Developmental Psychology
2008, Vol. 44, No. 6, 1572–1590

0012-1649/08/$12.00 DOI: 10.1037/a0013886

The Academic Trajectories of Children of Immigrants and Their School Environments

Wen-Jui Han
Columbia University

Data from approximately 14,000 children in the Early Childhood Longitudinal Survey–Kindergarten Cohort were analyzed to examine the associations between children's immigrant status and their academic trajectories from kindergarten to 3rd grade, with particular attention to the effects of school environments. Growth curve modeling results indicated that most children of Latin American origin improved their reading and math scores faster than non-Hispanic White children, thus narrowing their initial score gap and sometimes even surpassing White children by 3rd grade. In contrast, although they maintained higher reading and math scores, children from East Asia and India showed decreasing scores over time, which tended to narrow their initial score advantage over non-Hispanic White children. School-level factors accounted partially for these differences. Particularly in terms of the academic trajectories, children of Latin American origin responded more to school-level factors than did children of Asian origin, who responded more to child and family background, with the exception of children from Vietnam, Thailand, Cambodia, and Laos, who responded more to school-level factors. Simulation results point to the importance of school resources for the academic trajectories of children of immigrants.

Keywords: academic trajectory; school-aged children; ECLS–K; immigrants; school environment

Supplemental materials: http://dx.doi.org/10.1037/a0013886.supp

Today, nearly 17% of children under age 18, or 11.5 million children, are living with a foreign-born householder, and the percentage is almost double for children under 6 years old (U.S. Census Bureau, 2004). Between 1990 and 2010, children of immigrants are expected to account for more than half of the growth in the school-aged population (Nord & Griffin, 1999). The learning and development of children of immigrants will be affected in part by how well schools understand the cultures and unique experiences of these children, especially at the time of school entry and during the transition to first grade, both of which are considered to be critical periods for children's academic and social development (Entwisle & Alexander, 1989, 1998; Pianta & Walsh, 1996). Studies have also shown that the level of academic performance by third grade is highly stable thereafter (Entwisle & Alexander, 1999; Rutter & Maughan, 2002). Therefore, it is important to identify early on the factors that help prepare the children of immigrants for success and protect them from risk in the primary grades.

Previous research has shown that immigrant adolescents, particularly those from Asia, perform as well as if not better than native-born children (e.g., Caplan, Choy, & Whitmore, 1991; Fuligni, 1997; Kao & Tienda, 1995; Rumbaut, 1994). In contrast, the performance of some children, for example those from Latin America, tends to overlap with or fall below that of native-born children (Conchas, 2001; Kao & Tienda, 1995; Portes & Zhou, 1993; Rumbaut, 1995; Suárez-Orozco & Suárez-Orozco, 1995). While family background factors (e.g., socioeconomic status) are important in shaping the academic performance of children in immigrant families (e.g., Chao, 2001; Fuligni, 1997; Fuligni, Tseng, & Lam, 1999; Kao & Tienda, 1995), qualitative studies have also illustrated the importance of school contexts, particularly for minority and low-income students (e.g., Conchas, 2001; Louie, 2001; Suárez-Orozco & Suárez-Orozco, 1995, 2001). However, few empirical immigrant studies have examined school influences (see Crosnoe, 2005, for a recent exception). In addition, the vast majority of research has been conducted at one point in time, so we have relatively limited knowledge about whether children of immigrants catch up with or lag further behind their counterparts over time.

The raw reading and math trajectories from kindergarten to third grade for the children analyzed in the present study reveal a paradoxical pattern (see Appendix Figures 1 and 2 in the Supplementary Materials). Immigrant children from South American and Cuba exhibit a noteworthy increase in reading scores relative to their peers, while children of immigrants from Central America, Mexico, and Cuba also demonstrate a sizable increase in math. In contrast, children of immigrants from the Dominican Republic, East Asia, and India exhibit a substantial decrease in reading relative to their peers. The question is, then, what factors might account for these diverging academic trajectories by racial–ethnic group? Is this a natural process (e.g., regression to the mean), or does it have something to do with children's surrounding environments? This study used a large, contemporary longitudinal dataset, the Early Childhood Longitudinal Survey—Kindergarten Cohort

I gratefully acknowledge support from the Foundation for Child Development Young Scholars Program. I would like to thank Patrick Roysten for generously sharing his STATA program for multilevel analyses of multiple imputed datasets before releasing it for public use. I also would like to thank Jane Waldfogel and Jennifer Hill for valuable comments and Rocky Citro for wonderful editorial assistance.

Correspondence concerning this article should be addressed to Wen-Jui Han, Columbia University School of Social Work, 1255 Amsterdam Ave., New York, NY 10027. E-mail: wh41@columbia.edu

(ECLS–K), which contains rich information on school environments, to examine the school's role in shaping the academic trajectories of children of immigrants. The study was focused on Latin American and Asian ethnic groups for three reasons: first, they have been and are projected to be the fastest growing groups in the United States; second, the research to date has found that they exhibit significantly different academic performance than non-Hispanic White children; and last, a long-standing empirical void has largely prevented educators and psychologists from understanding the academic trajectories of children in these groups.

While the family undoubtedly serves as the most important force in children's learning and development, schools serve as another important influence by being children's first connection to the external macroenvironment and the place where they spend the majority of their day.[1] A large body of literature has shown that schools can affect children's academic performance both negatively and positively (e.g., Alexander & Entwisle, 1988; Alexander, Entwisle, & Olson, 1997; Entwisle & Alexander, 1989, 1998; Pianta & Walsh, 1996). Both how teachers interact with students in the classroom (e.g., Benard, 1991; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Entwisle & Alexander, 1998; Henderson & Milstein, 1996; Pianta, La Paro, Payne, Cox, & Bradley, 2002; Saft & Pianta, 2001; Sbarra & Pianta, 2001; Werner & Smith, 1989) and the school's structural resources and learning environments (e.g., Bennett, Elliott, & Peters, 2005; Borman & Overman, 2004; Crosnoe, 2005; Griffith, 1998, 2002; National Institute of Child Health and Human Development Early Child Care Research Network, 2003; Suárez-Orozco & Suárez-Orozco, 2001; Valenzuela, 1999) are undoubtedly important in this regard.

For example, teachers' perceptions of first graders have been found to not only differ systematically by race and class but also to be related to student performance as much as 9 years later (Entwisle & Hayduk, 1988). Teachers have also been found to have less positive (or more negative) interactions with students from low-income families or in poverty-stricken schools (Pianta et. al, 2002). This is especially harmful because teacher–child relationships matter greatly to children's academic learning process and their resulting achievements (Baker, 1999; Hamre & Pianta, 2001; Masten, 1994; Pianta & Walsh, 1996; Stuhlman & Pianta, 2004; Wang, Haertel, & Walberg, 1994), and early school experiences may be the most influential of all.

The educational literature has identified a number of important factors related to school environments that may promote or inhibit children's learning (Benard, 1991; Borman & Overman, 2004; Crosnoe, 2005; Griffith, 2003; Henderson & Milstein, 1996; Huff & Trump, 1996; Lee & Burkham, 2002; McNeal, 1997; Moody, 2001). These include the composition of the student body (e.g. the percentage of non-White, low-income, or limited-English-proficiency students), high achievement by students in the school (which may promote a positive learning atmosphere), school safety, and a school's commitment to providing an optimal learning experience, which may be expressed through communication to parents about children's performance and curriculum.

For example, students in schools with strong principal leadership and adequate school resources perform better academically than their counterparts (Bennett et al., 2005; Borman & Overman, 2004; Comer, 1984; Masten, 1994). Moreover, high academic standards and a supportive work atmosphere for teachers (e.g., staff cooperation) are associated with teachers doing more to promote student learning (Borman & Overman, 2004), and a safe and orderly school environment seems to help reaffirm the types of positive social behavior that resilient children often possess (Lee, Winfield, & Wilson, 1991; Masten, 1994; Smith & Carlson, 1997). However, schools that serve low-income and minority or immigrant children often fail to provide a supportive school climate, mainly by institutionalizing low academic expectations or by providing inadequate educational resources, thus jeopardizing student performance (e.g., Borman & Overman, 2004; Matute-Bianchi, 1986; Valencia, 2000; Valenzuela, 1999). Indeed, students who attend schools with high concentrations of underachieving, poor, and minority students may be at increased risk for academic failure (Wang & Gordon, 1994).

Children of immigrants are more likely to attend schools with multiple risk factors that put them in a disadvantaged position for school success (Conchas, 2001; Moody, 2001; Suárez-Orozco & Suárez-Orozco, 1995, 2001). Studies have shown that children of immigrants are likely to attend schools with a high concentration of minority students, crowded classroom space, and inadequate supplies of textbooks and materials (Crosnoe, 2005; Kasinitz, Mollenkopf, & Waters, 2004; Suárez-Orozco & Suárez-Orozco, 1995, 2001). In addition, the academic performance of some groups of immigrant children has been hindered by discriminatory treatment from teachers (Conchas, 2001; Moody, 2001; Suárez-Orozco & Suárez-Orozco, 1995, 2001). The integrative model developed by García Coll and colleagues (García Coll et al., 1996; García Coll & Szalacha, 2004) indicates that children's behavioral, emotional, and cognitive development are greatly influenced by their daily experiences and surrounding environments, both of which are significantly shaped by class position, discrimination, and oppression. Schools are undoubtedly affected by these factors and, in turn, impact the development of minority children and families.

Jointly, this theory and research suggest that children of immigrants and other students in schools with fewer resources and less advantageous characteristics are effectively segregated into an inhibiting learning environment that could stunt their academic performance. Indeed, the experiences of second-generation adolescents portrayed in a recent qualitative study (Kasinitz et al., 2004) highlighted how school quality and resources contributed to students' academic opportunities and long-term prospects: adolescents who attended schools with low teacher expectations, inadequate teaching materials, and crowded classrooms were more likely to drop out of school, while students who attended high-quality schools were more likely to attend a 4-year college.

However, school contexts may have different influences on children of diverse backgrounds (Lee & Smith, 1997). For example, studies have suggested that positive school characteristics help traditionally disadvantaged populations temper the risk factors that they face outside of school (Bryk, Lee, & Holland, 1993; Johnson, Crosnoe, & Elder, 2001; Muller, 2001). This evidence suggests that children from some immigrant backgrounds (e.g., Mexico, Dominican Republic) may be more reactive to school contexts

[1] While many children attend preschool, studies have shown that native-born children are more likely to do so than children of immigrants (who tend to be cared for by parents or through arrangements other than center-based care) (Brandon, 2002; Matthews & Ewen, 2006; Nord & Griffin, 1999).

than children from families that have more resources or that place a stronger emphasis on learning at home (e.g., Asian groups). In contrast, the immigrant literature has suggested that children may exhibit a certain form of resilience, and thus their academic achievements may be less related to school contexts than is the case for native-born children (Portes & Rumbaut, 2001; Zhou, 1997). For instance, children of immigrants tend to have a closer knit family and community than native-born children. These bonds help to instill educational values, a sense of responsibility, and positive social behavior, all of which may be important in withstanding negative peer pressures and risk factors at school (Zhou & Bankston, 1994, 1998). Indeed, this phenomenon has been documented for children of immigrants from both Asian (e.g., Zhou & Bankston, 1998) and Mexican origins (e.g., Matute-Bianchi, 1986; Valenzuela, 1999).

A large contemporary longitudinal dataset, the ECLS–K, was used to examine (a) whether children's academic trajectories differ by immigrant status and, if so, (b) how much school-level factors are able to explain such variations. The analyses focused on four dimensions of school environments that theory and empirical research have shown to be important to children's academic success: (a) resources, (b) learning environment, (c) school support and teaching environment and climate, and (d) safety.[2] Because of racial–ethnic and social class segregation in residential patterns, children are differentially selected into schools of varying resources. Thus, the influence of school-level factors on the trajectories of children of immigrants was made more transparent with a simulation that systematically varied relevant school-level factors. The net effects of school environments on children's academic trajectories were obtained with analyses that also controlled for family sociodemographic variables, the home environment, and parental educational practices (e.g., educational expectations), all of which are widely considered in both the child development (e.g., Bradley, 2002) and educational (e.g., Griffith, 2003) fields to have critical effects on children's academic achievement.

Data

The ECLS–K, collected by the U.S. Department of Education's National Center for Educational Statistics, consists of a nationally representative cohort of children (with a multistage probability sample design) who entered kindergarten in the fall of 1998 and who are being followed longitudinally. The primary sampling units (PSU) were geographic areas made up of counties or groups of counties. Schools were then sampled within PSUs. Children were drawn randomly from roughly 1,000 U.S. public and private schools with a full- or part-day kindergarten program, with an average of more than 20 children per school in the study. Thus, a national probability sample of 21,260 children in about 800 public and 200 private schools was assessed at entry to kindergarten in fall 1998. As of this writing, the children had been followed from kindergarten to third grade, with a total of 15,305 respondents.

The present study used direct assessments of children's reading and math achievement in the fall and spring of kindergarten, the spring of first grade, and the spring of third grade. Also considered was information gathered from parents on family characteristics and parental involvement in home learning and school activities, from teachers and school administrators on school characteristics, and from supervisors' observational ratings of the school environment. At each interview point, computer-assisted telephone interviews were used to collect family background information from the parent, who in most cases was the child's mother and the remainder of the time was another live-in adult who was knowledgeable about the child's schooling. About 6% of the parent interviews were conducted in a non-English language, which was Spanish 94% of the time.

Teachers and administrators completed self-administered surveys distributed and collected by field supervisors. At each data point, teachers provided information on individual students and classes and their own demographic and training backgrounds, teaching attitudes, and classroom practices. In the spring of each survey year, school administrators, principals, or headmasters reported on their own background and training and the school's student body, policies and practices, and physical, organizational, fiscal, and learning environments.

To restrict the analysis only to children from Latin American and Asian backgrounds, I excluded from analysis 1,108 children whose family roots were in other regions or who identified as having a multiracial or "other" racial–ethnic identity as well as children of immigrants from south central and western Asia for whom no significant results were found. The present sample thus consists of children in the ECLS–K who had information on any of the outcome variables during the 4-year period, resulting in a study sample of approximately 14,000 children. Of these, 58% are non-Hispanic White, 15% are non-Hispanic Black, 19% are Hispanic, and 3% are Asian. About half of the children are males. Fourteen percent of the children speak a non-English language at home. Finally, the sample includes children from diverse socioeconomic backgrounds.

It is worth noting that 7% of children (mostly those of Mexican origin) in the ECLS–K did not complete a direct reading assessment because of limited English proficiency in the fall of kindergarten. Because of students' increasing English abilities, this percentage dropped to less than 1% by the end of first grade, and by third grade, every student was assessed with reading test in English. All English- and Spanish-speaking students were administered the math assessment in all grades regardless of their language ability.

Multiple imputation (with STATA's "ice" command [StataCorp, College Station, TX]) was utilized to handle missing data (including outcome variables) with five imputed datasets. Rates of missing data were less than 1% for the demographic, family, and home environment variables measured in the fall of kindergarten, 3% for the spring of kindergarten, and 4% for the spring of first and third grades. Rates of missing data were higher for school factors but were generally below 20%. The multilevel structure of the ECLS-K data was preserved in the multiple imputation proce-

[2] A school's physical resources (e.g., whether the library, gymnasium, cafeteria, computer lab, and classroom meet the students' needs), quality of teaching space (e.g., space, size, and lighting of classrooms, library, computer labs, cafeteria, music rooms, and so forth), and teachers' and school administrators' characteristics and qualifications (e.g., education, years of teaching experience, race–ethnicity, and gender) were also examined, but no significant results were found on children's academic trajectories, and thus they were excluded from the analyses.

dure by assigning the same imputed values for school variables to students from the same school.[3]

Measures

Immigrant Status and Country of Origin

Immigrant status was determined by the parent's response to the question of (a) whether he or she was born in the United States (which was asked in the spring that the child was in first grade) and (b) whether the child was born in the United States (which was asked in the spring that the child was in kindergarten).[4] If either the parent or the child was born outside the United States, the parent was also asked to report the country from which he or she came. These questions were used to identify a family's immigrant status (coded as immigrant for children born outside of the United States and for children inside the United States if they had at least one foreign-born parent). Children's country of origin was categorized both by single country and by grouping countries with similar cultures or refugee histories (for a detailed methodology, see Portes & Rumbaut, 2006). Ten Latin American countries, Spanish-speaking Caribbean countries (hereafter, combined with Latin America for simplicity), and Asian regions were categorized as Puerto Rico,[5] Central America (e.g., Costa Rica, El Salvador), South America (e.g., Argentina, Brazil), the Dominican Republic, Mexico, Cuba, East Asia (e.g., China, Japan, Korea), Vietnam/Thailand/Cambodia/Laos, other Southeast Asia (e.g., Indonesia, Malaysia, Philippines), and India. Details on the sample's distribution by country of origin are provided in Appendix Table 1 in the Supplemental Materials. About 12% of the sample was composed of children of immigrants, with two thirds originating from Latin American countries and half of those originating from Mexico. Another 4% were children of immigrants from countries other than those examined in this study and were therefore excluded from the analyses.

For native-born children (both child and parent born in the United States), race–ethnicity was identified with four groups: non-Hispanic White (hereafter, native-born White), non-Hispanic Black, Hispanic, and Asian. Native-born Whites made up more than half of the total sample.

Academic Achievement

Direct assessments of reading and mathematics competence were collected via one-on-one testing sessions at all assessment points, using an item response theory (IRT) approach.[6] A brief language screening (the Oral Language Developmental Scale, or OLDS) was administered in the fall of kindergarten to 15% of children who were identified by teachers or school records as having a non-English language background. Approximately 51% or 1,010 of these children (7% of the overall sample) scored below the cutoff point and were administered only the mathematics and psychomotor assessments that year. By first grade, this number was down to 273, with 85% of these children's families originating from Mexico, 10% from other Latin American countries, and 5% from Asian countries. In third grade, the OLDS was not administered, and all children were assessed in English.[7] As discussed earlier, scores for children not assessed were imputed by multiple imputation.

In each assessment, floor and ceiling effects were avoided by the inclusion of a few items that almost all children would get wrong and a few that almost all children would get right (Pollack, Rock, Weiss, & Arkins-Burnett, 2005). In addition, the comparability of data was assured over time by the same assessments being used in the fall and spring of kindergarten and in the spring of first grade and by the inclusion in the third-grade assessment of several items from the earlier tests. Furthermore, the cognitive measures adopted in the ECLS–K have produced a smaller readiness gap between racial–ethnic groups compared with other datasets and methods, partly because the ECLS test was designed more recently and reflected updated methodology and administration to avoid possible racial or ethnic bias (Nisbett, 1998, 2005; Rock & Stenner, 2005).

---

[3] Another concern about the use of multiple imputation for multilevel data is the within-school covariance and how that may be taken care of in the multiple imputation. Unfortunately, thus far, there is no standard software yet that carries out multiple imputation while taking the within-school covariance (due to multilevel feature) into account in the multiple imputation procedure. It is a nontrivial task and computationally difficult. Nonetheless, the approach of including all of the variables in the final analyzed models in the multiple imputation procedure should at least partially deal with the similarity across individuals within schools (personal communication with statisticians).

[4] Because the interviewers only asked the nativity of one parent (mostly the mother) by third grade, it is likely that not all children of immigrants would be identified in the ECLS–K (e.g., for a child with a native-born mother and a foreign-born father). Thus, estimates presented may be biased downward.

[5] Although children from Puerto Rico are U.S. citizens, this article acknowledges the importance of the geographical and cultural differences between children from Puerto Rico and those born in the United States and thus separates them in the analyses. Children from U.S. commonwealths such as the Virgin Islands ($n = 20$), Guam ($n = 3$), and American Samoa ($n = 3$) were not included here because of small sample sizes and different cultural backgrounds from that of Puerto Rico.

[6] The tests were conducted in a two-stage process. Children were first given a common set of questions as a routing section with 12–20 items covering a broad range of difficulty. The second set of questions varied in regard to difficulty level, and children were administered these sections on the basis of their performance on the first set of questions. This approach maximizes measurement accuracy and minimizes the length of the assessments. Because children did not answer the same questions, the resulting score was calculated through the use of IRT, in which patterns of right, wrong, and missing answers as well as the difficulty of questions are used to place each child on a continuous ability scale. The resulting latent score is an estimate of the number of questions that the child would have correctly answered had he or she taken all available items.

[7] The raw data suggest that among immigrants, children who did not pass OLDS by first grade had different attributes (e.g., more likely to speak non-English language at home, to have more children under age 18 and more adults over age 18 living at home, to be poorer and have lower socioeconomic status, to be less likely to have attended center-based care before kindergarten, and to have mothers who were younger and had less education) from those who either passed OLDS or who were proficient in English at the start of kindergarten. However, in an ECLS–K report (Denton & West, 2002), no significant reading t score differences were found between the children who were assessed in English at all time points and the total sample, including those who were screened into the English assessment over time.

Standardized t tests ($M = 50$, $SD = 10$) were used to examine reading and math outcomes via a transformed measure of the IRT scale score. The scores represent children's abilities relative to their peers, and a change in mean t scores over time reflects a change in relative ability, which is the focus of this article. Although IRT scale and proficiency scores are both available in the ECLS–K dataset for measuring individual gains over time, gains made at different points on the IRT scale have qualitatively different interpretations for different individuals. For example, a child who makes gains in recognizing letters and letter sounds is learning a very different lesson from one who is progressing from reading words to reading sentences, although both gains may represent the same increase in scale score points. The t scores, on the other hand, are norm referenced and provide an indicator of the extent to which an individual or a subgroup ranks higher or lower than the national average and how much this relative ranking changes over time. Thus, t scores may be used longitudinally to illustrate the increase or decrease in gaps in achievement among subgroups over time rather than to directly address the skills children have (Pollack et al., 2005). Average reading and math outcomes at each assessment point are reported in Appendix Table 1 in the Supplementary Materials by children's immigrant status and race–ethnicity (for native-born children). Details about these assessments are provided later. All other model covariates are also described briefly below and are detailed in Appendix Table 2 (Supplementary Materials).

Reading (language and literacy). The kindergarten and first-grade reading assessments included questions to measure basic skills like letter and word recognition, receptive vocabulary, and comprehension. In third grade, the assessment included items designed to measure phonemic awareness, single-word decoding, vocabulary, passage comprehension, and some of the more difficult test items from the earlier assessments.

Math. The kindergarten and first-grade math assessments measured skills in conceptual and procedural knowledge and problem solving. About half of the math assessment consisted of questions on number sense, number properties, and operations. The remainder of the assessment included questions on measurement, geometry and spatial sense, data analysis, statistics and probability, and patterns, algebra, and functions. The third-grade math assessment addressed these same content areas, with a greater emphasis on problem solving.

School-Level Factors

A total of nine variables were used to evaluate the advantages and disadvantages of the schools: school resources (i.e., type of school, poor or minority student composition, provision of English-as-a-second-language [ESL] services to students, and provision of services or programs to ESL families), average student academic performance, school learning environment, school support and teaching environment (i.e., general work atmosphere and support provided to teachers), school climate, and school safety.

Child and Family Characteristics

Demographic information was collected through parent surveys at each interview. Time-invariant variables collected in the fall of kindergarten included child gender and birth weight, whether the child attended center-based care before kindergarten, family socioeconomic status (calculated from family income, parental education, and occupation), and non-English language use at home. Time-varying variables at each interview point included the number of people younger than age 18 in the household and whether the child lived in a single-parent family.

Parental Educational Practices and Home Environment

Parental educational expectations, parental participation in school events, home learning activities, and teacher-reported parental school involvement were collected in the spring of each survey year. Information on home learning activities was reported at all assessment points.

Method

Three-level growth curve modeling was used to estimate the associations between immigrant status and children's academic trajectories. Analyses were estimated with Level 1 as time (i.e., within-individual effects), Level 2 as individuals (i.e., between-individual and within-school effects), and Level 3 as schools (i.e., between-school effects). With longitudinal data involving four assessment points, children's developmental *trajectories* (growth/decay curves) were estimated instead of the individual time points typically used in multivariate regression models. Such growth curve models allow the rate of growth in each group to be compared, showing which have faster or slower learning paces over time. Three-level growth curve models also partition the outcome variance into between- and within-school portions, allowing for the most accurate estimation possible of school-level effects on individual-level outcomes and more accurate standard error estimates to account for students being nested within schools (Hox, 2002).

As recommended in the longitudinal data analysis literature (Hox, 2002; Kreft & de Leeuw, 1998; Singer & Willett, 2003), a sequence of statistical models was used to systematically evaluate (a) whether there were differences in the academic trajectories of children due to immigrant status and, if so, (b) the extent to which school-level factors could explain these variations. Typically, the first two models presented in a growth curve analysis are the unconditional means model and the unconditional growth model. The first of these models quantifies variation in outcomes across children and schools without regard to time in order to assess the amount of variation that exists at the within- and between-person and within- and between-school levels. The second of these models includes only a variable for time and allows determination of the extent to which within-person and within-school variation is systematically associated with time. Additionally, the amount of between-person and between-school variation present in this model indicates whether explanatory variables are needed. Thus, with these two models, one can establish (a) whether there is systematic variation in the outcomes that is worth exploring and (b) where that variation resides (within or between children or schools).

For brevity's sake, the results of these first two models are not presented in full, although the findings of each are described briefly in the Results section. Instead, the analysis focuses on three successively complex models that explore the main themes of the article. In Model 1, the unconditional growth model is expanded by the addition of controls for immigrant groups, race–ethnicity, and an interaction between immigrant groups and time (so that the growth rate of each immigrant group is allowed to differ). Model 2 provides additional controls for school-level factors and their interaction with time so that the effects of school-level factors are allowed to differ by time. Finally, in Model 3, controls for child and family characteristics, parental educational practices, and the home environment are added so that the associations between school characteristics and the outcome variables net of other important factors can be determined. Given that school-level factors are of primary substantive interest, they were evaluated on their own first and then after the addition of controls for other covariates (i.e., child and family characteristics, parental educational practices, and the home environment; Singer & Willett, 2003).

All continuous variables were centered at their mean values, except the dummy variables (e.g., attending public school), so that the reference child represented a realistic scenario (Singer & Willett, 2003). In addition, the variable "time" was centered so that the initial status would refer to the fall of kindergarten, which is the true starting point in this case.[8]

Results

Descriptive statistics for all variables are available on request. In general, compared with native-born White children, children of immigrants were more likely to be worse off, both in terms of a number of sociodemographic variables as well as their parents' involvement in their schooling. Regarding school characteristics, children of immigrants were more likely than native-born White children to attend schools that were public or that had a higher composition of poor or minority students, lower average academic performance, a poorer student learning environment, less school support for teachers and poorer teaching environments, a worse school climate, and poorer school safety. However, they were also more likely to attend schools that provided ESL programs and related services to their families.

Correlations among school-level predictors for the spring of third grade and the outcome variables at each time point are presented in Table 1. As evidenced in this table, there was a general baseline relationship between academic outcomes and school-level factors, which was also consistent when using school-level variables from kindergarten and first grade.

The multilevel results assess children's academic trajectories from kindergarten to third grade. Tables 2 and 3 present the reading and math results for Models 1–3. Because the focus of this article is school-level factors, estimates for child and family characteristics are not presented.

Reading

Results from the unconditional means model for reading indicated that the average child's reading trajectory was significantly different from zero between kindergarten and first grade (with a value of 50.46, $p < .001$) and that the average child's reading scores varied significantly over time among children and across schools. An important purpose of fitting this model is to calculate the intraclass correlation coefficient (ρ), a relative magnitude that describes the proportion of the total between-person and school outcome variations. In this case, coefficient values of 0.60 and 0.09 indicate that almost two thirds of the variation in reading scores was attributable to differences among children, while 9% was attributable to differences among schools.

Results from the unconditional growth model showed that the average true change reading trajectory was significantly different from zero (with a value of 50.40, $p < .001$) but had a weak, positive slope of 0.04, indicating that reading scores stayed fairly steady through all grades. Level-2 variance components quantify the amount of unpredicted variation in the individual growth parameters of initial status (60.59) and rate of change (0.37), while Level-3 variance components indicate unpredicted variation in school-level initial status (18.44) and rate of change (4.89). Most important, these figures provide benchmarks for quantifying the predictors' effects in subsequent models. Results also suggested the existence of significant variation between individuals in initial status and between schools in initial status and rate of change. Significant and negative covariance among both the Level-2 and Level-3 variance components suggested that children with initially higher reading scores relative to their peers increased these scores less rapidly over time, and schools with relatively higher initial scores increased their scores less rapidly over time as well.

In Table 2, Model 1 expands on the unconditional growth model by the addition of country of origin for children of immigrants and race–ethnicity for native-born children as predictors of both initial status and change. The coefficient estimates indicate that (a) the reading score for the average native-born White child was 52.13 ($p < .001$); (b) children of immigrants had significantly different reading scores compared with native-born White children; (c) the rate of change in reading scores for the average native-born White child was 0.20 ($p < .01$); and (d) children of immigrants from South America, Mexico, Cuba, East Asia, and India had significantly different rates of change in reading scores compared with native-born White children. This model provides *uncontrolled* answers to the first research question, suggesting that although children of immigrants from East Asia and India had higher reading scores than native-born White children, their reading scores between kindergarten and third grade had a decreasing rate. For example, the average child of immigrants from East Asia had a fitted trajectory with an intercept of 57.32 and a slope of -0.86, compared with 52.13 and 0.20 for the average native-born White child. By third grade, the reading scores were 54.74 for the former and 52.73 for the latter.

Model 2 in Table 2 allows evaluation of the associations of immigrant status with initial status and rates of change in reading scores while controlling for the effects of school-level factors on both. Results indicate that (a) the differentials in reading scores between children of immigrants and native-born White children

[8] For example, in models with controls for immigrant groups and school-level factors, the reference child would be a native-born White girl (*boy* = 1, *girl* = 0) who attended a private school (*public* = 1, *private* = 0) that had average levels of poor or minority student composition, student academic performance, student learning environment, school support and teaching environments, school climate, and school safety and that did not provide any language programs to students or services/programs to ESL families in the fall of kindergarten.

Table 1
Correlation Matrix for Analyzed Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Reading																
1. Fall K																
2. Spring K	.79***															
3. Spring F	.67***	.78***														
4. Spring T	.60***	.65***	.76***													
Math																
5. Fall K	.76***	.72***	.68***	.66***												
6. Spring K	.68***	.76***	.70***	.67***	.83***											
7. Spring F	.57***	.65***	.73***	.67***	.71***	.79***										
8. Spring T	.56***	.61***	.65***	.73***	.70***	.76***	.80***									
School-level predictors at third grade																
9. Attending public school (%)	−.18***	−.16***	−.15***	−.14***	−.18***	−.17***	−.14***	−.09***								
10. Poor/minority student composition	−.26***	−.23***	−.24***	−.32***	−.34***	−.30***	−.26***	−.28***	.26***							
11. School providing any ESL services	−.11***	−.12***	−.14***	−.17***	−.18***	−.16***	−.13***	−.12***	.07***	.30***						
12. School providing any services/programs to ESL families	−.07***	−.05***	−.06***	−.08***	−.11***	−.08***	−.06***	−.04***	.24***	.43***	.18***					
13. School supportive and teaching environments reported by teachers	.10***	.12***	.12***	.13***	.10***	.11***	.11***	.10***	−.22***	−.17***	−.05***	−.00				
14. School climate reported by school administrators	.14***	.14***	.15***	.16***	.16***	.15***	.14***	.16***	−.11***	−.33***	−.06***	−.09***	.23***			
15. School safety	.16***	.16***	.17***	.20***	.20***	.20***	.16***	.16***	−.13***	−.50***	−.16***	−.20***	.16***	.36***		
16. Student learning environment observed by field interviewer	.04***	.05***	.08***	.10***	.09***	.08***	.08***	.09***	−.02*	−.07***	−.03***	−.01	.11***	.13***	.14***	
17. Average student academic performance	.07***	.07***	.07***	.11***	.10***	.10***	.10***	.10***	−.12***	−.06***	−.02**	.23***	.14***	.12***	.12***	.10***

Note. Fall K = fall, kindergarten; Spring K = Spring, kindergarten; Spring F = spring, first grade; Spring T = spring, third grade; ESL = English as a second language.
* $p < .05$. ** $p < .01$. *** $p < .001$.

declined by 36% (for children of immigrants from the Dominican Republic) to over 100% (for children of immigrants from Vietnam/Thailand/Cambodia/Laos) but increased by 17% for children of immigrants from India, 20% for those from East Asia, and 94% for those from "other Southeast Asia"; (b) the differentials in the rates of change between children of immigrants from Cuba and native-born White children became nonsignificant (reduced by 22%); and (c) the rates of change for children of immigrants from South America, Mexico, East Asia, and India from Model 1 remained significant (these differentials increased by 3%, 47%, 10%, and 17%, respectively). Though the results from Model 1 are valid, Model 2 provides *controlled* answers to the research questions. These results show that although children of immigrants from South America and Mexico had lower reading scores than native-born White children, they had significantly increasing rates of change in their scores between kindergarten and third grade, while native-born White children had a weakly decreasing rate of change. The decreased magnitude in reading score differences in this model indicates that some of the differences between children of immigrants and native-born White children may be attributable to school-level factors. Specifically, attending a public school or a school with language programs for students was associated with significantly lower reading scores, but the former was associated with a significantly increasing rate of change over time. Average student academic performance, school support for teachers, teaching environment, school climate, and school safety were all associated with significantly higher reading scores, with student academic performance related to significantly increasing rates of change. Poor or minority student composition was significantly associated with not only lower reading scores but also decreasing rates of change over time. For example, the average child of immigrants from East Asia had a fitted trajectory with an intercept of 60.20 and a slope of −0.95, while for the average native-born White child, these values were 53.88 and −0.22, respectively. By third grade, the reading scores were 57.35 for the former and 53.22 for the latter, a 35% reduction in the difference after school-level factors have been controlled.

Model 3 in Table 2 is an improvement over Model 2 in that the effects of child and family characteristics were controlled, which allows assessment of the extent to which school-level factors explain the associations between immigrant status and academic trajectories net of other important factors. Results indicate that (a) the estimated differentials in reading scores between children of immigrants and native-born White children were further reduced for most immigrant groups, with decreases ranging from 8% (for children of immigrants from South America) to 60% (for children of immigrants from India); the exceptions were children of immigrants from Cuba and Vietnam/Thailand/Cambodia/Laos, whose estimated differentials became larger; (b) the estimated differentials in the rates of change in reading scores between children of immigrants from South America and native-born White children became nonsignificant (reduced by 18%), while they became significant for children of immigrants from Cuba and those from "other Southeast Asia" (increased by 34% and 12%, respectively); (c) although most of the estimates for the significant associations between reading scores and school-level factors were reduced from their levels in Model 2, student learning environment became associated with a significantly increasing rate of change; and (d) school services for ESL families and school climate were no longer significantly associated with reading scores.

As noted, the variance components of the unconditional growth model can be used as benchmarks to compare successive models. As seen in Table 2, within-person variance remained similar across all models, which was to be expected as no time-varying Level-1 predictors were added. Also, with the exception of Level-2 variance in rate of change, Models 1–3 all represented a reduction in all other variance components when compared with the unconditional growth model. Taken together in Model 3, immigrant status, school-level factors, and child and family backgrounds explained 26% of the variation in between-person initial status, 37% of the variation in between-person rates of change, 69% of the variation in between-school initial status, and 73% of the variation in between-school rates of change.

The fit of each model presented in Table 2 was evaluated with three goodness-of-fit indices (Kreft & de Leeuw, 1998; Singer & Willett, 2003): the deviance statistic, Akaike information criterion (AIC), and Bayesian information criterion (BIC). For each successive model, the decrease in the deviance statistic was significant at $p < .001$, indicating that Model 3 provided the best fit of all the models. The comparisons between models using the AIC and BIC were similar (the model with the smaller value is preferable).

Math

Similar to the results from the reading models, unconditional means model results for math indicates that the average child's math trajectory had a non-zero intercept (with a value of 50.74, $p < .01$) between kindergarten and third grade and that the average child's math scores varied significantly over time among children and across schools. The intraclass correlation coefficient for math scores indicates that almost two thirds of the total variation was attributable to differences among children and about 9% was attributable to differences across schools.

The unconditional growth model results show that the within-person variation in math scores was systematically associated with linear "time." The benchmarks for quantifying the effects of additional predictors were 57.82 and 0.15 at Level 2 and 18.19 and 4.52 at Level 3. As with reading scores, a significant negative Level-3 population covariance indicates that children in schools with higher initial math scores improved their performance less rapidly over time.

In Model 1 of Table 3, country of origin for children of immigrants and race–ethnicity for native-born children were added as predictors of both initial status and change. Results indicate that (a) children of immigrants (except those from India) had significantly different math scores compared with native-born White children; (b) the rate of change in math scores for the average native-born White child decreased over time, −0.14 ($p < .05$); and (c) children of immigrants from India and Latin American regions (except Puerto Rico and the Dominican Republic) had significantly steeper (increasing) rates of change. For instance, the average child of immigrants from Mexico had a fitted trajectory with an intercept of 43.39 and a slope of 1.13, whereas the figures for the average native-born White child were 53.33 and −0.14, respectively. By third grade, the math scores were 46.78 for the former and 52.91 for the latter, representing a score difference of 6.13 compared with the initial difference of 9.94.

Table 2
Results of Fitting a Sequence of Multilevel Models of Change in Reading Scores From Kindergarten to Third Grade for Children of Immigrants

Variable	Model 1			Model 2			Model 3		
	Coefficient	*SE*	95% CI	Coefficient	*SE*	95% CI	Coefficient	*SE*	95% CI
Fixed effects									
Intercept	52.130***	0.146	51.84, 52.42	53.877***	0.222	53.44, 54.31	52.401***	0.227	51.96, 52.85
Puerto Rico	−6.740***	0.979	−8.66, −4.82	−4.306***	0.969	−6.20, −2.41	−2.357**	0.968	−4.25, −0.46
Central America	−5.591***	0.646	−6.86, −4.32	−2.800***	0.646	−4.07, −1.53	−1.285*	0.638	−2.54, −0.03
South America	−3.070***	0.653	−4.35, −1.79	−1.829**	0.645	−3.09, −0.56	−1.681**	0.639	−2.93, −0.43
Dominican Republic	−5.786***	0.911	−7.57, −4.00	−3.638***	0.901	−5.40, −1.87	−1.415	0.894	−3.17, 0.34
Mexico	−9.474***	0.324	−10.11, −8.84	−5.328***	0.371	−6.06, −4.60	−3.135***	0.374	−3.87, −2.40
Cuba	−3.946**	1.256	−6.41, −1.48	−1.408	1.237	−3.83, 1.02	−2.565*	1.216	−4.95, −0.18
East Asia	5.194***	0.586	4.04, 6.34	6.328***	0.579	5.19, 7.46	5.705***	0.570	4.59, 6.82
Vietnam/Thailand/Cambodia/Laos	−1.906**	0.692	−3.26, −0.55	0.541	0.689	−0.81, 1.89	2.134**	0.687	0.79, 3.48
Other Southeast Asia	1.200*	0.537	0.15, 2.25	2.334***	0.529	1.30, 3.37	2.420***	0.518	1.40, 3.44
India	6.275***	0.804	4.70, 7.85	7.329***	0.790	5.78, 8.88	5.835***	0.775	4.32, 7.36
Non-Hispanic Black	−4.137***	0.233	−4.59, −3.68	−2.905***	0.253	−3.40, −2.41	−1.349***	0.249	−1.84, −0.86
Hispanic	−4.325***	0.245	−4.80, −3.84	−3.003***	0.251	−3.49, −2.51	−1.894***	0.247	−2.38, −1.41
Asia	−2.075***	0.419	−2.90, −1.25	−0.088	0.420	−0.91, 0.73	1.229**	0.413	0.42, 2.04
Attending public school				−2.902***	0.237	−3.37, −2.44	−1.682***	0.218	−2.11, −1.25
Poor/minority student composition				−0.249*	0.129	−0.50, 0.00	0.248*	0.122	0.01, 0.49
School providing any language programs				−4.073***	0.303	−4.67, −3.48	−2.482***	0.302	−3.07, −1.89
School providing services/programs for ESL families				0.111*	0.055	0.00, 0.22	0.085	0.050	−0.01, 0.18
Average student academic performance				0.720***	0.097	0.53, 0.91	0.332***	0.089	0.16, 0.51
Student learning environment				0.198	0.117	−0.03, 0.43	0.207	0.108	−0.00, 0.42
School support and teaching environments				0.497***	0.092	0.32, 0.68	0.293***	0.087	0.12, 0.46
School climate				0.681***	0.179	0.33, 1.03	0.109	0.165	−0.21, 0.43
School safety				0.528***	0.146	0.24, 0.81	0.442***	0.136	0.17, 0.71
Rate of change									
Intercept	0.197**	0.071	0.06, 0.34	−0.215	0.118	−0.44, 0.02	−0.162	0.108	−0.38, 0.05
Puerto Rico	0.200	0.491	−0.76, 1.16	0.316	0.487	−0.64, 1.27	−0.143	0.497	−1.12, 0.83
Central America	0.404	0.337	−0.26, 1.06	0.472	0.337	−0.19, 1.13	0.376	0.337	−0.28, 1.04
South America	0.701*	0.336	0.04, 1.36	0.772*	0.332	0.12, 1.42	0.634	0.335	−0.02, 1.29
Dominican Republic	−0.108	0.452	−0.99, 0.78	−0.094	0.447	−0.97, 0.78	−0.427	0.456	−1.32, 0.47
Mexico	0.540***	0.169	0.21, 0.87	0.794***	0.193	0.42, 1.17	0.738***	0.192	0.36, 1.11
Cuba	1.284*	0.655	0.00, 2.57	1.006	0.642	−0.25, 2.26	1.352*	0.646	0.08, 2.62
East Asia	−0.863**	0.309	−1.47, −0.26	−0.954**	0.304	−1.55, −0.36	−0.990***	0.302	−1.58, −0.40
Vietnam/Thailand/Cambodia/Laos	−0.068	0.359	−0.77, 0.64	0.058	0.357	−0.64, 0.76	0.039	0.363	−0.67, 0.75
Other Southeast Asia	−0.531	0.284	−1.09, 0.02	−0.477	0.279	−1.02, 0.07	−0.532*	0.277	−1.07, 0.00
India	−1.372***	0.424	−2.20, −0.54	−1.600***	0.415	−2.41, −0.79	−1.727***	0.413	−2.54, −0.92
Non-Hispanic Black	−0.835***	0.122	−1.07, −0.60	−0.519***	0.131	−0.78, −0.26	−0.588***	0.130	−0.84, −0.33
Hispanic	0.138	0.127	−0.11, 0.39	0.311*	0.130	0.06, 0.57	0.324*	0.130	0.07, 0.58
Asia	−0.474*	0.220	−0.90, −0.04	−0.382	0.220	−0.81, 0.05	−0.423*	0.219	−0.85, 0.01
Attending public school				0.472***	0.123	0.23, 0.71	0.457***	0.115	0.23, 0.68
Poor/minority student composition				−0.182**	0.066	−0.31, −0.05	−0.142*	0.063	−0.26, −0.02
School providing any language programs				−0.070	0.163	−0.39, 0.25	−0.144	0.161	−0.46, 0.17
School providing services/programs for ESL families				0.005	0.027	−0.05, 0.06	0.011	0.024	−0.04, 0.06
Average student academic performance				0.140***	0.038	0.07, 0.21	0.086**	0.035	0.02, 0.15
Student learning environment				0.099	0.057	−0.01, 0.21	0.108*	0.053	0.00, 0.21

(*table continues*)

Table 2 (*continued*)

Variable	Model 1			Model 2			Model 3		
	Coefficient	*SE*	95% CI	Coefficient	*SE*	95% CI	Coefficient	*SE*	95% CI
School support and teaching environments				−0.068	0.048	−0.16, 0.03	−0.042	0.046	−0.13, 0.05
School climate				0.119	0.077	−0.03, 0.27	0.120	0.072	−0.02, 0.26
School safety				−0.065	0.071	−0.20, 0.08	−0.104	0.068	−0.24, 0.03
Variance components									
Within-person	27.575***	1.189		27.517***	1.167		28.169***	1.156	
Level 2—between person									
In initial status	55.925***	1.659		53.402***	1.612		44.525***	1.535	
In rate of change	0.517	.370		0.745*	0.364		0.232	0.334	
Covariance	−1.944**	.610		−2.291***	0.598		−1.524**	0.548	
Level 3— between school									
In initial status	12.777***	.800		8.944***	0.619		5.710***	0.449	
In rate of change	3.234***	.214		2.169***	0.164		1.331***	0.117	
Covariance	−5.071***	.375		−3.500***	0.288		−2.174***	0.207	
Model fit statistics									
Deviance (= −2log-likelihood)	395426.1			392903.8			388081.7		
AIC	395496.1			393009.8			388195.7		
BIC	395807.8			393481.9			388703.4		

Note. In Model 3, the following characteristics were controlled—child's characteristics: being a boy, having low birth weight, and attending center-based care before kindergarten; family's characteristics: number of family members under age 18 at home, socioeconomic status, language other than English spoken in home, and living in a single-parent family; and parental educational practices and home environment: parental educational expectations, parents' participation in school events, home learning activities, and teacher-reported parental school involvement. CI = confidence interval; ESL = English as a second language; AIC = Akaike information criterion; BIC = Bayesian information criterion.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Results of Fitting a Sequence of Multilevel Models of Change In Math Scores From Kindergarten to Third Grade for Children of Immigrants

	Model 1			Model 2			Model 3		
Variable	Coefficient	*SE*	95% CI	Coefficient	*SE*	95% CI	Coefficient	*SE*	95% CI
Fixed effects									
Intercept	53.331***	0.137	53.06, 53.60	55.136***	0.211	54.72, 55.55	52.360***	0.231	51.90, 52.82
Puerto Rico	−9.375***	0.947	−11.23, −7.52	−6.471***	0.934	−8.30, −4.64	−4.740***	0.974	−6.67, −2.81
Central America	−8.082***	0.627	−9.31, −6.85	−4.832***	0.626	−6.06, −3.60	−3.543***	0.615	−4.75, −2.34
South America	−3.644***	0.632	−4.88, −2.40	−2.074***	0.623	−3.29, −0.85	−1.529*	0.627	−2.76, −0.29
Dominican Republic	−9.470***	0.879	−11.19, −7.75	−6.974***	0.864	−8.67, −5.28	−5.457***	0.852	−7.13, −3.78
Mexico	−9.938***	0.314	−10.55, −9.32	−7.182***	0.360	−5.89, −4.48	−3.481***	0.375	−4.22, −2.74
Cuba	−4.624***	1.219	−7.01, −2.23	−1.377	1.195	−3.72, 0.96	−2.938**	1.152	−5.20, −0.68
East Asia	2.367***	0.570	1.25, 3.48	3.677***	0.561	2.58, 4.78	3.674***	0.638	2.39, 4.96
Vietnam/Thailand/Cambodia/Laos	−2.261***	0.671	−3.58, −0.94	0.592	0.667	−0.72, 1.90	2.501**	0.762	0.96, 4.04
Other Southeast Asia	−1.243*	0.521	−2.26, −0.22	0.163	0.512	−0.84, 1.17	0.238	0.518	−0.78, 1.26
India	0.064	0.783	−1.47, 1.60	1.334	0.766	−0.17, 2.84	0.533	0.793	−1.03, 2.10
Non-Hispanic Black	−5.996***	0.226	−6.44, −5.55	−4.126***	0.247	−4.61, −3.64	−2.991***	0.255	−3.49, −2.49
Hispanic	−5.316***	0.238	−5.78, −4.85	−3.569***	0.244	−4.05, −3.09	−2.640***	0.236	−3.10, −2.18
Asia	−2.828***	0.407	−3.62, −2.03	−0.538	0.406	−1.33, 0.26	0.505	0.409	−0.42, 1.43
Attending public school				−2.916***	0.226	−3.36, −2.47	−1.743***	0.222	−2.18, −1.30
Poor/minority student composition				−0.857***	0.132	−1.12, −0.60	−0.169	0.123	−0.41, 0.07
School providing any language programs				−3.625***	0.294	−4.20, −3.05	−1.974***	0.303	−2.57, −1.38
School providing services/programs for ESL families				−0.057	0.052	−0.16, −0.04	−0.104*	0.052	−0.21, −0.00
Average student academic performance				0.641***	0.093	0.46, 0.82	0.308***	0.091	0.13, 0.49
Student learning environment				0.463***	0.112	0.24, 0.68	0.346**	0.126	0.09, 0.60
School support and teaching environments				0.469***	0.089	0.30, 0.64	0.271**	0.087	0.10, 0.44
School climate				0.654***	0.172	0.32, 0.99	0.295	0.189	−0.08, 0.67
School safety				0.531***	0.157	0.22, 0.84	0.262*	0.138	−0.00, 0.53
Rate of change									
Intercept	−0.137*	0.067	−0.27, −0.01	−0.845***	0.113	−1.07, −0.62	−0.879***	0.106	−1.09, −0.67
Puerto Rico	0.911	0.478	−0.02, 1.85	0.688	0.474	−0.24, 1.62	0.407	0.513	−0.62, 1.43
Central America	01.288***	0.330	0.64, 1.94	1.063***	0.331	0.41, 1.71	1.023**	0.329	0.38, 1.67
South America	0.646*	0.328	0.00, 1.29	0.517	0.325	−0.12, 1.15	0.281	0.333	−0.38, 0.94
Dominican Republic	0.416	0.438	−0.44, 1.27	0.214	0.433	−0.63, 1.06	0.405	0.429	−0.44, 1.25
Mexico	01.129***	0.165	0.80, 1.45	0.844***	0.190	0.47, 1.22	0.988***	0.201	0.59, 1.39
Cuba	01.428*	0.640	0.17, 2.68	0.795	0.629	−0.44, 2.03	1.407*	0.606	0.22, 2.60
East Asia	0.187	0.303	−0.40, 0.78	−0.036	0.299	−0.62, 0.55	−0.237	0.328	−0.89, 0.42
Vietnam/Thailand/Cambodia/Laos	0.377	0.351	−0.31, 1.06	0.187	0.350	−0.50, 0.87	0.035	0.382	−0.73, 0.80
Other Southeast Asia	−0.018	0.278	−0.56, 0.53	−0.120	0.273	−0.66, 0.42	−0.203	0.271	−0.74, 0.33
India	0.894*	0.416	0.08, 1.71	0.563	0.408	−0.24, 1.36	0.295	0.404	−0.50, 1.09
Non-Hispanic Black	−0.640***	0.119	−0.87, −0.41	−0.682***	0.129	−0.94, −0.43	−0.574***	0.135	−0.84, −0.31
Hispanic	0.385**	0.124	0.14, 0.63	0.301*	0.128	0.05, 0.55	0.428***	0.124	0.18, 0.67
Asia	−0.041	0.215	−0.46, 0.38	−0.209	0.215	−0.63, 0.21	−0.109	0.229	−0.56, 0.35
Attending public school				0.862***	0.119	0.63, 1.10	0.911***	0.112	0.69, 1.13
Poor/minority student composition				0.130	0.070	−0.01, 0.27	0.060	0.066	−0.07, 0.19
School providing any language programs				0.084	0.160	−0.23, 0.40	−0.027	0.163	−0.35, 0.30
School providing services/programs for ESL families				0.057*	0.026	0.01, 0.11	0.060*	0.025	0.01, 0.11
Average student academic performance				0.217***	0.036	0.15, 0.29	0.166**	0.047	0.07, 0.26

(*table continues*)

Table 3 (*continued*)

Variable	Model 1			Model 2			Model 3		
	Coefficient	*SE*	95% CI	Coefficient	*SE*	95% CI	Coefficient	*SE*	95% CI
Student learning environment				−0.042	0.055	−0.15, 0.07	0.041	0.068	−0.10, 0.18
School support and teaching environments				−0.118**	0.047	−0.21, −0.03	−0.082	0.046	−0.17, 0.01
School climate				0.217**	0.075	0.07, 0.36	0.080	0.110	−0.16, 0.32
School safety				−0.202*	0.084	−0.37, −0.04	−0.144	0.077	−0.30, 0.01
Variance components									
Within-person	25.852***	1.069		25.408***	1.037		25.266***	1.052	
Level 2—between person									
In initial status	52.490***	1.513		49.961***	1.448		43.131***	1.308	
In rate of change	0.185	0.355		0.464	0.348		0.323	0.309	
Covariance	−0.559	0.580		−0.726	0.562		−0.694	0.508	
Level 3—between school									
In initial status	10.804***	0.712		6.718***	0.510		4.892***	1.099	
In rate of change	2.635***	0.186		1.696***	0.139		1.179***	0.114	
Covariance	−4.208***	0.329		−2.613***	0.240		−1.804***	0.200	
Model fit statistics									
Deviance (= −2log-likelihood)	393614.1			391253.2			387321.6		
AIC	393684.1			391359.2			387435.6		
BIC	393995.8			391831.2			387943.3		

Note. In Model 3, the following characteristics were controlled—child's characteristics: being a boy, having low birth weight, and attending center-based care before kindergarten; family's characteristics: number of family members under age 18 at home, socioeconomic status, language other than English spoken in home, and living in a single-parent family; and parental educational practices and home environment: parental educational expectations, parents' participation in school events, home learning activities, and teacher-reported parental school involvement. CI = confidence interval; ESL = English as a second language; AIC = Akaike information criterion; BIC = Bayesian information criterion.
* $p < .05$. ** $p < .01$. *** $p < .001$.

With school-level factors controlled, the results of Model 2 in Table 3 indicate that (a) the estimated differentials in math scores between children of immigrants and native-born White children declined by about 26% (for children of immigrants from the Dominican Republic) to more than 100% (for children of immigrants from Vietnam/Thailand/Cambodia/Laos); (b) the significant differences in the rates of change from Model 3 became smaller (e.g., reduced by 17% for children of immigrants from Central America and 25% for children of immigrants from Mexico); and (c) the estimated differentials in the rates of change between native-born White children and children of immigrants from South America, Cuba, and India became nonsignificant (reduced by 20%, 44%, and 37%, respectively). The magnitude of the score differential was smaller, indicating that at least some of the differences may have been attributable to school-level factors. Specifically, except for the provision of services to ESL families, all school-level factors were significantly associated with math scores. In addition, attendance of a public school, provision of services for ESL families, average student academic performance, and school climate were all significantly associated with increasing rates of change over time, while teaching environment and school safety were associated with changes at a significantly decreasing rate. For example, the average child of immigrants from Mexico had a fitted trajectory with an intercept of 47.95 and a slope of 0.84, while the figures for the average native-born White child were 55.14 and −0.84, respectively. By third grade, the math scores were 50.49 for the former and 52.62 for the latter. In other words, after the school-level factors were controlled, the difference in math scores between these two groups decreased by 70% by third grade.

Adding controls for child and family characteristics, results in Model 3 of Table 3 indicate that (a) the differences in math scores between most children of immigrants and native-born White children further declined, with decreases ranging from 22% for children of immigrants from the Dominican Republic to 60% for children of immigrants from India, except for children of immigrants from Cuba and from Vietnam/Thailand/Cambodia/Laos whose estimated differentials became larger; (b) the differences in the rate of change in math scores between children of Cuban origin and native-born White children became significant (increased by 77%), and the significant rate of change for children of immigrants in Model 2 remained (e.g., reduced by 4% for children of immigrants from Central America, 45% for those from South America, and 48% for those from India, but increased by 17% for those from Mexico); and (c) the magnitudes of the estimates of the associations between math scores and school-level factors from Model 2 declined.

Much as with the reading models, there was no reduction in within-person variance across models due to the lack of time-varying Level-1 predictors. In each model, variance in initial status at Level 2 and both variance in initial status and rate of change for Level 3 were lower when compared with the unconditional growth model. As with reading results, there was no change in rate of change between persons at Level 2 across models. In Model 3, immigrant status, school-level factors, and child and family backgrounds jointly explained 25% of the variation in between-person initial status, 73% of the variation in between-school initial status, and 74% of the variation in between-school rates of change.

The three goodness-of-fit indices presented at the bottom of Table 3 (the deviance statistic, AIC, and BIC) indicate that each subsequent model provided a better fit than the previous model. Model 3 thus provided the best fit of all models presented here.

Simulations

Table 4 presents the results of two simulations that illustrate the influence of school-level factors on the trajectories of the children of immigrants with the use of opposite sets of school characteristics. The three columns on the left of the table present the results for reading, while the three on the right present the results for math. Given that the majority of children of immigrants attended public schools, the column labeled "baseline" presents the predicted academic outcomes for children attending public school on the basis of Model 3 of Table 2 for reading and Table 3 for math. The school characteristics that were found to be consequential in the growth curve analyses are then varied.

For reading scores, Scenario 1 presents what would happen if a student attended a public school with a poor or minority student composition at the 75th percentile and school academic performance and student learning environment both 1 *SD* below the average. Scenario 2 presents what would happen if a student attended a public school with a poor or minority student composition at the 25th percentile and academic performance and student learning environment both 1 *SD* above the average. As expected, students' learning trajectories worsened if they were attending schools with disadvantaged characteristics (except children of immigrants from the Dominican Republic or Mexico, which suggests that these children attended schools with even more disadvantaged characteristics from the start). In contrast, students' learning trajectories benefited substantially if they attended a public school with more advantageous characteristics.

For math scores, Scenario 1 presents what would happen if a student attended a public school with no services or programs for ESL families and academic performance at 1 *SD* below the average (25th percentile), and Scenario 2 presents what would happen if a student attended a public school with academic performance 1 *SD* above the average and at least three different services or programs for ESL families (75th percentile). As expected, students' math trajectories worsened compared with baseline in schools with disadvantaged characteristics and improved in those with advantageous characteristics. In particular, in Scenario 2, children in families from Central America, Mexico, and Cuba had a 10% rate of increase in math scores from kindergarten to third grade, while children from East Asia and "other Southeast Asia" moved from decreasing to increasing rates of change.

Discussion

Previous scholarship has shown the importance of family backgrounds for the academic achievement of children of immigrants. Given that schools are also an important force in children's development, I set out in this article to examine (a) whether there are different academic trajectories between children of immigrants and native-born non-Hispanic White children and, if so, (b) the extent to which school-level factors explain such differences.

Empirical growth curve results provide an affirmative answer to the first question. The findings further revealed that school-level factors explained about 4% of the variance in between-person reading scores but about 20% of the variance in both between-

Table 4
Simulated Effects of School Environments on Children's Academic Trajectories From Kindergarten to Third Grade by Ethnicity or Country of Origin

	Reading			Math		
Variable	Baseline	Scenario 1	Scenario 2	Baseline	Scenario 1	Scenario 2
Non-Hispanic White						
Fall K	51.84	51.46	52.20	53.12	52.86	53.16
Spring T	52.92	51.67	53.72	53.33	52.28	54.12
Change between Fall K & Spring T (%)	2.1	0.4	2.9	0.4	−1.1	1.8
Puerto Rico						
Fall K	45.00	44.68	45.42	43.66	43.76	44.06
Spring T	44.98	44.50	46.56	45.34	44.91	46.74
Change between Fall K & Spring T (%)	−0.0	−0.4	2.5	3.8	2.6	6.1
Central America						
Fall K	46.30	45.92	46.66	44.88	45.01	45.31
Spring T	48.47	47.93	49.98	48.91	48.34	50.18
Change between Fall K & Spring T (%)	4.7	4.4	7.1	9.0	7.4	10.7
South America						
Fall K	48.90	48.42	49.16	49.65	49.59	49.89
Spring T	51.46	50.64	52.69	50.91	50.10	51.94
Change between Fall K & Spring T (%)	5.2	4.6	7.2	2.5	1.0	4.1
Dominican Republic						
Fall K	45.99	45.50	46.24	42.57	42.68	42.98
Spring T	45.10	44.62	46.68	44.39	43.82	45.65
Change between Fall K & Spring T (%)	−1.9	−1.9	1.0	4.3	2.7	6.2
Mexico						
Fall K	42.14	41.80	42.54	42.52	42.87	43.17
Spring T	44.62	44.44	46.49	46.37	46.01	47.84
Change between Fall K & Spring T (%)	5.9	6.3	9.3	9.0	7.3	10.8
Cuba						
Fall K	47.99	47.43	48.18	48.33	48.43	48.73
Spring T	52.78	51.88	53.94	53.08	52.16	54.00
Change between Fall K & Spring T (%)	10.0	9.4	12.0	9.8	7.7	10.8
East Asia						
Fall K	57.50	57.01	57.75	56.21	56.06	56.36
Spring T	55.41	54.36	56.41	55.98	54.97	56.81
Change between Fall K & Spring T (%)	−3.6	−4.6	−2.3	−0.4	−1.9	0.8
Vietnam/Thailand/Cambodia/Laos						
Fall K	49.55	49.13	49.87	50.51	50.59	50.89
Spring T	50.72	50.15	52.21	51.72	51.06	52.89
Change between Fall K & Spring T (%)	2.4	2.1	4.7	2.4	0.9	3.9
Other Southeast Asia						
Fall K	53.42	52.99	53.74	51.95	51.97	52.27
Spring T	52.41	51.77	53.82	51.74	51.01	52.85
Change between Fall K & Spring T (%)	−1.9	−2.3	0.1	−0.4	−1.8	1.1
India						
Fall K	58.82	58.34	59.09	54.10	53.92	54.22
Spring T	55.24	53.97	56.03	56.13	54.98	56.82
Change between Fall K & Spring T (%)	−6.1	−7.5	−5.2	3.7	2.0	4.8

Note. Numbers based on Model 3 in Table 2 for reading and Model 3 in Table 3 for math. Fall K = Fall, kindergarten; Spring T = spring, third grade. Simulated scenarios for reading: (baseline) predicted scores based on Model 3 in Table 2 if students attended public schools: (Scenario 1) If attending public school, % of poor/minority student is at 75 percentile, school academic performance is 1 *SD* below the average, and student learning environment is 1 *SD* below the average; (Scenario 2) If attending public schools, % of poor/minority students is at the 25th percentile, school academic performance is 1 *SD* above the average, and student learning environment is 1 *SD* above the average. Simulated scenarios for math: (baseline) predicted scores based on Model 3 in Table 3 if students attended public schools: (Scenario 1) If attending public school, school academic performance is 1 *SD* below the average, and school did not provide any services/programs to English-as-a-second-language (ESL) families (25th percentile); (Scenario 2) If attending public schools, school academic performance is 1 *SD* above the average, and school provided 3 different services/programs to ESL families (75th percentile).

school scores and rates of change over time (child and family factors explained 13% in between-person reading scores, 18% in between-school reading scores, and 17% in rates of change over time). School factors explained similar amounts of the variances in between-person (5%) and between-school (17%) math scores and their rates of change (20%); child and family factors explained 11% in between-person math scores, 13% between-school math scores, and 12% in rates of change. These results suggest that school environments affect between-child differences, although, as expected, to a lesser extent than child and family characteristics. The effect sizes of mean score differences in reading varied from small (about 0.05 for children of immigrants from India, East Asia, and Cuba, 0.11 for those from "other Southeast Asia," and 0.14 for those from South America) to medium (0.42 for children of immigrants from Vietnam/Thailand/Cambodia/Laos and Puerto Rico and 0.70 for those from Mexico). The effect sizes of the mean score differences in math were similar; they were generally small for children from most Asian origins and from South America and Cuba and medium for those from Latin American origins and from Vietnam/Thailand/Cambodia/Laos.

Figures 1 and 2 present the reading and math trajectories by country of origin for children of immigrants and by race–ethnicity for native-born children after school, child, and family characteristics have been considered. Overall, the results indicate that children of immigrants tended to close the gaps in reading and math relative to their native-born White peers. Specifically, children from Mexican and Cuban families improved their reading and math scores and children from Central American families improved their math scores, while children of immigrants from Asian origin (except Vietnam/Thailand/Cambodia/Laos) showed declining reading scores during the years between kindergarten and third grade. Thus, despite starting kindergarten with lower reading and math scores relative to their peers, by third grade children from Central American and Cuban families were scoring as well as and better than native-born White children, respectively. Although children with Mexican origins had a faster pace compared with native-born White children, their significantly lower reading and math scores in kindergarten only allowed them to narrow but not close the score gap. In contrast, the slower reading paces exhibited by children from East Asian and Indian families narrowed the reading gap slightly with their native-born White peers, although children from most Asian regions had higher reading and math scores from kindergarten to third grade.

Two simulated scenarios were presented in order to make the influence of school-level factors more transparent. The results indicate that, as expected, students' reading and math trajectories worsened if they were attending schools with disadvantaged characteristics and improved if they were attending schools with more advantageous characteristics, with all immigrant groups displaying their highest increasing rates of change (or their lowest decreasing rates of change) in Scenario 2. These results may be a manifestation of the inadequate resources that tend to be found in schools with large poor or minority student populations (e.g., Masten, 1994), which is essentially a form of segregation (García Coll et al., 1996; García Coll & Szalacha, 2004). Conversely, adequate resources (as proxied by low poor or minority student composition) may benefit students' academic trajectories. The benefits of above-average school academic performance and student learning environment seem to echo previous findings that the presence of many high-achieving students may create a learning atmosphere that promotes positive academic performance (Borman & Overman, 2004).

An important finding of this study is that the academic trajectories of children of Latin American origin seem to respond more to school-level factors than those of children of Asian origin (with the exception of those of children from Vietnam/Thailand/Cambodia/Laos). Thus, it seems that the benefits of a positive school environment are greater among disadvantaged Latin American populations, particularly those from Mexico, as suggested by the literature on the diverse effects of school contexts (e.g., Lee & Smith, 1997). On the other hand, the findings for children of Asian immigrants may support the immigrant literature on the resiliency of children, that is, that their positive ethnic ties outside of school may account more for their academic performance than the schools

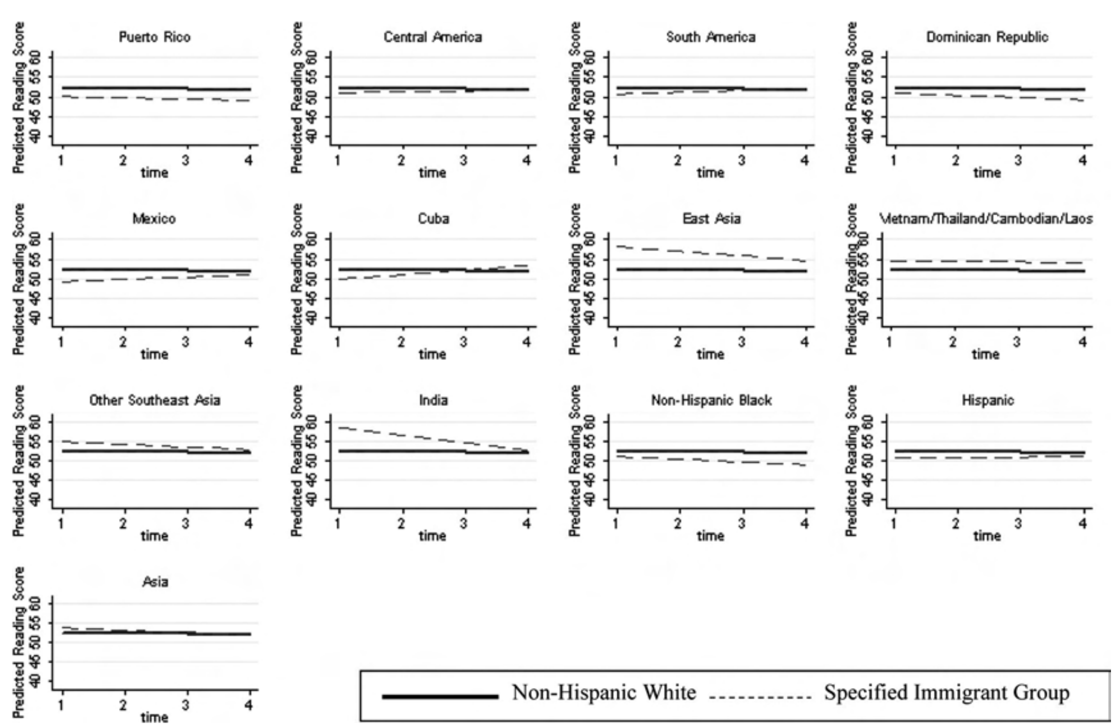

Figure 1. Predicted reading scores from kindergarten to third grade by country of origin and race–ethnicity based on Model 3 of Table 2.

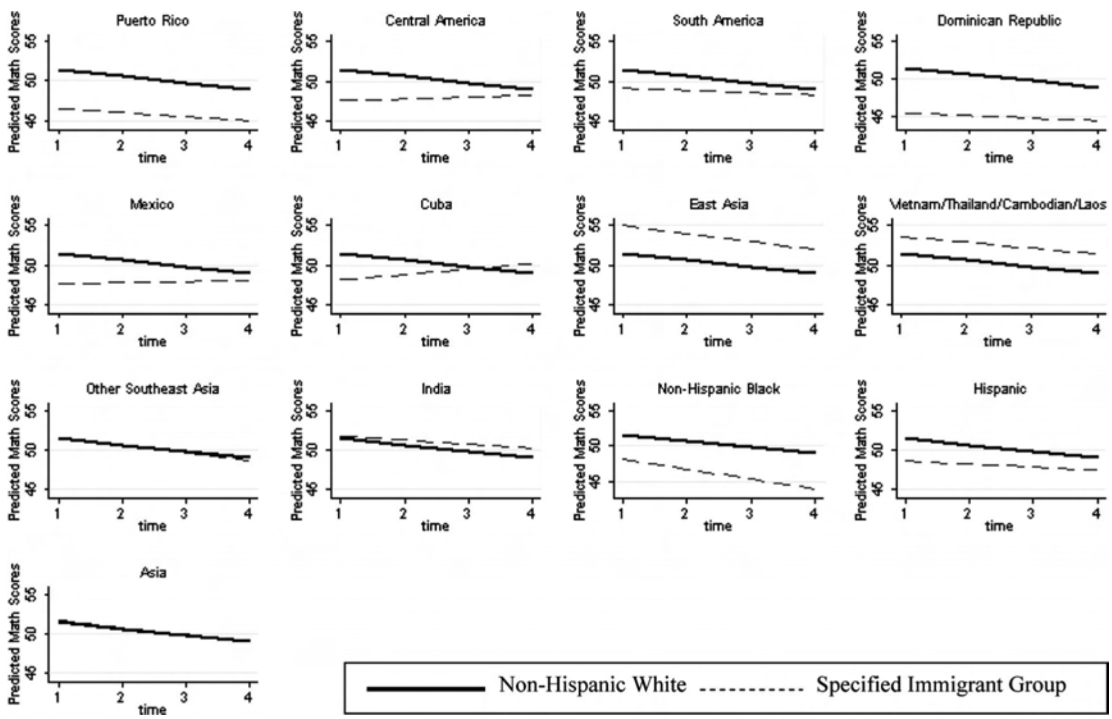

Figure 2. Predicted math scores from kindergarten to third grade by country of origin and race–ethnicity based on Model 3 of Table 3.

that they attend. Previous studies (Crosnoe, Lopez-Gonzalez, & Muller, 2004; Lee & Burkam, 2002) have documented that children of Latin American origin are more likely to attend schools with less advantageous characteristics (e.g., poor school safety, inadequate resources, crowded space, low-qualified teachers), and thus they can benefit more from schools with positive characteristics (Suárez-Orozco & Suárez-Orozco, 2001). In contrast, children from Asian origins are more likely to attend schools with relatively better characteristics. Indeed, the raw data from this sample indicate that children of immigrants from Latin America (except those from Cuba) were significantly more likely ($p < .01$) than those of Asian origin (except those from Vietnam/Thailand/Cambodia/Laos) to attend schools with a high concentration of poor or minority students, poor school academic performance, unsupportive school environments for both teachers and students, and poor school safety.

The exception to these findings that cannot be ignored is the diversity among children of Asian origin. In particular, children of Vietnam/Thailand/Cambodia/Laos indeed seem to respond more to school-level factors than do children of other Asian origins. The raw data suggest that the former attended schools that were quite similar to those attended by children of Latin American origins (except those from Cuba). Recent data also suggest that children in families from Thailand, Cambodian, or Laos have very high, if not the highest, poverty rates that set them apart from other children of immigrants (Hernandez, Denton, & Macartney, 2007). This relatively disadvantaged family background may speak to why, at least partially, children of Vietnam/Thailand/Cambodia/Laos might respond more to school environments.

Although it is not clear why certain school-level factors were important to children's reading or math trajectories but others were not, the significant factors found in this analysis were mostly proxies for school resources. Furthermore, although children attending public school had significantly lower reading and math scores, they had significantly higher increasing rates of change from kindergarten to third grade. These seemingly contradictory findings reveal the multifaceted nature of school factors. For instance, public schools often face challenges such as a lack of funding or resources, but being surrounded by peer group with similar characteristics may provide a sense of belonging that promotes children's learning.

In contrast, the results that teaching environment and school climate and safety were not found to be important to the academic trajectories of children of immigrants seems consistent with evidence suggesting that these children respond differently to the contextual factors that typically promote "mainstream" children's learning process (Chao, 2001). Studies have also found school safety to play a similar role in the lives of children of Mexican immigrant families as for other populations (Crosnoe, 2005), and this may explain the nonsignificant result of school safety on children's learning trajectories between groups. This is not to say that school-level factors were not important to students' learning experiences. In fact, they were significantly related to students' reading and math scores at each assessment point during years between kindergarten and third grade.

This study is not without limitations. First, although the immigrant groups were carefully categorized, the diversity within ethnic groups makes culture an elusive concept to capture (Bean & Stevens, 2003; Portes & Rumbaut, 2006; Portes & Zhou, 1993). Future research on the similarities and differences within particular immigrant and cultural groups is needed to provide a more indepth understanding of children in immigrant families. Second, research on how different types of migration are related to family background and, in turn, children's learning trajectories would shed light on the initial and long-term differences in the learning pathways of children of Latin American and Asian origins. Third, the present results may be biased because some children did not complete a reading assessment at some data points; most of these children were from families of Mexican origin. Although data for these children were imputed, it would nevertheless have been preferable to have actual assessment data for them. The implication of not having these children in the analyses due to missing reading scores is that if, as is likely, these children scored most poorly on the reading examination, then the analyses underestimated the score disadvantage for the Mexican-origin children, suggesting a larger difference with other children than estimated here. Similarly, if these children had increasing change scores on the reading test as found in this analysis, then the analyses also underestimated the change score trajectories for the children of Mexican origin, suggesting a faster learning trajectory compared with other children than estimated here. This concern strengthens the call for the inclusion of a broader array of cultures and languages in future data collection and measurement development. Fourth, although this study considered many covariates, some important school-level characteristics that might help explain children's academic trajectories were not considered (mainly due to the data at hand). For instance, information on children's interactions with their teachers and peers might be valuable given previous findings showing their influence on children's academic achievement (e.g., Conchas, 2001; Suárez-Orozco & Suárez-Orozco, 2001). Additionally, despite including school-level factors that have been found to be associated with inadequate educational resources and academic failure (Wang & Gordon, 1994), the data at hand did not allow for a thorough analysis of forces important to the academic achievement of children of immigrants, such as racial discrimination and oppression. In future studies, use of both qualitative and quantitative methods would be beneficial to untangle the still underresearched issue of the academic experiences of young children of immigrants.

Despite these limitations, the present results provide empirical evidence that supports the importance of school resources for students' academic progress. In particular, services and programs for ESL families proved to be critical elements in improved math performance for children of immigrants. Although a school's poor or minority student composition is not a direct index for school resources, previous findings that they are strongly associated suggest that the present results speak volumes to the importance of school resources in providing students with an optimal learning environment. This may be particularly true for immigrant families who stand to benefit more from these resources, especially when these children are in schools with inadequate resources from the start. These results have added value when placed in the context of previous findings that children's academic performance is likely to be stable after third grade and that third-grade performance is usually a good indicator of future school performance (Kraus, 1973; Pope, Lehrer, & Stevens, 1980; Weller, Schnittjer, & Tuten, 1992). This study provides further evidence that schools can play a role in shaping children's academic trajectories from kindergarten to third grade. In particular, the school resources available to the children of immigrants and their families were an important reason that some children improved significantly faster and were able to make up initial deficits compared with native-born White children.

References

Alexander, K. L., & Entwisle, D. R. (1988). Achievement in the first two years of school: Patterns and processes. *Monographs of the Society for Research in Child Development, 53*(2, Serial No. 218).

Alexander, K. L., Entwisle, D. R., & Olson, L. S. (1997). *Children, schools, and inequality.* New York: Westview Press.

Baker, J. A. (1999). Teacher–student interaction in urban at-risk classrooms: Differential behavior, relationship quality, and student satisfaction with school. *Elementary School Journal, 100,* 57–70.

Bean, F. D., & Stevens, G. (Eds.). (2003). *America's newcomers and the dynamics of diversity*. New York: Russell Sage Foundation.

Benard, B. (1991). *Fostering resiliency in kids: Protective factors in the family, school, and community.* Portland, OR: Northwest Regional Educational Laboratory.

Bennett, P., Elliott, M., & Peters, D. (2005). Classroom and family effects on children's social and behavioral problems. *The Elementary School Journal, 105,* 461–480.

Borman, G. D., & Overman, L. T. (2004). Academic resilience in mathematics among poor and minority students. *The Elementary School Journal, 104,* 177–195.

Bradley, R. H. (2002). Environment and parenting. In Marc H. Bornstein (Ed.), *Handbook of parenting: Vol. 2. Biology and ecology of parenting* (pp. 281–314). Mahwah, NJ: Erlbaum.

Brandon, P. (2002). *The child care arrangements of preschool-age children in immigrant families in the United States.* New York: Foundation for Child Development.

Bryk, A. S., Lee, V. E., & Holland, P. B. (1993). *Catholic schools and the common good.* Cambridge, MA: Harvard University Press.

Burchinal, M. R., Peisner-Feinberg, E., Pianta, R. C., & Howes, C. (2002). Development of academic skills from preschool through second grade: Family and classroom predictors of developmental trajectories. *Journal of School Psychology, 40,* 415–436.

Caplan, N., Choy, M. H., & Whitmore, J. K. (1991). *Children of the boat people: A study of educational success.* Ann Arbor, MI: University of Michigan Press.

Chao, R. K. (2001). Extending research on the consequences of parenting style for Chinese Americans and European Americans. *Child Development, 72,* 1832–1843.

Comer, J. P. (1984). Home–school relationships as they affect the academic success of children. *Education and Urban Society, 16,* 322–337.

Conchas, G. Q. (2001). Structuring failure and success: Understanding the variability in Latino school engagement. *Harvard Educational Review, 71,* 475–504.

Crosnoe, R. (2005). Double disadvantage or signs of resilience? The elementary school contexts of children from Mexican immigrant families. *American Educational Research Journal, 42,* 269–303.

Crosnoe, E., Lopez-Gonzalez, L., & Muller, C. (2004). Immigration from Mexico into the math/science pipeline in American education. *Social Science Quarterly, 85,* 1208–1226.

Denton, K., & West, J. (2002). *Children's reading and mathematics achievement in kindergarten and first grade* (NCES 2002–125). Washington, DC: National Center for Education Statistics.

Entwisle, D. R., & Alexander, K. L. (1989). Early schooling as a "critical period" phenomenon. In K. Namboodiri & R. Corwin (Eds.), *Sociology of education and socialization* (pp. 27–55). Greenwich, CT: JAI.

Entwisle, D. R., & Alexander, K. L. (1998). Facilitating the transition to first grade: The nature of transition and research on factors affecting it. *The Elementary School Journal, 98,* 351–364.

Entwisle, D. R., & Alexander, K. L. (1999). Early schooling and social stratification. In R. C. Pianta & M. J. Cox (Eds.), *The transition to kindergarten* (pp. 3–35). Baltimore: Paul H. Brookes.

Entwisle, D. R., & Hayduck, L. A. (1988). Lasting effects of elementary school. *Sociology of Education, 42,* 387–409.

Fuligni, A. J. (1997). The academic achievement of adolescents from immigrant families: The roles of family background, attitudes, and behavior. *Child Development, 68,* 351–363.

Fuligni, A. J., Tseng, V., & Lam, M. (1999). Attitudes toward family obligations among American adolescents with Asian, Latin American, and European backgrounds. *Child Development, 70,* 1030–1044.

Garc´ia Coll, C., Lamberty, G., Jenkins, R., McAdoo, H. P., Crnic, K., Wasik, B. H., & García, H. V. (1996). An integrative model for the study of developmental competencies in minority children. *Child Development, 67,* 1891–1914.

Garc´ia Coll, C., & Szalacha, L. A. (2004). The multiple contexts of middle childhood. *The Future of Children, 14,* 81–97.

Griffith, J. (1998). The relation of school structure and social environment to parent involvement in elementary schools. *The Elementary School Journal, 99,* 53–80.

Griffith, J. (2002). A multilevel analysis of the relation of school learning and social environments to minority achievement in public elementary schools. *The Elementary School Journal, 102,* 349–366.

Griffith, J. (2003). Schools as organizational models: Implications for examining school effectiveness. *The Elementary School Journal, 104,* 29–47.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectories of children's school outcomes through eighth grades. *Child Development, 72,* 625–638.

Henderson, N., & Milstein, M. M. (1996). *Resiliency in schools: Making it happen for students and educators.* Thousand Oaks, CA: Corwin.

Hernandez, D. J., Denton, N. A., & Macartney, S. E. (2007). Child poverty in the U. S.: A new family budget approach with comparison to European countries. In H. Wintersberger, L. Alanen, T. Olk, & J. Ovortrup (Eds.), *Childhood, generational order, and the welfare state: Exploring children's social and economic welfare: Vol. 1 of COST A19. Children's welfare* (pp. 109–140). Odense, Denmark: University Press of Southern Denmark.

Hox, J. (2002). *Multilevel analysis: Techniques and applications.* Mahwah, NJ: Erlbaum.

Huff, R., & Trump, K. (1996). Youth violence and gangs: School safety initiatives in urban and suburban school districts. *Educational and Urban Society, 28,* 492–503.

Johnson, M. K., Crosnoe, R., & Elder, G. H., Jr. (2001). Student attachment and academic engagement: The role of ethnicity. *Sociology of Education, 74,* 318–340.

Kao, G., & Tienda, M. (1995). Optimism and achievement: The educational performance of immigrant youth. *Social Science Quarterly, 76,* 1–19.

Kasinitz, P., Mollenkopf, J. H., & Waters, M. C. (eds.) (2004). *Becoming New Yorkers: Ethnographies of the new second generation.* New York: Russell Sage Foundation.

Kraus, P. E. (1973). *Yesterday's children.* New York: Wiley.

Kreft, I., & de Leeuw, J. (1998). *Introducing multilevel modeling.* Thousand Oaks, CA: Sage.

Lee, V. E., & Burkham, D. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school.* Washington, DC: Economic Policy Institute.

Lee, V. E., & Smith, J. B. (1997). High school size: Which works best and for whom? *Educational Evaluation and Policy Analysis, 19,* 205–227.

Lee, V. E., Winfield, L. F., & Wilson, T. C. (1991). Academic behaviors among high-achieving African American students. *Education and Urban Society, 24,* 65–86.

Louie, V. (2001). Parents' aspirations and investment: The role of social class in the educational experiences of 1.5- and second-generation Chinese Americans. *Harvard Educational Review, 71,* 438–474.

Masten, A. S. (1994). Resilience in individual development: Successful adaptation despite risk and adversity. In M. C. Wang & F. W. Gordon (Eds.), *Educational resilience in inner-city America: Challenges and prospects* (pp. 3–25). Hillsdale, NJ: Erlbaum.

Matthews, H., & Ewen, D. (2006). *Reaching all children? Understanding early care and education participation among immigrant families.* Retrieved on April 6, 2006, from the Center for Law and Social Policy Web site at http://www.clasp.org/publications/child_care_immigrant.pdf

Matute-Bianchi, M. E. (1986). Ethnic identities and patterns of school success and failure among Mexican-descent and Japanese-American students in a California high school: An ethnographic analysis. *American Journal of Education, 95,* 233–255.

McNeal, R. (1997). High school dropouts: A closer examination of school effects. *Social Science Quarterly, 78,* 209–222.

Moody, J. (2001). Race, school integration, and friendship segregation in America. *American Journal of Sociology, 107,* 679–716.

Muller, C. (2001). The role of caring in the teacher–student relationship for at-risk students. *Sociological Inquiry, 71,* 241–255.

National Institute of Child Health and Human Development Early Child Care Research Network. (2003). Social functioning in first grade: Associations with earlier home and child care predictors and with current classroom experiences. *Child Development, 74,* 1639–1662.

Nisbett, R. E. (1998). Race, genetics, and IQ. In C. Jencks & M. Phillips (Eds.), *The Black–White test score gap* (pp. 86–102). Washington, DC: Brookings Institution Press.

Nisbett, R. E. (2005). Heredity, environment, and race differences in IQ: A commentary on Rushton and Jensen (2005). *Psychology, Public Policy, and Law, 11,* 302–310.

Nord, C. W., & Griffin, J. A. (1999). Educational profile of 3- to 8-year-old children of immigrants. In D. J. Hernadez (Ed.) *National Research Council Committee on the Health and Adjustment of Immigrant Children and Families: Children of immigrants. Health, adjustment, and public assistance* (pp. 348–409). Washington, DC: National Academy Press.

Pianta, R. C., La Paro, K. M., Payne, C., Cox, M. J., & Bradley, R. (2002). The relation of kindergarten classroom environment to teacher, family, and school characteristics and child outcomes. *The Elementary School Journal, 102,* 225–238.

Pianta, R. C., & Walsh, D. (1996). *High-risk children in the schools: Creating sustaining relationships.* New York: Routledge.

Pollack, J. M., Rock, D. A., Weiss, M. J., & Arkins-Burnett, S. (2005). *Early Childhood Longitudinal Study—Kindergarten Class of 1998*–99 (*CELS–K*): *Psychometric report for the third grade*. Washington, DC: National Center for Education Statistics.

Pope, J., Lehrer, B., & Stevens, J. (1980). A multiphasic reading screening procedure. *Journal of Learning Disabilities, 13,* 98–102.

Portes, A., & Rumbaut, R. G. (2001). *Legacies: The story of the immigrant second generations.* Berkeley: University of California Press.

Portes, A., & Rumbaut, R. G. (2006). *Immigrant America: A portrait.* Berkeley: University of California Press.

Portes, A., & Zhou, M. (1993). The new second generation: Segmented assimilation and its variants. *Annals of the American Academy, 530,* 74–96.

Rock, D. A., & Stenner, A. J. (2005). Assessment issues in the testing of children at school entry. *Future of Children, 15,* 15–34.

Rumbaut, R. G. (1994). The crucible within: Ethnic identity, self-esteem, and segmented assimilation among children of immigrants. *International Migration Review, 28,* 748–794.

Rumbaut, R. G. (1995). The new Californians: Comparative research findings on the educational progress of immigrant children. In R. G. Rumbaut & W. Cornelius (Eds.), *California's immigrant children* (pp. 17–69). LaJolla, CA: Center for U. S.–Mexican Studies.

Rutter, M., & Maughan, B. (2002). School effectiveness findings, 1979–2002. *Journal of School Psychology, 40,* 451–475.

Saft, E. W., & Pianta, R. C. (2001). Teachers' perceptions of their rela-

tionships with students: Effects of child age, gender, and ethnicity of teachers and children. *School Psychology Quarterly, 16,* 125–141.
Sbarra, D. A., & Pianta, R. C. (2001). Teacher ratings of behavior among African American and Caucasian children during the first two years of school. *Psychology in the Schools, 38,* 229–238.
Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence.* New York: Oxford University Press.
Smith, C., & Carlson, B. E. (1997). Stress, coping, and resilience in children and youth. *Social Science Review, 71,* 231–256.
Stuhlman, M., & Pianta, R. (2004). Teacher–child relationships and children's success in the first years of school. *School Psychology Review, 33,* 444–458.
Suárez-Orozco, C., & Suárez-Orozco, M. M. (1995). *Transformations: Immigration, family life, and achievement motivation among Latino adolescents.* Stanford, CA: Stanford University Press.
Suárez-Orozco, C., & Suárez-Orozco, M. M. (2001). *Children of immigration.* Cambridge, MA: Harvard University Press.
U.S. Census Bureau. (2004). *The foreign-born population in the United States: 2004.* Retrieved on August 1, 2005, from http://www.census.gov/population/www/socdemo/foreign/ppl-176.html
Valencia, R. (2000). Inequalities and the schooling of minority students in Texas. *Hispanic Journal of Behavioral Sciences, 22,* 445–459.
Valenzuela, A. (1999). Subtractive schooling: U. S.–Mexican youth and the politics of caring. Albany, NY: State University of New York Press.
Wang, M. C., & Gordon, E. W. (Eds.). (1994). *Educational resilience in inner-city America: Challenges and prospects.* Hillsdale, NJ: Erlbaum.
Wang, M. C., Haertel, G. D., & Walberg, H. J. (1994). What influences learning? A content analysis of review literature. *Journal of Educational Research, 84,* 30–43.
Weller, L. D., Schnittjer, C. J., & Tuten, B. A. (1992). Predicting achievement in grades three through ten using the Metropolitan Readiness Test. *Journal of Research in Childhood Education, 6,* 121–129.
Werner, E., & Smith, R. (1989). *Vulnerable but invincible: A longitudinal study of resilient children and youth.* New York: Adams, Bannister, & Cox.
Zhou, M. (1997). Growing up American: The challenge confronting immigrant children and children of immigrants. *Annual Review of Sociology, 23,* 63–95.
Zhou, M., & Bankston, C. L. III. (1994). Social capital and the adaptation of the second generation: The case of Vietnamese youth in New Orleans. *International Migration Review, 28,* 821–845.
Zhou, M., & Bankston, C. L. III. (1998). *Growing up American: How Vietnamese children adapt to life in the United States.* New York: Russell Sage Foundation.

Received August 18, 2006
Revision received August 22, 2008
Accepted September 2, 2008 ■