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Reading and Math Achievement among Low-Income Urban Latino Youth: The Role of Immigration

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Abstract

Using data from a household-based, stratified random sample of youth and their caregivers from low-income inner-city neighborhoods, this study examined the variability in the academic achievement of Latino youth. The results indicate a significant advantage in reading achievement for first- and second-generation immigrant youth, as compared to the third generation, which persisted even after controlling for important child, parenting, human capital, neighborhood, and demographic covariates. Follow-up analyses within the subsample of the first- and second-generation youth indicate that more recent arrival to the U.S. predicted higher reading achievement. Yet, there was no evidence of a similar immigrant advantage in math. The implications of these findings, limitations of the present study, and directions for future research are discussed.

Introduction

The Latino population in the United States represents one of the fastest growing ethnic and immigrant groups (U.S. Census Bureau 2011). Yet, many members of this vibrant community face great socioeconomic challenges. Approximately 27% of Latinos live below the federal poverty line compared to 19% among the general population (Marotta and Garcia 2003). The poverty rate for Latino children is similarly high, an alarming statistic given the size of the population and their rapidly increasing numbers (Lichter et al. 2005). Understanding the academic trajectories of Latino youth and the factors that contribute to or, conversely, hinder their academic success is of paramount importance, especially given the importance of academic achievement for upward mobility and success in adulthood (Mayer and Peterson 1999; Rouse and Barrow 2006).

National data indicates that there is considerable variability in educational outcomes within Latino groups (Baker et al. 2000). On one hand, the socio-economic disadvantage represents a serious barrier to school success. Many Latinos live in crime-ridden neighborhoods with few resources and many risks to healthy development (Plunkett et al. 2007; Suárez-Orozco and Suárez-Orozco 2001), and attend low-resource schools that are ill-equipped to handle an ethnically diverse, and often limited English proficient population (Schneider et al. 2006). This context of disadvantage has contributed to their lower grades in school (Plunkett et al. 2007), lower scores on standardized tests of math and reading achievement (Eamon 2002; 2005), and higher school dropout rates (Schneider et al. 2006). On the other hand, many Latinos possess important strengths that may increase the likelihood of academic success, such as close cohesive families (Chase-Lansdale et al. 2007; Landale et al. 2006).

Understanding this variability within a group and identifying the risk and protective factors

that explain it, are the necessary prerequisites for the development of effective preventive and interventive programs aimed at fostering the youth's success (e.g., Coie et al. 1993; Hawkins et al. 2002).

One such source of variability has been evidenced among children from immigrant families. While large numbers of immigrant children and youth in the United States experience poverty (e.g., Capps et al. 2005), studies indicate that many children from immigrant families do better than would be expected based on their socio-economic circumstances, a phenomenon that has been termed the "immigrant paradox" (e.g., Portes and MacLeod 1996; Suárez-Orozco et al. 2009). These findings have been reported in several domains of functioning including educational attainment such as grades in English and math (e.g., Fuligni 1997; Kao and Tienda 1995) and high school completion (Driscoll 1999), yet they are not uniform across ethnic groups. Findings regarding the relationship between immigrant status and academic achievement of Latino children and youth have been mixed, ranging from no differences in achievement between native and foreign-born youth (Harris et al. 2008; Kao and Tienda 1995), an advantage of the second generation over first and third generation (Fuligni 1997), and a small advantage of first generation Latinos over second and third generations (Palacios et al. 2008). The common theme, though, is that Latinos underperform in relation to other ethnic groups (Fuligni 1997; Harris et al. 2008; Kao and Tienda 1995; Palacios et al. 2008).

However, a salient confound present in many studies reporting the achievement gap for ethnic minority youth, particularly when compared to European Whites, includes the persistent socio-economic disadvantage that many Latino and other ethnic minority youth experience. This confound is difficult to isolate in the analytic models because it permeates most domains and contexts of development. Thus, the present study zooms in on a sample of low-income inner city youth and examines the within-group variability in academic functioning of Latino immigrant and native-born adolescents living in low-income, urban environments. It also examines a set of salient predictors and control variables, which are organized into conceptual blocks according to the ecological systems hypothesized to shape child and adolescent development (Bronfenbrenner 1977). Furthermore, because more recent theoretical frameworks have highlighted the importance of unique developmental and ecological experiences of minority children (Chase-Lansdale et al. 2007; García-Coll et al. 1996), this study examines a number of specific factors that could predict school success of Latino youth. The models also adjust for the differences in socio-demographic characteristics. Importantly, the second part of the analysis zooms in on Latino youth from immigrant families and includes the proportion of life spent in the U.S., a more fine-tuned operationalization of immigrant status, to examine the immigrant paradox.

Child Functioning Factors

Children's socio-emotional functioning plays an important role in their school success, with well-adjusted children doing better in school (Becker and Luthar 2002). Children and youth confronting multiple risks and stressful conditions of economically disadvantaged environments are particularly vulnerable to socio-emotional difficulties (Goosby 2007; McLoyd 1998; McLoyd et al. 2009). Thus, when examining the academic success of ethnic

minority children from low-income urban neighborhoods, it is especially important to consider their socio-emotional health. Moreover, several studies of immigrant adjustment indicate that first-generation immigrant youth have lower rates of behavior problems (Harris 1999) and delinquency (Gfroerer and Tan 2003; Powell et al. 2010) than their native-born counterparts. This socio-emotional advantage could help explain the variability in academic outcomes across the immigrant groups. This study includes a parent report of behavior problems as well as a youth self-report of engagement in serious delinquency. In addition, because achievement in one academic domain, such as reading, can influence achievement in another domain, such as math (e.g., Larwin 2010), the models of reading and math also include controls for functioning in the other academic domain.

Maternal Functioning and Parenting Factors

Maternal functioning and parenting are powerful predictors of their children's school success. Yet, poverty and other stressful environmental conditions widespread in inner cities have been identified as poignant negative influences on maternal psychological functioning (such as psychological distress, sense of mastery, and positive self-concept), parenting, and consequently their children's socio-emotional and academic outcomes (e.g., Goosby 2007; Gutman et al. 2005; McLoyd 1998; McLoyd and Wilson 1991). Studies indicate that foreign-born Latino adults tend to have lower rates of mental health problems including psychological distress (as indicated by depression and anxiety) than their U.S.-born counterparts (e.g., Alegria et al. 2008), although these findings vary somewhat by the country of origin. Again, the potential differences in parental psychological resources could help explain some of the variability in Latino youth academic outcomes. Thus, the maternal functioning predictors in this study included maternal psychological distress and maternal positive self-concept. Furthermore, studies indicate that maternal English language proficiency not only predicts a mother's ability to participate in her children's schooling, but also influences the amount of time her children spend speaking English in social situations, and thus indirectly, their English language skills (Carhill et al. 2008). Lower English language proficiency has been associated with lower academic achievement and attainment (Ruiz-de-Velasco et al. 2000; Suárez-Orozco et al. 2008). Therefore, maternal English language proficiency is also controlled for in the present models of youth academic achievement. Finally, cognitive stimulation at home such as the exposure to reading materials including books and magazines, can improve children's academic functioning (Bradley et al. 2001; Magnuson et al. 2006), so the level of cognitive stimulation at home is also included in the models.

Neighborhood Factors

A powerful stressor in the lives of ethnic minority youth living in poverty involves neighborhood conditions. Neighborhood disorganization and serious problems in the neighborhood have been shown to predict worse academic outcomes in adolescence (Bowen et al. 2002; Henry et al. 2008; Plunkett et al. 2007). Importantly, immigrant youth are more likely to reside in disadvantaged neighborhoods (Suárez-Orozco et al. 2009), which could contribute to the variability in their academic outcomes as compared to their native-born co-ethnics. However, collective efficacy (Sampson et al. 1997), which includes individuals' perceptions of social control (the likelihood of action to resolve problems in the

neighborhood), and social cohesion (mutual trust and solidarity among residents), has been shown to provide an important buffer from neighborhood risks to well-being, particularly the mental health of youth residing in neighborhoods with concentrated disadvantage (Xue et al. 2005). Therefore, both a measure of serious problems in the neighborhood, as well as collective efficacy, are included as predictors of academic outcomes of Latino youth from low-income inner-city neighborhoods in this study.

General Sociodemographic Factors

Additional predictors of academic outcomes in this study involve familial resources such as parental education and income, which are some of the strongest predictors of academic achievement of children in general (Duncan and Murnane 2011; Reardon 2011), and academic success of immigrant children and youth in particular (Suárez-Orozco et al. 2008). Further, controls for maternal employment, welfare receipt, and number of children in the household are also included. Immigrant Latino children are also more likely to reside in two-parent families than their native-born counterparts (Hernandez 2004), a factor that has been shown to predict better academic achievement and attainment (e.g., Amato 2001). However, while cohabitation, or *uniones libres* (Rodríguez 2004), is more common in many Latino immigrants' countries of origin than in the United States, the unions of most foreign-born Latinos who reside in the U.S. are those of marriage, not cohabitation (Fomby and Estacion 2007). Finally, studies on immigrant youth also indicate that adolescent Latinas outperform adolescent Latinos (Henry et al. 2008; Suárez-Orozco and Qin-Hillard 2004). Thus, this study also includes marital status and the child's gender among the demographic controls.

Variability Within Latino Groups

It is, however, also important to recognize that Latino immigrants are not a uniform, homogenous group. Studies indicate that there is a considerable degree of variability in outcomes by country of origin as well as by the timing of arrival among immigrants from various Latin American countries. Just as the poverty rates among Latinos differ as a function of country of origin, their academic achievement varies as well. Specifically, Mexican and Puerto Rican Americans have the highest poverty rates, at 32% and 41%, respectively, while Cubans and South Americans have the lowest rates among Latinos at 17% (Lichter et al. 2005). Regarding their academic achievement, Baker and colleagues (2000) in their within-group analysis of Latino subgroups of the NELS'88 data found that Cuban students outperformed students of Mexican origin, and they, in turn, outperformed Puerto Rican students in math achievement. However, there were no differences in reading achievement among the Latino subgroups. These regional differences might reflect the differences in socioeconomic status among the groups. It is, however, possible that the average differences in academic outcomes by the country of origin also reflect some variation in cultural practices that is not accounted for by SES. Therefore, it is important to account for both covariates in models predicting variability in achievement of Latino youth.

In addition, timing of migration can be an important source of variability in academic success of immigrant youth. Some studies have shown that the timing of immigration relative to one's developmental period predicts one's academic achievement. Not only have there been differences identified by immigrant generation (i.e., the aforementioned

differences by first vs. second or third generations), but even within the foreign-born or the first-generation youth, differences have sometimes been identified by whether the migration occurred during early childhood, middle childhood, or in adolescence. Indeed, some scholars (e.g., Rumbaut 1997) have even used the term 1.5 generation to distinguish those who immigrated before adolescence (usually by the age of 12 or 13) from those who arrived later; and in later work (Rumbaut 2004) a further distinction has been made between those who arrive as young children (between ages 0-5, termed 1.75 generation) and those who arrived in adolescence (between ages 13-17, termed 1.25 generation). Few studies on developmental outcomes have moved beyond categorical partitioning of their sample into a few generational groups. The present study examines variation in academic achievement by the youth's generational status in the full sample using the "traditional" categorization of first, second, and third generations. In addition, it examines the relationship between proportion of life spent in the United States and youth's educational success in the subsample of youth from immigrant families.

In summary, the present study examines the trajectories of scores on standardized tests of math and reading achievement over the course of adolescence in a sample of low-income, urban Latino youth from immigrant and U.S.-born families and a set of predictors that have been identified as explaining variability in achievement outcomes of youth in general, and ethnic minority youth in particular. These predictors are organized in conceptual blocks of ecological systems (e.g., Bronfenbrenner 1977) that are hypothesized to influence adolescent development. Importantly, the second part of the analyses in this study zooms in on Latino youth from immigrant families with a more fine-tuned operationalization of immigrant status to examine intragroup variation in their reading and math achievement trajectories. Specifically, this study examines the following three research questions: (1) What are the trajectories of reading and math achievement of immigrant and native-born Latino adolescents living in low-income, urban environments? (2) Does a set of salient individual, family, and neighborhood characteristics that have been shown to predict educational success explain the intragroup variability in achievement of these Latino youth; and (3) Within the subsample of youth from immigrant families, does the timing of migration and duration of time spent in the U.S. explain the variation in achievement of youth from immigrant families?

Method

Participants

Longitudinal data from *Welfare, Children and Families: A Three-City Study*, a household-based, stratified random sample of approximately 2,400 children and their primary caregivers from low-income neighborhoods in Boston, Chicago, and San Antonio, was used in these analyses. Interviews and standardized assessments were collected in 1999, 2000-2001, and 2005. The present study used the data on the adolescent cohort of Latino children ($N = 545$, average age = 12.51 years; see Table 1 for an additional description of the sample). Approximately 48.1% of the Latino adolescents were of Mexican origin, 12.5% were of Dominican, 28.8% of Puerto Rican origin, and 10.6% of origin from other Latin American countries such as El Salvador, Guatemala, Honduras, and Venezuela. At Wave 1, a

majority of families were living in poverty (mean income-to-needs = 0.74); 19.8% of mothers were married and 53.4% did not have a high school degree. The overall Wave 1 to Wave 3 response rate was 80%.

Measures

Youth outcomes—The primary dependent variables in this study were academic achievement in reading and mathematics. In each wave, the youths were administered two subscales of the Woodcock Johnson-Revised (WJ-R) (Woodcock & Johnson, 1990) battery: Letter-Word Identification (LWI) and Applied Problems (AP). The LWI subscale is a measure of reading identification that reflects whether the respondent can recognize letters or decode words. The AP subscale assesses mathematics skills related to the ability to analyze and solve practical problems. The easier items are visual displays and the more difficult items are word problems (Woodcock and Mather 1990). The Spanish version of the WJ-R (Woodcock and Munoz-Sandoval 1996) was administered if either the child or parent reported that Spanish was the child's primary language.

In addition to the standard scores, W-scores were computed according to the manual. W-scores are equal-interval, constant-metric scores computed by a transformation of the Rasch-ability scale (Rasch 1980; Wright and Stone 1979). They are centered at a value of 500, the approximate average performance at the beginning of 5th grade (Woodcock and Mather 1990). In longitudinal analyses, W-scores are preferred over the standard scores because standard scores adjust for age-related improvements; but Rasch-scaled scores, with their constant metric and equal-interval property, are sensitive to patterns of change over time (Bryk and Raudenbush 1987; Jordan et al. 2002).

Predictor variables

Immigration-related variables: The main predictor variable was *generational or immigration status*. This variable was defined in two ways. The first definition involved a categorical designation of the immigrant status. This variable was used in the full sample analyses of Latino youth. Youth who were born outside the U.S. were identified as the first generation, those who were born in the U.S. but whose one or both parents were foreign born were categorized as the second generation, and those who were born in the U.S. to U.S.-born parents were classified as third generation.

The second definition was used in the follow-up analyses involving the subsample of youth from immigrant families (i.e., the first- and second-generation youth), where the generational status variable was fine-tuned to represent the *proportion of life spent in the United States* (e.g., Shen and Takeuchi 2001). For the first generation youth, this variable was computed based on child's age in Wave 1 and his or her age at immigration to the U.S. Specifically, it was computed by dividing the age at immigration by age in Wave 1 and subtracting it from 1. For the second-generation youth, this variable was coded as 1 (= lived in the U.S. the whole life).

Other covariates—Other important variables included in the analyses constitute adolescents' psychosocial functioning, maternal functioning and parenting, and

neighborhood variables as well as the demographic and human capital covariates that, as described in the introduction, have been linked to academic achievement of youth in general and low-income youth from inner cities in particular. All of the covariates used in this study were assessed at Wave 1. Table 1 presents descriptive values on all of the variables in the analytic sample.

Adolescent functioning variables

Delinquency: Adolescents' engagement in delinquency was assessed using items from the National Longitudinal Study of Youth (Borus et al. 1982) and the Youth Deviance Scale (Gold 1970; Steinberg, et al. 1991). The modified delinquency scale had 17 items measuring involvement in school misconduct, drug use, and other delinquent behaviors such as truancy and vandalism ($\alpha = .74$). Adolescents reported how frequently they engaged in these activities in the previous 12 months, using a 4-point scale (ranging from 1 = "never" to 4 = "often"). Mean score across items was computed, with higher scores indicating greater problems.

Behavior problems: Behavior problems were assessed using the Child Behavior Checklist (CBCL 4/18) (Achenbach 1991), a well-validated parental report of children's behavioral functioning containing 100+ items. Age-standardized total problem behavior score was computed according to the manual.

In addition, each model of adolescent achievement outcome included a control for the level of achievement in the other domain. Thus, when examining math achievement outcomes, a control for reading achievement in Wave 1 was also included and vice versa.

Adolescent grades: Adolescents reported on their grades in school, using an 8-point scale (ranging from 1 = Mostly A's to 8 = mostly F's). The grade variables were recoded to correspond to the traditional 4-point grade point average (GPA) scale.

Maternal functioning and parenting variables

Psychological Distress: Maternal psychological distress was assessed with the Brief Symptom Inventory (BSI) (Derogatis 2001). Standardized t-scores were computed based on responses to the 18 items ($\alpha = 0.92$) using the adult norms provided in the manual. Higher scores indicate more psychological distress.

Positive self-concept: A composite score of maternal positive self-concept was computed based on five items from the Rosenberg (1989) Self-Esteem Scale. Items included questions such as "I'm a person of worth, at least on an equal basis with others," and "I am a useful person to have around" and were rated on a 4-point Likert scale ranging from "strongly agree" to "strongly disagree." Responses to the five items were summed into a total score ($\alpha = 0.69$), with higher scores indicating more positive self-concept.

English language proficiency: Mothers were asked if English was their first language. If English was not their first language, they rated their language proficiency in reading in English, ranging from 1 = "not at all" to 4 = "very well." Those who indicated "not at all" or

“not very well” were coded as having low English proficiency, whereas those who indicated “pretty well” or “very well” were coded as having high English proficiency. The maternal English language proficiency covariate included a set of dummy variables indicating either low English proficiency or high English proficiency, with English as the first language coded as the referent group.

Cognitive stimulation: Cognitive stimulation in youth’s home was measured using the age-appropriate version of the Home Observation for Measurement of the Environment – Short Form (HOME-SF) (Baker et al. 1993) that combines mother report and interviewer observations. The cognitive stimulation composite was created using 13 items such as “How many magazine subscriptions does your household get regularly?” Each item was dichotomized (1 indicating the presence of a developmentally supportive aspect and 0 indicating its absence). These raw scores were converted to age-standardized scores to account for instrumentation effects.

Neighborhood variables

Severity of neighborhood problems: A composite score of the severity of various neighborhood problems such as unemployment, abandoned houses, burglaries, assaults, gangs, and drug dealing was computed as a sum of responses to 11 items from the caregiver interview ($\alpha = .91$). While these items reflect respondents’ subjective perception of neighborhood problems, studies indicate that these correspond strongly with more objective assessments in national census data (e.g., Herrenkohl et al. 2002). Higher scores indicate greater severity of neighborhood problems.

Collective efficacy: This scale is based on items from the Collective Efficacy Scale (Sampson et al. 1997) and involves mother’s perception of collective efficacy in her neighborhood, combining five items measuring perceptions of neighborhood social control (e.g., the likelihood of intervention to resolve neighborhood problems) and four items assessing neighborhood cohesion and trust. Higher scores reflect greater collective efficacy ($\alpha = .87$).

Demographic and human capital variables—Mothers reported on their background characteristics such as their education (1 = high school diploma or higher, 0 = less than high school), income (coded as income-to-needs ratio and computed by dividing the total family income by the poverty threshold for the appropriate family size), number of minors in the household, their age, and marital status (coded 1 = married, 0 = not married). Similarly, the adolescents reported on their gender (1 = male, 0 = female) and country of origin/ethnic heritage (expressed as a series of three dummy variables denoting Dominican, Puerto Rican, and “other Latino” heritage, with Mexican origin coded as the referent category). The Spanish version of the Woodcock-Johnson (Woodcock and Munoz-Sandoval 1996) was administered if either the youth or parent reported that Spanish was the youth’s primary language. The language of test administration was included as a covariate (coded 1 = “Spanish”, 0 = “English”) in the analyses.

Additional controls included maternal employment and welfare receipt. However, instead of assessing whether the mother was working or on welfare at the date of the interview providing only a momentary snapshot of the experience, a more long-term assessment of labor force and welfare participation was included. A mother was defined as working if she had been employed full-time (30 or more hours) in at least 6 out of the prior 11 months (coded 1 = employed full-time, 0 = less than full-time). Similarly, a mother was coded on welfare if she had been receiving welfare for 6 of the last 11 months (coded 1 = on welfare, 0 = not on welfare).

Data Analytic Strategy

The primary data analytic strategy was growth curve modeling. In both, a multilevel model perspective as well as within a structural equation modeling (SEM) framework, growth curve models assess the inter-individual differences in intra-individual change. The repeated measures are used to estimate an underlying growth trajectory for each individual in the sample. This trajectory is defined by an average intercept and average slope (fixed effects) and the variability around these averages (random effects). From the SEM perspective, the intercept and slope are conceptualized as latent variables. From the multilevel perspective, the computation of this trajectory is done on two levels: Level 1 represents intra-individual differences in initial status (intercept) and rate of growth (slope), and Level 2 refers to the inter-individual differences in the intercept and slope.

The growth curve models presented here combine the SEM and HLM approach and are defined by random intercept and random slope. To capitalize on the variability in age among the adolescents at Wave 1 and to maximize the modeling flexibility, the analyses allow for individually varying ages at observation across waves (Muthén 2000). Thus, the growth curves were strung along the age continuum across the three waves (see Figure 1) and modeled using random coefficient growth modeling (Muthén and Muthén 2000). The analyses include both descriptive (unconditional) and relational (conditional) components (Singer and Willett 2003). The unconditional models examine reading and math achievement over time and describe trajectories of change for each individual in the sample. The initial step in conditional modeling involved comparing trajectories of adolescents by generational status. Then, the aforementioned child and maternal functioning, neighborhood, and demographic covariates were added in conceptually meaningful blocks, organized from the most proximal outward to the more distal ecological systems (e.g., Bronfenbrenner 1977)—from child functioning factors, to maternal functioning factors, out to factors capturing the characteristics of neighborhoods in which the youth development is embedded.

Full sample analyses

In the first set of analyses, the full sample of Latino youth who had valid outcome (reading and math) scores available in at least one wave ($n = 543$) was used. The best fitting average trajectory was established in the unconditional models and the effects of the predictors were examined in the conditional models. To maximize the use of available data and minimize the bias, the present analyses use growth models based on full-information maximum likelihood procedure for incomplete data using the robust maximum likelihood estimator in Mplus

(Muthén and Muthén 2010). The conditional analyses exclude a small number of participants ($n = 37$) who had missing values on one or more covariates. As a robustness check, the unconditional models were run with and without the participants who had missing values on covariates and the results were analogous (data not shown).

Follow-up analyses

The second set of analyses focused on the first- and second-generation youth and examined the role of timing of immigration in predicting the adolescents' achievement trajectories. The unconditional models were re-estimated for the subsample of the first- and second-generation youth in order to double check that the trajectories specified for the full sample of Latino youth were also appropriate for these subsample analyses. In the conditional models, the effects of a more fine-tuned immigration-related variable (proportion of life spent in the United States) on achievement trajectories was examined while controlling for the cultural, child and maternal functioning, neighborhood, and demographic covariates.

Results

Reading and Math Achievement Trajectories: Full Sample Analyses

Unconditional models—A series of unconditional growth models with no predictor variables were used to examine the developmental trajectories of the reading and math achievement of Latino youth in the full sample. The growth function that best fit the achievement data in both domains was quadratic in shape (evaluated against the linear model in terms of absolute value on three comparative fit indices: the Akaike Information Criterion (AIC) (Akaike 1987); Bayesian Information Criterion (BIC) (Schwarz 1978); and Sample-size Adjusted BIC (SABIC) (Sclove 1987). Thus, for an outcome y_{it} for occasion t and individual i , the growth model was expressed as:

$$Y_{ti} = i_i + s_i * (x_{ti} - d) + q_i * (x_{ti} - d)^2,$$

where x_{ti} represents the age of the participant and d is a centering constant set at age 12 (mean age in wave 1). The random effect intercepts i_i , linear slopes s_i , and quadratic slopes q_i were allowed to vary across individuals, and their means and variances were estimated.

For reading achievement, there was significant variation across youth with respect to the intercept, but there was no significant variation in the rate of growth and the acceleration or curvature component. Thus, the conditional analyses fit an average growth trajectory that was quadratic in form with individual variation in intercept. Mean intercept, linear slope, and curvature term were statistically significant ($b = 511.7$, $p < .001$; $b = 4.51$, $p < .001$; and $b = -0.34$, $p < .001$, respectively). Positive mean linear slope and negative mean acceleration and non-significant variance of these terms indicate that youth's reading achievement increased over time, although this rate of growth leveled off as they got older, and this general trajectory was similar for most youth in the sample. Importantly, this also means that the variability to be explained in the conditional growth models of reading achievement is the variance of the intercept. However, to be conservative, the variances of the growth components were allowed to be freely estimated in all of the conditional models. The

variances of slope and curvature were not significant in any of the models. In the robustness checks, the variance terms were constrained to 0 and the results were analogous to those presented here (data not shown).

For math achievement, the unconditional models indicated positive mean linear slope ($b = 3.84, p < .001$) and negative mean curvature ($b = -0.33; p < .001$) in addition to positive mean intercept ($b = 505.32, p < .001$). This means that, as with reading, math achievement increased over time but this rate of change leveled off as the youth got older. However, unlike reading, the math models had significant variance of all growth components. Thus, the conditional models for math achievement include predictors of variability in the intercept, slope, and curvature.

Conditional models—First, the association between the main predictor, generational status, on each achievement trajectory was assessed. Then the data were entered in separate blocks to adjust for the impact of the covariates. These included adolescents' psychosocial functioning, maternal functioning and parenting, neighborhood demographic, and background characteristics. The reported coefficients are unstandardized (Muthén and Muthén 2010).

Reading achievement

Conditional model 1: Immigrant generation status: The first conditional specification involved inclusion of the main predictor, the generational status (see Table 2, Model 1). Significant generational differences emerged, with both the first generation as well as second generation of youth outperforming the third ($b = 10.92, p < .01$ and $b = 10.11, p < .001$, respectively) at the beginning of adolescence.

Full model with all covariates: The covariates were included in a series of conceptually meaningful blocks to examine whether their inclusion attenuates the relationship between the generational status and achievement. The immigrant advantage persisted even after controlling for all of the covariates; the final model indicates that the first- and second-generation youth had higher scores on reading achievement than the third-generation youth ($b = 10.01, p < .05$ and $b = 11.10, p < .001$, respectively) at the beginning of adolescence, and because the rate of change in reading achievement was similar for all youth in the sample, youth from immigrant families (i.e., first- and second-generation youth) maintained this advantage over time. Higher grades, higher math achievement, more cognitive stimulation, and lower severity of neighborhood problems were associated with higher scores on reading achievement at the beginning of adolescence (see Table 2, Model 5). Dominican and "other Latino" youth had higher scores than youth of Mexican origin as did those with Spanish test administration. In addition, there were few relationships significant at a marginal level ($p < .10$), which, while consistent with the literature, are not interpreted in order to minimize capitalizing on chance findings. Table 3 showcases the findings from these models excluding those who took the achievement test in Spanish, the results, in terms of the role of immigration, were analogous.

Math achievement

Conditional model 1: Immigrant generation status: As with reading, the first conditional specification involved inclusion of the main predictor, the generational status, although unlike reading, the predictors were also used to explain variability in intercept, as well as slope and curvature (see Tables 4a, 4b and 4c, Model 1, respectively). The first-generation youth had significantly lower scores on math achievement than their third-generation counterparts ($b = -7.10$; $p < .01$) at the beginning of adolescence, but the rate of change over time in their scores did not differ ($b_{\text{slope}} = 0.87$, $p = 0.46$; $b_{\text{curvature}} = -0.02$, $p = 0.86$). The second-generation youth's math achievement at the beginning of adolescence was not significantly different from the third ($b = -1.36$, $p = 0.42$), their linear slope was only marginally higher ($b = 1.16$, $p < .10$), and the curvature was not statistically different ($b = -0.10$, $p = 0.25$) than that of the third generation.

Full model with all covariates: With the inclusion of the covariates, the first generation's disadvantage in math achievement scores was reduced to nonsignificance. While the present models are not designed to formally test mediation hypotheses, the bivariate relationships among the predictors and outcome variables and the results in Models 3 and 5 of Table 4 indicate that it is primarily the lower English language proficiency (both maternal and, to some extent, the youth's—as indexed by the language of test of administration) that accounted for the first generation's disadvantage in math achievement when compared to the third generation. Specifically, on a bivariate level, first-generation youth were more likely to have mothers with low English language proficiency than the third-generation youth (73.6% of the first-generation versus 48.1% of the second-generation and 8.2% of the third-generation youths' mothers had low English proficiency, $\chi^2(2, N = 545) = 165.37$, $p < 0.001$), and low proficiency in English also predicted lower math achievement scores at Wave 1 ($b = -4.90$; $p < .05$ when compared to youth of mothers for whom English was their first language; there was no statistically significant difference for those with high proficiency in English). Similarly, those who took the test in Spanish were more likely to be first-generation youth (24.5% of the first-generation youth took the test in Spanish versus 8.7% and 0% of the second- and third-generation youth, respectively; $\chi^2(2, N = 545) = 63.83$, $p < 0.001$), and taking the test in Spanish predicted marginally lower math achievement scores at the beginning of adolescence ($b = -9.73$; $p < .10$). Finally, the generational status variable did not predict the rate of change in math achievement over time.

Regarding the relationships between other covariates and math achievement in the final model, the results indicate that those with higher reading achievement scores, those whose mothers' were married, and youth of Mexican origin when compared to Puerto Rican origin youth had higher math achievement scores at the beginning of adolescence. Few covariates predicted significantly the rate of change over time and none had statistically significant coefficients for both the linear slope and the associated curvature terms that described the underlying trajectory of math achievement over the course of adolescence. Table 5 showcases the findings from these models excluding those who took the math achievement test in Spanish, the results, in terms of the role of immigration, were analogous.

Reading and Math Achievement Trajectories of Latino Youth from Immigrant Families: Follow-up Analyses

This set of analyses focused on the first and second generation youth and examined the variability in reading and math achievement within the subsample of youth from immigrant families focusing on the proportion of life spent in the United States as the main predictor of academic achievement while controlling for the aforementioned covariates.

Unconditional models

A series of unconditional growth models with no predictor variables were used to double-check that the average developmental trajectories of reading and math achievement specified for the full sample still fit the trajectories of achievement scores of the subsample of Latino youth from immigrant families. For reading achievement, the immigrant subsample results were analogous to those of the full sample (i.e., mean intercept, linear slope, and curvature term were statistically significant: $b = 517.82$, $p < .001$; $b = 4.02$, $p < .001$; and $b = -0.33$, $p < .01$, respectively), with the only significant variance pertaining to the intercept term. Similarly, the unconditional math model results were analogous to those of the full sample; the mean intercept, linear slope, and curvature term were statistically significant ($b = 503.71$, $p < .001$; $b = 4.28$, $p < .001$; and $b = -0.36$, $p < .01$, respectively), as were their variance components.

Conditional models

Based on the results from the unconditional models, the predictors were used to explain variability in the levels of reading achievement at the beginning adolescence, the levels of math achievement at the beginning of adolescence, as well as the rate of change in math achievement over time among youth from immigrant families. The primary predictor in these models was the proportion of life spent in the U.S., while controlling for the other covariates.

Conditional models for the immigrant subsample: immigration-related variables—

The model that included only the proportion of life spent in the U.S. immigration-related variables indicated that those with lower proportion of life spent in the U.S. had higher scores on reading achievement ($b = -16.58$; $p < .001$) at the beginning of adolescence. Importantly, even after the aforementioned covariates from the full sample analyses were included, the effect of length of time spent in the U.S. on the reading achievement intercept persisted ($b = -10.63$; $p < .05$), see Table 6.

However, the timing of immigration variable did not predict math achievement of youth from immigrant families in the model without the other covariates ($b_{\text{intercept}} = 6.95$, $p = .15$; $b_{\text{slope}} = -2.96$, $p = .21$; $b_{\text{curvature}} = 0.24$, $p = .36$), nor in the fully controlled model ($b_{\text{intercept}} = 6.49$, $p = .36$; $b_{\text{slope}} = 0.62$, $p = .80$; $b_{\text{curvature}} = -0.25$, $p = .38$), see Table 7.

Discussion

This study examined the variability in the academic achievement of Latino youth who constitute a rapidly growing, yet under-researched segment of the U.S. population. It focused on youth from immigrant and native-born families residing in low-income, urban neighborhoods who must overcome multiple risks to healthy development. The results indicate a significant advantage in reading for youth from immigrant families (i.e., first- and second-generation youth). This advantage persisted even with the inclusion of important child, parenting, human capital, and demographic covariates. In addition, the follow-up analyses within the subsample of the first- and second-generation youth indicate that more recent arrival to the United States was associated with higher achievement in reading among youth from immigrant families. Yet, there was no evidence of a similar immigrant advantage in math achievement. In fact, first-generation youth had lower math achievement than third-generation youth until the inclusion of variables indexing the English language proficiency of the students and their caregivers.

Reading Achievement

The results of this study pertaining to reading achievement are consistent with a growing body of research that documents what some have termed the immigrant paradox. The first- and second-generation Latino youth had higher reading achievement than did the third-generation youth. This advantage was somewhat attenuated but remained significant after controlling for Spanish language test administration, which was also positively related to reading achievement. However, even when the youth that took the test in Spanish were excluded from the analyses, the immigrant advantage was evidenced (see Table 3). In addition, the findings indicate that the length of residence in the U.S. was negatively related to youths' reading achievement. Specifically, within the subsample of youth from immigrant families, the proportion of life spent in the U.S. was negatively related to the reading achievement, with those who have been in the U.S. for a shorter amount of time having higher levels of reading achievement. These findings are in line with predictions made based on the segmented assimilation theory (Portes and Zhou 1993), wherein different paths of integration into the U.S. society are available to immigrants, based on their economic, social, and human capital. Those of limited capital are more likely to experience downward mobility and worse outcomes with increased time and exposure to life in the United States. However, the present findings may also reflect the potential effect of schooling that some of these children have experienced in their countries of origin. Presumably, those who have been in the U.S. for a shorter amount of time were likely to receive some of their elementary school education in another country, which may have provided better foundation for literacy skills than the reading education in the U.S.

Furthermore, research indicates that children from immigrant families are often involved in language brokering on behalf of their limited English-proficient family members (Fuligni and Fuligni 2007), and this experience in turn can contribute to their advantage in reading (Dorner et al. 2007). Exposure to other languages may also improve children's phonological awareness, metalinguistic ability, and processing skills, contributing to their advantage in reading (Bialystok 2001). Thus, another possible explanation of the immigrant advantage in

reading in this study might involve exposure to multiple languages common in immigrant families. It is possible that the Latino youth from immigrant families in the sample engage in language tasks and assistance that promote their reading skills. However, the study does not provide information on the number of languages in which the youth are proficient nor about the language and translational assistance that the youth might provide for their families. The language variables in this study included whether English was the primary language spoken at home, parental English language proficiency, and the youth's choice of language of test administration. Those youth who chose to take the test in Spanish had higher reading scores than those who took it in English. In the sensitivity tests, those who took the test in Spanish were excluded from the analyses and the results were analogous – the immigrant advantage in reading was still evidenced. Future studies with other data should explore the link between bilingualism and reading achievement.

In addition, immigrant Latino families possess important strengths that can influence their children's academic outcomes and socio-emotional adjustment. These include resources such as optimism, motivation, and courage that stimulated the migration process (Kao and Tienda 1995). Moreover, many immigrant Latino families also have close, cohesive bonds among family members and high levels of familism (Landale et al. 2006). Higher levels of familism and family cohesion among the foreign-born Latinos have been linked to more positive outcomes for their children (Bacallao and Smokowski 2007; Landale et al. 2006). Yet, in this study, controlling for family structure and household size did not reduce the immigrant advantage. On the other hand, these are only some of the structural indicators of family life among Latinos. Familism is a rich, multidimensional construct that encompasses both values and behaviors related to beliefs about the importance of family, and feelings of loyalty and togetherness among family members (Halgunseth et al. 2006; Landale et al. 2006). Familism has been described as one of the pillars of Latino culture (Marín and Marín 1991). Future studies should collect more detailed and culturally specific data that tap into multiple and diverse dimensions of family life to explore the mechanism of influence of these important strengths on child and adolescent functioning.

Consistent with findings reported in other studies, higher math achievement and higher grades were related to higher reading achievement at the beginning of adolescence, strengthening the evidence of the validity of these indicators of academic functioning. Also, as reported in other samples (e.g., Eamon 2005), more cognitive stimulation at home, and lower severity of neighborhood problems were associated with higher scores on reading achievement at the beginning of adolescence. However, none of these predictors explained the immigrant advantage in reading achievement.

Math Achievement

Why then wasn't there evidence of immigrant advantage in math achievement? Children from low-income neighborhoods are more likely to attend lower quality schools and experience a reduced opportunity to learn, as indicated by, for example, the number and quality of mathematics courses taken (Wang and Goldschmidt 1999), and mathematics achievement in particular is heavily influenced by the effects of formal education and schooling (Bryk, Lee, and Smith 1990). This sample as a whole suffered the disadvantage.

Indeed, when the average standard scores of the full sample were compared to the national average for the non-poor sample, this trend was particularly salient for math achievement with the *Welfare, Children and Families* sample of adolescents lagging behind the national average (Chase-Lansdale et al. 2002). In addition, first-generation youth, who constitute the majority of English as a second-language (ESL) learners, might have a particularly difficult time in inner-city schools that are under-resourced, segregated, and linguistically isolated (Suárez-Orozco et al. 2010). Second-language learners require, under *optimal* academic instruction, a number of years to develop academic English-language skills that are on par with native language speakers (Hakuta et al. 2000). Without these language skills, learning content (in mathematics and other subjects) in school can be very challenging (August and Hakuta 1997). Furthermore, low-income, inner-city youth from immigrant families might be additionally disadvantaged because their parents are less likely to be able to help them with homework in subjects that require proficiency in English to understand the assignments (Lee and Bowen 2006). The results from the math models in this study support these findings. Specifically, children of low English proficient mothers had significantly lower scores on math achievement at the beginning of adolescence than children of those for whom English was their first language and this finding persisted even when the lowest English proficient youth (i.e., those who chose to take the test in Spanish) were excluded from the model. Importantly, the first-generation Latino youth in the study had lower levels of math achievement until the controls for English language proficiency of their mothers were included. After accounting for the fact that the majority of the first-generation Latino youth live in families where English is not the first language and their caregivers or they themselves have lower English language proficiency, the gap in their math achievement was no longer statistically significant.

Limitations, Implications and Future Directions

The analyses have an important strength in comparing the achievement of children from immigrant and native-born families of similar ethnic and economic background. Thus, unlike many studies of immigrant adaptation that used Whites as the referent group, this study estimates the immigrant effect within a group of co-ethnics. This represents a more fine-tuned approach to understanding of the adaptation of immigrant groups (Harris et al. 2008). Moreover, the study focuses on the academic functioning of Latino youth residing in low-income, inner-city environments, which is an under-researched population. A potential drawback of this approach is the inability to examine the effects of socioeconomic variability within Latino communities. While the Latino population in the U.S. faces high rates of poverty, many Latino families are prospering economically. And many of those whose families have lived in low-income inner cities have subsequently managed to move away to less stressful, more thriving environments. The present analyses compare relatively recent arrivals to the United States with the third-generation Latino Americans who may have experienced American inner cities and persistent poverty for perhaps generations. Arguably, some of the immigrants in the sample have fled socioeconomic conditions in their country of origin that were worse than those in the U.S. inner cities. The present analyses cannot disentangle these potential sources of variability. Therefore, the findings should be interpreted with this caveat in mind.

However, the findings of this study point to several important implications for policy-makers, educators and social scientists designing programs aimed at fostering school success of Latino youth growing up in the conditions of disadvantage. First, this study challenges the common view that limited English proficiency of students uniformly predicts lower academic achievement. In this study, taking the standardized achievement test in Spanish was marginally related ($p < .10$) to lower scores in math but significantly higher scores in reading. Future educational programs and supports that address students' needs should also capitalize on their strengths. Second, low English proficiency of the caregivers was related to youths' lower math scores even after controlling for youths' own language proficiency and all other covariates, yet this was not the case for reading achievement. It is possible that parents are able to support the reading skills of their children even if their own English proficiency is low—by, for example, teaching their children to read in their native language or providing stimulating resources and activities. Indeed, cognitive stimulation at home was positively related to reading achievement in this study. It is likely that fostering one's children's math achievement requires a higher level of cognitive skill in order to understand the assignments, including a higher level of mastery of English. Providing materials such as homework assignments and instructions in families' native languages might increase the concrete, substantive math assistance that parents are able to provide, and perhaps boost overall parental involvement in their children's learning, which has consistently been linked to better outcomes (e.g. Walker et al. 2004). Third, the results of this study also serve as a reminder that achievement in one domain is related to achievement in other domains. In this study, there was a strong link between math and reading achievement, consistent with findings from other studies that showed that reading predicts math achievement in adolescence (Larwin 2010). Thus, programs aimed at improving adolescents' math achievement should also assess and foster any necessary improvements in reading skills. Finally, the results of this study indicate that youth differed in their reading achievement at the beginning of adolescence, but they all, on average, increased their skills at about the same rate. Thus, any differences or deficits in reading achievement present at the beginning of adolescence were maintained over time. This underscores the crucial importance of prevention, early identification and intervention programs, in grade school and beyond, in addressing achievement gaps.

In summary, this study revealed insights into the variability in academic functioning and what factors predict better outcomes for Latino youth growing up in the condition of disadvantage. As such, it constitutes an important stepping-stone toward creating successful prevention and intervention programs that can improve the health and well-being of our youth.

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Figure 1.
Welfare Children and Families adolescent data structure

Table 1

Descriptive Information about Latino Participants in WCF study by Immigrant Group.

	Overall Sample	1st Generation	2nd Generation	3rd Generation
N	545	106	183	256
Child Demographics				
Girls	280 (51.4%)	55 (51.9%)	98 (53.6%)	127 (49.6%)
Child Age at Wave1 in years	12.51 (1.53)	12.64 (1.30)	12.39 (1.54)	12.54 (1.61)
Low Income ^b	74.5%	77.40%	73.20%	74.20%
<i>Child ethnicity/National origin</i>				
Dominican	68 (12.5%)	37 (34.9%)	27 (14.8%)	4 (1.6%)
Mexican	262 (48.1%)	23 (21.7%)	73 (39.9%)	166 (64.8%)
Puerto Rican	157 (28.8%)	37 (34.9%)	61 (33.3%)	59 (23.0%)
Other Latino	58 (10.6%)	9 (8.5%)	22 (12.0%)	27 (10.5%)
Woodcock Johnson Letter-Word ^a				
Wave 1	511.67 (31.60)	520.86 (39.27)	515.82 (28.99)	504.81 (28.27)
Wave 2	519.06 (26.88)	524.05 (32.10)	523.79 (24.81)	513.86 (25.01)
Wave 3	526.54 (24.28)	531.92 (25.73)	530.07 (22.47)	521.92 (24.23)
Woodcock Johnson Applied Problems ^a				
Wave 1	504.29 (21.66)	499.42 (26.67)	504.55 (22.00)	506.14 (18.66)
Wave 2	511.67 (18.31)	507.04 (25.29)	512.62 (17.64)	512.89 (14.91)
Wave 3	516.09 (16.30)	514.58 (19.17)	518.41 (16.79)	514.99 (14.60)
Child Functioning ^c				
Total Behavior Problems (CBCL)	53.99 (12.16)	55.18 (9.63)	53.40 (12.20)	53.92 (13.05)
Youth Serious Delinquency	.20 (.28)	.16 (.27)	.16 (.25)	.24 (.31)
Grades - GPA (on a 4-point scale)	2.72 (.85)	2.56 (.88)	2.72 (.82)	2.78 (.86)
Maternal Functioning and Parenting ^c				
Positive Self-Concept	21.98 (3.70)	23.08 (2.95)	22.18 (3.72)	21.38 (3.85)
Psychological Distress (BSI total)	48.65 (11.86)	46.66(10.40)	48.91 (11.06)	49.28 (12.90)
English is the first language (referent)				
English proficiency high	150 (27.5%)	24 (22.6%)	74 (40.4%)	52 (20.3%)
English proficiency low	187 (34.3%)	78 (73.6%)	88 (48.1%)	21 (8.2%)
Cognitive Stimulation (HOME-SF)	96.86 (15.34)	90.82 (14.63)	95.36 (14.73)	100.46 (15.14)
Neighborhood Characteristics ^c				
Collective Efficacy	26.81 (9.51)	27.02 (9.56)	26.07 (8.80)	27.24 (9.98)
Severity of Neighborhood Problems	19.87 (6.15)	19.14 (5.95)	19.86 (6.06)	20.18 (6.29)
Demographic and Background Variables ^c				
Parent Education				
No High School Education	291 (53.4%)	57 (53.8%)	103 (56.3%)	131 (51.2%)
High School Education or higher	254 (46.6%)	49 (46.2%)	80 (43.7%)	125 (48.8%)
Married	108 (19.8%)	28 (26.4%)	48 (26.2%)	32 (12.5%)
Number of Minors in household	2.83 (1.30)	2.61 (1.05)	2.94 (1.35)	2.85 (1.36)

	Overall Sample	1st Generation	2nd Generation	3rd Generation
N	545	106	183	256
Needs Ratio, w/Imp	.74 (.54)	.70 (.47)	.76 (.54)	.74 (.58)
Employment	159 (29.2%)	31 (29.2%)	54 (29.5%)	74 (28.9%)
Welfare receipt	195 (35.8%)	30 (28.3%)	70 (38.3%)	95 (37.1%)
Mother's age	37.42 (7.18)	37.39 (6.58)	38.58 (7.27)	36.61 (7.27)

^aNote. mean W-scores (Rasch-scaled scores), standard deviations in parentheses unless noted otherwise;

^bpercent of subgroup in rows;

^cassessed at Wave 1. WCF=Welfare, Children and Families; CBCL=Child Behavior Checklist; GPA=Grade Point Average; BSI=Brief Symptom Inventory; HOME-SF= Home Observation for Measurement of the Environment - Short Form.

Table 2

Conditional Models for All Latino Youth - Reading Achievement.

Reading Achievement (Intercept)		Model 1		Model 2		Model 3		Model 4		Model 5	
		Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 1: Generational Status	1st generation (3 rd gen omitted)	10.920 ^{**}	3.467	14.269 ^{***}	3.435	16.391 ^{***}	4.148	16.260 ^{***}	4.086	10.005 [*]	4.304
	2nd generation	10.112 ^{***}	2.300	10.195 ^{***}	2.132	12.198 ^{***}	2.732	12.216 ^{***}	2.682	11.103 ^{***}	2.647
Model 2: Child Functioning	CBCL total behavior problems			-0.126	0.082	-0.075	0.091	-0.065	0.093	-0.159T	0.096
	Youth serious delinquency			-9.835	6.037	-10.224T	6.057	-10.274T	6.000	-7.035	5.866
	Math Achievement			0.328 ^{***}	0.086	0.303 ^{***}	0.085	0.288 ^{**}	0.086	0.290 ^{***}	0.073
	Grades			5.808 ^{***}	1.625	5.247 ^{**}	1.536	4.986 ^{**}	1.569	4.266 ^{**}	1.548
Model 3: Maternal Functioning and Parenting	Positive Self-Concept					0.469T	0.256	0.445T	0.253	0.197	0.250
	Psychological Distress (BSI - total)					-0.003	0.124	0.040	0.124	0.027	0.133
	Low English Prof (English 1st lang omitted)					-2.919	3.404	-3.030	3.348	-5.588	3.532
	High English Prof					-3.157	2.541	-2.930	2.541	-4.785T	2.479
Model 4: Neighborhood	HOME cognitive stimulation					0.169 [*]	0.081	0.180 [*]	0.081	0.162 [*]	0.081
	Collective efficacy							0.052	0.116	0.025	0.109
Model 5: Demographics and background	Severity of neighborhood probs							-0.358 [*]	0.178	-0.345 [*]	0.172
	Dominican (Mexican omitted)									12.667 ^{***}	3.157
	Puerto Rican									4.172	2.572
	Other Latino									6.716 [*]	3.106
	Male									-1.761	1.844
	Spanish WJ administration (English omitted)									15.010 ^{***}	4.075
	Mother's age									0.002	0.133
	High school grad or higher									3.588T	2.017
	Employment									1.871	2.534
	Welfare receipt									-2.299	2.216
	Married									-1.412	2.631
	Income-to-needs									1.237	1.606
	# of minors on household									1.420T	0.796

Note: T<.10,

p<.001; all covariates were assessed at Wave 1; S.E. = standard error; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory

p <.01

**

p<.05

*

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Table 3

Conditional Models for Latino Youth (excluding those who took the WJ test in Spanish) - Reading Achievement.

Reading Achievement (Intercept)		Model 1	Model 2	Model 3	Model 4	Model 5
		Estimate	S.E.	Estimate	S.E.	Estimate
Model 1: Generational Status	1st generation (3 rd gen omitted)	7.947 *	4.042	12.066 **	3.794	14.876 **
	2nd generation	8.906 ***	2.347	8.816 ***	2.097	11.008 ***
Model 2: Child Functioning	CBCL total behavior problems			-0.076	0.079	-0.030
	Youth serious delinquency			-9.932T	5.837	-10.474T
	Math Achievement			0.459 ***	0.062	0.430 ***
Model 3: Maternal Functioning and Parenting	Grades			5.257 **	1.600	4.863 **
	Positive Self-Concept					0.410
	Psychological Distress (BSI - total)					0.007
	Low English Prof (English 1st lang omitted)					-4.034
Model 4: Neighborhood	High English Prof			-2.339	2.453	-1.931
	HOME cognitive stimulation			0.143T	0.086	0.151T
	Collective efficacy					-0.042
	Severity of neighborhood probs					-0.395 *
Model 5: Demographics and background	Dominican (Mexican omitted)					13.792 ***
	Puerto Rican					4.207
	Other Latino					6.701 *
	Male					-1.969
	Mother's age					-0.051
	High school grad or higher					3.510T
	Employment					1.507
	Welfare receipt					-1.672
	Married					-2.614
	Income-to-needs					1.801
	# of minors on household					1.308T

Note: T < 10,

* p < .05,

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p < .01
d

p<.001; all covariates were assessed at Wave 1; S.E. = standard error; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory

Table 4

Conditional Models for All Latino Youth - Math Achievement.

4a - Math Achievement (Intercept)	Model 1	Model 2	Model 3	Model 4	Model 5
	Estimate	S.E.	Estimate	S.E.	Estimate
Model 1: Generational Status					
1st generation (3 rd gen omitted)	-7.097**	2.697	-10.398***	2.686	-6.998*
2nd generation	-1.360	1.680	-3.449*	1.608	-0.921
Model 2: Child Functioning					
CBCL total behavior problems					
Youth serious delinquency					
Reading Achievement					
Grades					
Model 3: Maternal Functioning and Parenting					
Positive Self-Concept					
Psychological Distress (BSI - total)					
Low English Prof (English 1st lang omitted)					
High English Prof					
Model 4: Neighborhood					
HOME cognitive stimulation					
Collective efficacy					
Severity of neighborhood probs					
Model 5: Demographics and background					
Dominican (Mexican omitted)					
Puerto Rican					
Other Latino					
Male					
Spanish WJ administration (English omitted)					
Mother's age					
High school grad or higher					
Employment					
Welfare receipt					
Married					
Income-to-needs					
# of minors on household					

4b - Math Achievement (Slope)		Model 1		Model 2		Model 3		Model 4		Model 5	
		Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 1: Generational Status	1st generation (3r gen omitted)	0.867	1.172	1.312	1.424	0.199	1.616	0.041	1.639	-1.108	1.635
	2nd generation	1.155T	0.688	1.144	0.776	0.324	1.050	0.203	1.032	0.104	1.081
Model 2: Child Functioning	CBCL total behavior problems			0.027	0.026	0.038	0.029	0.038	0.029	0.039	0.033
	Youth serious delinquency			-1.816	1.489	-1.853	1.502	-1.600	1.481	-1.351	1.604
	Reading Achievement			0.003	0.020	0.005	0.021	0.005	0.022	0.002	0.021
	Grades			0.804	0.494	0.678	0.479	0.748	0.479	0.946T	0.487
Model 3: Maternal Functioning and Parenting	Positive Self-Concept					0.109	0.091	0.116	0.092	0.100	0.091
	Psychological Distress (BSI - total)					-0.025	0.035	-0.024	0.035	-0.013	0.038
	Low English Prof (English 1st lang omitted)					1.190	1.026	1.463	1.041	0.659	1.133
	High English Prof					0.995	0.929	1.295	0.932	0.824	0.995
	HOME cognitive stimulation					0.000	0.027	0.002	0.027	0.010	0.028
	Collective efficacy							-0.057	0.038	-0.062T	0.037
Model 4: Neighborhood	Severity of neighborhood probs							-0.039	0.062	-0.039	0.059
	Dominican (Mexican omitted)									1.248	1.327
	Puerto Rican									0.281	0.940
	Other Latino									-0.621	1.148
	Male									0.634	0.750
	Spanish WJ administration (English omitted)									3.870T	2.229
	Mother's age									-0.063	0.057
	High school grad or higher									-0.531	0.733
	Employment									-1.661 *	0.755
	Welfare receipt									-1.961 *	0.833
	Married									-0.400	0.928
	Income-to-needs									0.336	0.676
	# of minors on household									0.498T	0.301

4c - Math Achievement (Curvature)		Model 1		Model 2		Model 3		Model 4		Model 5	
		Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 1: Generational Status	1st generation (3r gen omitted)	-0.022	0.129	-0.075	0.159	0.083	0.182	0.104	0.184	0.192	0.179
	2nd generation	-0.099	0.086	-0.088	0.100	0.036	0.127	0.048	0.124	0.042	0.126

4c - Math Achievement (Curvature)		Model 1	Model 2	Model 3	Model 4	Model 5
		Estimate	S.E.	Estimate	S.E.	Estimate
Model 2: Child Functioning	CBCL total behavior problems			Estimate	S.E.	S.E.
	Youth serious delinquency			Estimate	S.E.	S.E.
	Reading Achievement			Estimate	S.E.	S.E.
	Grades			Estimate	S.E.	S.E.
Model 3: Maternal Functioning and Parenting	Positive Self-Concept			Estimate	S.E.	S.E.
	Psychological Distress (BSI - total)			Estimate	S.E.	S.E.
	Low English Prof (English 1st lang omitted)			Estimate	S.E.	S.E.
	High English Prof			Estimate	S.E.	S.E.
Model 4: Neighborhood	HOME cognitive stimulation			Estimate	S.E.	S.E.
	Collective efficacy			Estimate	S.E.	S.E.
	Severity of neighborhood probs			Estimate	S.E.	S.E.
	Dominican (Mexican omitted)			Estimate	S.E.	S.E.
Model 5: Demographics and background	Puerto Rican			Estimate	S.E.	S.E.
	Other Latino			Estimate	S.E.	S.E.
	Male			Estimate	S.E.	S.E.
	Spanish WJ administration (English omitted)			Estimate	S.E.	S.E.
	Mother's age			Estimate	S.E.	S.E.
	High school grad or higher			Estimate	S.E.	S.E.
	Employment			Estimate	S.E.	S.E.
	Welfare receipt			Estimate	S.E.	S.E.
	Married			Estimate	S.E.	S.E.
	Income-to-needs			Estimate	S.E.	S.E.
	# of minors on household			Estimate	S.E.	S.E.

Note: T<.10,

*
p<.05,**
p <.01,***
p<.001; all covariates were assessed at Wave 1; S.E. = standard error; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory

Note: T<.10,

*
p<.05,

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p <.01,
**

p<.001; all covariates were assessed at Wave 1; S.E. = standard error; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory

Note: T<.10,
*
p<.05,
**

p <.01,

p<.001; all covariates were assessed at Wave 1; S.E. = standard error; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory

Table 5
Conditional Models for Latino Youth (excluding those who took the WJ test in Spanish) - Math Achievement.

5a - Math Achievement (Intercept)	Model 1	Model 2	Model 3	Model 4	Model 5
	Estimate	S.E.	Estimate	S.E.	S.E.
Model 1: Generational Status					
1st generation (3 rd gen omitted)	-6.369 *	3.134	-6.870 *	3.474	-4.453
2nd generation	-0.700	1.529	-0.255	1.731	0.920
Model 2: Child Functioning					
CBCL total behavior problems	-0.193 ***	0.055	-0.140 *	0.063	-0.111
Youth serious delinquency	2.281	2.443	2.041	2.465	0.465
Reading Achievement	0.234 ***	0.035	0.226 ***	0.035	0.219 ***
Grades	2.039 *	1.013	2.055 *	1.031	2.229 *
Model 3: Maternal Functioning and Parenting					
Positive Self-Concept			-0.056	0.167	-0.223
Psychological Distress (BSI - total)			-0.118T	0.070	-0.098
Low English Prof (English 1st lang omitted)			-3.632T	2.050	-4.793 *
High English Prof			-3.069T	1.710	-3.241T
Model 4: Neighborhood					
HOME cognitive stimulation			0.035	0.046	0.019
Collective efficacy				0.134T	0.145T
Severity of neighborhood probs				0.064	0.120
Model 5: Demographics and background					
Dominican (Mexican omitted)					-2.605
Puerto Rican					-4.393 *
Other Latino					-2.005
Male					2.603T
Mother's age					0.163T
High school grad or higher					0.539
Employment					2.352
Welfare receipt					1.169
Married					4.756 **
Income-to-needs					-1.230
# of minors on household					-0.164

5b - Math Achievement (Slope)		Model 1	Model 2	Model 3	Model 4	Model 5
		Estimate	S.E.	Estimate	S.E.	Estimate
Model 1: Generational Status	1st generation (3r gen omitted)	0.305	1.243	1.008	1.494	0.471
	2nd generation	0.846	0.679	0.952	0.750	0.600
Model 2: Child Functioning	CBCL total behavior problems			0.039T	0.024	0.061 *
	Youth serious delinquency			-2.280T	1.378	-2.326T
Model 3: Maternal Functioning and Parenting	Reading Achievement			-0.005	0.020	-0.004
	Grades			0.618	0.485	0.484
Model 4: Neighborhood	Positive Self-Concept					0.123
	Psychological Distress (BSI - total)					-0.043
Model 5: Demographics and background	Low English Prof (English 1st lang omitted)					0.184
	High English Prof					0.713
Model 6: Neighborhood	HOME cognitive stimulation					0.005
	Collective efficacy					-0.062T
Model 7: Demographics and background	Severity of neighborhood probs					-0.042
	Dominican (Mexican omitted)					0.944
Model 8: Demographics and background	Puerto Rican					0.596
	Other Latino					-0.449
Model 9: Demographics and background	Male					0.398
	Mother's age					-0.070
Model 10: Demographics and background	High school grad or higher					-0.397
	Employment					-1.468 *
Model 11: Demographics and background	Welfare receipt					-1.551T
	Married					-0.696
Model 12: Demographics and background	Income-to-needs					0.585
	# of minors on household					0.453T

5c - Math Achievement (Curvature)		Model 1	Model 2	Model 3	Model 4	Model 5
		Estimate	S.E.	Estimate	S.E.	Estimate
Model 1: Generational Status	1st generation (3r gen omitted)	0.060	0.137	-0.024	0.164	0.045
	2nd generation	-0.037	0.083	-0.050	0.095	0.006
Model 2: Child Functioning	CBCL total behavior problems			-0.003	0.003	-0.005

5c - Math Achievement (Curvature)		Model 1		Model 2		Model 3		Model 4		Model 5	
		Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 3: Maternal Functioning and Parenting	Youth serious delinquency			0.182	0.160	0.190	0.161	0.172	0.158	0.163	0.164
	Reading Achievement			0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.002
	Grades			-0.067	0.054	-0.048	0.052	-0.053	0.051	-0.065	0.049
Model 4: Neighborhood	Positive Self-Concept					-0.014	0.011	-0.014	0.011	-0.014	0.011
	Psychological Distress (BSI - total)					0.003	0.004	0.002	0.004	0.001	0.004
	Low English Prof (English 1st lang omitted)					-0.033	0.121	-0.069	0.121	-0.010	0.129
	High English Prof					-0.116	0.109	-0.155	0.111	-0.100	0.117
Model 5: Demographics and background	HOME cognitive stimulation					-0.001	0.003	-0.001	0.003	-0.002	0.003
	Collective efficacy							0.006	0.004	0.006	0.004
	Severity of neighborhood probs							0.008	0.007	0.008	0.007
	Dominican (Mexican omitted)							-0.043	0.136	-0.043	0.136
	Puerto Rican							-0.047	0.106	-0.047	0.106
	Other Latino							0.086	0.134	0.086	0.134
	Male							-0.037	0.082	-0.037	0.082
	Mother's age							0.006	0.006	0.006	0.006
	High school grad or higher							0.052	0.086	0.052	0.086
	Employment							0.145	0.088	0.145	0.088
	Welfare receipt							0.145	0.093	0.145	0.093
	Married							0.031	0.105	0.031	0.105
	Income-to-needs							-0.067	0.071	-0.067	0.071
# of minors on household								-0.067 *	0.029	-0.067 *	0.029

Note: T<.10,

* p<.05,

** p <.01,

*** p<.001; all covariates were assessed at Wave 1; S.E. = standard error; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory

Note: T<.10,

* p<.05,

** p <.01,

*** p<.001; all covariates were assessed at Wave 1; S.E. = standard error; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory

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p <.01,

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p<.05,

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Note: T<.10,

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Table 6
Conditional Models for Latino Youth from Immigrant Families only - Reading Achievement

Reading Achievement (Intercept)	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 1: Generational Status	-16.577***	4.563	-18.050***	4.416	-17.529***	4.704	-17.504***	4.638	-10.631*	5.180
Model 2: Child Functioning	Proportion of life in US									
	CBCCL total behavior problems		-0.131	0.130	-0.113	0.128	-0.079	0.128	-0.122	0.143
	Youth serious delinquency		-10.828	10.513	-10.587	10.597	-10.765	10.335	-8.346	9.979
	Math Achievement		0.248*	0.109	0.246*	0.110	0.234*	0.109	0.235*	0.098
Model 3: Maternal Functioning and Parenting	Grades		5.178*	2.269	4.739*	2.188	4.763*	2.206	3.892	2.403
	Positive Self-Concept				0.152	0.347	0.124	0.349	-0.070	0.346
	Psychological Distress (BSI - total)				-0.010	0.201	0.092	0.195	0.064	0.219
	Low English Prof (High prof or Engl 1st language omitted)				2.943	2.973	2.184	2.980	0.319	3.219
Model 4: Neighborhood	HOME cognitive stimulation				0.136	0.101	0.155	0.099	0.132	0.101
	Collective efficacy						0.282T	0.146	0.230	0.151
	Severity of neighborhood probs						-0.315	0.237	-0.292	0.238
Model 5: Demographics and background	Dominican (Mexican omitted)								5.644	3.433
	Puerto Rican								-3.124	4.685
	Other Latino								6.975	4.566
	Male								-2.863	2.549
	Spanish WJ administration (English omitted)								9.287*	4.224
	Mother's age								-0.080	0.209
	High school grad or higher								1.533	2.998
	Employment								-0.879	3.624
	Welfare receipt								-2.011	3.101
	Married								-1.256	3.270
	Income-to-needs								-0.340	2.273
	# of minors on household								0.174	1.246

Note: T<.10,

p<.001; all covariates were assessed at Wave 1; S.E. = standard error; CBCL = Child Behavior Checklist; BSI = Brief Symptom Inventory

p <.01

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p <.05

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Table 7

Conditional Models for Latino Youth from Immigrant Families only - Math Achievement

7a: Math Achievement (Intercept)		Model 1		Model 2		Model 3		Model 4		Model 5	
		Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 1: Generational Status	Proportion of life in US	6.951	4.880	12.786**	4.661	11.257*	5.425	11.356*	5.422	5.586	7.107
Model 2: Child Functioning	CBCL total behavior problems			-0.225*	0.095	-0.226*	0.113	-0.223*	0.110	-0.251T	0.128
	Youth serious delinquency			3.950	4.733	4.037	4.386	3.701	4.513	-1.487	6.143
Model 3: Maternal Functioning and Parenting	Reading Achievement			0.206***	0.046	0.211**	0.061	0.209**	0.062	0.199***	0.057
	Grades			1.903	1.852	2.403	1.768	2.359	1.831	1.346	2.178
	Positive Self-Concept					0.101	0.247	0.117	0.255	0.030	0.291
Model 4: Neighborhood	Psychological Distress (BSI - total)					0.091	0.119	0.109	0.134	0.111	0.147
	Low English Prof (High prof or Engl 1st language omitted)					-3.776	2.296	-4.018T	2.433	-2.901	2.530
	HOME cognitive stimulation					-0.030	0.084	-0.027	0.085	0.000	0.088
	Collective efficacy							-0.036	0.101	0.019	0.114
Model 5: Demographics and background	Severity of neighborhood probs							-0.158	0.234	0.043	0.188
	Dominican (Mexican omitted)									-5.957T	3.090
	Puerto Rican									-8.726T	5.231
	Other Latino									-5.144T	2.941
	Male									0.973	2.112
	Spanish WJ administration (English omitted)									-9.262	5.673
	Mother's age									0.034	0.288
	High school grad or higher									3.549	2.439
	Employment									5.089T	2.931
	Welfare receipt									4.201	2.988
	Married									4.226*	2.039
	Income-to-needs									-1.071	2.354
	# of minors on household									-2.002	2.135

7b: Math Achievement (Slope)		Model 1		Model 2		Model 3		Model 4		Model 5	
		Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 1: Generational Status	Proportion of life in US	-2.962	2.352	-2.759	2.251	-2.716	2.493	-2.533	2.406	0.761	2.488
Model 2: Child Functioning	CBCL total behavior problems			-0.001	0.047	0.011	0.062	0.007	0.063	0.065	0.064
	Youth serious delinquency			-5.449	3.632	-5.735	3.613	-5.389	3.821	-2.537	3.142
	Reading Achievement			0.021	0.032	0.022	0.040	0.020	0.039	0.024	0.035
	Grades			1.377T	0.794	1.037	1.158	1.058	1.111	1.426T	0.856
Model 3: Maternal Functioning and Parenting	Positive Self-Concept					0.188	0.158	0.177	0.150	0.152	0.150
	Psychological Distress (BSI - total)					-0.023	0.065	-0.010	0.067	-0.016	0.078
	Low English Prof (High prof or Engl 1st language omitted)					0.305	1.473	0.270	1.474	-0.411	1.319
Model 4: Neighborhood	HOME cognitive stimulation					0.029	0.043	0.034	0.043	0.019	0.045
	Collective efficacy							-0.032	0.064	-0.032	0.061
	Severity of neighborhood probs							-0.083	0.096	-0.128	0.092
Model 5: Demographics and background	Dominican (Mexican omitted)									0.559	1.846
	Puerto Rican									0.061	1.782
	Other Latino									0.197	1.998
	Male									0.985	1.197
	Spanish WJ administration (English omitted)									3.322	2.458
	Mother's age									-0.047	0.118
	High school grad or higher									-1.612	1.348
	Employment									-3.414 *	1.504
	Welfare receipt									-2.801 *	1.314
	Married									-0.826	1.525
	Income-to-needs									0.292	1.340
	# of minors on household									0.844	0.668

7c: Math Achievement (Slope)		Model 1		Model 2		Model 3		Model 4		Model 5	
		Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 1: Generational Status	Proportion of life in US	0.243	0.263	0.189	0.263	0.178	0.297	0.159	0.278	-0.252	0.281
Model 2: Child Functioning	CBCL total behavior problems			0.004	0.006	0.004	0.007	0.004	0.007	-0.004	0.007
	Youth serious delinquency			0.618	0.429	0.636	0.454	0.593	0.485	0.224	0.346
	Reading Achievement			-0.003	0.004	-0.003	0.005	-0.003	0.005	-0.004	0.004

7c: Math Achievement (Slope)		Model 1		Model 2		Model 3		Model 4		Model 5	
		Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Model 3: Maternal Functioning and Parenting	Grades			−0.117	0.092	−0.083	0.152	−0.090	0.145	−0.146	0.097
	Positive Self-Concept					−0.029	0.022	−0.026	0.019	−0.020	0.018
	Psychological Distress (BSI - total)					−0.002	0.008	−0.005	0.008	−0.004	0.009
	Low English Prof (High prof or Engl 1st language omitted)					−0.046	0.187	−0.041	0.188	0.047	0.154
	HOME cognitive stimulation					−0.002	0.005	−0.004	0.005	0.000	0.006
Model 4: Neighborhood	Collective efficacy							0.001	0.008	0.001	0.007
	Severity of neighborhood probs							0.015	0.011	0.017	0.012
Model 5: Demographics and background	Dominican (Mexican omitted)									0.104	0.234
	Puerto Rican									0.111	0.192
	Other Latino									0.123	0.268
	Male									−0.158	0.141
	Spanish WJ administration (English omitted)									−0.489T	0.272
	Mother's age									−0.001	0.012
	High school grad or higher									0.090	0.151
	Employment									0.382*	0.186
	Welfare receipt									0.331*	0.156
	Married									0.086	0.187
	Income-to-needs									−0.016	0.160
	# of minors on household									−0.101	0.062

Note: T<.10,

* p<.05,

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