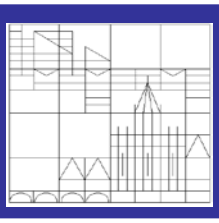
University of Konstanz
Department of Economics



Benefits of Education at the Intensive Margin: Childhood Academic Performance and Adult Outcomes among American Immigrants

Deniz Gevrek, Z. Eylem Gevrek, and Cahit Guven

Working Paper Series
2013-11

http://www.wiwi.uni-konstanz.de/econdoc/working-paper-series/

Benefits of Education at the Intensive Margin: Childhood Academic Performance and Adult Outcomes among American Immigrants

Deniz Gevrek*

Z. Eylem Gevrek†

Cahit Guven‡

June 8, 2013

Abstract

Using the Children of the Immigrants Longitudinal Study from the United States, this paper examines the association between schooling at the intensive margin and adult outcomes among first- and second-generation American immigrants. Schooling at the intensive margin is measured by reading and math scores in middle school and by GPA scores in both middle and high school. We find that measures of academic performance predict pecuniary and nonpecuniary adult outcomes. We also find that academic performance in high school relative to middle school is important in explaining adult socioeconomic outcomes. Immigrants with higher GPAs in high school compared to middle school have more schooling, are in better health, are less likely to commit crime, and have higher expectations regarding future job prestige and schooling. On the other hand, a decline in GPAs is associated with lower satisfaction with income and occupation. Moreover, our results indicate that infant mortality rate, which is used as a proxy for unfavorable health conditions in the country of birth, has a negative impact on academic performance during childhood and on personal earnings and income satisfaction during adulthood.

JEL Classification: I21; I25; J15; J24.
Keywords: Economics of Education; Human Capital; School Performance; Immigrants.

*Texas A&M University, Corpus Christi, 6300 Ocean Drive, Corpus Christi, TX 78412 and IZA, Bonn, Germany.

†University of Konstanz, Box 137, 78457, Konstanz, Germany.

‡Deakin University, Victoria 3125, Australia. Phone: +61 3 924 45087. E-mail: cahit.guven@deakin.edu.au

1 Introduction

An extensive theoretical and empirical literature substantiates pecuniary private benefits of educational attainment.[1] Recently, researchers have turned their attention to non-pecuniary benefits of schooling both in and out of the labor market. Literature on the nonpecuniary benefits of education provides evidence that years of schooling is positively associated with labor force participation, individual health, life and job satisfaction, occupational prestige, stable and happier marriages, better parenting practices, and successful children. On the other hand, years of schooling reduces unemployment rate, unemployment duration, likelihood of being on welfare, criminal and risky behavior such as teen fertility, incarceration, and smoking (Oreopolous & Salvanes, 2011). However, most of this literature focuses on the impact of schooling at the extensive margin, measured by years of schooling, on various pecuniary and nonpecuniary outcomes. Only a few studies explore the impact of schooling at the intensive margin, measured by college GPA and college class rank, on earnings and other outcomes. (Weisbrod & Karpoff, 1968; Wise, 1975; Ehrenberg & Sherman, 1987; James et al., 1989; Hamermesh & Donald, 2008).

The contribution of this study to the literature is threefold. First, using data from the Children of the Immigrants Longitudinal Study (CILS), we investigate the relationship between academic performance in middle and high school and pecuniary and nonpecuniary wellbeing outcomes during adulthood among first- and second-generation American immigrant youth.[2] Second, we examine the hypothesis that the gap in academic perfor-

[1]For example, see Angrist & Krueger, 1991; Kane & Rouse, 1993; Card, 1995, 2001; Acemoglu & Angrist, 2001; Meghir & Palme, 2005; Oreopoulos, 2006; Aakvik, Salvanes, & Vaage, 2010; Oreopolous & Salvanes, 2011.

[2]Immigrant children make up nearly 25 percent of school children in the U.S. (Haskins & Tienda, 2011). Education, training, and labor market outcomes of immigrant children, either foreign-born (the first-generation) or U.S.-born (the second-generation), promise to increase in importance over the next decade as the population of immigrant children in the U.S. grew by 28 percent between 2000 and 2009. See http://www.childtrendsdatabank.org/?q=node/333 for more information.

mance between middle and high school could have an impact on adult wellbeing even after controlling for the levels of academic performance in middle and high school. An individual's future wellbeing is a function of several decisions made relatively early in youth such as attending a college, choosing a major, and pursuing an advanced degree. While many factors influence these decisions, an individual's motivation and expectations are among the most important factors. An improvement or decline in GPA from middle to high school could be associated with better or worse outcomes later in life, which might be reflected in expectations, motivation and competitiveness at younger ages. To our best knowledge, this is the first study that examines the relative importance of middle and high school performance in predicting adult outcomes of immigrant children. Therefore, this paper expands on the existing literature by considering how the relative performance of immigrant children in high school compared to middle school affects their future adult outcomes. Third, we investigate whether early health conditions measured by infant mortality rate in the country of birth are statistically significant predictors of academic success and adult wellbeing. Although there is a large literature on the relationship between childhood conditions and cognitive skills, the use of the infant mortality rate as a proxy for unfavorable health conditions in the country of birth is a novel way to examine this relationship for immigrant children.[3]

The CILS consists of three rounds of interviews that were conducted in two of the most preferred immigrant destination states in the U.S., namely California and Florida. The first round was conducted when immigrant children were in eight or ninth grade. The second round was conducted three years later at grades 11 or 12 and the last round was

[3]Currie and Moretti, 2007 find that higher infant mortality and lower birth weight could be explained by poverty and lower socioeconomic status. See Long et al., 1999; Leigh, 1998; Le et al., 2005; and Robertson & Reynolds, 2010 for the literature on the relationship between childhood conditions and cognitive skills.

conducted approximately 10 years after the first round to measure adult wellbeing outcomes of those immigrant children.[4] This unusually rich data set contains information on academic performance, demographic characteristics, detailed school information, parental socioeconomic and demographic characteristics, language use, employment/occupational status, and incarceration history among other important characteristics.

To measure education at the intensive margin, we use middle school (round 1) and high school (round 2) GPAs and two widely used standardized math and reading test scores (ASAT) and national percentile rankings in these tests measured during middle school (round 1).[5] The pecuniary and nonpecuniary outcomes used in this study reflect different aspects of adult wellbeing and can be grouped into the following three categories: labor market outcomes (household income, personal earnings, job prestige score, labor force participation, unemployment, self-employment, income satisfaction, occupation satisfaction, first job prestige score, and expected job prestige score at the age of 30); educational outcomes (completed schooling, currently in school, expected schooling at the age of 30, and subjective English reading, understanding, writing and speaking ability); and health and social outcomes (health insurance status, subjective health status, sickness status, arrest/incarceration history, and presence of a partner).

We do not have exogenous shifters, therefore, terms like "matter" should not be understood in a strong causal sense. However, our results could be interpreted as an effect, which is stronger than a simple correlation because outcome variables were measured several years after the independent variables had been measured. A comparison of the results from our basic specification and those from the extended specification reveals

[4]Throughout the paper, the first round covering 8 and 9 graders is referred to as middle school and the second round covering 11 and 12 graders is referred to as high school.

[5]Previous literature uses standardized test scores and GPAs as measures of cognitive skills. In a recent study, Benjamin, Brown & Shapiro, 2013 find that standardized test scores and GPAs during childhood are negatively associated with risk aversion and short-run discounting later in life.

that there is a small change in the size of the coefficients on academic performance measures across the two specifications, suggesting that endogeneity does not play an important role in our estimations. Our findings regarding educational outcomes show that academic success during middle and high school predict higher years of schooling and higher expected schooling in addition to higher likelihood of being in school. Only ASAT reading scores and national percentile rankings in ASAT reading test can predict adult English abilities. In terms of labor market outcomes, we find that higher test scores predict higher household income and personal earnings. All measures of academic performance are associated with higher job prestige score. Students with better academic performance are less likely to be in the labor force at the age of 24 and more likely to pursue higher education. Academic success predicts lower probability of being self-employed. Income satisfaction at the age of 24 is lower for students with higher GPAs and reading scores. With respect to health and social outcomes, the results suggest that higher GPAs and test scores are positively associated with likelihood of having health insurance but negatively associated with having a partner. Higher math scores, math rankings, and GPAs predict less sickness while higher GPAs and math scores are associated with less crime.

Academic performance in high school relative to middle school also matters for future wellbeing even after controlling for absolute performances. We find that immigrant children with higher GPA in high school compared to middle school complete more schooling and have better health. Moreover, an improvement in GPA is associated with a higher likelihood of pursuing higher education, a lower likelihood of committing crime, and having higher expectations regarding future job prestige and schooling. On the other hand, a decline in GPA is associated with lower income and occupation satisfaction. We also

find that infant mortality rate, which is used as a proxy for unfavorable health conditions in the country of birth, has a negative impact on academic performance during childhood and on personal earnings and income satisfaction during adulthood.

The remainder of the paper is organized as follows. Section 2 provides a brief review of the literature. Section 3 describes the data and variables used in the empirical analysis. Section 4 introduces our econometric framework and presents results, while Section 5 concludes.

2 Literature and Motivation

2.1 Pecuniary and nonpecuniary benefits of education.

Previous research provides evidence of the causal relationship between schooling choices at the extensive margin and adult outcomes by focusing on large samples of twins and siblings and by utilizing natural experiments that use exogenous variation in compulsory schooling laws, proximity to a college, and cost of college education.[6] In their comprehensive study, Oreopolous and Salvanes (2011) show that schooling relates to not only pecuniary benefits but also nonpecuniary benefits both in the labor market (e.g. higher levels of labor force participation, job satisfaction, occupational prestige, lower unemployment probability, shorter unemployment spells, smaller likelihood of being on welfare) and out of the labor market (e.g. better individual health, life satisfaction and happiness, more stable and happier marriages, better parents, more successful children, reduced myopia, and reduced criminal and risky behavior such as teen fertility, lower likelihood having been incarcerated and smoking). Riddell and Song (2011) find that

[6]Recent studies in this large literature are Angrist & Krueger, 1991; Kane & Rouse, 1995; Card, 1995, 2001; Acemoglu & Angrist, 2001; Meghir & Palme, 2005; Oreopoulos, 2006; Aakvik, Salvanes, & Vaage, 2010; Oreopolous & Salvanes, 2011.

education significantly increases reemployment rates of the unemployed. The impact of education on reemployment is very large, especially for those who have 12-16 years of schooling. Grossman (2006) and Lochner (2011) review literature on the non-pecuniary benefits of education and find that education has a substantial impact on non-market outcomes such as longevity, health, mortality, criminal activity, citizenship, and civic participation. In our study, we aim to provide a detailed account of the relationship between education at the intensive margin measured in middle and high school and adult outcomes.

2.2 Childhood environment, family background, and adult outcomes.

Overwhelming empirical evidence indicates that childhood conditions and parental characteristics are strong predictors of adult health, labor market and social outcomes. Using Australian Twin Register, Le et al. (2005) find that childhood conduct disorder is positively associated with dropping out of school and not being employed. Long et al. (1999) show that decision to drop out of school is related to the type of school attended and family background factors including family wealth, parental education and father's occupational status. Parental background has been also found to be related to adult education and frailty (Leigh, 1998; Robertson & Reynolds, 2010). Among several predictors of adult outcomes and cognitive function, family size, birth order and presence of parents have received a lot of attention in recent studies. Family size has negative effects on schooling, test scores, and behavioral development even at very early ages (Black et al., 2005; Le & Miller, 2004). First-born children obtain higher test scores and higher level of schooling than middle- or last-born children (Silles, 2010; Guven & Lee 2011). In the light of these

discussions, we also aim to contribute to the existing literature on the role of household size, birth order, presence of both parents and parental background in cognitive function and success in life with special reference to immigrant children.

Previous research on the influence of early life conditions on cognitive development suggests that socioeconomic conditions in childhood and early life experiences have a large impact on cognitive development and abilities. Children from poor backgrounds show worse achievement outcomes in the first 5 years of life (Duncan et al., 1994). Lower socioeconomic status in childhood is associated with lower cognitive function in middle age (Kaplan et al., 2001). In recent years, adopting a life course approach, researchers have begun to trace the origin of cognitive functioning in old age to early life conditions. For example, Van den Berg et al. (2010) show that the negative impacts of a stroke on cognition are stronger if the individual was born under adverse economic conditions.

2.3 Academic success, expectations, and adult outcomes.

Aspirations and future expectations during childhood may be related to the decisions made early in life such as the level of effort put in classes, which may in turn, affect adult outcomes. Although several factors may influence the decision to exert higher effort in classes, the two most important factors are an individual's motivation and expectations in life. Delaney et al. (2011) find a strong relationship between student expectations during college and adult socioeconomic status, which persists even after controlling for a rich set of covariates including previous academic performance. Feliciano and Rumbaut (2005) find that early educational expectations and aspirations are important predictors of completed schooling and occupational choices for both male and female immigrant children. Similar significant associations between motivation, schooling and subsequent

annual earnings are also found by Hilmer and Hilmer (2012). Taking the previous research as our starting point, we examine a novel hypothesis that the gap in academic performance between middle and high school could be related to adult wellbeing outcomes. More specifically, we study the impact of an improvement or decline in GPA from middle to high school on the pecuniary and nonpecuniary outcomes later in life.

Another line of research focuses on the role of academic achievement at different stages of schooling in wellbeing outcomes during adulthood. Using the National Education Longitudinal Survey data on young men, Segal (2013) finds associations between middle school test scores and adult earnings. Spinks et al. (2007) find high correlations between elementary school achievement (grades 3-8) and various adult outcomes. Le and Miller (2004) indicate that early childhood achievements in literacy and numeracy are the strongest predictors of the likelihood of completing 12 years of education. Ishikawa and Ryan (2002) also conclude that literacy skills acquired through schooling relate to earnings in adulthood. Examining the extensive literature on the relationship between academic performance and adult outcomes, Baird (1985) criticizes that most studies have focused either on one measure of academic performance or on one outcome variable. Using several measures of academic performance in middle and high school, our study provides a comprehensive examination of indicators reflecting different aspects of adult wellbeing.

3 Data

The data used in the empirical analysis come from the three rounds of the CILS conducted in 1992-2003 period (Portes and Rumbaut, 2008). The CILS data provide unusually detailed information on immigrant children's demographic characteristics, academic performance, school properties, language use, subjective measures of wellbeing, parental so-

cioeconomic and demographic characteristics.[7] The sample consists of second-generation immigrant children who were born in the U.S. with at least one immigrant parent and first-generation immigrant children who were born abroad and brought to the U.S. before they were ten years of age. The CILS data is the largest study that follows teenage immigrants from various nationalities in two of the most preferred immigrant destination states, California and Florida, in the U.S.[8] The interviews were carried out in three cities: Sand Diego, Miami and Ft. Lauderdale.

The first interview was conducted with immigrant children who were attending eight or ninth grades in 1992. The first round of the CILS has detailed information on 5262 immigrant children of 77 nationalities. The second round of the survey was conducted three years later in 1995 when the respondents were about to graduate from high school. The survey response rate was 81.5 percent with 4288 of the originally surveyed respondents. A decade after the first round, the third round of the survey was conducted and achieved a 68.9 percent response rate with 3613 of the original respondents answering questions about educational attainment, employment/occupational status, family characteristics, and incarceration history among other important demographic and socioeconomic characteristics.

Infant mortality, which was measured at the birth country in the year of birth, is used as an indicator of health conditions during birth.[9] The infant mortality rate (IMR) is the number of infants dying before reaching one year of age, per 1000 live births in a given year. The children in our sample were born between 1975 and 1979. For the 1974-1979

[7]Definitions of all variables used in the current analysis are provided in Table A.1 of the Appendix.

[8]The Congressional Budget Office calculates that California has the largest share of the immigrant population in the U.S. with 26.2 percent and Florida ranks fifth with 16.7 percent in 2000. Source: http://www.cbo.gov/ftpdocs/60xx/doc6019/11-23-Immigrant.pdf.

[9]Our sample consists of first- and second-generation immigrants. For second-generation immigrants we use the U.S. infant mortality rates in the year of birth.

period, the IMR data for all countries except Taiwan are obtained from World Bank Key Development Indicators (2011).[10] The IMR data for Taiwan is obtained from Table 2 in Chow (2001). Figure 1 shows the average of IMR for the 1974-1979 period for each country and each broad category.[11] The lowest and the highest IMRs are in Japan and Bangladesh with 9.1 and 142.6 infants dying before reaching one year of age per 1000 live births respectively.

3.1 Summary statistics.

Table 1 presents the summary statistics for the variables, which are categorized by three rounds of the CILS interviews. Definitions of all variables presented in Table 1 are provided in Table A.1 of Appendix. Immigrant children predominantly reside in Miami and San Diego, only six percent reside in Ft. Lauderdale during the first round of the survey. The average age of the students is 14.2. Half of the children were born overseas. 46 percent of the sample is Hispanic and 64 percent of the children live with both biological parents in round 1. Household size is approximately 4.2. The average number of older siblings is 1.69. In the third round, average schooling is 14.3 years and 51 percent of immigrants are still in school. Nine percent of immigrants are unemployed while five

[10]See http://data.worldbank.org/indicator/SP.DYN.IMRT.IN/countries.

[11]The infant mortality rate for each broad category in Figure 1 is calculated by taking the simple average of the IMRs of countries that make up the category. There are five broad categories of country of origin (ancestry): Other Europe, Other Asia, Other Africa, Other Caribbean, and Other South America. Here is the list of countries that constitute each broad category. Other Europe: Austria, Belarus, Belgium, Bulgaria, Denmark, Finland, Hungary, Iceland, Luxembourg, Malta, Moldova, Netherlands, Norway, Portugal, Sweden, Switzerland, Ukraine; Other Asia: Afghanistan, Armenia, Bahrain, Bhutan, Cyprus, Indonesia, Iraq, Israel, Jordan, Kazakhstan, Kyrgyz Republic, Maldives, Mongolia, Myanmar, Nepal, Oman, Qatar, Saudi Arabia, Sri Lanka, Tajikistan, Turkmenistan, United Arab Emirates, Uzbekistan, West Bank and Gaza, Yemen, Rep.; Other Africa: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Egypt, Arab Rep., Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe; Other Caribbean: St. Lucia, St. Vincent and the Grenadines; Other South America: Paraguay.

percent is self-employed. Seventy-four percent of the sample have health insurance. Six percent of the sample are either ill or disabled while seven percent of the sample have been arrested or incarcerated at some stage in their lives.

The correlation between GPA scores in the first and the second round is 0.807.[12] Around 40 percent of people (2023 people) did score the same GPAs in both rounds however 34 percent (1147 people) did better and 27 percent (1384) did worse.

4 Empirical Method and Results

To examine the importance of academic achievement in middle and high school in predicting pecuniary and nonpecuniary adult outcomes, we run a series of regressions of the following type:

$$Y_i = \beta_0 + \beta_1 A_i + X_i'\delta + \varepsilon_i \tag{1}$$

where Y_i represents the realization of a certain adult outcome for individual i measured in the third round when immigrant children were on average 24 years old. We present marginal effects using Probit model for binary dependent variables and coefficients using OLS otherwise. The main variable of interest, A_i, is one of the five academic performance measures for individual i measured in the first round of the survey. In our analysis, we use GPA and standardized math and reading test scores (ASAT) and national percentile rankings in these tests as proxies for academic performance. X_i is a vector of explanatory variables measured in round 1 and round 2. The estimations are carried out through two specifications. In the basic specification, X_i includes a male dummy, age, age-squared, number of older siblings, two indicator variables for Miami and Ft. Lauderdale, and

[12]See Table A.2 of appendix for correlations among all measures of academic performance.

dummies for 8^{th} grade, for U.S.-born individuals, and for country-of-origin. All the explanatory variables used in the basic specification are measured in round 1. The extended specification adds to the basic specification both round 1 variables (households size, presence of both biological parents, dummies for parental education, income levels, home ownership, and being discriminated, parental occupational prestige, number of friends, aspirations to get a graduate degree, self-esteem and depressions indices, desired status and job prestige, dummies for minority and inner-city schools, white, black, hispanic and asian percentages in school, percent eligible for subsidized lunch at middle school, school population, hours studied, and dummies for school fixed effects in round 1) and round 2 variables (hours studied, private school dummy, school drop-out rate, percent regularly attend school, and subjective school quality as well as dummies for school fixed effects in round 2). Standard errors are clustered at the school level (school as of round 1).

The first nonpecuniary adult outcome we focus on is the completed years of schooling in the third round. Table 2 presents the correlates of completed years of schooling in five OLS regressions. Measures of academic performance (GPA, ASAT math and reading scores and national percentile rankings) in middle school are statistically significant and predict higher years of schooling.[13] Age and age-squared are not statistically significant at the conventional levels. The number of older siblings is associated with less schooling and eight graders complete more schooling. In the first three specifications, where we control for GPA, ASAT math score, and ASAT math national percentile rankings as measures of academic performance, the coefficient of U.S.-born children dummy is positive and statistically significant, suggesting that second-generation immigrant children complete more schooling than first-generation immigrant children.

[13]We do not include more than one performance measure in pecuniary and nonpecuniary adult outcome regressions to avoid potential multicollinearity.

Table 3 presents the results of the extended specification. Inclusion of additional cofactors decreases the coefficients on all five measures of academic performance approximately by 10 to 30 percent, however, the t-statistics barely change. Individuals who lived in large households during childhood complete less schooling while the presence of both biological parents is associated with more schooling. Immigrant children whose mothers have more than high school degree complete more schooling, while father's education is statistically insignificant. Parental occupational prestige scores and home ownership predict more schooling. Immigrant children who aspired to earn a graduate degree complete more schooling, while desired prestige and status do not matter for completed schooling. Depression negatively relates to schooling whereas higher self-esteem predicts more schooling.[14] Immigrant children who attended middle schools with a larger population and those with many low-income students (as measured by a higher percentage of student who are eligible for subsidized lunch) do worse. Hours studied during high school has a greater impact on completed schooling than hours studied during middle school.

Table 4 replicates Table 2, while Table 5 replicates Table 3 for each of the 22 adult outcomes. As the significant coefficients are similar between the extended specification presented in Table 5 and the basic specification presented in Table 4, we focus on Table 5. The top panel in Table 5 presents seven educational outcomes. Higher GPAs, test scores and percentage rankings all predict higher completed schooling and higher expected schooling.[15] Higher math score in middle school predicts a higher probability of being at school as of round 3, presumably attending college. Adult English reading, understanding,

[14]We create a depression index based on students' answers to four questions that measure subjective wellbeing. Similarly, we create a self-esteem index based on students' answers to 10 questions that measure subjective self-esteem. The correlations between our indices and the indices provided in the data are 0.9999. Detailed descriptions of our indices are provided in Table A.1 of Appendix.

[15]Our findings regarding the impact of English reading test scores and national percentile rankings on schooling is consistent with previous research by Bleakley and Chin (2008), which concludes that English proficiency is positively associated with educational outcomes for immigrant children.

speaking and writing abilities can be explained only by ASAT reading scores and reading national percentile rankings in middle school.

The two middle panels of Table 5 show ten pecuniary and nonpecuniary labor market outcomes. All measures of academic success, except for GPA, predict higher household income and personal earnings. All five measures of academic success have positive impact on job prestige scores. Individuals with higher GPAs are less likely to be in the labor market at the age of 24. However, conditional on being in the labor market, higher GPAs and percentile rankings of math and reading tests predict lower unemployment. Higher rankings on these tests and higher reading scores are associated with lower probability of being self-employed while higher GPAs and reading scores predict lower income satisfaction.

The bottom panel of Table 5 shows five health and social outcomes. All academic performance measures, except for reading scores, predict higher probability of having health insurance. Individuals with higher GPAs, math scores, and math percentile rankings are less likely to be sick. GPAs and math scores predict a lower probability of committing crime. Individuals with better academic performance in middle school are less likely to have a partner at the age of 24. This finding is consistent with the fact that more educated people in the U.S. are getting married later in life (Isen & Stevenson, 2008).

The unreported relationships between control variables used in the extended specification and the adult outcome variables can be summarized as follows: Household size positively correlates with household income while it negatively correlates with job prestige, occupational satisfaction, being in school, English speaking and writing abilities, and having health insurance. The number of older siblings is associated with lower values of English understanding abilities, subjective health and probability of being sick.

People who grew up with both biological parents have higher income satisfaction and first job prestige, higher expected schooling, and are more likely attend school at the age 24. Having both parents during childhood is also related to lower likelihood of committing crime and having a partner. Parental characteristics also play an important role in shaping adult outcomes. Results also point to the importance of non-cognitive skills such as motivation, self-esteem, and depression in explaining adult outcomes.

To check the robustness of the results we conduct three exercises. First, we examine non-linear effects of academic performance on adult outcomes. We recode the performance measures into four quantiles and replicate the analysis presented in Table 5. However, in most specifications, we do not find any non-linear effects.[16] Second, we reestimate the regressions of Table 5 for the U.S.-born (second-generation) and non-U.S. born (first-generation) immigrant children separately. Tables A.3 and A.4 show that the results are similar across the two samples. Third, to investigate whether the impact of academic performance on adult outcomes differs between men and women, we include an interaction dummy (male dummy $\times$ academic performance measures) into the analysis. We find statistically significant interactions for completed schooling, expected schooling and criminal behavior. The results are presented in Table A.5.

4.1 Relative performance matters.

We estimate the impact of performance changes between middle and high school on pecuniary and nonpecuniary adult outcomes. The main motivation for this exercise is to test the hypothesis that relative performance of children in high school compared to middle school could matter even after controlling for academic performance levels. For

[16]The results are available upon request from the authors.

instance, an improvement in GPA from middle to high school could be an indicator of academic ambition and success, which may translate into better adult outcomes. On the other hand, a decline in GPA from middle to high school could serve as a warning and help immigrant children to get motivated to do better. Therefore, the effect of relative performance between middle and high school on adult outcomes is ambiguous. To investigate this hypothesis, we estimate the following model:

$$Y_i = \alpha_0 + \alpha_1(GPA(1)_i + GPA(2)_i) + \alpha_2 1[GPA(2)_i > GPA(1)_i] + (\alpha_3 1[GPA(2)_i < GPA(1)_i] + X_i'\delta + \upsilon_i) \quad (2)$$

where Y_i is one of the 22 pecuniary and nonpecuniary adult outcomes for individual i measured in the third round. $GPA(1)_i$ and $GPA(2)_i$ are middle school GPA and high school GPA, respectively. Dummy variable, $1[GPA(2)_i > GPA(1)_i]$ represents an improvement in GPA from middle to high school, while $1[GPA(2)_i < GPA(1)_i]$ is a dummy variable that represents a decline in GPA from middle to high school. The omitted category is having the same GPA in both middle and high school. To control for absolute performances in middle and high school, we include a variable $(GPA(1)_i + GPA(2)_i)$, which is the sum of middle school and high school GPAs. We use this specification to avoid the potential multicollinearity problem that may arise from including middle and high school GPAs separately.[17] We use the vector of control variables, X_i, from the extended specification presented in Table 3.

Table 6 shows that an improvement in GPA is associated with higher expected school-

[17]Dougherty (2007) suggests that if two highly collinear variables (in our case middle and high school GPAs) are conceptually similar, potential multicollinearity issue could be avoided by including a variable that combines those variables into an overall index. Therefore, we use the sum of middle and high school GPA rather than including them individually. We also estimate the entire model by including middle and high school GPAs separately. The results are not presented here but are similar and available upon request from the authors.

ing and job prestige score, and lower probabilities of being sick and criminal behavior. A decline in GPA predicts lower income and occupational satisfaction. The coefficients of improvement and decline in GPA dummies are both statistically significant in three cases: completed schooling, probability of being in school and probability of being self-employed. We test the equality of the coefficients of improvement and decline dummies in these cases. The rationale behind this exercise is that equal coefficients imply no significant role for the relative performance. The results show that we reject the equality of these coefficients for completed schooling, but we fail to reject their equality for the other two adult outcomes.

The results presented in Table 6 show that both a decline and an increase in GPA from middle to high school predict more schooling. The unexpected positive coefficient of the decline in GPA can be explained by senioritis experienced by high-school seniors. High school seniors may stop exerting high effort in school after they were admitted to college or made other post-graduation plans. To test the senioritis hypothesis, we create a dummy variable for being a high school senior in round 2 (compared to being a high school junior) and interact the senior dummy with improvement and decline in GPA dummies. Table A.6 shows that the coefficient of the interaction term as the product of senior dummy and decline in GPA dummy is negative and statistically significant. Moreover, in the absolute values, the coefficient of the interaction term is larger than that of the decline in GPA dummy, suggesting that senioritis hypothesis is credible.

4.2 Predictors of academic performance.

After showing that the measures of academic performance in middle and high school predict pecuniary and nonpecuniary adult outcomes, we examine the determinants of

academic performance. Table 7 indicates that males have lower GPAs than females, but there is no gender difference in standardized test scores and percentile rankings contrary to previous literature providing evidence that boys excel in math while girls do better in language. The number of older siblings relate to lower reading scores. Household size is negatively related to math and reading scores. Presence of both biological parents is positively linked to children's academic success. Mother's education predict higher math scores. Family socioeconomic indicators such as home ownership and household income are statistically significant determinants of academic performance.

Father's occupational prestige score has a positive impact on test scores, percentile rankings, and GPAs while mother's occupational prestige score is statistically insignificant. Children with more friends have lower academic success. Aspirations to get a graduate degree in round 1 are important in explaining better academic outcomes. Discriminated children do better in reading and math. Higher self-esteem improves GPA, test scores and rankings, while depression worsens GPA. Children in minority schools have lower GPAs but they do better in reading. Students who attended inner-city schools or schools with larger population do worse. Children attending middle schools with a higher percentage of students who are eligible for subsidized lunch have lower middle school GPAs, tests scores and rankings. The second-generation immigrant children have lower GPAs, however, higher reading test scores and rankings than first-generation immigrant children.

4.3 Health conditions at birth.

We use infant mortality rate (IMR), which is defined as the number of infants dying before reaching one year of age per 1000 live births in a given year, as a proxy for birth environ-

ment and general health conditions in the country of birth. We estimate the relationship between IMR in the year and country of birth and academic performance controlling for economic conditions (GDP per capita and unemployment rate).[18] The results for the full sample and the non-U.S. born sample of immigrant children are presented in Table 8. In addition to IMR, GDP per capita and unemployment rate, we include country of birth dummies in all regressions.[19] In Table 8, the sources of data on IMR and GDP per capita differ between panel A and panel B. Panel A uses data on IMR and GDP per capita constructed by the authors (see data section for details) while panel B uses IMR data from Gapminder and GDP per capita data from Maddison.[20] In addition, panel B only includes individuals whose country of birth is specifically provided in the CILS data (i.e. we exclude five broad categories of country of origin).

Panel A shows that IMR has a negative impact on all academic performance measures. The coefficient estimates are similar between the full sample and the non-U.S. born sample of immigrant children. The results on IMR presented in panel B are consistent with those presented in panel A. GDP per capita has a positive impact on math and reading score rankings and reading scores for the full sample while unemployment rate has a negative impact on math scores for the full sample and on middle school GPAs for the non-U.S. born sample.[21]

It is possible that IMR could have an effect on adult outcomes if it does not solely

[18]We use per capita GDP and unemployment rate as proxies of standard of living and overall economic conditions in the country of birth.

[19]The correlations among these three variables are around 0.6 which confirms that multicollinearity is not likely to be an issue in the estimations.

[20]This IMR data is available online and more information can be found at http://www.gapminder.org/documentation/documentation/gapdoc002.pdf while GDP data developed by Maddison is downloaded from the following web site: http://www.ggdc.net/MADDISON/Historical_Statistics/horizontal-file_02-2010.xls

[21]For the non-U.S. born sample, we examine the interaction effects between age at migration and IMR. However, we do not find any statistically significant effects. The coefficients of IMR remain the same in these specifications. The results are available upon request.

operate through test scores or if test scores fail to capture all aspects of cognitive abilities. To this end, we add IMR, GDP per capita, unemployment rate in the country of birth to the set of covariates in the extended specification of Table 5. We run regressions for each outcome variable however only the statistically significant results are presented in Table 9. Panel A shows that IMR has a statistically significant negative impact on income satisfaction in both samples. Panel B indicates that unemployment rate has a negative effect on first job prestige score. Panel C presents that IMR has a negative impact on personal earnings and the relationship is stronger for the non-U.S. born sample. Our results suggest that the health and economic conditions at birth are important in explaining both academic performance and adult outcomes for the American immigrants.

5 Conclusion

Using the Children of the Immigrants Longitudinal Study from the U.S., this study investigates the relationship between academic performance in middle and high school and adult outcomes among first- and second-generation immigrants. We also contribute to the literature by examining the hypothesis that the gap in academic performance between middle and high school could have an impact on adult wellbeing even after controlling for the levels of academic performance in middle and high school. In addition, using the infant mortality rate (IMR) as a proxy for unfavorable health conditions in the country of birth, we examine the impact of IMR on academic success and adult outcomes.

Our results suggest that higher academic performance in middle school is associated with more years of completed schooling, higher job prestige score, and higher likelihood of having health insurance. High achievers are also less likely to commit crime and to be sick. Moreover, we find that academic performance in high school relative to middle school

matters for adult outcomes. Immigrants with higher GPAs in high school compared to middle school are more likely to pursue higher education, are in better health, and are less likely to commit crime. On the other hand, a decline in GPAs is associated with lower satisfaction with income and occupation.

Our results also indicate that infant mortality rate in the country of birth has a negative impact on academic performance during childhood and on personal earnings and income satisfaction during adulthood. This finding has important policy implications in terms of benefits of U.S. foreign aid. The return to foreign aid that targets child health and survival in the immigrant sending countries could be much higher than expected for the U.S. This type of well-targeted foreign aid may not only help improve economic and health conditions in those countries but also provide the U.S. with a better educated and more able work force.

References

Aakvik, A., K.G. Salvanes, and K. Vaage. 2010. Measuring Heterogeneity in the Returns to Education in Norway Using Educational Reforms. European Economic Review 54(4): 483500.

Acemoglu, D., and J. Angrist. 2001. How Large are Human-Capital Externalities? Evidence from Compulsory-Schooling Laws. in NBER Macroeconomics Annual 2000, Volume 15, MIT Press.

Angrist, J.D., and A.B. Krueger. 1991. Does Compulsory Schooling Attendance Affect Schooling and Earnings. Quarterly Journal of Economics 106(4): 9791014.

Baird, L. 1985. Do Grades and Tests Predict Adult Accomplishment? Research in Higher Education 23(1): 3-85.

Benjamin, D.J., S.A. Brown, and J.M. Shapiro. 2013. Who is "Behavioral"? Cognitive Ability and Anomalous Preferences. Forthcoming. Journal of the European Economic Association.

Black, S., P. Devereux, and K. Salvanes. 2005. The More the Merrier? The Effect of Family Size and Birth Order on Children's Education. Quarterly Journal of Economics 120(2): 669-700.

Bleakley, Hoyt and Aimee Chin. 2008. What Holds Back the Second Generation? The Intergenerational Transmission of Language Human Capital Among Immigrants. Jour-

nal of Human Resources 43(2): 267-98.
Card, D. 1995. Using Geographic Variation in College Proximity to Estimate the Return to Schooling. In *Aspects of Labour Market Behaviour: Essays in Honour of John Vanderkamp*, ed. Louis N. Christofi des, E. Kenneth Grant, and Robert Swidinsky, 201222. University of Toronto Press.
Card, D. 2001. Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems. Econometrica 69(5): 1127-1160.
Chow, P. 2001. Social Expenditure in Taiwan (China). The World Bank Report 22716.
Currie, J., and E. Moretti. 2007. Biology as Destiny? Short- and Long-Run Determinants of Intergenerational Transmission of Birth Weight. Journal of Labor Economics 25(2): 23163.
Delaney, L., C. Harmon, and C. Redmond. 2011. Parental Education, Grade Attainment and Earnings Expectations among University Students. Economics of Education Review 30(6): 1136-1152.
Duncan G., J. Brooks-Gunn and P. Klebanov. 1994. Economic Deprivation and Early Childhood Development. Child Development 65(2): 296-318.
Ehrenberg, R.G., D.R. Sherman. 1987. Employment While In College, Academic achievement, and Postcollege Outcomes: A Summary of Results. Journal of Human Resources 22(1): 123.
Feliciano, C., and R. Rumbaut. 2005. Gendered Paths: Educational and Occupational Expectations and Outcomes Among Adult Children of Immigrants. Ethnic and Racial Studies 28(6): 1087-1118.
Grossman, M. 2006. Education and Nonmarket Outcomes. In Hanushek, E., and F. Welch (ed.) Handbook of the Economics of Education 1(1). Elsevier.
Guven, C., and W. Lee. 2011. Height and Cognitive Function among Older Europeans: Do People from "Tall" Countries Have Superior Cognitive Abilities? IZA Discussion Papers 6210.
Hamermesh, D.S., S.G. Donald. 2008. The Effect Of College Curriculum On Earnings: An Affinity Identifier For Non-Ignorable Non-Response Bias. Journal of Econometrics 144(2): 479491.
Haskins, R., and M. Teinda (editors.). 2011. Immigrant Youth. *The Future of Children*, Vol. 21 (Spring). Princeton: Princeton University.
Hilmer, M., and C. Hilmer. 2012. On the Relationship between Student Tastes and Motivations, Higher Education Decisions, and Annual Earnings. Economics of Education Review 31(1): 66-75.
Isen, A., and B. Stevenson. 2008. Women's Education and Family Behavior: Trends in Marriage, Divorce and Fertility. NBER Chapters, in: Topics in Demography and the Economy.
Ishikawa, M., and D. Ryan. 2002. Schooling, Basic Skills and Economic Outcomes. Economics of Education Review 21(3): 231-243.
James, E., N., Alsalam, J.C., Conaty, and D. To. 1989. College Quality And Future Earnings: Where Should You Send Your Child To College? American Economic Review. 79(2): 24752.
Kane, T., and C. Rouse. 1995. The Labor Market Returns to Two and Four Year College: Is a Credit a Credit and Do Degrees Matter? American Economic Review 85(3): 600-614.
Kaplan G., G. Turrell, J. Lynch, S. Eversona, E. Helkalac and J. Salonenc. 2001. Childhood Socioeconomic Position and Cognitive Function in Adulthood. International

Journal of Epidemiology 30(2): 256-63.
Le, A., and P. Miller. 2004. School Leaving Decisions in Australia: A Cohort Analysis. Education Economics 12(1): 39-65.
Le, A., P. Miller, A.C. Heath, and N. Martin. 2005. Early Childhood Behaviours, Schooling and Labour Market Outcomes: Estimates from a Sample of Twins. Economics of Education Review 24(1): 1-17.
Leigh, J. 1998. Parents' Schooling and the Correlation between Education and Frailty. Economics of Education Review 17(3): 349-358.
Lochner, L. 2011. Non-Production Benefits of Education: Crime, Health, and Good Citizenship. Handbook of the Economics of Education Volume 4, Chapter 2.
Long, M., P. Carpenter, and M. Hayden. 1999. Participation in Education and Training 1980-1994. Victoria: Australian Council for Education Research Report 13.
Meghir, C., and M. Palme. 2005. Educational Reform, Ability, and Family Background. American Economic Review 95(1): 41424.
Oreopoulos, P. 2006. The Compelling Effects of Compulsory Schooling: Evidence from Canada. Canadian Journal of Economics 39(1): 2252.
Oreopoulos, P., and K. Salvanes. 2011. Priceless: The Nonpecuniary Benefits of Schooling. Journal of Economic Perspectives 25(1): 159-84.
Portes, A., and R. Rumbaut. 2001. Legacies: The Story of the Immigrant Second Generation. Berkeley and Los Angeles: University of California Press.
Portes, A., and R. Rumbaut. 2008. Children of Immigrants Longitudinal Study (CILS): 1991-2006 [Computer file]. ICPSR20520-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.
Riddell, W., and X. Song. 2011. The Impact of Education on Unemployment Incidence and Re-employment Success: Evidence from the U.S. Labour Market. Labour Economics 18(4): 453-463.
Robertson, D., and A. Reynolds. 2010. Family Profiles and Educational Attainment. Children and Youth Services Review 32(8): 1077-1085.
Segal, C. 2013. Misbehavior, Education and Labor Market Outcomes. Forthcoming. Journal of the European Economic Association.
Silles, M. 2010. The Implications of Family Size and Birth Order for Test Scores and Behavioral Development. Economics of Education Review 29(5): 795-803.
Spinks, R., S. Arndt, K. Caspers, R. Yucuis, L. McKirgan, C. Pfalzgraf, and E. Waterman. 2007. School Achievement Strongly Predicts Midlife IQ. Intelligence 35(6): 563-567.
Van den Berg, G., D. Deeg, M. Lindeboom and F. Portrait. 2010. The Role of Early-Life Conditions in the Cognitive Decline due to Adverse Events Later in Life. Economic Journal, 120(548): F411-F428.
Weisbrod, B.A., P. Karpoff. 1968. Monetary Returns To College Education, Student Ability, and College Quality. Review of Economics and Statistics 50(4): 49197.
Wise, D. 1975. Academic Achievement and Job Performance. American Economic Review 65(3): 35066.

Table 1: Summary Statistics.

Variable	Mean	Standard Deviation	Minimum	Maximum
Round 1				
GPA	2.52	0.91	0	4.96
ln Math score percentile	3.68	0.96	0	4.59
ln Math score	6.54	0.07	6.33	6.75
ln Reading score percentile	3.33	1.11	0	4.59
ln Reading score	6.50	0.06	6.26	6.72
Math score percentile	53.15	29.67	0	99
Math score	693.99	62.03	0	857
Reading score percentile	41.55	27.84	0	99
Reading score	663.68	61.10	0	830
Male	0.49	0.50	0	1
Age	14.23	0.86	12	18
Miami	0.48	0.50	0	1
Fort Lauderdale	0.06	0.24	0	1
San Diego	0.46	0.50	0	1
U.S.-born children	0.50	0.50	0	1
Number of older siblings	1.69	1.98	0	21
8^{th} Grade	0.46	0.49	0	1
Household size	4.23	1.87	0	15
Biological parents present	0.64	0.48	0	1
Mother < high school	0.32	0.46	0	1
Mother high school	0.25	0.43	0	1
Mother > high school	0.43	0.49	0	1
Father < high school	0.28	0.45	0	1
Father high school	0.24	0.43	0	1
Father > high school	0.47	0.50	0	1
Family economic status	2.21	0.76	1	3
Own home	0.55	0.49	0	1
Father occupational prestige	43.40	14.44	13	78
Mother occupational prestige	43.10	13.93	17	78
Number of friends	13.10	18.43	0	98
Aspire graduate degree	0.66	0.47	0	1
Discriminated	0.55	0.49	0	1
Self-esteem index	3.30	0.52	1	4
Depression index	1.65	0.63	1	4
Desired status	67.36	20.21	17.24	89.57
Desired job prestige	62.33	12.70	13	78
Hours studied	2.48	1.35	1	6
School population	1792.2	764.5	707	3568
Private school	0.04	0.19	0	1
Minority school (> 60%)	0.42	0.49	0	1
Inner city school	0.37	0.48	0	1
White percent	23.72	19.38	0.1	65
Black percent	15.91	18.77	0	92
Hispanic percent	45.76	33.17	4	99
Asian percent	14.48	17.03	0	45
Subsidized-lunch eligible percent	45.45	24.43	0	92.3
English-speak	3.73	0.54	1	4
English-understand	3.77	0.48	1	4
English-read	3.67	0.55	1	4
English-write	3.64	0.59	1	4

Table 1 (continued): Summary Statistics.

Variable	Mean	Standard Deviation	Minimum	Maximum
Round 2				
Surveyed	0.81	0.38	0	1
GPA	2.46	0.95	0	5
Hours studied	2.74	1.46	1	6
School population	2522.9	1068.4	227	4930
Private school	0.04	0.18	0	1
School dropout rate	5.51	4.13	0.2	27.6
School percent attend	93.01	1.98	88.3	96
Subjective school quality	2.93	0.457	1.2	4
Round 3				
Educational outcomes				
Completed schooling	14.32	1.82	10	18
In school	0.51	0.49	0	1
Expected schooling-by 30	16.75	1.48	12	18
English-read	3.87	0.39	1	4
English-understand	3.90	0.34	1	4
English-speak	3.87	0.39	1	4
English-write	3.79	0.48	1	4
Labor market outcomes				
ln household income	10.57	0.91	7.82	12.77
ln personal earnings	7.31	0.68	3.91	9.74
Job prestige score	44.54	11.81	16	78
In labor force	0.90	0.29	0	1
Unemployed	0.09	0.29	0	1
Self-employed	0.05	0.22	0	1
Income satisfaction	3.16	1.11	1	5
Occupation satisfaction	3.80	1.05	1	5
First job prestige score	39.76	11.59	16	78
Expected job prestige score-by 30	54.77	10.33	18	78
Health and social outcomes				
Health insurance	0.74	0.44	0	1
Subjective health	4.21	0.84	1	5
Sick (ill or disabled)	0.06	0.24	0	1
Arrested/incarcerated	0.07	0.23	0	1
Partner	0.29	0.46	0	1

Notes: This table shows the summary statistics of the variables used in three rounds of the CILS data.

Table 2: Academic Performance in Middle School and Completed Years of Schooling.

GPA	0.998**				
	(26.91)				
ln Math score percentile		0.676**			
		(11.66)			
ln Math score			10.33**		
			(17.36)		
ln Reading score percentile				0.573**	
				(11.07)	
ln Reading score					10.89**
					(15.01)
Male	0.040	-0.223*	-0.237**	-0.194+	-0.208*
	(0.46)	(2.21)	(2.69)	(1.87)	(2.20)
Age	0.063	-0.378	-0.256	-0.423	-0.099
	(0.06)	(0.42)	(0.27)	(0.42)	(0.10)
Age-squared/100	-1.229	0.187	-0.165	0.290	-0.828
	(0.35)	(0.06)	(0.05)	(0.08)	(0.24)
Number of older siblings	-0.040*	-0.055**	-0.046*	-0.049*	-0.040*
	(2.32)	(2.95)	(2.25)	(2.45)	(2.02)
Miami	0.467*	0.064	0.146	0.257	0.426*
	(2.43)	(0.30)	(0.73)	(1.31)	(2.25)
Ft. Lauderdale	0.221	-0.028	0.026	0.041	0.141
	(0.89)	(0.11)	(0.11)	(0.17)	(0.60)
8^{th} Grade	0.503**	0.510**	0.286**	0.535**	0.400**
	(4.88)	(4.97)	(3.14)	(5.30)	(4.38)
U.S.-born children	0.268**	0.148*	0.120+	0.070	0.063
	(3.95)	(2.10)	(1.71)	(0.97)	(0.88)
Country-of-origin dummies	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.316	0.214	0.239	0.208	0.220
N			3264		

Notes: Regression of completed years of schooling on middle school variables in each column. t-statistics are reported in parentheses and are in absolute values together with the coefficients which are estimated using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 3: Academic Performance in Middle School and Completed Years of Schooling in Extended Specification.

GPA	0.762**				
	(20.97)				
ln Math score percentile		0.451**			
		(9.04)			
ln Math score			6.790**		
			(10.76)		
ln Reading score percentile				0.368**	
				(9.02)	
ln Reading score					6.923**
					(10.59)
Household size	-0.041*	-0.030+	-0.031+	-0.025	-0.025
	(2.34)	(1.75)	(1.84)	(1.39)	(1.42)
Biological parents present	0.139*	0.184**	0.152*	0.214**	0.211**
	(2.36)	(2.85)	(2.38)	(3.33)	(3.31)
Mother high school	0.015	0.065	0.036	0.079	0.058
	(0.11)	(0.52)	(0.29)	(0.63)	(0.45)
Mother > high school	0.256*	0.319**	0.288**	0.314**	0.298**
	(2.28)	(2.91)	(2.61)	(2.74)	(2.57)
Father high school	-0.035	-0.039	-0.018	-0.038	-0.038
	(0.30)	(0.33)	(0.15)	(0.31)	(0.30)
Father > high school	0.062	0.081	-0.060	0.066	0.062
	(0.69)	(0.91)	(0.59)	(0.71)	(0.66)
Middle Income	0.012	0.063	0.052	0.080	0.079
	(0.13)	(0.71)	(0.60)	(0.95)	(0.80)
High Income	0.031	0.050	0.046	0.067	0.058
	(0.33)	(0.54)	(0.50)	(0.75)	(0.64)
Own home	0.258**	0.247**	0.231**	0.212*	0.207*
	(2.95)	(2.87)	(2.67)	(2.25)	(2.20)
Father occupational prestige	0.005*	0.006*	0.006*	0.006**	0.006*
	(2.56)	(2.54)	(2.40)	(2.79)	(2.56)
Mother occupational prestige	0.005*	0.005+	0.005*	0.005+	0.004+
	(2.29)	(1.91)	(2.07)	(1.93)	(1.77)
Number of friends	-0.0007	-0.003	-0.003	-0.003	-0.002
	(0.33)	(1.40)	(1.22)	(1.14)	(0.96)
Aspire graduate degree	0.260**	0.339**	0.330**	0.347**	0.333**
	(3.55)	(4.45)	(4.22)	(4.42)	(4.15)
Discriminated	-0.009	-0.038	-0.029	-0.059	-0.049
	(0.14)	(0.55)	(0.43)	(0.88)	(0.74)
Self-esteem	0.086	0.151**	0.127*	0.099+	0.086
	(1.62)	(2.68)	(2.14)	(1.65)	(1.45)
Depression	-0.005	-0.057	-0.063	-0.087+	-0.101*
	(0.12)	(1.26)	(1.39)	(1.85)	(2.14)
Desired status	0.004	0.004	0.004	0.005+	0.005+
	(1.22)	(1.40)	(1.37)	(1.70)	(1.75)
Desired prestige	0.003	0.004	0.005	0.003	0.003
	(0.56)	(0.98)	(1.03)	(0.61)	(0.64)
Minority school	0.337+	0.011	-0.011	0.165	0.039
	(1.94)	(0.06)	(0.05)	(0.72)	(0.17)
Inner city school	0.072	0.173	0.171	0.192	0.186
	(0.56)	(1.34)	(1.33)	(1.44)	(1.45)
White percent	-0.079	-0.043	-0.032	0.014	0.033
	(0.61)	(0.32)	(0.23)	(0.10)	(0.24)
Black percent	-0.088	-0.055	-0.045	0.003	0.024
	(0.67)	(0.40)	(0.31)	(0.03)	(0.17)
Hispanic percent	-0.077	-0.043	-0.034	0.013	0.035
	(0.59)	(0.31)	(0.24)	(0.10)	(0.26)
Asian percent	-0.054	-0.026	-0.015	0.029	0.056
	(0.42)	(0.19)	(0.10)	(0.22)	(0.40)
Subsidized-lunch eligible	-0.013**	-0.011**	-0.009**	-0.010**	-0.009**
	(7.71)	(5.30)	(4.77)	(4.84)	(4.88)
School population(1)/100	-0.014+	-0.019**	-0.017*	-0.023**	-0.022**
	(1.89)	(2.69)	(2.40)	(3.03)	(3.12)
Hours studied(1)	-0.013	0.043+	0.038	0.047+	0.043+
	(0.63)	(1.69)	(1.59)	(1.87)	(1.73)
School population(2)/100	-0.008**	0.011	0.017	0.018	0.014
	(3.15)	(0.41)	(0.63)	(0.64)	(0.50)
Hours studied(2)	0.118**	0.173**	0.163**	0.182**	0.180
	(4.87)	(7.45)	(7.00)	(8.07)	(7.99)
Private school(2)	-1.234**	-1.066*	-0.147*	-0.972*	-1.055*
	(2.74)	(2.42)	(2.46)	(2.27)	(2.45)
School dropout rate(2)	-0.0002	-0.0002	-00005	-0.001	-0.0008
	(0.14)	(0.16)	(0.31)	(0.65)	(0.51)
School percent attend(2)	-0.0006	-0.001*	-0.001*	-0.0005	-0.0005
	(1.29)	(2.20)	(2.25)	(1.23)	(1.08)
Subjective school quality(2)	0.067	0.123*	0.099	0.131*	0.121+
	(1.01)	(1.93)	(1.51)	(2.13)	(1.91)
Controls in Table 3	Yes	Yes	Yes	Yes	Yes
Rounds 1&2: School fixed effects	Yes	Yes	Yes	Yes	Yes
Country-of-origin dummies	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.421	0.375	0.381	0.370	0.372
N			3264		

Notes: Regression of completed years of schooling on independent variables measured in middle and high school in each column. Variables measured in round 1 (middle school) have either no number attached to them or a suffix of (1) attached to them. Variables measured in round 2 (high school) have a suffix of (2) attached to them. t-statistics are reported in parentheses and are in absolute values together with the coefficients which are estimated using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 4: Academic Performance in Middle School and Adult Outcomes in Basic Specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.998**	0.043**	0.533**	0.016+	0.009	0.006	0.025*
	(26.91)	(3.59)	(12.15)	(1.88)	(1.29)	(0.84)	(2.21)
ln Math score percentile	0.676**	0.048**	0.406**	0.029**	0.023**	0.017+	0.026*
	(11.66)	(3.83)	(10.53)	(2.57)	(2.57)	(1.94)	(2.11)
ln Math score	10.33**	0.329*	5.453**	0.311*	0.258**	0.173+	0.374**
	(17.36)	(2.04)	(14.30)	(2.25)	(2.63)	(1.79)	(2.61)
ln Reading score percentile	0.573**	0.027**	0.290**	0.063**	0.046**	0.045**	0.071**
	(11.07)	(3.07)	(8.00)	(5.44)	(4.63)	(4.18)	(5.20)
ln Reading score	11.89**	0.257	5.390**	0.978**	0.713**	0.718**	1.203**
	(15.01)	(1.52)	(10.90)	(5.28)	(4.72)	(4.38)	(5.40)
N	3264	3233	2465	3177	3181	3183	2716

Labor market outcomes

	ln household Income	ln personal earnings	job prestige score	in labor force	unemployed	self employed	income satisfaction
GPA	0.050**	0.009	3.349**	-0.032**	-0.020**	-0.009	-0.010
	(4.30)	(0.50)	(14.68)	(4.14)	(2.75)	(1.51)	(0.47)
ln Math score percentile	0.112**	0.050**	1.826**	-0.016+	-0.016*	-0.008+	0.023
	(5.15)	(2.63)	(7.69)	(1.78)	(2.10)	(1.66)	(1.02)
ln Math score	1.46**	0.698*	30.587**	-0.278**	-0.211+	-0.127+	0.363
	(4.94)	(2.31)	(7.94)	(2.99)	(1.86)	(1.78)	(1.07)
ln Reading score percentile	0.124**	0.048**	1.660**	-0.011	-0.017**	-0.012**	-0.023
	(5.72)	(2.95)	(6.60)	(1.60)	(2.96)	(2.68)	(0.95)
ln Reading score	1.634**	0.815**	32.059**	-0.246*	-0.272**	-0.255**	-0.609
	(4.15)	(2.91)	(5.72)	(2.07)	(2.83)	(2.67)	(1.54)
N	2966	2603	2591	3262	2829	2669	2939

	occupation satisfaction	first job prestige	expected job prestige
GPA	0.015	3.539**	2.926**
	(0.69)	(11.61)	(13.38)
ln Math score percentile	0.052**	2.148**	1.773**
	(2.72)	(8.52)	(6.25)
ln Math score	0.614*	38.829**	31.081**
	(2.21)	(10.99)	(11.03)
ln Reading score percentile	-0.009	1.920**	1.727**
	(0.54)	(7.32)	(6.78)
ln Reading score	-0.085	38.936**	34.823**
	(0.29)	(8.14)	(9.24)
N	2828	2393	2869

Health and social outcomes

	health insurance	subjective health	sick	arrested/ incarcerated	partner
GPA	0.060**	0.695**	-0.013*	-0.038**	-0.054**
	(5.56)	(3.62)	(2.53)	(5.62)	(5.66)
ln Math score percentile	0.048**	0.040*	-0.012*	-0.016**	-0.034**
	(4.70)	(1.95)	(2.16)	(2.69)	(3.05)
ln Math score	0.749**	0.867**	-0.235**	-0.271**	-0.661**
	(5.24)	(3.79)	(3.90)	(3.51)	(3.88)
ln Reading score percentile	0.038**	0.041*	0.0005	-0.008*	-0.040**
	(4.59)	(2.40)	(0.97)	(1.80)	(3.78)
ln Reading score	0.602**	1.000**	0.011	-0.174**	-.0738**
	(3.81)	(3.45)	(0.13)	(2.14)	(3.46)
N	3272	3302	3158	3049	3300

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 2. t-statistics are reported in parentheses and are in absolute values. Marginal effects are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 5: Academic Performance in Middle School and Adult Outcomes in Extended Specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.762**	0.020	0.350**	-0.009	-0.006	-0.008	-0.012
	(20.97)	(1.06)	(7.69)	(1.05)	(0.79)	(0.85)	(0.82)
ln Math score percentile	0.451**	0.037*	0.253**	0.001	0.004	-0.001	-0.005
	(9.04)	(2.33)	(5.44)	(0.08)	(0.42)	(0.18)	(0.37)
ln Math score	6.790**	0.045	3.200**	-0.035	0.001	-0.084	-0.129
	(10.76)	(0.21)	(6.71)	(0.23)	(0.01)	(0.81)	(0.78)
ln Reading score percentile	0.368**	0.016	0.182**	0.028*	0.021*	0.012	0.028*
	(9.02)	(1.35)	(6.46)	(2.20)	(1.80)	(1.03)	(2.18)
ln Reading score	6.923**	-0.076	3.271**	0.388*	0.297*	0.203	0.450**
	(10.59)	(0.34)	(8.07)	(2.51)	(2.08)	(1.45)	(2.99)
N	3264	3194	2465	3177	3181	3183	2716

Labor market outcomes

	ln household Income	ln personal earnings	job prestige score	in labor force	unemployed	self employed	income satisfaction
GPA	0.014	0.003	2.363**	-0.019**	-0.016*	-0.007	-0.045+
	(0.80)	(0.21)	(9.45)	(2.69)	(1.82)	(1.13)	(1.73)
ln Math score percentile	0.079**	0.038*	1.050**	-0.006	-0.012+	-0.010*	0.004
	(3.40)	(2.08)	(4.86)	(0.85)	(1.65)	(2.05)	(0.16)
ln Math score	0.927**	0.553+	18.092**	-0.120	-0.153	-0.103	0.153
	(3.21)	(1.94)	(4.86)	(1.63)	(1.59)	(1.34)	(0.44)
ln Reading score percentile	0.106**	0.030+	0.992**	0.001	-0.012*	-0.013**	-0.037
	(4.59)	(1.73)	(4.00)	(0.24)	(1.99)	(3.30)	(1.38)
ln Reading score	1.268**	0.451	16.907**	0.026	-0.174	-0.229**	-0.017*
	(3.23)	(1.44)	(3.12)	(0.24)	(1.44)	(2.60)	(2.41)
N	2966	2603	2591	2978	2547	2340	2939

	occupation satisfaction	first job prestige	expected job prestige
GPA	-0.015	2.508**	2.056**
	(0.50)	(7.55)	(8.87)
ln Math score percentile	0.035	1.060**	1.030**
	(1.53)	(3.72)	(3.95)
ln Math score	0.360	23.239**	20.058**
	(1.09)	(6.22)	(7.48)
ln Reading score percentile	-0.028	0.954**	1.093**
	(1.33)	(3.44)	(3.94)
ln Reading score	-0.390	21.144**	23.258**
	(0.89)	(3.94)	(5.53)
N	2828	2393	2869

Health and social outcomes

	health insurance	subjective health	sick	arrested/ incarcerated	partner
GPA	0.039**	0.005	-0.010*	-0.020**	-0.043**
	(2.84)	(0.23)	(2.07)	(3.64)	(4.59)
ln Math score percentile	0.029**	-0.011	-0.012*	-0.008	-0.029*
	(3.06)	(0.51)	(2.07)	(1.43)	(2.48)
ln Math score	0.411**	0.076	-0.221**	-0.121*	-0.463**
	(2.86)	(0.30)	(3.23)	(1.75)	(2.67)
ln Reading score percentile	0.019*	-0.011	0.004	-0.001	-0.037**
	(2.04)	(0.51)	(0.70)	(0.17)	(3.37)
ln Reading score	0.247	0.112	0.024	-0.013	-0.537**
	(1.41)	(0.31)	(0.30)	(0.18)	(2.51)
N	3187	3302	2882	2851	3204

Notes: Regression of adult outcomes on the middle school academic performance measures in each cell including controls in Table 3. t-statistics are reported in parentheses and are in absolute values. Marginal effects are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 6: Academic Performance in High School Relative to Middle School and Adult Outcomes

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA(1) + GPA(2)	0.450**	0.011	0.209**	-0.003	-0.001	-0.003	-0.0007
	(23.25)	(1.17)	(7.91)	(0.58)	(0.31)	(0.79)	(0.09)
GPA(2) > GPA(1)	0.442**	0.099**	0.171+	0.027	0.019	0.023	0.052
	(2.68)	(3.53)	(1.78)	(0.88)	(0.87)	(0.85)	(1.51)
GPA(2) < GPA(1)	0.249+	0.104**	0.034	0.011	0.006	0.012	0.043
	(1.83)	(3.67)	(0.29)	(0.44)	(0.30)	(0.53)	(1.46)
N	3203	3134	2413	3122	3127	3128	2675
H_0 : improvement=decline	F(1,41)=5.89	$\chi^2(1)$=0.06					

Labor market outcomes

	ln household Income	ln personal earnings	job prestige score	in labor force	unemployed	self employed	income satisfaction
GPA(1) + GPA(2)	0.018+	0.009	1.522**	-0.011**	-0.010*	0.004	-0.007
	(1.94)	(1.07)	(12.49)	(3.34)	(2.06)	(1.07)	(0.63)
GPA(2) > GPA(1)	-0.006	-0.021	0.760	-0.029	-0.019	-0.016+	-0.003
	(0.10)	(0.40)	(0.80)	(1.49)	(0.94)	(1.91)	(0.04)
GPA(2) < GPA(1)	-0.095	-0.057	-0.532	0.003	-0.012	-0.023*	-0.183*
	(1.47)	(1.28)	(0.53)	(0.15)	(0.58)	(2.10)	(2.22)
N	2916	2558	2543	2916	2512	2281	2885
H_0 : improvement=decline						$\chi^2(1)$=0.79	

	occupation satisfaction	first job prestige	expected job prestige
GPA(1) + GPA(2)	0.005	1.551**	1.221**
	(0.29)	(9.12)	(9.66)
GPA(2) > GPA(1)	-0.090	0.641	1.594*
	(1.54)	(0.66)	(2.41)
GPA(2) < GPA(1)	-0.220**	-0.591	0.710
	(3.51)	(0.63)	(0.93)
N	2776	2347	2822

Health and social outcomes

	health insurance	subjective health	sick	arrested/ incarcerated	partner
GPA(1) + GPA(2)	0.026**	0.015	-0.005*	-0.007	-0.023**
	(3.78)	(1.31)	(2.12)	(1.28)	(4.05)
GPA(2) > GPA(1)	0.041	0.089	-0.022+	-0.039+	-0.019
	(1.38)	(1.43)	(1.82)	(1.86)	(0.66)
GPA(2) < GPA(1)	-0.029	-0.024	-0.014	-0.014	-0.015
	(0.89)	(0.42)	(1.24)	(0.72)	(0.46)
N	3118	3240	2833	3160	3144

Notes: Regression of adult outcomes on the sum of middle school GPA (1) and high school GPA (2) and the gap between them in each cell including controls in Table 3. The omitted category is having the same GPA in both middle and high school. t-statistics are reported in parentheses and are in absolute values. Marginal effects are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 7: Predictors of Academic Performance in Middle and High School.

	Middle school GPA	High school GPA	ln Math score percentile	ln Math score	ln Reading score percentile	ln Reading score
Male	-0.269**	-0.280**	-0.006	0.001	-0.053	-0.002
	(7.18)	(6.55)	(0.15)	(0.02)	(1.47)	(1.01)
Age	-0.402	-0.595+	0.628	0.017	1.444**	0.041
	(1.25)	(1.71)	(1.14)	(0.56)	(3.04)	(1.57)
Age-squared	1.028	1.686	-2.686	-0.095	-5.571**	-0.167+
	(0.92)	(1.39)	(1.37)	(0.86)	(3.30)	(1.82)
Number of older siblings	-0.006	-0.004	-0.001	-0.001	-0.009	-0.001*
	(0.82)	(0.51)	(0.10)	(1.38)	(1.22)	(2.07)
Miami	0.207*	-0.205**	0.616**	0.014*	0.510**	-0.034**
	(2.47)	(2.48)	(5.45)	(2.01)	(4.54)	(4.69)
Ft. Lauderdale	-0.117+	-0.488**	0.399**	-0.005	0.560**	-0.018**
	(1.65)	(7.14)	(3.71)	(0.70)	(5.19)	(2.69)
8^{th} Grade	0.267**	0.361**	0.238**	0.038**	0.157+	0.020**
	(4.33)	(6.60)	(5.41)	(8.98)	(1.84)	(4.10)
Household size	0.005	0.002	-0.022**	-0.001*	-0.049**	-0.002**
	(0.71)	(0.30)	(2.65)	(2.54)	(5.30)	(5.80)
Biological parents present	0.107**	0.092**	0.058*	0.007**	0.034	0.002
	(3.84)	(2.96)	(2.31)	(4.10)	(1.02)	(0.90)
Mother high school	0.050	0.019	0.005	0.005+	0.052	0.004
	(1.38)	(0.55)	(0.12)	(1.76)	(0.96)	(1.26)
Mother > high school	0.109+	0.087	0.041	0.006*	0.082	0.006*
	(1.88)	(1.47)	(1.01)	(2.33)	(1.59)	(2.33)
Father high school	-0.011	0.002	-0.055*	-0.006*	-0.037	-0.002
	(0.33)	(0.05)	(2.11)	(2.38)	(0.85)	(1.20)
Father > high school	0.045	0.056	-0.049	-0.001	0.053	-0.003
	(1.33)	(1.58)	(1.02)	(0.40)	(1.26)	(1.35)
Middle Income	0.064**	0.055	0.044	0.004*	0.001	0.003
	(2.82)	(1.51)	(1.15)	(1.95)	(0.03)	(1.35)
High Income	-0.072*	-0.045	-0.014	-0.007**	-0.230**	-0.009**
	(2.20)	(1.29)	(0.45)	(2.66)	(4.29)	(3.53)
Own home	0.064**	0.089**	0.062*	0.006**	0.124**	0.007**
	(2.82)	(3.61)	(2.55)	(3.77)	(4.58)	(4.84)
Father occupational prestige	0.002**	0.003**	0.002**	0.001**	0.003*	0.001**
	(2.95)	(3.32)	(3.06)	(3.84)	(2.39)	(4.18)
Mother occupational prestige	0.001	0.001	0.001	0.001	0.001	0.001
	(0.79)	(0.67)	(0.96)	(0.64)	(1.02)	(1.47)
Number of friends	-0.003**	-0.002**	-0.002**	-0.001**	-0.002**	-0.001**
	(5.54)	(3.28)	(2.76)	(3.25)	(2.65)	(3.86)
Aspire graduate degree	0.267**	0.230**	0.199**	0.016**	0.189**	0.011**
	(9.00)	(7.24)	(5.63)	(7.14)	(6.80)	(8.09)
Discriminated	-0.020	-0.009	0.065*	0.004+	0.161**	0.008**
	(0.57)	(0.03)	(2.17)	(1.74)	(4.97)	(4.81)
Self-esteem	0.228**	0.221**	0.232**	0.017**	0.421**	0.022**
	(10.97)	(11.69)	(6.79)	(8.20)	(9.49)	(12.95)
Depression	-0.068**	-0.049**	-0.017	-0.001	0.092**	0.006**
	(4.09)	(2.62)	(0.72)	(0.12)	(3.90)	(5.82)
Desired status	0.001	0.001	0.003+	0.001	0.002	0.001
	(0.27)	(0.61)	(1.87)	(1.40)	(0.90)	(1.14)
Desired prestige	0.005**	0.004**	-0.001	0.001	0.002	0.001
	(2.75)	(2.28)	(0.37)	(0.44)	(0.77)	(0.71)
Minority school	-0.401**	-0.276**	-0.080*	-0.003	0.157**	0.052**
	(14.87)	(9.11)	(2.25)	(1.33)	(4.39)	(32.12)
Inner city school	-0.088**	-0.168**	-0.381**	-0.022**	-0.184**	-0.004**
	(4.90)	(8.15)	(15.98)	(13.35)	(7.85)	(3.86)
White percent	0.109**	0.202**	0.011	0.006**	0.006	0.003+
	(5.34)	(10.69)	(0.59)	(3.35)	(0.23)	(1.76)
Black percent	0.106**	0.204**	0.012	0.006**	0.007	0.002+
	(5.18)	(10.70)	(0.61)	(3.25)	(0.23)	(1.69)
Hispanic percent	0.110**	0.204**	0.014	0.006**	0.007	0.002
	(5.36)	(10.66)	(0.72)	(3.32)	(0.24)	(1.40)
Asian percent	0.108**	0.199**	0.013	0.006**	0.015	0.002
	(5.30)	(10.39)	(0.70)	(3.08)	(0.54)	(1.35)
Subsidized lunch eligible	0.003**	-0.002	-0.002**	-0.003**	-0.003**	-0.001**
	(4.13)	(0.37)	(2.72)	(6.96)	(3.20)	(5.87)
School population/100	-0.015**	-0.001**	-0.003**	-0.001**	-0.007**	-0.001**
	(10.62)	(5.82)	(2.37)	(12.31)	(4.85)	(17.04)
U.S.-born children	-0.087**	-0.062*	-0.263	0.029	0.165**	0.008**
	(3.96)	(2.03)	(1.39)	(1.25)	(4.94)	(5.03)
Controls in Table 3	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-of-origin dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.334	0.375	0.309	0.353	0.403	0.393
N	5154	5154	4406	4431	4496	4499

Notes: Regression of academic performance measures on controls which are measured in the same round. t-statistics are reported in parentheses and are in absolute values together with the coefficients which are estimated using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 8: Health Conditions at Birth and Academic Performance.

	Outcome											
	(1) Middle school GPA	(2) High school GPA	(3) ln Math score percentile	(4) ln Math score	(5) ln Reading score percentile	(6) ln Reading score	(7) Middle school GPA	(8) High school GPA	(9) ln Math score percentile	(10) ln Math score	(11) ln Reading score percentile	(12) ln Reading score
	Full sample	Full sample	Full sample	Full sample	Full sample	Full sample	Non-U.S. born sample	Non-U.S. born sample	Non-U.S. born sample	Non-U.S. born sample	Non-U.S. born sample	Non-U.S. born sample
PANEL A												
IMR	-0.024**	-0.020*	-0.031+	-0.002+	-0.026*	-0.001	-0.026*	-0.023*	-0.037*	-0.002*	-0.016	-0.000
	(2.59)	(2.26)	(1.89)	(1.98)	(2.15)	(1.05)	(2.64)	(2.45)	(2.26)	(2.23)	(1.39)	(0.08)
ln GDP per capita	0.163	0.191	0.667*	0.029	0.728*	0.042**	-0.218	-0.126	0.077	-0.012	0.310	0.019
	(0.91)	(0.72)	(2.81)	(1.59)	(2.50)	(2.84)	(1.32)	(0.46)	(0.30)	(0.65)	(0.87)	(1.13)
Unemployment rate	-0.027	-0.025	-0.027	-0.001	-0.023	-0.001	-0.003	-0.003	0.009	0.001	-0.006	-0.001
	(1.47)	(1.31)	(1.30)	(1.15)	(1.24)	(1.50)	(0.14)	(0.14)	(0.40)	(1.02)	(0.27)	(0.49)
N	4487	4487	3858	3876	3934	3937	1930	1930	1621	1630	1647	1649
Adjusted R-squared	0.298	0.265	0.283	0.304	0.346	0.349	0.323	0.272	0.289	0.300	0.344	0.322
PANEL B												
IMR	-0.028**	-0.021**	-0.039**	-0.002**	-0.030*	-0.001*	-0.030**	-0.021**	-0.036**	-0.002**	-0.009	-0.000
	(3.67)	(2.75)	(3.05)	(3.07)	(2.88)	(2.17)	(3.71)	(2.58)	(2.70)	(2.76)	(0.78)	(0.44)
ln GDP per capita	0.764	0.430	1.502*	0.069	1.018	0.075*	-0.104	-0.208	0.373	-0.010	0.308	0.034
	(1.52)	(0.64)	(2.52)	(1.40)	(1.55)	(2.26)	(0.30)	(0.34)	(0.70)	(0.27)	(0.43)	(0.93)
Unemployment rate	-0.034	-0.029	-0.071+	-0.003	-0.059	-0.002	-0.064+	0.056	0.006	0.005	-0.020	0.002
	(1.06)	(0.73)	(1.70)	(1.22)	(1.16)	(0.86)	(1.73)	(1.39)	(0.12)	(1.42)	(0.34)	(0.57)
N	4335	4335	3721	3738	3796	3799	1778	1778	1484	1492	1509	1511
Adjusted R-squared	0.297	0.267	0.297	0.314	0.381	0.371	0.329	0.289	0.312	0.332	0.393	0.366

Notes: Regression of academic performance measures on infant mortality rate, ln GDP per capita and unemployment rate at the country of birth in the year of birth including controls in Table 7, Round 1 and 2 school fixed effects and country of origin dummies. Full sample refers to both first and second generation immigrants while non-U.S. born sample refers to only first generation immigrants. Panel A and Panel B uses IMR and GDP data from different sources. t-statistics are reported in parentheses and are in absolute values together with the coefficients which are estimated using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table 9: Health Conditions at Birth and Adult Outcomes.

	(1) Middle school GPA	(2) ln Math score percentile	(3) ln Math score	(4) ln Reading score percentile	(5) ln Reading score	(6) Middle school GPA	(7) ln Math score percentile	(8) ln Math score	(9) ln Reading score percentile	(10) ln Reading score
	Full sample	Full sample	Full sample	Full sample	Full sample	Non-U.S. born sample	Non-U.S. born sample	Non-U.S. born sample	Non-U.S. born sample	Non-U.S. born sample
PANEL A										
Outcome: Income satisfaction										
IMR	-0.060*	-0.059*	-0.059*	-0.060*	-0.060*	-0.066+	-0.067+	-0.066+	-0.068+	-0.068+
	(2.11)	(2.08)	(2.07)	(2.11)	(2.11)	(1.70)	(1.76)	(1.75)	(1.78)	(1.78)
ln GDP per capita	-0.227	-0.210	-0.208	-0.204	-0.202	-0.289	-0.272	-0.284	-0.252	-0.258
	(0.46)	(0.42)	(0.42)	(0.42)	(0.41)	(0.43)	(0.41)	(0.43)	(0.38)	(0.39)
Unemployment rate	-0.030	-0.029	-0.029	-0.028	-0.028	-0.044	-0.041	-0.041	-0.041	-0.041
	(0.61)	(0.60)	(0.60)	(0.58)	(0.58)	(1.00)	(0.95)	(0.95)	(0.96)	(0.94)
N	2629	2629	2629	2629	2629	1069	1069	1069	1069	1069
Adjusted R-squared	0.021	0.019	0.020	0.020	0.021	0.049	0.046	0.047	0.048	0.048
PANEL B										
Outcome: First job prestige										
IMR	-0.291	-0.280	-0.298	-0.274	-0.279	-0.342	-0.345	-0.370	-0.331	-0.340
	(1.15)	(1.08)	(1.15)	(1.05)	(1.06)	(1.08)	(1.08)	(1.17)	(1.04)	(1.06)
ln GDP per capita	-0.001	-0.039	-0.257	-0.056	-0.172	1.316	0.407	0.516	0.359	0.309
	(0.00)	(0.01)	(0.07)	(0.01)	(0.05)	(0.26)	(0.08)	(0.10)	(0.07)	(0.06)
Unemployment rate	-1.043**	-1.130**	-1.126**	-1.120**	-1.127**	-1.083*	-1.196**	-1.186**	-1.147*	-1.162**
	(3.02)	(3.17)	(3.17)	(3.11)	(3.14)	(2.54)	(2.74)	(2.71)	(2.55)	(2.60)
N	2149	2149	2149	2149	2149	893	893	893	893	893
Adjusted R-squared	0.176	0.161	0.167	0.161	0.163	0.141	0.137	0.142	0.134	0.135
PANEL C										
Outcome: ln personal earnings										
IMR	-0.021+	-0.020+	-0.020+	-0.020+	-0.020+	-0.032*	-0.030*	-0.031*	-0.031*	-0.032*
	(1.82)	(1.67)	(1.72)	(1.73)	(1.73)	(2.22)	(1.99)	(2.15)	(2.09)	(2.15)
ln GDP per capita	-0.276	-0.282	-0.275	-0.283	-0.284	-0.341	-0.311	-0.311	-0.334	-0.330
	(1.06)	(1.08)	(1.06)	(1.06)	(1.07)	(0.93)	(0.86)	(0.86)	(0.92)	(0.91)
Unemployment rate	-0.014	-0.013	-0.013	-0.013	-0.013	-0.022	-0.022	-0.021	-0.019	-0.020
	(0.52)	(0.49)	(0.49)	(0.50)	(0.49)	(0.87)	(0.85)	(0.82)	(0.77)	(0.79)
N	2328	2328	2328	2328	2328	937	937	937	937	937
Adjusted R-squared	0.046	0.046	0.046	0.045	0.045	0.063	0.070	0.064	0.066	0.063

Notes: Regression of adult outcomes on birth country's on infant mortality rate, ln GDP per capita and unemployment rate at the country of birth in the year of birth including controls in Table 3, academic performance measure, Round 1 and 2 school fixed effects and country of origin dummies. Full sample refers to both first and second generation immigrants while non-U.S. born sample refers to only first generation immigrants. t-statistics are reported in parentheses and are in absolute values together with the coefficients which are estimated using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

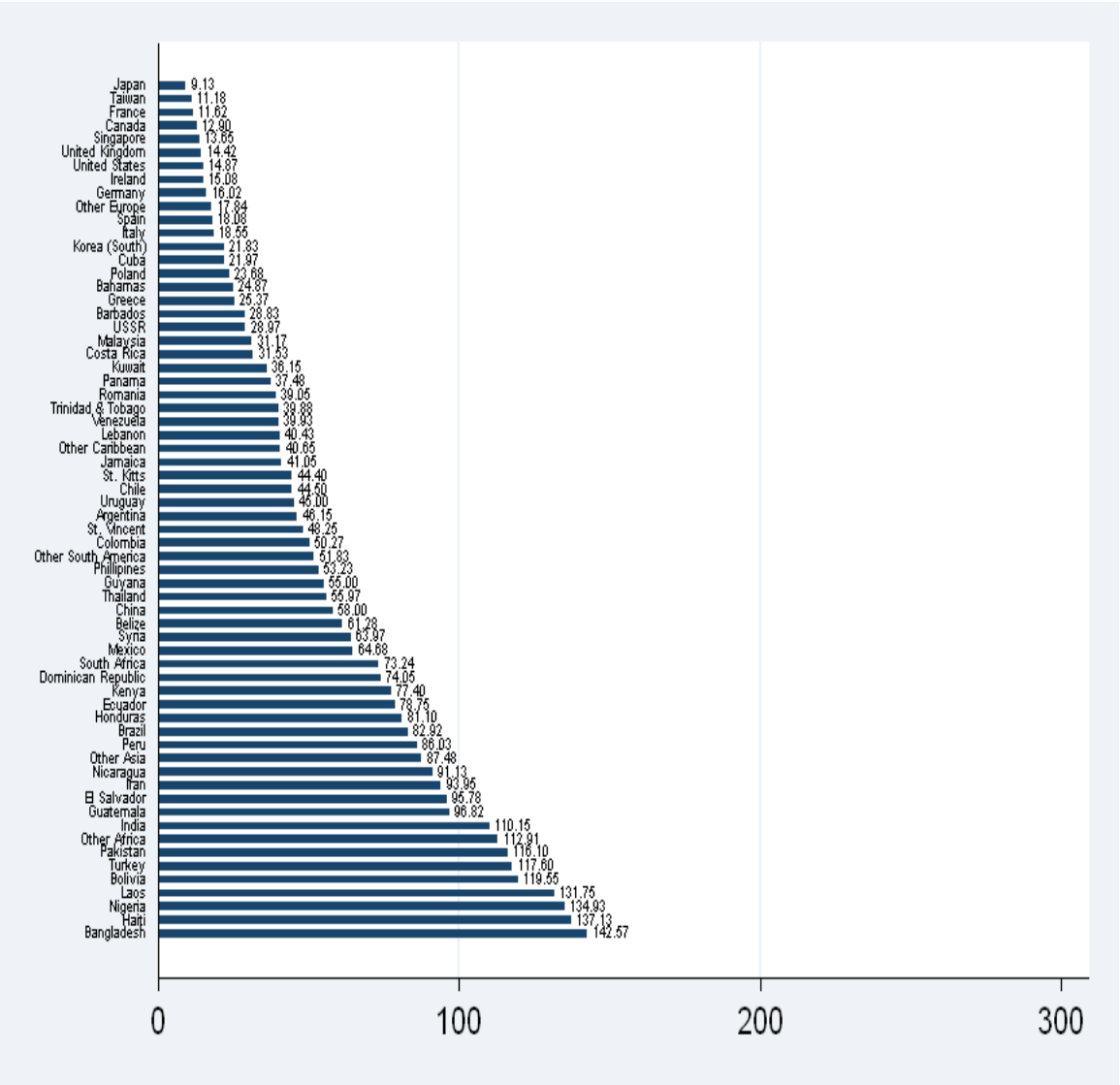


Figure 1: Infant mortality 1974-1979.
Sources: Data for Taiwan are from Table 2 in Chow (2001) and data for other countries are from World Bank Key Development Indicators.

APPENDIX

Table A.1: Variable Definitions.

Variable name	Definition
Cofactors	
GPA	Grade point average based on school records
Math score percentile	National Percentile on Stanford Math Achievement Test
Math score	Total Score on Stanford Math Achievement Test
Reading score percentile	National Percentile on Stanford Reading Achievement Test
Reading score	Total Score on Stanford Reading Achievement Test
Male	dummy for male
Age	Respondent age in years
Miami	First interview site, dummy for Miami
Fort Lauderdale	First interview site, dummy for Ft. Lauderdale
San Diego	First interview site, dummy for San Diego
U.S.-born children	Respondent birth country, dummy for U.S.-born
Number of older siblings	Total number of older siblings
Household size	Total number household members
Mother's highest education	less than high school, high school,more than high school degree
Father's highest education	less than high school, high school,more than high school degree
8^{th} Grade	Student's grade, dummy variable for 8^{th}
Biological parents present	Present living situation & household guardians, dummy for two biological parents
Family economic status	Family current economic situation, lower=1 if working-class/poor; middle=1 if middle-class; upper=1 if wealthy/upper-middle class
Home ownership	Parent's own home, dummy for home ownership
Father occupational prestige	Father Occupational Prestige Score-Treiman Scale
Mother occupational prestige	Mother Occupational Prestige Score-Treiman Scale
Number of friends	Number respondent close friends at school
Aspire graduate degree	Respondent education aspiration, dummy for finish graduate degree
Discriminated	Respondent ever felt discriminated, dummy for having felt discriminated against
Self-esteem index	Self-esteem index is created by taking the average of 10 items. I am a person of worth, I have a number of good qualities, I'm inclined to feel I'm a failure (reversed scale), I do things as well as other people, I do not have much to be proud of (reversed scale), I take a positive attitude toward myself, I am satisfied with myself, I wish I had more respect for myself (reversed scale), I certainly feel useless at times (reversed scale), At times I think I am no good at all (reversed scale). 1=Disagrees a lot; 2=Disagrees a little, 3=Agrees a little; 4=Agrees a lot.
Depression index	Depression index is created by taking the average of 4 items. Felt sad past week Could not get going past week, Did not feel like eating past week, I felt depressed past week. 1=Rarely, 2=Some of the time; 3=Occasionally; 4=Most of the time.
Desired status	Respondent's desired job Socio-Economic Index score
Desired job prestige	Respondent's Desired Job Prestige Score [Treiman Scale]
Minority school (> 60%)	Minority school, dummy for 60% or more Black/Hispanic
Inner city school	School type attended, dummy for inner city [control group suburban]
White percent	Percent of white students in school
Black percent	Percent of black students in school
Hispanic percent	Percent of Hispanic students in school
Asian percent	Percent of Asian students in school
Subsidized-lunch eligible %	Percent of students eligible for subsidized lunch at school
Hours studied	During a typical weekday, hours spent studying/doing school homework
Private school	Dummy for private school
School population	Total school population
English-speak	How well do you speak English? 1=not at all; 2=not well; 3=well; 4=very well
English-understand	How well do you understand English? 1=not at all; 2=not well; 3=well; 4=very well
English-read	How well do you read English? 1=not at all; 2=not well; 3=well; 4=very well
English-write	How well do you write English? 1=not at all; 2=not well; 3=well; 4=very well
School dropout rate	annual dropout rate based on school records
School percent attend	percent daily attendance at school based on school records
Subjective school quality	Subjective school quality index is created by taking the average of 10 items: There is real school spirit, Students make friends with students of other racial and ethnic groups, The teaching is good, Teachers are interested in students, I don't feel safe at this school (reversed scale), Disruptions by other students get in the way of learning (reversed scale), Fights often occur between different racial or ethnic groups (reversed scale), There are many gangs in school (reversed scale), Students are graded fairly, Discipline is fair. 1=Disagrees a lot; 2=Disagrees a little, 3=Agrees a little; 4=Agrees a lot.
Educational outcomes	
Completed schooling	Highest grade or year of school completed
In school	Currently in school, dummy for being in school
Expected schooling-by 30	Highest level of education realistically expect to have achieved by age 30
English-speak	How well do you speak English? 1=not at all; 2=not well; 3=well; 4=very well
English-understand	How well do you understand English? 1=not at all; 2=not well; 3=well; 4=very well
English-read	How well do you read English? 1=not at all; 2=not well; 3=well; 4=very well
English-write	How well do you write English? 1=not at all; 2=not well; 3=well; 4=very well
Labor market outcomes	
ln household income	Logarithm of total household income from all sources last year
ln personal earnings	Logarithm of total personal earnings per month from all sources
Job prestige score	Current job Treiman prestige score
In labor force	Currently in labor force. Coded form present work situation
Unemployed	Currently unemployed. Coded form present work situation
Self-employed	Self-employed=1 and =0 otherwise
Income satisfaction	Current income satisfaction. min=1, max=5
Occupation satisfaction	Current income satisfaction. min=1, max=5
First job prestige score	First job Treiman prestige score
Expected job prestige-by 30	Expected occupation Treiman prestige score by age 30
Health & social outcomes	
Health insurance	Respondent has health insurance, dummy variable
Subjective health	Respondent's subjective health. poor=1; fair=2; good=3; very good=4; excellent=5
Sick (ill or disabled)	Dummy. Respondent became seriously ill or disabled during the last 5 years
Arrested/incarcerated	Average of two dummies: I was arrested during the last 5 years and I spent time in a reform school Detention center, jail, or prison during the last 5 years
Partner	Dummy for married, engaged, or living with partner [control group single, divorced, separated & other]

Notes: This table shows the variable definitions used in the analysis CILS 1991-2006.

Table A.2: Correlations Among Measures of Academic Performance.

	Middle school GPA	ln Math score percentile	ln Math score	ln Reading score percentile	ln Reading score GPA	High school
Middle school GPA	1.000					
ln Math score percentile	0.438	1.000				
ln Math score	0.550	0.829	1.000			
ln Reading score percentile	0.304	0.603	0.552	1.000		
ln Reading score	0.404	0.545	0.637	0.879	1.000	
High school GPA	0.807	0.398	0.539	0.285	0.409	1.000

Table A.3: Second-generation Immigrants' (U.S.-born) Adult outcomes: Extended specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.799**	0.007	0.399**	0.012	0.006	0.007	0.011
	(16.19)	(0.32)	(6.37)	(0.90)	(0.48)	(0.51)	(0.51)
ln Math score percentile	0.515**	0.028	0.316**	0.017	0.013	-0.001	0.003
	(8.34)	(0.90)	(4.49)	(0.72)	(0.58)	(0.09)	(0.15)
ln Math score	7.120**	-0.198	3.987**	0.146	0.108	-0.093	0.117
	(9.73)	(0.58)	(5.45)	(0.72)	(0.55)	(0.52)	(0.48)
ln Reading score percentile	0.503**	0.015	0.289*	0.033	0.016	0.014	0.035
	(9.02)	(0.67)	(4.70)	(1.26)	(0.67)	(0.64)	(1.19)
ln Reading score	7.863**	0.052	3.860**	0.453	0.162	0.194	0.568+
	(6.64)	(0.17)	(4.70)	(1.63)	(0.72)	(0.89)	(1.80)
N	1733	1643	1332	1675	1675	1678	1434

Labor market outcomes

	ln household Income	ln personal earnings	job prestige score	in labor force	unemployed	self employed	income satisfaction
GPA	0.017	0.032	2.125**	-0.014	-0.015	-0.003	0.024
	(0.61)	(1.15)	(6.22)	(1.29)	(1.41)	(0.50)	(0.59)
ln Math score percentile	0.063+	0.003	0.636	-0.003	0.004	-0.008+	0.023
	(1.81)	(0.12)	(1.63)	(0.27)	(0.42)	(1.77)	(0.42)
ln Math score	0.795*	0.334	14.655**	-0.141	-0.056	-0.086	0.290
	(2.10)	(0.76)	(2.62)	(1.08)	(0.44)	(1.29)	(0.43)
ln Reading score percentile	0.095**	0.007	1.122**	0.006	-0.012	-0.011*	-0.044
	(3.22)	(0.26)	(2.80)	(0.69)	(1.24)	(2.52)	(1.03)
ln Reading score	0.997+	0.396	15.072*	-0.009	-0.199	-0.117	-1.039
	(1.87)	(0.97)	(2.06)	(1.01)	(1.10)	(1.31)	(1.34)
N	1590	1394	1210	1362	1169	1061	1563

	occupation satisfaction	first job prestige	expected job prestige
GPA	0.285	2.805**	2.021**
	(0.69)	(5.25)	(6.01)
ln Math score percentile	0.095*	1.365**	0.961*
	(1.97)	(3.53)	(2.36)
ln Math score	1.016	26.561**	18.140**
	(1.70)+	(5.19)	(3.40)
ln Reading score percentile	-0.018	1.537**	1.113*
	(0.44)	(3.97)	(2.35)
ln Reading score	-0.229	27.483**	22.321**
	(0.42)	(4.41)	(4.03)
N	1501	1260	1569

Health and social outcomes

	health insurance	subjective health	sick	arrested/ incarcerated	partner
GPA	0.047*	-0.004	-0.009+	-0.018+	-0.037**
	(2.44)	(0.11)	(1.71)	(1.82)	(2.84)
ln Math score percentile	0.020	-0.08	-0.011	-0.019+	-0.012
	(1.34)	(0.27)	(1.40)	(1.71)	(0.76)
ln Math score	0.225	0.453	-0.264**	-0.117	-0.199
	(0.88)	(1.19)	(2.84)	(1.15)	(1.05)
ln Reading score percentile	0.024	0.008	0.002	-0.003	-0.057**
	(1.24)	(0.26)	(0.31)	(0.31)	(3.62)
ln Reading score	0.081	0.484	-0.068	0.012	-0.571*
	(0.28)	(1.05)	(0.77)	(0.10)	(2.38)
N	1623	1758	1340	1707	1759

Notes: Regression of adult outcomes on middle school academic performance measures in each cell including controls in Table 3. t-statistics are reported in parentheses and are in absolute values. Marginal effects are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table A.4: First-generation Immigrants' (non-U.S.-born) Adult outcomes: Extended specification.

Educational outcomes

	completed schooling	in school	expected schooling	English read	English understand	English speak	English write
GPA	0.700**	0.026	0.290**	-0.033**	-0.018	-0.017	-0.038
	(9.90)	(1.07)	(4.91)	(1.97)	(1.19)	(1.04)	(1.56)
ln Math score percentile	0.412**	0.045*	0.217**	-0.011	0.001	0.004	-0.009
	(6.83)	(2.46)	(2.99)	(0.78)	(0.12)	(0.33)	(0.62)
ln Math score	6.230**	0.241	3.122**	-0.239	-0.029	0.037	-0.256
	(7.04)	(1.07)	(2.64)	(1.04)	(0.21)	(0.20)	(1.12)
ln Reading score percentile	0.332**	0.022	0.135*	0.018	0.024	0.007	0.019
	(6.32)	(1.36)	(2.54)	(1.12)	(1.26)	(0.35)	(1.32)
ln Reading score	6.667**	0.052	2.461**	0.242	0.467+	0.177	0.397+
	(6.64)	(0.17)	(2.57)	(1.12)	(1.87)	(0.70)	(1.86)
N	1531	1469	1133	1502	1506	1505	1282

Labor market outcomes

	ln household Income	ln personal earnings	job prestige score	in labor force	unemployed	self employed	income satisfaction
GPA	0.014	-0.025	2.773**	-0.034**	-0.009	-0.009	-0.115*
	(0.43)	(1.08)	(5.67)	(3.12)	(0.71)	(1.23)	(2.34)
ln Math score percentile	0.076*	0.065*	1.458**	-0.012	-0.019	-0.013**	-0.058
	(2.40)	(2.18)	(3.41)	(1.27)	(1.50)	(3.08)	(1.50)
ln Math score	0.800+	0.668	21.395**	-0.183+	-0.192	-0.196**	-0.590
	(1.84)	(1.28)	(3.37)	(1.88)	(1.24)	(3.07)	(1.09)
ln Reading score percentile	0.115**	0.050+	0.943**	0.006	-0.013	-0.014**	-0.039
	(3.80)	(1.73)	(2.61)	(0.69)	(1.13)	(4.25)	(1.05)
ln Reading score	1.743**	0.723	18.681*	0.095	-0.248	-0.327**	-0.674
	(3.37)	(1.25)	(2.23)	(0.52)	(1.35)	(4.72)	(1.00)
N	1376	1209	1210	1175	1405	798	1376

	occupation satisfaction	first job prestige	expected job prestige
GPA	-0.078	2.048**	2.170**
	(1.59)	(5.18)	(4.85)
ln Math score percentile	-0.049	0.997*	1.250**
	(1.08)	(2.22)	(2.92)
ln Math score	-0.647	18.552**	25.532**
	(0.98)	(3.48)	(4.49)
ln Reading score percentile	-0.028	0.763*	1.182**
	(1.06)	(2.21)	(3.07)
ln Reading score	-0.388	15.454*	23.894**
	(0.66)	(1.99)	(3.26)
N	1327	1133	1300

Health and social outcomes

	health insurance	subjective health	sick	arrested/ incarcerated	partner
GPA	0.042*	0.026	-0.008+	-0.017+	-0.049**
	(2.07)	(0.77)	(1.71)	(1.68)	(2.83)
ln Math score percentile	0.047*	-0.022	-0.005	0.001	-0.054**
	(2.53)	(0.71)	(1.27)	(0.02)	(3.20)
ln Math score	0.795**	-0.349	-0.055	-0.010	-0.787**
	(2.02)	(0.82)	(1.05)	(0.08)	(3.53)
ln Reading score percentile	0.027*	-0.014	-0.001	-0.008	-0.025+
	(2.01)	(0.45)	(0.02)	(1.27)	(1.77)
ln Reading score	0.644*	-0.065	0.026	-0.104	-0.383
	(2.27)	(0.13)	(0.50)	(0.74)	(1.21)
N	1435	1544	1069	1504	1451

Notes: Regression of adult outcomes on middle school academic performance measures in each cell including controls in Table 4. t-statistics are reported in parentheses and are in absolute values. Marginal effects are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and + indicate respectively 1%, 5% and 10% significance levels.

Table A.5: Gender Interactions.

	completed schooling		expected schooling		arrested/ incarcerated	
	coefficient	t	coefficient	t	coefficient	t
Male	0.456	(2.35)	-0.396	(1.85)	0.203	(6.38)
GPA	0.953	(20.60)	0.398	(8.92)	-0.009	(1.31)
Male*GPA	-0.178	(3.16)	0.078	(1.03)	-0.044	(4.73)
Male	0.093	(0.24)	-0.988	(3.80)	0.173	(3.24)
ln Math score percentile	0.584	(7.68)	0.202	(3.17)	-0.001	(0.20)
Male*ln Math score percentile	-0.086	(0.83)	0.175	(2.60)	-0.021	(1.69)
Male	0.049	(0.01)	-19.019	(3.69)	2.177	(2.56)
ln Math score	8.321	(9.67)	2.643	(4.43)	-0.036	(0.39)
Male*ln Math score	-0.043	(0.04)	2.855	(3.63)	-0.318	(2.47)
Male	0.103	(0.36)	-0.379	(1.82)	0.141	(3.69)
ln Reading score percentile	0.513	(9.53)	0.210	(5.16)	0.001	(0.21)
Male*ln Reading score percentile	-0.096	(1.19)	0.024	(0.41)	-0.014	(1.46)
Male	8.510	(1.13)	-9.637	(1.35)	2.256	(2.51)
ln Reading score	9.430	(12.42)	3.371	(5.39)	0.044	(0.51)
Male*ln Reading score	-1.343	(1.16)	1.434	(1.31)	-0.332	(2.41)

Notes: Regression of adult outcomes on middle school academic performance measures and interactions with gender including controls in Table 3. t-statistics are reported in parentheses and are in absolute values. Marginal effects are presented for binary outcomes using Probit while coefficients are presented for other outcomes using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and $^{+}$ indicate respectively 1%, 5% and 10% significance levels.

Table A.6: Dependent variable: Completed years of schooling.

	coefficient	t
GPA(2) + GPA(1)	0.487	(22.72)
GPA(2) > GPA(1)	0.963	(4.41)
GPA(2) < GPA(1)	0.888	(4.91)
Senior in high school	0.684	(3.26)
Senior in high school*GPA(2) > GPA(1)	-0.753	(3.62)
Senior in high school*GPA(2) < GPA(1)	-0.997	(4.81)

Notes: t-statistics are reported in parentheses and are in absolute values together with the coefficients*100 which are estimated using OLS. Robust standard errors are clustered at the school level (school as of round 1). **, * and $^{+}$ indicate respectively 1%, 5% and 10% significance levels.