48 **	0.48 **	0.52 **	0.52 **	0.06	0.06
# years in U.S.	0.01	0.00	0.01	0.01	0.02 **	0.02 **	0.00	0.00
Pre-migration parental attributes								
Education at arrival	0.04 **	0.03 **	0.04 **	0.03 **	0.03 **	0.03 *	0.02 **	0.02 *
Premigration ISEI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Premigration work	0.03	0.01	0.08	0.06	0.21 **	0.19 **	0.06	0.05
English at arrival	0.24 **	0.20 **	0.26 **	0.22 **	0.12	0.08	0.05	0.02
Cognitive HOME		0.01 **		0.01 **		0.01 **		0.01 **
R-square	0.376	0.391	0.326	0.343	0.307	0.324	0.537	0.544

N=2,147. Regressions are run on 5 imputed datasets and are corrected for design effects. All test scores are age adjusted.

**
 p<.01,

*
 p<.05.