The Role of Culture in Student's Academic, Anthropometric, and Fitness Outcomes*

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Abstract

This paper explores the transmission of culture among immigrants and how culture may influence immigrant students' academic, anthropometric, and fitness outcomes. We use data on all immigrant students in K-12 public schools in New York City between the years 2006-2017. We implement an epidemiological approach to explore the effects of home country proxies for culture on immigrants' outcomes. We find strong and robust evidence that home-country education, female labor force participation, and fertility can explain a significant portion of immigrants' outcomes. Among females, an additional year of schooling in the home-country is associated with an increase in math test score, ELA test score, height-for-age, and fitness score of 0.048, 0.039, 0.036, and 0.024 standard deviation change from the mean of variables, respectively. The results suggest that the gender gap in immigrants' outcomes is correlated with aggregate measures of gender inequality in the home-country and immigrants from more gender-equal countries reveal a higher gender gap in their outcomes. We provide discussions on why and how the culture could influence these outcomes.

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1. Introduction

The share of foreign-born persons in the US population has increased considerably during the past decades, 8.5 percent in 1960, 7.2 percent in 1980, 12.3 percent in 2000, and 15.1 percent in 2019. The average number of residence permits authorized by the Department of Homeland Security experienced an annual growth rate of 1.3 percent since the year 2000 (DHS, 2019). More noticeable than this secular increase is the change in the composition of admitted immigrants towards countries with more traditional views towards gender roles in the society (Blau et al., 2013; Borjas, 1985, 2015). This compositional change was also associated with changes in rates of assimilation and integration into the US society specifically for labor market outcomes (Bohn, 2009; Borjas, 2015; LaLonde and Topel, 1991). Therefore, it is of policy importance to understand the dynamics behind the immigrants' integration. This paper aims to explore one important factor: culture. We investigate whether there are cultural values or socially induced opinions to influence academic and anthropometric outcomes of immigrant students in the US.

Our research design implements an epidemiological approach to compare the outcomes of immigrants who reside in the same host country and were exposed to cross-country variations in cultural values (Fernández, 2010; Fernandez and Fogli, 2009). This design solves some of the problems associated with intergenerational studies to explore the correlates between parental outcomes and their children's outcomes and attempt to disentangle cultural factors from other family-society influences (Booth and Kee, 2009; Brannen, 2017; Dhar et al., 2018; Farré and Vella, 2013; Laspita et al., 2012). The primary issue with isolating culture is that it is correlated with other political and institutional factors such as women empowerment, level of democracy, welfare codes, economic conditions, and the level of development. The epidemiological method eliminates

these confounders by exposing immigrants to virtually the same environment and economic condition allowing for the design to surface the cultural values.

In this paper, we use data on immigrant students in New York City linked to their home-country characteristics, including education, female labor force participation, gender inequality index, and fertility. First, we argue that these measures could potentially be a proxy for the cultural values prevalent in their home-country. Second, we investigate the intergenerational transmission of these cultural elements from home-country to different outcomes of immigrant students including their test scores, measures of anthropometric, and fitness outcomes. Our findings are in line with the literature examining the cultural influences in education and health outcomes (Fernandez and Fogli, 2009; Gentili et al., 2017; Giuliano and Nunn, 2017; Nollenberger et al., 2016). We find that an increase of one year of schooling in immigrants' home-country is correlated with an increase in math test scores, height-for-age, and fitness score by roughly 5.4, 4.4, and 1.2 percent of standard deviation change from the mean of their respective variables. We also investigate whether the average home-country gender inequality index (a summary of female-male differences in the labor market and health outcomes) can be detected in the gender gap of immigrants' outcomes. The results suggest that a one-standard-deviation change in gender inequality index can explain 2.5, 2.2, and 7.5 standard deviation change in gender gap observed in math test score, height-for-age, and fitness score. These results are quite robust to a battery of robustness checks, across subsamples, and reveal similar results when we use average home-country female labor force participation and fertility. To complement this analysis, we implement the same design on Public Arts Supplement of Current Population Survey data (2002-2020) and restrict the sample to New York City immigrant students. We show that home-country education is associated with non-school-related cultural activity. Immigrant students from higher education

home-countries are more likely to read non-school-required books, write non-scientific pieces, visit museums and art galleries, and attend non-school-related sporting activities.

The contribution of this paper to the literature is threefold. First, we provide novel and first-hand evidence of the importance of cultural values and specifically gender norms in determining anthropometric and fitness outcomes of immigrants. This aspect of cultural transmission among immigrants has been ignored by the literature. Second, while a strand of research attempts to explain the gender gap in test scores and specifically math test scores only a few have explored the role of culture (Fryer and Levitt, 2010; Guiso et al., 2008; Nollenberger et al., 2016; Pope and Sydnor, 2010). Virtually no paper studies the role of culture in test scores of immigrants using US data. Third, we also add to the literature of immigration by offering an element that explains the variation in immigrants' outcomes and may affect their assimilation into the host country.

The rest of the paper is organized as follows. Section 2 provides a brief review of the literature. Section 3 describes data and sample selection. Section 4 discusses the empirical method. We review the results and offer additional robustness and heterogeneity analyses in section 5. Finally, we depart some concluding remarks in section 6.

2. Literature Review

This section offers a brief review of studies that explore the role of culture in economic and non-economic outcomes specifically among immigrants. One highly studied outcome that is often claimed to reflect cultural norms towards gender is female labor force participation. In an early study, Carroll et al. (1994) investigate the cultural factors in explaining the cross-country differences in saving rates. They use cross-country average saving rate as a cultural proxy and search for this factor in the saving behavior of immigrants in Canada. Their results do not support any evidence that the home-country values are associated with immigrants' behavior. Alesina et

al. (2013) posit that cross-cultural differences regarding gender roles can explain the variations in female labor force participation among immigrants. They hypothesize that geographical suitability for plow agriculture has induced a specific gender-based division of labor with men working outside in agriculture and industry. They show that descendants of those immigrants who come from societies with higher plough agriculture suitability reveal lower female labor force participation. The geography-based historical gender norms and social beliefs about gender roles in the society have been transmitted from the home-country to the host country and can be detected in outcomes of second-generation immigrants. Fernandez and Fogli (2009) argue that ancestral country average fertility and female labor force participation contain cultural beliefs in addition to past economic and institutional factors. After migration, as they are exposed to a different environment, only the cultural aspect of these variables operates. Implementing an epidemiological approach and using the 1970 US Census, they find that home-country cultural proxies can explain the behavior of second-generation women. Fernández and Fogli (2006) use fertility as a cultural proxy and explore its association with fertility rates of second-generation women in the US. They attempt to disentangle the role of family influences by controlling women's number of siblings. Their results suggest that even after controlling for family-level characteristics, the cultural proxies can significantly explain the fertility rates of women. Blau et al. (2013) extend this analysis using Current Population Survey and using three proxies for culture: female labor force participation, fertility, and education. They show that these cultural proxies are significantly associated with respective outcomes of second-generation women.

Culture also plays a part in living arrangements, co-residing with unmarried couples, and nonmarital fertility (Bellido et al., 2016; Giuliano, 2007; Kearney and Wilson, 2018; Marcén and Morales, 2019). For instance, Giuliano (2007) posits that the sexual revolution during the 1970s

had a differential impact in northern Europe versus southern Europe where there have been historically closer parent-child ties. She observes the same living arrangement pattern among second-generation immigrants in the US both in 1970 (before sexual revolution) and 2000 (cohorts after the revolution). She interprets these findings as cultural role in explaining the living arrangements.

Bozzano (2017) establishes a relationship between culture and women's political empowerment. She proxies culture with religious marriage and shows that, across Italian provinces, areas with a higher concentration of religious culture have lower rates of women who hold office in local political bodies and have fewer women in high-ranking jobs. Fisman and Miguel (2007) establish how cultural norms can affect corruption. Their analysis is based on the accumulated parking ticket of United Nations officials in Manhattan, New York before 2002. They argue that before 2002 the UN officials were protected from parking enforcement actions and their behavior was primarily driven by culture. They find that those officials from high corruption countries have accumulated more unpaid parking tickets. In a similar study, DeBacker et al. (2015) show that owners of US-based corporations who are originated from countries with higher corruption norms evade more tax and are less likely to comply with new tax policies compared to those who come from countries with less corruption. The cultural aspect of corruption is also documented by other studies (Barr and Serra, 2010; Paldam, 2002; Salmon and Serra, 2017).

Nollenberger et al. (2016) investigate how cultural norms can explain the gender gap in math test scores. They show that descendants from countries with more traditional views towards gender and less gender-equal norms reveal higher gender gaps in math test scores. These effects are robust even after controlling for home-country GDP and parental education and parental labor force status. Cultural norms also play a role in long-term care (LTC) arrangement decisions.

Gentili et al. (2017) explore the role of culture in the Long-Term Care (LTC) market in Switzerland. They compare the outcomes of individuals in different language groups using a spatial regression discontinuity design. They find that people residing in Latin language-speaking regions enter nursing homes at later ages and in worse conditions in contrast to those elderly people residing in German language speaking regions who enter at earlier ages. They argue that differences in cultural values and family ties is a candidate for the observed differences. Other studies also document the role of cultural beliefs and social norms in economic and social outcomes that can be transmitted in the intergenerational process including entrepreneurship (Bogan and Darity, 2008), age at first birth (Barber, 2001; Kim, 2014; Steenhof and Liefbroer, 2008), language human capital (Bleakley and Chin, 2008), feeling of identity (Casey and Dustmann, 2010), language capital (Casey and Dustmann, 2008), home-ownership (Marcén and Morales, 2020), trust (Alesina and Giuliano, 2011; Becker et al., 2016), feeling of national identity (Dustmann, 1996), art participation (DiMaggio and Mukhtar, 2004), female labor force participation (Blau et al., 2011), marital decisions (Bisin and Verdier, 2000), gender gaps in labor force status (Antecol, 2000), and family ties (Alesina and Giuliano, 2011).

3. Data and Sample Selection

The primary source of data is restricted-use Fitnessgram data obtained from the New York City (NYC) Department of Education (DoE). The NYC-DoE required all K-12 public schools in New York City to measure, collect, and report anthropometric and fitness data starting from 2005. The Fitnessgram data reports NYC public school students' measures of height, weight, and fitness level which measures students' strength, endurance, and flexibility. This data is merged with NYC-DoE school records of K-12 students which contain their demographic data, school, grade,

birthplace, home language, meal-type, as well as raw test scores in math and English Language Art (ELA).

The cross-country data on years of schooling comes from Barro and Lee (2001). While the average years of schooling in our data is 6.56 (SD=2.13), it varies between 0.42 years for the Yemen Republic and 13.16 years for the Czech Republic. The measures of fertility rate (per 1,000 women) and female labor force participation rate (FLFPR, the share of women aged 15 and over in the labor force) are extracted from World Bank. The gender inequality index (GII) comes from the Human Development Reports of the United Nations Development Program. The GII summarizes the inequality in health, economic, and social status of females versus males. It focuses on three aspects of women in society including female reproductive health, female political empowerment, and female labor market outcomes. It varies between 0.062 for Sweden to 0.818 for Niger, the most and least gender-equal countries in our sample, respectively. We keep the observations at the year 2000 for two reasons. First, the NYC-Fitnessgram data covers birth cohorts of 1986-2012 with an average birth year of 1998.3. As suggested by the literature, culture evolves slowly and within a limited, narrow window it can capture the cultural values that each cohort was exposed to during early childhood (Fernández and Fogli, 2006; Tabellini, 2008). Second, focusing on later dates allows for larger sample sizes as the earlier data is not available for a portion of the sample if, for instance, we chose to merge based on year of birth.[4]

We merge the cross-country characteristics with our NYC-Fitnessgram data based on country of birth. Eliminating unmerged data and those with missing home-country variables leaves us with a sample of 1,755,663 observations from 127 home-countries residing in 5 counties within New York City in 12 grade levels and studying in 2,173 public schools. However, the subsample

[4] For instance, gender inequality index is available in the year 1995 and 2000-2019.

sizes vary by the availability of the data for each outcome. Figure 1 shows the cross-country and within New York City distribution of the data. The left panel shows the quartiles of education (top panel) and gender inequality index (bottom panel) across countries. The right panel shows the geographic distribution of the share of immigrants in school census tracts crossed with counties in New York City.

A summary statistic of the final sample is reported in Table 1 for males and females and for two subsamples of low education and high education home-countries.[5] Immigrant students from high-income countries show better achievements in both math and English Language Art (ELA) test scores. On average, females from high-income countries receive 0.18 of a standard deviation above sample mean in math scores while females of low education countries obtain 0.016 standard deviations below sample average.[6] Moreover, females perform relatively better than males in both math and ELA test scores. The difference in female-male math test scores is slightly larger in high educated countries (0.073 SD) relative to low educated countries (0.070 SD).

4. Econometric Method

Our empirical method compares the test scores, anthropometric measures, and fitness outcomes of those who have emigrated from countries with different characteristics (e.g., high versus low education. Our argument is that the cultural proxy is influenced by economic, institutions, welfare programs, as well as social beliefs and once the immigrants move to a new environment the cultural aspects are isolated from other home-country features. Therefore, home-country proxies can reveal the correlates of culture with immigrants' outcomes. Specifically, we implement the following ordinary-least-square models:

[5] In Appendix A, we report a summary statistics table for the pooled sample.
[6] This relatively better performance of girls versus boys is also discussed in Fryer and Levitt (2010), Nollenberger et al. (2016), and Pope and Sydnor (2010).

$$y_{isgtbc} = \alpha_0 + \alpha_1 CP_b + \alpha_2 X_i + \zeta_s + \eta_g + \gamma_t + \lambda_c + \varepsilon_{isgtb} \quad (1)$$

Where y is the outcome of the immigrant student (test scores, anthropometric measures, and fitness outcomes) of immigrant i in school s in grade-level g observed in year t whose birth country is b and currently resides in county c. The parameter CP is the cultural proxy at the home-country level (i.e., education, female labor force participation, and fertility) in the year 2000. In X, we include a series of individual covariates. The matrices ζ, η, γ, and λ include fixed effects for school, grade level, year, and county of residence, respectively. In some sensitivity analyses, we also include home-country controls and county of residence fixed effects, too. The parameter ε is an error term. We cluster standard errors at the home-country and year of observation level to account for both serial and spatial correlations in the error term (Blau et al., 2013).[7]

5. Results

5.1. Correlational Links

We start our analysis by showing a series of visual correlations relating the cultural proxies to immigrants' test outcomes. In so doing, we collapse the final sample at the home-country level and for two grade levels of elementary students and middle-school students. In four panels of Figure 2, we depict the visual unconditional correlation between math test scores of immigrants and the home-country average education (top panels) and ELA test scores and the home-country average education (bottom panels) for elementary school students and middle-school students (left and right panels, respectively). The correlational link is positive and meaningful for both outcomes and samples suggesting that home-country education could partly explain immigrants' outcomes. The next question is whether average education or measures of gender inequality index are good

[7] The results are very similar if we exercise with alternative clustering levels including birthplace, school, and school by grade.

predictors of cultural values and whether or not they could reveal social beliefs towards gender. While we primarily rely on the relatively large body of literature for our cultural proxies, we also attempt to answer this question using the World Value Survey (WVS) data. The WVS is a cross-country cross-sectional survey of social beliefs among many other economic, religious, and political questions. We use waves 3 and 4 of the survey covering the years 1995-1998 and 1999-2004, respectively. We use the responses to two gender-related questions: 1) if you were to have a child, would you prefer to have a boy or a girl? (yes/no) 2) a university is more important for a boy than a girl? (Scale: 1-4). After excluding the missing values, we end up with a sample of 341,271 respondents from 101 countries. We then collapse the data at the country level and merge it with cross-country data on education and gender inequality index. Figure 3 depicts the visual correlation between the average responses to the two questions and the average education and gender inequality index. There is a strong correlational link between the social opinions about the role of gender in education and gender preference and our proxies for culture. For instance, the preference of "child being boy" has a correlation of roughly 0.7 with the gender inequality index. These illustrations suggest that our proxy partly contains cultural values and social beliefs.

5.2. Main Results

The association between test scores and home-country education using the OLS regressions of equation 1 is reported in Table 2 for all students (panel A) and then for females (panel B) and males (panel C), separately. An additional year of schooling in the home-country is associated with 0.05 and 0.04 standard deviation change from the mean in scale scores of math and ELA tests, respectively. The association is economically and statistically stronger for math test scores and math sub-test scores compared with different categories of ELA tests and slightly larger among males than females. A one-standard-deviation change in cross-country schooling (2.1 years) is associated with 0.1 and 0.14 standard deviation change in the mean of math scale score of females

and males, respectively. To put these numbers into perspective, we use the marginal effects on raw scores (not reported here) and compare it with the average of scores of each grade as the scales are hard to compare for the raw scores by grade and year. We then provide a range for the effects across grades. These calculations suggest that A one-standard-deviation change in cross-country schooling (2.1 years) is associated with 0.75-0.8 percent and 1-1.1 percent rise from the mean of math test scores among females and males in different grades, respectively.

Table 3 replicates the results with anthropometric and fitness outcomes. There is no statistical relationship between home-country education and measures of BMI including a dummy for being in the normal BMI range and BMI z-score (columns 1-2). Moreover, the effects on weight-for-age z-score among females are also insignificant (panel B, column 4) while there is small evidence for an association among males (panel C, column 4). These results are in contrast to several studies that find cultural elements in weight and obesity (Caprio et al., 2008; Kumanyika, 2008; Renzaho, 2004; Sobal, 2003). Interestingly, there are discernible associations between our cultural proxy and height-for-age. One may truly argue that countries with higher education have also higher income and health-related resources which leads to better results for height-for-age (Akachi and Canning, 2009; Brinkman et al., 1988; María-Dolores and Martínez-Carrión, 2011). However, the coefficients on females will even rise when we add a battery of home-country level controls including GDP and rates of infant mortality (Appendix Table D-4).

One plausible explanation is that culture can operate through other mechanisms to affect health outcomes. Several studies show the nexus between ecology, culture, and food and discuss how food availability slowly change the culture and, in return, how culture affects food choice (Alonso, 2015; Atkins and Bowler, 2001; Counihan and Van Esterik, 2012; Fieldhouse, 2013; McNamara and Wood, 2019; Sabate, 2004). The selection of food is not only about tastes and

preferences that evolve over time under local constraints but also is influenced by cultural beliefs and religious ideas that appear in food proscription and taboos (Chowdhury et al., 2014; Gadegbeku et al., 2013; Meyer-Rochow, 2009). These differences in culture-related food choice can also appear in botanical medicine and ethnomedicine (Quinlan, 2011) and most notably arise in the culture of medicine during pregnancy through various food prescriptions and proscriptions (Christian et al., 2006; Koo, 1984). Beyond food and medicine, culture and beliefs shape the way people perceive their own body, their beauty, their fitness, and their appearance (Aune and Aune, 2016; Scheper-Hughes and Lock, 1987; White et al., 2013). For instance, Scheper-Hughes and Lock (1987) discuss how different cultures view their physical body in three dimensions: 1) individual body-self, 2) a social body, a method for interpreting their interaction with culture, nature, and the collective appearance of others, 3) as an artifact of social control. Therefore, one may expect that culture is correlated with measures of health, appearance, and fitness, either through indirect mechanisms of food choice, health behavior during pregnancy, and ethnomedicine or directly by imposing the expectations of society into one's management of appearance and fitness.

Indeed, we observe the influence of our cultural proxy in the fitness outcomes including z-scores of PACER (Progressive Aerobic Cardiovascular Endurance Run)[8], Push-Up[9], Curl-Up[10], and fitness[11]. The effects are small in magnitude and insignificant among males while relatively large and strongly significant among females. For instance, an additional year of schooling in the home-country is associated with a 2.4 percent of standard deviation change from the mean of

[8] PACER is a multistage shuttle run in a 20-meter space in certain shortening intervals.
[9] An exercise to raise the body using hands when facing the floor and keeping the body straight leveraging the strengths of both arms.
[10] An exercise for abdominal muscles, in which individual curl-up the body while lying on the floor in the crook-lying supine position.
[11] The fitness score is the summation of scores in PACER, Push-Up, and Curl-Up tests.

fitness score among females while the respective effect is only an insignificant change of 0.1 percent of standard deviation among males. To have a better perspective for the 0.024 standard deviation change among females, we use the coefficients on raw fitness score (which is the summation of raw scores of Pacer, Push-Up, and Curl-Up) and compare it with the mean to reach a change of 1.5 percent from the mean of fitness score.

5.3. Alternative Proxies for Culture

We observe similar patterns when we change cultural proxy by home-country female labor force participation rate[12]. The results are reported in Table 4 and Table 5 for test scores and anthropometric/fitness outcomes. The effects on test scores are considerably larger for math and slightly more pronounced among females. A one-standard-deviation change in female labor force participation rate (an increase of 15.18 percentage points) leads to a 0.12 standard deviation rise from the mean of math scores among females (panel A, column 1, Table 4). It is also negatively correlated with BMI z-score and positively correlated with all measures of fitness scores (Table 5). Consistent with Table 3, the effects are more pronounced among females. The marginal effects are larger among females versus males by a factor of 2.5 (for Push-Up z-score) to 5.5 (for PACER z-score). Moreover, all the coefficients are only statistically significant among females. These associations are again confirmed when we replace the cultural proxy with fertility rates in Table 6 for test scores and Table 7 for anthropometric/fitness outcomes. Immigrants from countries with higher fertility tend to persistently have worse academic outcomes. The effects are more concentrated on math test scores and virtually similar among males and females. Higher home-country fertility is also associated with lower weight- and height-for-age and worse achievements in fitness scores. A rise of on-standard-deviation in fertility rate per 1,000 women in home-country

[12] It is defined as percentage of women aged 15-and-above who are active in labor force.

(1.1 higher births) is associated with 8.3 percent and 3.8 percent of standard deviation fall from the mean of height-for-age and overall fitness score. The overall evidence of Table 2 through Table 7 suggests that the cultural proxies explain an economically (and in most cases statistically) significant portion of test scores and anthropometric/fitness outcomes of immigrants.

5.4. Gender Gap in Outcomes

Looking at the main results, one reasonable question that may arise is to what extent the differences between females' and males' outcomes are driven by culture as opposed to the cultural influences on each gender separately? To answer this question, we use the home-country gender inequality index as the cultural proxy (CP in equation 1) and interact a female dummy with all the right-hand side variables of equation 1 (including CP).[13] In these regressions, the coefficient of interest (α_1) can be interpreted as the gender gap (females relative to males) in outcomes of immigrants as a result of an increase of one unit in gender inequality index in their home-country. The results are reported in Table 8 and Table 9 for test scores and anthropometric/fitness outcomes, respectively. A one-standard-deviation increase in gender inequality index (0.14 units) is associated with 0.025 and 0.046 standard deviation change in the gender gap in math and ELA test scores (columns 1 and 6, Table 8). We also detect a similar correlation between the gender inequality index and the gender gap in height-for-age and all measures of fitness (columns 3, 5-8, Table 9). This fact once again confirms the results of previous tables suggesting that there are cultural elements and specifically gender-related cultural factors in explaining the variations in these outcomes. However, the signs are reversed for weight-for-age and BMI z-scores suggesting that higher gender inequality in home-country is correlated with a lower gender gap in these

[13] The only addition to this specification is that with the interaction between female and GII we can add a series of dummies for the birth country which, in addition to the main effects of GII, can control for all time-nonvariant features of the home-country. The results, reported in Appendix G, is virtually similar if we exclude this fixed effect.

outcomes among immigrant students. This is not unexpected as we have seen that immigrant of countries with higher female labor force participation and lower fertility (possibly more gender-equal) have lower BMI z-score with stronger effects among females and much smaller effects among males (Table 5 and Table 7).

5.5. Robustness Checks

This section validates the main results through a series of robustness practices. As another measure of home-country education, we replace years of schooling with the share of individuals in home-country aged 25-and-above who have completed secondary schooling. The results are reported in Appendix B. we observe the same pattern of effects and significance for both test scores and anthropometric/fitness outcomes as the main results. One concern is that the transmission of culture from home-country to immigrants in the US is non-linearly correlated with levels of economic development and income per capita at home-country. We address this by interacting real GDP per capita with years of schooling. The results, reported in Appendix C, show no evidence that there is heterogeneity in the effects by GDP per capita for virtually all outcomes.

We also practice the robustness of the results by including additional covariates to the model to control for possible omitted variables. In so doing, we add days of being absent from school, year-by-grade-level, year-by-school, school-by-grade level, residential census-tract-by-year fixed effect, and some measures of income, health, and quality of education at the home-country including GDP per capita, spending on education relative to total government expenditure, infant mortality rate, and share of natural resources in GDP. The results are reported in Appendix D. The overall results suggest that while the coefficients drop slightly, they hold their sign and, in most cases, their statistical significance. In our main analysis, we pool all cohorts in the sample which potentially could be problematic specifically for test outcomes as the grading schemes may

vary by grade and year. We address this issue in two ways. First, we had computed the z-scores using the mean and standard deviations at the year-grade-school level and included fixed effects for year, grade, and school in our main analysis and then the 2-by-2 interaction of these effects in Appendix D. Second, we show the results for elementary, middle school, and high school, separately.[14] The results are reported in Appendix E. Although there is heterogeneity in the results, they follow the same pattern as the main results. The associations are stronger among elementary school students, they drop slightly for middle-school students, and become even smaller for high school students. This heterogeneity implies partial assimilation of immigrants and detachments from their source country characteristics in higher grade levels. However, since we do not have information on the year of immigration, we are unable to distinguish between age effects and age since immigration effects.

As a final robustness check, we show that the results are robust to alternative clustering levels including school, school-by-grade, and home-country level (Appendix H).

5.6. Other Outcomes in CPS Public Arts Supplement

We complement our main analysis by probing the effects across a series of outcomes in CPS Public Arts Supplement (2000-2020) that contributes to the mechanisms behind the effects in the main result. The advantage of this data is a rich set of questions about social participation, art participation, and other extracurricular activities. The data is extracted from Flood et al. (2020). We restrict the sample to immigrants residing in counties within New York City and belong to similar birth cohorts as NYC-Fitnessgram cohorts.[15] We merge it with our cross-country data of years of schooling based on country of birth and then implement regressions that include as

[14] We aggregate by grade-groups as there are several grades for which we do not have enough observations in each gender category. This lack of data is worse if we try grade-by-year disaggregation.

[15] In Appendix F, we replicate the results without any of these sample restrictions. The coefficients are quite comparable to the results of this section except that they are less noisy and standard errors are smaller.

individual controls dummies for female, white, black, and a quadratic in age, as well as fixed effects for county and year.[16] The results are reported in Table 10. Each outcome (shown in rows) is a dummy that equals one if the respondent has answered yes and zero if answered no. These outcomes measure whether or not during the last year the individual has read any extracurricular books, has written any literacy piece, visited any museum, art gallery, or historical places, participated in any sports event, used the internet, took writing classes, and took art-related lessons. Not only all the coefficients are positive but also most of them are statistically significant even with considerably low sample sizes. An additional year of home-country schooling is associated with 2.6 percentage points higher likelihood of attending any sports activity (row 6), 77 basis points increase in the probability of writing a story, poem, or play (row 2), and 4 percentage points higher likelihood of using the internet (row 7). These findings partly add to our main results of English Language Art tests, math tests, and fitness outcomes.

Other outcomes of this section are of interest in their own right. Sociologists refer to art-related activities and art participation as cultural capital (DiMaggio and Mukhtar, 2004; Willekens and Lievens, 2014). Therefore, one may expect that our proxy for culture is detected in measures of cultural capital among immigrants. Indeed, the fact that home-country education is associated with attending art galleries, art museums, taking creative writings classes, and taking lessons in visual arts and music implies the intergenerational transmission of culture among immigrants and complement the findings in our main analysis.

[16] The CPS suppresses a fraction of usually low-populated counties for confidentiality purposes. However, all the NYC counties have large population and their county code is reported in our IPUMS extract.

6. Conclusion

Political institutions, economic conditions, environment, and social peers among many other factors influence culture (Alesina et al., 2013; Campa and Serafinelli, 2019; Giuliano and Spilimbergo, 2013; Tella et al., 2007). Although it is a dynamic process, culture evolves slowly and is passed from generation to generation. We attempted to document some aspects of this intergenerational transmission of culture among immigrants and by doing so we explored how the home-country cultural values and proxies may explain the academic, anthropometric, and fitness outcomes among immigrant students.

We used restricted-use NYC-Fitnessgram data for all immigrant students in New York City public schools and documented a significant association between home-country proxies for culture and immigrants' outcomes. Immigrant students from countries with higher education, higher female labor force participation, and lower fertility perform relatively better in math and ELA tests. Some evidence suggests that these students also have higher height-for-age scores. The effects on fitness outcomes are more pronounced for females, both economically and statistically. Among females, an additional year of schooling in the home-country is associated with an increase in math test score, ELA test score, height-for-age, and fitness score of 0.048, 0.039, 0.036, and 0.024 standard deviation change from the mean of variables, respectively. We also documented how the gender gap in outcomes among immigrants can be explained by the gender gap in their home-country. The results suggest that immigrants who come from countries in which more traditional views towards gender norms prevail also reveal higher gender gaps in virtually all categories of math and ELA test scores, anthropometric measures, and fitness outcomes. We also relied on the literature to discuss why and how culture can influence health, anthropometric, and fitness outcomes.

Finally, as a complement to our analysis, we used CPS Public Arts supplement and showed that, among immigrants in New York City, those who come from higher education countries compared to those from lower education home-country are more likely to read an extracurricular book, attend a sporting event, attend art gallery, take art-related classes, and use the internet. These results also confirm our main findings specifically for ELA test scores and fitness outcomes.

All in all, one may interpret these findings with caution for two reasons. First, immigration is not a natural experiment. People select themselves into migration for unobservable reasons. Moreover, the visa admission could also vary by country or for individuals within a country for reasons that are correlated with the country's average characteristics. These selection issues could potentially generate bias which cannot be solved by the epidemiological approach implemented in this paper. Second, most studies in the assimilation of immigrants focus on labor market outcomes. Cultural attachments and detachments consist of several aspects which may or may not be correlated with each other (Casey and Dustmann, 2010). Therefore, the outcomes studied in this paper only reveal parts of cultural transmission among immigrants.

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Tables

Table 1 - Summary Statistics

	Low Education Home Country					
	Males			Females		
	Obs.	Mean	SD	Obs.	Mean	SD
Math Scale Z-Score	351016	-.037	1.016	325772	.036	.988
Math Sub 1 Z-Score	172582	-.024	1.008	159506	.02	.996
Math Sub 2 Z-Score	172582	-.035	1.009	159506	.032	.993
Math Sub 3 Z-Score	172582	-.033	1.011	159506	.031	.991
ELA Raw Z-Score	286896	-.131	1.016	268783	.12	.975
ELA Scale Z-Score	312840	-.131	1.017	293176	.121	.974
ELA Sub 1 Z-Score	155515	-.096	1.003	145369	.08	.993
ELA Sub 2 Z-Score	155515	-.184	1.015	145369	.18	.959
BMI Z-Score	673059	.506	.5	631820	.507	.5
Normal Weight (BMI≥18.5,<25)	673059	.335	1.235	631820	.187	1.091
Height for Age Z-Score	673059	.081	1.119	631820	-.026	1.114
Weight for Age Z-Score	673059	.376	1.225	631820	.17	1.109
PACER Z-Score	557671	.019	.958	522628	.024	.945
Push-Up Z-Score	557771	-.009	.974	522617	-.029	.967
Curl-Up Z-Score	557683	-.007	.962	522517	-.027	.962
Fitness Z-Score	552990	0	.959	518243	-.019	.95
Race: Non-Hispanic White	919269	.113	.316	836394	.108	.31
Race: Non-Hispanic Black	919269	.127	.333	836394	.134	.341
Race: Hispanic	919269	.428	.495	836394	.433	.495
Age	919269	13.386	3.655	836394	13.171	3.606

Table 2 - Home-Country Schooling and Test Scores of Immigrant Students in New York City

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. All Students.								
Home-Country Years of Schooling	.07432***	.07491***	.07244***	.07518***	.05442*	.05352*	.05859**	.05149*
	(.01963)	(.02011)	(.01991)	(.01977)	(.02847)	(.02775)	(.02833)	(.02897)
Observations	627647	329491	329491	329491	526685	565620	299988	299988
R-Squared	.19261	.20526	.18487	.18898	.12873	.12565	.11703	.13624
Panel B. Females								
Home-Country Years of Schooling	.06136***	.06349***	.06068***	.06272***	.04912**	.04886**	.05342**	.04329*
	(.02036)	(.02173)	(.02098)	(.02098)	(.02247)	(.02174)	(.02457)	(.02431)
Observations	302081	158249	158249	158249	254743	273596	144917	144917
R-Squared	.18847	.19583	.17806	.18137	.11704	.11721	.10994	.1029
Panel C. Males								
Home-Country Years of Schooling	.09336***	.0909***	.08919***	.09277***	.0641*	.06311*	.06755*	.06245*
	(.02009)	(.01926)	(.0195)	(.01903)	(.03703)	(.0362)	(.0342)	(.03618)
Observations	325566	171242	171242	171242	271941	292023	155071	155071
R-Squared	.19725	.21551	.1924	.19712	.11435	.10819	.11201	.11174

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
*** p<0.01, ** p<0.05, * p<0.1

Table 3 - Home-Country Schooling and Anthropometric-Fitness Outcomes of Immigrant Students in New York City

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. All Students.								
Home-Country Years of Schooling	-.00233	-.01489*	.0449**	.00901	.0146**	.01677***	.01808***	.02193***
	(.00216)	(.00807)	(.01717)	(.01175)	(.00673)	(.00496)	(.00606)	(.00571)
Observations	1243231	1243231	1243231	1243231	1036521	1036669	1036564	1028694
R-Squared	.07478	.05116	.09926	.06677	.01827	.01725	.02587	.03154
Panel B. Females								
Home-Country Years of Schooling	-.00294	-.02215**	.03626**	-.00306	.02593**	.02578***	.02588***	.0345***
	(.00228)	(.00918)	(.01572)	(.01175)	(.01074)	(.00668)	(.00595)	(.00869)
Observations	602049	602049	602049	602049	501440	501534	501470	497706
R-Squared	.08507	.06211	.10991	.08037	.02048	.02064	.02866	.03834
Panel C. Males								
Home-Country Years of Schooling	-.00218	-.01123	.05128**	.01683	.00516	.0106*	.01126*	.0118**
	(.00229)	(.00812)	(.02062)	(.01335)	(.005)	(.0055)	(.00664)	(.00475)
Observations	641182	641182	641182	641182	535081	535135	535094	530988
R-Squared	.06659	.04049	.09939	.04902	.01914	.01877	.02456	.0296

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Table 4 - Home-Country Schooling and Test Scores of Immigrant Students in New York City

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. All Students.								
Home-Country Years of Schooling	0.05443***	0.05015**	0.04904**	0.05030**	0.04192*	0.04077*	0.04243*	0.03904
	(0.01395)	(0.01388)	(0.01376)	(0.01351)	(0.02012)	(0.01984)	(0.01893)	(0.02027)
Observations	627631	329479	329479	329479	526670	565607	299973	299973
R-Squared	0.28060	0.29997	0.27945	0.28870	0.23651	0.22937	0.23205	0.23896
Panel B. Females								
Home-Country Years of Schooling	0.04831***	0.04393**	0.04271**	0.04322**	0.03977**	0.03918**	0.03913*	
	(0.01349)	(0.01368)	(0.01317)	(0.01303)	(0.01634)	(0.01587)	(0.01624)	(0.01702)
Observations	325747	159480	159480	159480	268749	293150	145343	145343
R-Squared	0.27989	0.30501	0.28435	0.29499	0.22761	0.22540	0.23571	0.21450
Panel C. Males								
Home-Country Years of Schooling	0.06732***	0.06086***	0.06038***	0.06241***	0.04930*	0.04822*	0.05021*	0.04781
	(0.01557)	(0.01480)	(0.01495)	(0.01453)	(0.02561)	(0.02533)	(0.02276)	(0.02527)
Observations	325548	171226	171226	171226	271923	292007	155055	155055
R-Squared	0.28326	0.30590	0.28476	0.29309	0.22830	0.21658	0.23021	0.22379

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
*** p<0.01, ** p<0.05, * p<0.1

Table 5 - Home-Country Schooling and Anthropometric-Fitness Outcomes of Immigrant Students in New York City

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. All Students.								
Home-Country Years of Schooling	-0.00118	-0.00651	0.04440**	0.01566	0.00853	0.00824*	0.00901**	0.01147**
	(0.00173)	(0.00667)	(0.01610)	(0.01082)	(0.00554)	(0.00423)	(0.00381)	(0.00442)
Observations	1243227	1243227	1243227	1243227	1036510	1036659	1036555	1028683
R-Squared	0.08319	0.06736	0.12331	0.07941	0.20341	0.12329	0.19108	0.19088
Panel B. Females								
Home-Country Years of Schooling	-0.00184	-0.01392	0.03730**	0.00433	0.02117**	0.01564***	0.01705***	0.02390***
	(0.00176)	(0.00775)	(0.01486)	(0.01103)	(0.00685)	(0.00451)	(0.00392)	(0.00542)
Observations	602041	602041	602041	602041	501424	501517	501452	497689
R-Squared	0.09740	0.08286	0.14117	0.09746	0.22236	0.17497	0.21783	0.23481
Panel C. Males								
Home-Country Years of Schooling	-0.00110	-0.00233	0.04805**	0.02252*	-0.00243	0.00332	0.00183	0.00125
	(0.00189)	(0.00703)	(0.01908)	(0.01194)	(0.00504)	(0.00514)	(0.00417)	(0.00429)
Observations	641168	641168	641168	641168	535066	535120	535079	530972
R-Squared	0.07704	0.06011	0.12785	0.06523	0.20344	0.10881	0.18586	0.17390

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Table 6 - Home-Country Female Labor Force Participation and Test Scores of Immigrant Students in New York City

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country FLFP rate	0.00794***	0.00793***	0.00715**	0.00759***	0.00240	0.00259	0.00256	0.00195
	(0.00180)	(0.00189)	(0.00182)	(0.00183)	(0.00216)	(0.00209)	(0.00219)	(0.00207)
Observations	315609	166465	166465	166465	267046	286557	152932	152932
R-Squared	0.28346	0.30278	0.28171	0.29306	0.22356	0.22049	0.22934	0.20813
Panel B. males								
Home-Country FLFP Rate	0.00724***	0.00739**	0.00688**	0.00726**	0.00155	0.00153	0.00225	0.00209
	(0.00201)	(0.00209)	(0.00206)	(0.00208)	(0.00284)	(0.00277)	(0.00259)	(0.00267)
Observations	339198	179474	179474	179474	284392	305156	163161	163161
R-Squared	0.27763	0.30106	0.27902	0.28806	0.22175	0.21007	0.22273	0.21609

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
*** p<0.01, ** p<0.05, * p<0.1

Table 7- Home-Country Female Labor Force Participation and Anthropometric-Fitness Outcomes of Immigrant Students in New York City

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country FLFP rate	0.00029	-0.00331**	0.00243	-0.00206	0.00555***	0.00335***	0.00142**	0.00456***
	(0.00025)	(0.00139)	(0.00204)	(0.00130)	(0.00067)	(0.00033)	(0.00058)	(0.00054)
Observations	625468	625468	625468	625468	518767	518873	518816	514916
R-Squared	0.09795	0.08232	0.14031	0.09789	0.22758	0.17571	0.21673	0.23618
Panel B. Males								
Home-Country FLFP rate	0.00064**	-0.00121	0.00184	-0.00033	0.00099	0.00131	-0.00044	0.00080
	(0.00023)	(0.00100)	(0.00219)	(0.00116)	(0.00059)	(0.00086)	(0.00062)	(0.00081)
Observations	665133	665133	665133	665133	552890	552946	552888	548679
R-Squared	0.07877	0.05935	0.12299	0.06339	0.20488	0.11024	0.18656	0.17502

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Table 8 - Home-Country Fertility Rate and Test Scores of Immigrant Students in New York City

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Fertility Rate	-0.10338***	-0.09627**	-0.09306**	-0.09327**	-0.06024	-0.06151	-0.06417	-0.05540
	(0.02465)	(0.02485)	(0.02355)	(0.02424)	(0.03607)	(0.03442)	(0.03429)	(0.03535)
Observations	315609	166465	166465	166465	267046	286557	152932	152932
R-Squared	0.28511	0.30369	0.28378	0.29415	0.22679	0.22370	0.23314	0.21137
Panel B. males								
Home-Country Fertility Rate	-0.10357***	-0.09937***	-0.09782***	-0.09935***	-0.05716	-0.05724	-0.06694	-0.06020
	(0.02350)	(0.02185)	(0.02179)	(0.02194)	(0.04322)	(0.04231)	(0.03619)	(0.04118)
Observations	339198	179474	179474	179474	284392	305156	163161	163161
R-Squared	0.28152	0.30446	0.28320	0.29172	0.22507	0.21340	0.22740	0.21976

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Table 9- Home-Country Fertility Rate and Anthropometric-Fitness Outcomes of Immigrant Students in New York City

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Fertility Rate	0.00171	0.02324	-0.07634**	-0.01301	-0.03344**	-0.02114**	-0.02384**	-0.03468***
	(0.00204)	(0.01621)	(0.02960)	(0.02294)	(0.01393)	(0.00821)	(0.00882)	(0.01030)
Observations	625468	625468	625468	625468	518767	518873	518816	514916
R-Squared	0.09790	0.08122	0.14445	0.09744	0.22290	0.17411	0.21697	0.23354
Panel B. Males								
Home-Country Fertility Rate	-0.00056	0.00085	-0.08819**	-0.04390**	0.01701**	0.00895	0.00409	0.01289**
	(0.00249)	(0.01018)	(0.03131)	(0.01877)	(0.00588)	(0.00689)	(0.00770)	(0.00582)
Observations	665133	665133	665133	665133	552890	552946	552888	548679
R-Squared	0.07848	0.05918	0.12984	0.06489	0.20505	0.11001	0.18655	0.17510

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Table 10 – Home-Country Gender Inequality Index and Gender Gap in Test Scores among Immigrant Students in New York City

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Gender Inequality Index×Female	-.07661	-.06274	-.04615	-.02042	-.07991	-.10016	-.01616	-.00175
	(.05891)	(.03998)	(.04518)	(.04281)	(.08248)	(.08929)	(.04905)	(.06937)
Gender Inequality Index	-.85392***	-.85612***	-.81787***	-.85569***	-.32059	-.31783	-.43286	-.36915
	(.2066)	(.19511)	(.19995)	(.19491)	(.38583)	(.3774)	(.33537)	(.3601)
Female	.77352***	.70084*	.97806***	.56473	2.23739***	.04394	.01308	-.04584
	(.28034)	(.38728)	(.35998)	(.39443)	(.41435)			
Observations	640369	337941	337941	337941	538679	578096	308359	308359
R-Squared	.28525	.3071	.28607	.2956	.23629	.2292	.23411	.24053

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Table 11 - Home-Country Gender Inequality Index and Gender Gap in Anthropometric-Fitness Outcomes among Immigrant Students in New York City

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Gender Inequality Index×Female	.01344	.20259***	-.03841	.21038***	-.52598***	-.31128***	-.26084***	-.4846***
	(.01486)	(.06026)	(.07711)	(.04572)	(.07244)	(.04997)	(.03116)	(.06271)
Gender Inequality Index	.00161	.14321	-.6358***	-.19694	.03847	.04061	.06611	.0624
	(.02032)	(.09786)	(.24196)	(.17159)	(.05769)	(.057)	(.06429)	(.05236)
Female	.12675	-1.58383***	-.27408	-1.59433***	-.12565	.14753	-.03323	.47652
	(.16438)	(.31652)	(.28863)	(.35933)		(12.50268)	(18.94828)	(.3096)
Observations	1264698	1264698	1264698	1264698	1050806	1050960	1050841	1042875
R-Squared								

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Table 12 - Home-Country Schooling and other Outcomes of Immigrant Students in New York City in the Current Population Survey Public Arts Supplement

		Independent Variable and Regression Statistics:							
		Females				**Males**			
		Home-Country Years of Schooling	Observations	R-Squared	Mean DV	Home-Country Years of Schooling	Observations	R-Squared	Mean DV
Outcomes in Rows:									
Read any book that were not required for work/school	(1)	.0224***	670	.10125	.5033	.01654*	551	.08612	.3918
		(.00454)				(.00813)			
Wrote any story, poem, or play	(2)	.00939**	794	.05117	.0698	.0058*	683	.04621	.07918
		(.00288)				(.00285)			
Visited historical places	(3)	.01601*	796	.11082	.2913	.01807***	669	.09565	.2971
		(.00793)				(.00386)			
Visited art museums or gallery	(4)	.01713*	678	.13891	.2824	.01854*	560	.14344	.2687
		(.00669)				(.00753)			
Attended live nonmusical stage play	(5)	.0152*	402	.08575	.132	.01988**	335	.1703	.1353
		(.00508)				(.00593)			
Participated in any sport activity	(6)	.01884	301	.14343	.2606	.03385**	251	.26836	.3768
		(.00874)				(.00838)			
Used internet	(7)	.03772**	209	.2409	.5826	.04351*	183	.29042	.5497
		(.00473)				(.01148)			
Took creative writing class	(8)	.00535	462	.10702	.05702	-.00084	377	.0504	.02646
		(.0046)				(.00264)			
Attended live book-reading event	(9)	.00964	378	.05695	.09891	.00431	316	.06763	.05985
		(.00694)				(.00441)			
Took lessons in visual art	(10)	.00779*	345	.11651	.07228	.0092**	279	.11308	.04602
		(.0035)				(.00317)			
Took lessons in music	(11)	.00328	420	.11847	.04086	.00658***	353	.07153	.04553
		(.00256)				(.00163)			

Notes. Notes. Each column represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (white, black, Hispanic) and a gender dummy. All regressions include year fixed effects and county-of-residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
*** p<0.01, ** p<0.05, * p<0.1

Figures

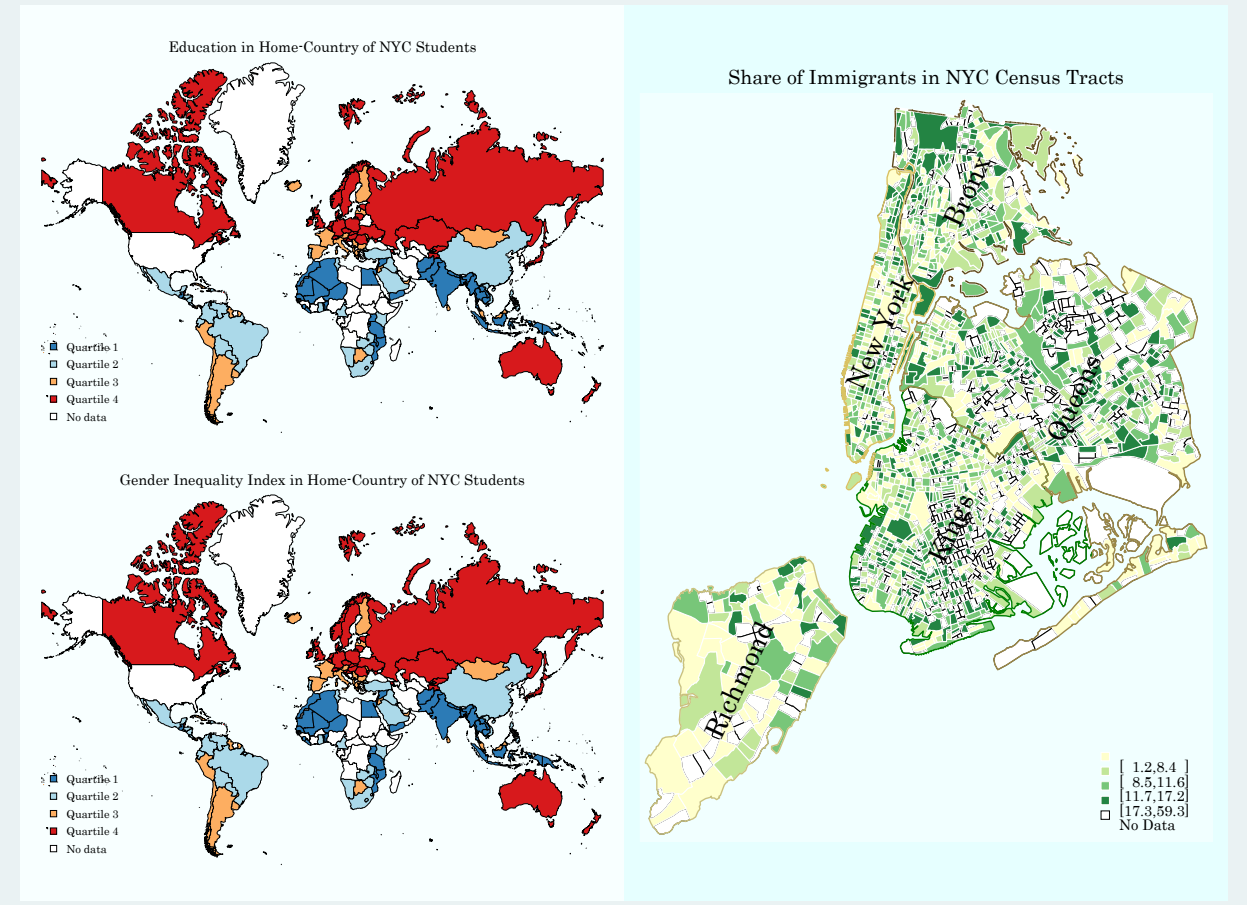

Figure 1 - Distribution of Home Country of New York City Students by Education and Gender Inequality Index (Left Panel), and Distribution of Immigrant Students across New York City Census Tracts and Counties (Right Panel)

Figure 2 - Cross-Correlation of Home-Country Education and Test Scores of New York City Students

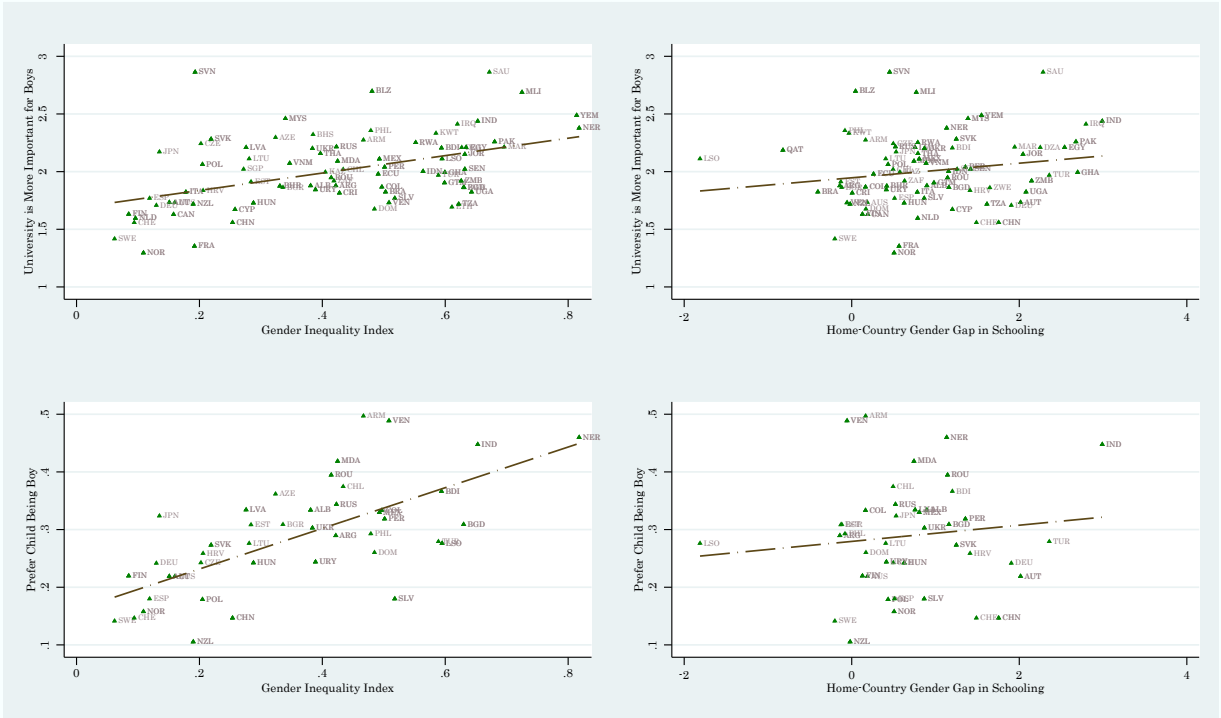

Figure 3 - Cross-Country Correlation between Opinions about Gender (from World Value Survey) and Gender-Difference (Male-Female) in Education

Appendix A

Appendix Table A-1 - Summary Statistics of the Full Sample Including Home-Country Characteristics

Variable	Observations	Mean	SD	Min	Max
Math Scale Z-Score	676788	-.002	1.003	-8.493	3.599
Math Sub 1 Z-Score	332088	-.003	1.003	-2.778	6.885
Math Sub 2 Z-Score	332088	-.003	1.002	-2.679	5.069
Math Sub 3 Z-Score	332088	-.002	1.002	-2.992	7.603
ELA Raw Z-Score	555679	-.01	1.004	-4.137	69.533
ELA Scale Z-Score	606016	-.009	1.004	-9.22	6.838
ELA Sub 1 Z-Score	300884	-.011	1.002	-2.874	2.647
ELA Sub 2 Z-Score	300884	-.008	1.005	-2.888	2.718
BMI Z-Score	1304879	.376	.484	0	1
Normal Weight (BMI≥18.5,<25)	1304879	.264	1.17	-3.999	7.968
Height for Age Z-Score	1304879	.029	1.118	-4.998	4
Weight for Age Z-Score	1304879	.276	1.175	-4.922	7.952
PACER Z-Score	1080299	.021	.952	-3.064	4.693
Push-Up Z-Score	1080388	-.019	.971	-2.572	4.689
Curl-Up Z-Score	1080200	-.017	.962	-2.632	4.386
Fitness Z-Score	1071233	-.009	.955	-3.327	4.209
Race: Non-Hispanic White	1755663	.111	.314	0	1
Race: Non-Hispanic Black	1755663	.13	.337	0	1
Race: Hispanic	1755663	.43	.495	0	1
Age	1755663	13.283	3.633	4	30
Home-Country Characteristics					
Years of Schooling	1755663	6.563	2.134	.419	13.164
Female Labor Force Participation	1755663	45.23	15.175	9.66	87.55
Fertility Rate	1755663	2.89	1.079	1.11	7.679
Gender Inequality Index	1752458	.48	.142	.062	.818

Appendix B

This appendix replaces the home-country years of schooling as a proxy in the main results with the share of people who completed secondary education.

Appendix Table B-1 - Home-Country Share of Secondary Schooling Completed and Test Scores of Immigrant Students in New York City

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Share of Secondary Schooling Completed	0.01126***	0.01087**	0.01042**	0.01064**	0.00947**	0.00909**	0.00949*	0.00821
	(0.00359)	(0.00376)	(0.00363)	(0.00360)	(0.00389)	(0.00381)	(0.00406)	(0.00414)
Observations	302056	158222	158222	158222	254712	273571	144890	144890
R-Squared	0.28279	0.30365	0.28304	0.29352	0.22873	0.22564	0.23476	0.21410
Panel B. Males								
Home-Country Share of Secondary Schooling Completed	0.01451***	0.01304**	0.01265**	0.01307**	0.01011*	0.00992*	0.00986*	0.00994*
	(0.00342)	(0.00334)	(0.00340)	(0.00338)	(0.00472)	(0.00462)	(0.00449)	(0.00482)
Observations	325548	171226	171226	171226	271923	292007	155055	155055
R-Squared	0.28361	0.30561	0.28405	0.29233	0.22790	0.21627	0.22899	0.22333

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table B-2 - Home-Country Share of Secondary Schooling Completed and Anthropometric/fitness Outcomes of Immigrant Students in New York City

	Outcome:							
	BMI Z-Score	BMI in Normal Range	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Share of Secondary Schooling Completed	-0.00041	-0.00438*	0.00937**	0.00030	0.00512**	0.00329**	0.00440***	0.00567***
	(0.00052)	(0.00205)	(0.00343)	(0.00277)	(0.00167)	(0.00113)	(0.00096)	(0.00138)
Observations	602041	602041	602041	602041	501424	501517	501452	497689
R-Squared	0.09738	0.08312	0.14071	0.09741	0.22205	0.17460	0.21777	0.23434
Panel B. Males								
Home-Country Share of Secondary Schooling Completed	0.00034	-0.00054	0.00959**	0.00423	-0.00011	0.00032	0.00088	0.00046
	(0.00027)	(0.00122)	(0.00390)	(0.00240)	(0.00103)	(0.00094)	(0.00077)	(0.00089)
Observations	641168	641168	641168	641168	535066	535120	535079	530972
R-Squared	0.07706	0.06011	0.12723	0.06502	0.20342	0.10879	0.18590	0.17391

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Appendix C

This appendix replicates the main results for a linear of interaction between home-country years of schooling and GDP per capita.

Appendix Table C-1 - The Role of GDP per Capita in The Association between Immigrants' Test Scores and their Home-Country Education

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Years of Schooling×GDP per Capita	0.00394	0.00773	0.00657	0.00536	0.01297*	0.01389*	0.01400	0.00772
	(0.00859)	(0.00865)	(0.00815)	(0.00814)	(0.00603)	(0.00632)	(0.00707)	(0.00638)
Home-Country Years of Schooling	0.03281*	0.02471	0.02335	0.02605	0.00672	0.00640	0.00241	-0.00155
	(0.01650)	(0.01775)	(0.01606)	(0.01629)	(0.00967)	(0.00969)	(0.01110)	(0.00956)
GDP per Capita	-0.04483	-0.07923	-0.06624	-0.05912	-0.09994*	-0.10663*	-0.10314	-0.04821
	(0.07753)	(0.07289)	(0.06834)	(0.06933)	(0.05260)	(0.05555)	(0.06144)	(0.05929)
Observations	315888	152990	152990	152990	261137	285164	140049	140049
R-Squared	0.28606	0.31286	0.29169	0.30221	0.23233	0.23049	0.23962	0.22036
Panel B. males								
Home-Country Years of Schooling×GDP per Capita	0.00855	0.00923	0.00906	0.00624	0.01885*	0.01894*	0.01771	0.01381
	(0.01074)	(0.01073)	(0.00961)	(0.01017)	(0.00904)	(0.00888)	(0.00984)	(0.01006)
Home-Country Years of Schooling	0.04822**	0.04068	0.03803	0.04249*	-0.01236	-0.01255	-0.00977	-0.01367
	(0.02104)	(0.02169)	(0.01981)	(0.02036)	(0.01830)	(0.01767)	(0.01769)	(0.01677)
GDP per Capita	-0.10194	-0.11341	-0.10970	-0.08018	-0.14153	-0.14196	-0.13100	-0.10090
	(0.10400)	(0.10344)	(0.09115)	(0.09770)	(0.08428)	(0.08251)	(0.09351)	(0.09872)
Observations	337433	163933	163933	163933	276648	302092	148514	148514
R-Squared	0.28642	0.31648	0.29400	0.30142	0.23336	0.22214	0.23760	0.23258

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Table C-2 - The Role of GDP per Capita in The Association between Immigrants' Anthropometric-Fitness Outcomes and their Home-Country Education

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Years of Schooling×GDP per Capita	0.00088	-0.00479	0.00852	-0.00026	-0.00606	0.00338	0.00365	0.00062
	(0.00122)	(0.00585)	(0.01826)	(0.00673)	(0.00754)	(0.00382)	(0.00395)	(0.00512)
Home-Country Years of Schooling	-0.00144	-0.02411**	0.01928	-0.01310	0.02628**	0.01584**	0.01245***	0.02415**
	(0.00189)	(0.01063)	(0.01688)	(0.00946)	(0.01094)	(0.00664)	(0.00279)	(0.00803)
GDP per Capita	-0.01100	0.07859	-0.09520	0.02717	0.05145	-0.04342	-0.04330	-0.01713
	(0.01181)	(0.05156)	(0.19415)	(0.06684)	(0.07198)	(0.03217)	(0.03961)	(0.04457)
Observations	815359	615083	615083	615083	510363	510375	510290	506133
R-Squared	0.12448	0.08318	0.14181	0.09783	0.22228	0.17523	0.21684	0.23529
Panel B. Males								
Home-Country Years of Schooling×GDP per Capita	0.00180	-0.01080	0.00076	-0.00986	0.00253	0.01039**	0.00828**	0.00911**
	(0.00135)	(0.00743)	(0.01340)	(0.00659)	(0.00468)	(0.00393)	(0.00357)	(0.00372)
Home-Country Years of Schooling	-0.00045	-0.00171	0.02183	0.01000	-0.00149	0.00453	-0.00826	-0.00214
	(0.00232)	(0.01319)	(0.01847)	(0.00966)	(0.00637)	(0.00775)	(0.00570)	(0.00699)
GDP per Capita	-0.02513*	0.10733	-0.02569	0.09143	-0.00693	-0.10907**	-0.07365*	-0.08125**
	(0.01343)	(0.07291)	(0.14441)	(0.06265)	(0.04694)	(0.03898)	(0.03655)	(0.03446)
Observations	885729	647913	647913	647913	537681	537772	537685	533184
R-Squared	0.11689	0.06082	0.12648	0.06444	0.20311	0.10875	0.18552	0.17455

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Appendix D

This appendix explores additional specifications, adding more controls and fixed effects to the regressions.

Appendix Table D-1 - Home-Country Schooling and Test Scores of Immigrant Students in New York City, Alternative Specification 1

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Years of Schooling	0.04228***	0.03973**	0.03832**	0.03888**	0.03630**	0.03588**	0.03724**	0.03083*
	(0.01018)	(0.01101)	(0.01037)	(0.01036)	(0.01304)	(0.01256)	(0.01356)	(0.01404)
Observations	300218	157076	157076	157076	253073	271781	143845	143845
R-Squared	0.39504	0.40368	0.38924	0.39598	0.33444	0.33374	0.33089	0.32388
Panel B. Males								
Home-Country Years of Schooling	0.06292***	0.05575***	0.05504***	0.05724***	0.04671*	0.04571*	0.04731*	0.04413*
	(0.01344)	(0.01259)	(0.01286)	(0.01236)	(0.02219)	(0.02179)	(0.01957)	(0.02179)
Observations	323580	170030	170030	170030	270081	290042	153943	153943
R-Squared	0.38349	0.39264	0.37903	0.38504	0.32635	0.31855	0.31847	0.32574

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
This specification adds to the above controls interactions of year-grade, year-school, school-grade, and residence census-tract-year fixed effects. It also adds a continuous measure of absent school days.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table D-2 - Home-Country Schooling and Anthropometric-Fitness Outcomes of Immigrant Students in New York City, Alternative Specification 1

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Years of Schooling	-0.00058	-0.01220	0.03404**	0.00433	0.02081***	0.01513***	0.01629***	0.02316***
	(0.00131)	(0.00691)	(0.01335)	(0.00983)	(0.00530)	(0.00375)	(0.00352)	(0.00433)
Observations	782512	600880	600880	600880	500017	500106	500039	496271
R-Squared	0.20410	0.14815	0.21069	0.15570	0.38468	0.30173	0.35174	0.37773
Panel B. Males								
Home-Country Years of Schooling	-0.00007	-0.00098	0.04462**	0.02194*	-0.00324	0.00361	0.00125	0.00074
	(0.00141)	(0.00653)	(0.01760)	(0.01096)	(0.00452)	(0.00503)	(0.00382)	(0.00422)
Observations	859474	640006	640006	640006	533742	533780	533745	529638
R-Squared	0.19223	0.12051	0.19544	0.12041	0.34814	0.21130	0.31296	0.29715

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
This specification adds to the above controls interactions of year-grade, year-school, school-grade, and residence census-tract-year fixed effects. It also adds a continuous measure of absent school days.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table D-3 - Home-Country Schooling and Test Scores of Immigrant Students in New York City, Alternative Specification 2

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Years of Schooling	0.02694**	0.01583	0.01530	0.01872	0.03239***	0.03085***	0.02027*	0.02288**
	(0.01172)	(0.01567)	(0.01388)	(0.01405)	(0.00926)	(0.00947)	(0.00983)	(0.00874)
Observations	260648	126169	126169	126169	215778	235920	115430	115430
R-Squared	0.24180	0.26201	0.24975	0.25559	0.24948	0.24068	0.25287	0.23381
Panel B. Males								
Home-Country Years of Schooling	0.06357**	0.04167*	0.03805*	0.04122*	0.04597**	0.04503**	0.03066	0.03511
	(0.02249)	(0.02013)	(0.01832)	(0.01967)	(0.01983)	(0.01938)	(0.01769)	(0.02016)
Observations	281785	136290	136290	136290	231613	253342	123518	123518
R-Squared	0.25034	0.26747	0.25674	0.25853	0.25799	0.24264	0.25376	0.24897

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
This specification adds to the above controls interactions of year-grade, year-school, school-grade, and residence census-tract-year fixed effects. It also adds a continuous measure of absent school days. It also controls for home-country GDP, share of government expenditure on education, infant mortality rate, and share of natural resources in GDP.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table D-4 - Home-Country Schooling and Anthropometric-Fitness Outcomes of Immigrant Students in New York City, Alternative Specification 2

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Years of Schooling	-0.00419	-0.04760*	0.04388*	-0.02000	-0.00006	0.00576	0.02088***	0.01187
	(0.00339)	(0.02258)	(0.02022)	(0.02169)	(0.01068)	(0.00905)	(0.00303)	(0.00887)
Observations	664946	499396	499396	499396	413206	413224	413129	409641
R-Squared	0.12105	0.06474	0.16240	0.08508	0.21589	0.17459	0.21593	0.22991
Panel B. Males								
Home-Country Years of Schooling	-0.00226	-0.01722	0.03089	0.00310	0.00393	0.01041	0.00665	0.00931
	(0.00285)	(0.01475)	(0.02908)	(0.01423)	(0.01094)	(0.00923)	(0.00540)	(0.00828)
Observations	731153	533469	533469	533469	441935	442134	442058	438251
R-Squared	0.11614	0.05415	0.13810	0.06287	0.20382	0.11280	0.18691	0.17553

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
This specification adds to the above controls interactions of year-grade, year-school, school-grade, and residence census-tract-year fixed effects. It also adds a continuous measure of absent school days. It also controls for home-country GDP, the share of government expenditure on education, infant mortality rate, and share of natural resources in GDP.
*** p<0.01, ** p<0.05, * p<0.1

Appendix E

This appendix disaggregates the main results by grade level, for elementary students, middle-school students, and high school student.

Appendix Table E-1 - Home-Country Schooling and Test Scores/Anthropometric/fitness Outcomes of Immigrant Students in New York City, Elementary Schools Only

	Outcomes:							
	Math Scale Z-Score	ELA Scale Z-Score	BMI Z-Score	Height-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Years of Schooling	0.05158***	0.04366**	-0.00511	0.02548	0.01963***	0.02439***	0.02136***	0.02971***
	(0.01404)	(0.01684)	(0.00861)	(0.01720)	(0.00595)	(0.00547)	(0.00237)	(0.00534)
Observations	140022	122428	195679	195679	87120	87073	86978	86077
R-Squared	0.24466	0.19366	0.07074	0.07218	0.27272	0.24384	0.28438	0.30423
Panel B. males								
Home-Country Years of Schooling	0.07010***	0.05358**	0.00211	0.03328	0.01085	0.00738	0.01512***	0.01454*
	(0.01536)	(0.02377)	(0.01085)	(0.02346)	(0.00790)	(0.00892)	(0.00296)	(0.00723)
Observations	148482	128838	207719	207719	92973	92846	92749	91829
R-Squared	0.25022	0.19158	0.05752	0.05939	0.25762	0.18455	0.26614	0.26032

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Table E-2 - Home-Country Schooling and Test Scores/Anthropometric/fitness Outcomes of Immigrant Students in New York City, Middle Schools Only

	Outcomes:							
	Math Scale Z-Score	ELA Scale Z-Score	BMI Z-Score	Height-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Females								
Home-Country Years of Schooling	0.04552***	0.03531**	-0.01872**	0.03872**	0.02240***	0.02075***	0.02145***	0.02865***
	(0.01319)	(0.01524)	(0.00737)	(0.01448)	(0.00588)	(0.00427)	(0.00426)	(0.00486)
Observations	185694	170690	167903	167903	167533	167437	167401	166119
R-Squared	0.31078	0.25439	0.06566	0.14217	0.27559	0.20391	0.22600	0.25976
Panel B. males								
Home-Country Years of Schooling	0.06919***	0.04585	0.00333	0.05394**	0.00410	0.00582	0.00600	0.00693
	(0.01618)	(0.02691)	(0.00615)	(0.01894)	(0.00581)	(0.00615)	(0.00412)	(0.00488)
Observations	202495	183960	180596	180596	180604	180723	180716	179278
R-Squared	0.30633	0.23554	0.04687	0.08369	0.26029	0.10718	0.19395	0.18298

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Table E-3 - Home-Country Schooling and Test Scores/Anthropometric/fitness Outcomes of Immigrant Students in New York City, High Schools Only

	Outcome:					
	BMI Z-Score	Height-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Females						
Home-Country	-0.01897**	0.04157**	0.02208**	0.01010*	0.01301**	0.01986**
Years of Schooling	(0.00749)	(0.01642)	(0.00828)	(0.00515)	(0.00473)	(0.00656)
Observations	268223	268223	267953	268084	268115	266024
R-Squared	0.08971	0.09357	0.17245	0.13733	0.19214	0.19828
Panel B. Males						
Home-Country	-0.00872	0.05428**	-0.00932*	0.00064	-0.00438	-0.00563
Years of Schooling	(0.00720)	(0.01840)	(0.00430)	(0.00414)	(0.00499)	(0.00414)
Observations	284724	284724	284069	284176	284191	281855
R-Squared	0.05177	0.09978	0.14944	0.08424	0.15470	0.13908

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Appendix F

This appendix replicates the results of Table 10 (CPS-Public Arts Supplement analysis) for all individuals in the sample before restricting to those place-time-cohorts of NYC-Fitnessgram sample.

Appendix Table F-1 - Home-Country Schooling and other Outcomes of Immigrant Students in the Current Population Survey Public Arts Supplement

		Independent Variable and Regression Statistics:			
		Home-Country Years of Schooling	Observations	R-Squared	Mean DV
Outcomes in Rows:					
Read any book that were not required for work/school	(1)	0.02739*** (0.00577)	81128	0.09563	.5146
Wrote any story, poem, or play	(2)	0.00588*** (0.00043)	97915	0.02390	.06016
Visited historical places	(3)	0.01646*** (0.00367)	96796	0.04452	.2949
Visited art museums or gallery	(4)	0.01450*** (0.00322)	81695	0.05476	.2273
Attended live nonmusical stage play	(5)	0.01007*** (0.00153)	48590	0.03849	.1007
Participated in any sport activity	(6)	0.02340*** (0.00339)	36922	0.09441	.3844
Used internet	(7)	0.04005* (0.01138)	23912	0.13015	.6965
Took creative writing class	(8)	0.00074** (0.00024)	56073	0.06915	.02577
Attended live book-reading event	(9)	0.00195 (0.00070)	44714	0.02357	.05052
Took lessons in visual art	(10)	0.00257*** (0.00057)	41558	0.06337	0.04878
Took lessons in music	(11)	0.00148** (0.00044)	51762	0.05934	0.0529

Notes. Notes. Each column represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (white, black, Hispanic) and a gender dummy. All regressions include year fixed effects and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.
*** p<0.01, ** p<0.05, * p<0.1

Appendix G

This appendix replicates the results of Table 8 and Table 9 by excluding fixed effects for home-country. Therefore, we have home-country GII in the following tables as the main effect of interacting GII with female.

Appendix Table G-1 - Home-Country Gender Inequality Index and Gender Gap in Test Scores among Immigrant Students in New York City, Excluding Home-Country Fixed Effects

	Outcomes as Z-Scores:							
	Math Z-Scores				ELA Z-Scores			
	Scale Score	Sub-Score 1	Sub-Score 2	Sub-Score 3	Raw Score	Scale Score	Sub-Score 1	Sub-Score 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Gender Inequality Index×Female	-0.18624***	-0.10605***	-0.10486**	-0.09334**	-0.30061***	-0.33118***	-0.13314**	-0.16897***
	(0.03286)	(0.04008)	(0.04568)	(0.03893)	(0.05427)	(0.05419)	(0.06667)	(0.06283)
Gender Inequality Index	-0.65835***	-0.78410***	-0.69498***	-0.74573***	0.45306***	0.42628***	0.28604***	0.38699***
	(0.07504)	(0.08606)	(0.07743)	(0.08753)	(0.09953)	(0.08816)	(0.08332)	(0.07254)
Female	0.53827*	0.35698	0.49398	0.26579	1.92510***	1.44200***	0.60941	0.59315*
	(0.30282)	(0.42356)	(0.49374)	(0.38973)	(0.42211)	(0.35929)	(0.54567)	(0.31774)
Observations	618764	322978	322978	322978	521745	560575	296114	296114
R-Squared	0.29188	0.31599	0.29402	0.30318	0.24643	0.23915	0.24300	0.25123

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Table G-2 - Home-Country Gender Inequality Index and Gender Gap in Anthropometric-Fitness Outcomes among Immigrant Students in New York City, Excluding Home-Country Fixed Effects

	Outcome:							
	BMI in Normal Range	BMI Z-Score	Height-for-Age Z-Score	Weight-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Gender Inequality Index×Female	0.03066**	0.32436***	-0.16551***	0.25347***	-0.61477***	-0.33040***	-0.28617***	-0.54166***
	(0.01248)	(0.02588)	(0.02783)	(0.02588)	(0.02750)	(0.02716)	(0.02027)	(0.02714)
Gender Inequality Index	-0.02513**	0.24596***	-0.41559***	0.01370	0.04150*	0.03539	0.17399***	0.10786***
	(0.01058)	(0.04209)	(0.06155)	(0.04145)	(0.02142)	(0.02805)	(0.02073)	(0.02235)
Female	0.17479	-1.64612***	-0.20070	-1.62948***	0.67366	0.19885	0.22567	0.18929
	(0.14469)	(0.36849)	(0.34195)	(0.43585)		(0.30197)	(0.26432)	
Observations	1225273	1225273	1225273	1225273	1020306	1020471	1020359	1012668
R-Squared	0.08613	0.07553	0.13839	0.08750	0.21519	0.14185	0.20211	0.20450

Notes. Each column within each panel represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects. All standard errors are two-way clustered at the home-country level crossed with year.

*** p<0.01, ** p<0.05, * p<0.1

Appendix H

This appendix replicates the main results for alternative clustering levels: school, school-by-grade-level, and home-country.

Appendix Table H-1 - Home-Country Schooling and Test Scores/Anthropometric/Fitness Outcomes among Female Immigrant Students in New York City, Alternative Clustering of Standard Errors

	Outcomes:						
	Math Scale Z-Score	ELA Scale Z-Score	Height-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(5)	(6)	(7)	(8)
Clustering at School-by-Grade:							
Home-Country Years of Schooling	0.04736***	0.03838***	0.03730***	0.02117***	0.01564***	0.01705***	0.02390***
	(0.00137)	(0.00132)	(0.00102)	(0.00099)	(0.00095)	(0.00082)	(0.00100)
Observations	302056	273571	602041	501424	501517	501452	497689
R-Squared	0.28468	0.22694	0.14117	0.22236	0.17497	0.21783	0.23481
Clustering at School:							
Home-Country Years of Schooling	0.04736***	0.03838***	0.03730***	0.02117***	0.01564***	0.01705***	0.02390***
	(0.00223)	(0.00214)	(0.00185)	(0.00163)	(0.00149)	(0.00121)	(0.00163)
Observations	302056	273571	602041	501424	501517	501452	497689
R-Squared	0.28468	0.22694	0.14117	0.22236	0.17497	0.21783	0.23481
Clustering at Home-Country:							
Home-Country Years of Schooling	0.04736***	0.03838**	0.03730**	0.02117***	0.01564***	0.01705***	0.02390***
	(0.01336)	(0.01595)	(0.01493)	(0.00691)	(0.00441)	(0.00380)	(0.00535)
Observations	302056	273571	602041	501424	501517	501452	497689
R-Squared	0.28468	0.22694	0.14117	0.22236	0.17497	0.21783	0.23481

Notes. Each column represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table H-2 - Home-Country Schooling and Test Scores/Anthropometric/Fitness Outcomes among Male Immigrant Students in New York City, Alternative Clustering of Standard Errors

	Outcomes:						
	Math Scale Z-Score	ELA Scale Z-Score	Height-for-Age Z-Score	PACER Z-Score	Push-Up Z-Score	Curl-Up Z-Score	Fitness Z-Score
	(1)	(2)	(3)	(5)	(6)	(7)	(8)
Clustering at School-by-Grade:							
Home-Country Years of Schooling	0.06732***	0.04822***	0.04805***	-0.00243***	0.00332***	0.00183*	0.00125
	(0.00136)	(0.00209)	(0.00122)	(0.00094)	(0.00107)	(0.00094)	(0.00102)
Observations	325548	292007	641168	535066	535120	535079	530972
R-Squared	0.28326	0.21658	0.12785	0.20344	0.10881	0.18586	0.17390
Clustering at School:							
Home-Country Years of Schooling	0.06732***	0.04822***	0.04805***	-0.00243*	0.00332**	0.00183	0.00125
	(0.00212)	(0.00347)	(0.00206)	(0.00146)	(0.00166)	(0.00137)	(0.00162)
Observations	325548	292007	641168	535066	535120	535079	530972
R-Squared	0.28326	0.21658	0.12785	0.20344	0.10881	0.18586	0.17390
Clustering at Home-Country:							
Home-Country Years of Schooling	0.06732***	0.04822*	0.04805**	-0.00243	0.00332	0.00183	0.00125
	(0.01574)	(0.02558)	(0.01913)	(0.00517)	(0.00521)	(0.00413)	(0.00435)
Observations	325548	292007	641168	535066	535120	535079	530972
R-Squared	0.28326	0.21658	0.12785	0.20344	0.10881	0.18586	0.17390

Notes. Each column represents a separate regression. All regressions include as individual covariates a quadratic in age and race dummies (non-Hispanic white, non-Hispanic black, Hispanic, Asian-pacific, other). All regressions include year fixed effects, grade-level fixed effects, school fixed effects, and county of residence fixed effects.
*** p<0.01, ** p<0.05, * p<0.1