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Educational Achievement Gaps between Immigrant and Native Students in Two "New Immigration Countries": Italy and Spain in comparison

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Abstract

We use PISA 2009 data to determine how immigrant children in Italy and Spain compare with native students in reading and mathematics skills. Drawing on the vast empirical literature in traditional immigration countries, we test the extent to which the most well-established patterns and hypotheses of immigrant/native educational achievement gaps also apply to these new immigration countries. Findings show that both first- and second-generation immigrant students underperform natives in both countries. Although socioeconomic background and language skills contribute to the explanation of achievement gaps, significant differences remain within countries. While modeling socioeconomic background reduces the observed gaps to a very similar extent in the two countries, language spoken at home is more strongly associated with achievement in Italy. School-type differentiation, such as tracking in Italy and school ownership in Spain, do not reduce immigrant/native gaps, although in Italy tracking is strongly associated with students' test scores.

Keywords

educational achievement gap; immigrant children; generational status; new immigration countries; Italy; Spain; PISA

Introduction

The great shift of migration flows from old to new destinations in the past three decades has been one of the most striking demographic developments in recent European history. More than half the increase in the foreign population of the EU-15[1] during the past decade is

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concentrated in Southern European countries, namely Italy, Spain, Greece, and Portugal (OECD 2011). As a result of these novel migration patterns, a growing number of immigrant children have entered the educational systems and are coming of age in countries that had, until recently, been known as net senders of migrants and are now net receivers.

This study investigates the educational achievements of children of immigrants in the two "new" immigration countries of the Mediterranean area that have attracted the largest migration inflows: Italy and Spain. While there has been some research on the labor-market outcomes of adult immigrants in these two countries, information about the educational achievement of their children has been scarce, thus restricting the empirical basis for theoretical explanations of immigrant student achievement mainly to countries with longer immigration traditions. In this article, we aim to partially redress this shortcoming by providing a descriptive inquiry into the educational achievement gaps between natives and children of immigrants in Italy and Spain.

Beyond the novelty and the rapid growth of their migratory inflows and the similar structural features of their immigration experiences, Italy and Spain share notable similarities in the structure of their economies and labor markets and in their welfare regimes. The combination of these features makes the two countries not only very similar to each other but markedly different from old receiving countries. Whether explanations of educational achievement gaps derived from traditional immigration countries extend to these new cases remains unclear, and that is one of the reasons why this study has great value.

Drawing upon the rich international literature on traditional receiving countries as background, we examine educational outcomes in Italy and Spain using multilevel models that allow us to partition variance in student achievement into within-school and between-schools components. Our research advances the understanding of achievement differences between natives and children of immigrants in new immigration countries in two ways. First, after documenting how the performance of children of immigrants varies by generational status, we investigate the extent to which family socioeconomic background and language spoken at home account for these variations. Although the contribution of these two factors varies across countries, family socioeconomic background often explains substantial parts of the disadvantage of children of immigrants, while language represents a crucial resource especially for recently arrived immigrants. Second, we explore variations in immigrant student performance according to two widely documented factors of internal differentiation in educational systems: tracking and school ownership. Our analysis relies on standardized tests in mathematics and reading administered by the Programme for International Student Assessment (PISA) in 2009.

The paper begins with a review of the literature on the immigrant/native educational gaps in traditional receiving countries. It then considers the patterns of immigration to Italy and Spain and the key features of their educational systems. We summarize our research questions and assumptions before proceeding with a description of the data and methods, and a presentation of our empirical findings. We conclude by discussing our results and providing suggestions for future research.

Accounting for the Immigrant/Native Educational Gap: An Overview of the Literature

The achievement gap between natives and children of immigrants is a well-established regularity in several Western countries (Schnepf 2004; Marks 2005). However, immigrants'

[1]EU-15 refers to the 15 countries that were members of the European Union prior to its enlargements of 2004 and 2007.

performances and their relative positions compared with their native classmates are highly heterogeneous (Schnepf 2008). Contradicting straight-line assimilation theory, which predicts children of immigrants progressively assimilate to the mainstream (Alba and Nee 1997), there are good reasons to suspect children follow multiple paths of assimilation and attain different levels of education (Portes and Zhou 1993).

One major factor of differentiation is immigrant generational status. In general, the second generation (native-born children of foreign-born parents) tends to outperform the first (foreign-born children of foreign-born parents) (OECD 2006). The explanation for this is related to the fact that second-generation immigrant children do not directly face the hurdles of migration and the difficulties of adapting to new contexts, languages, and schools. Some second-generation groups have been found to even outperform native-born students (Chiswick and DebBurman 2004). For instance, this pattern has been observed in many Asian students in the United States (Kao and Tienda 1995; Portes, Fernandez-Kelly, and Haller 2009) as well as in Indians in the United Kingdom and Northern Europe (Heath and Brinbaum 2007; Heath, Rothon, and Kilpi 2008). In contrast, other groups show limited progress across generations, with a well-known example in the literature being the experience of Mexican descendants in the United States (Telles and Ortiz 2008). Whether comparable patterns take place in new immigration countries, such as Italy and Spain remains a matter of empirical investigation and underlines the importance of examining achievement differences according to generational status.

Most empirical findings point to the prominent contribution of family background in accounting for substantial parts of these educational gaps, although there are notable variations across countries (Heath, Rothon, and Kilpi 2008). Research on inequality in educational opportunities has usually employed variables like parental occupation and educational level to measure family socioeconomic background. Socioeconomic background mediates the association between migration background and educational outcomes because immigrant families tend to be concentrated in the lower social strata. However, these “traditional” factors—especially parental education—might not always work the same way for natives as for immigrants and across national-origin groups (Heath and Brinbaum 2007). For instance, immigrants frequently have lower occupational returns on education compared to natives, especially if they hold foreign qualifications. This is particularly true in Italy and Spain, as recently demonstrated by Bernardi, Garrido, and Miyar (2011) and Fullin and Reyneri (2011). The strong devaluation of foreign educational credentials in these two countries might weaken the power of parental education to explain educational outcomes of the children of immigrants, underlining the need for more direct measures of family background to better capture the actual differences in the socioeconomic and cultural resources available in immigrant versus native households. Also, the specific mechanisms through which socioeconomic background relates to children’s outcomes often remain elusive (Heath and Brinbaum 2007). Socioeconomic background is associated with an ample array of other family characteristics with effects that are not easily distinguishable from one another. For instance, low socioeconomic resources are associated with weak family structures (McLanahan and Percheski 2008) and with shortages of cognitively stimulating resources at home (Lahaie 2008).

Although measures of parental education pick up some of the cultural factors relevant for children’s education, some additional cognitive factors are more specific to the children of immigrants and their families. Language represents one of the most important types of human capital possessed by immigrant families, and it is commonly indicated as a crucial determinant of educational achievement (Esser 2006). Proficiency in the host language varies across generations, with second generations generally showing higher proficiency in the host-country language than first generations (Portes and Rumbaut 2001; Esser 2006).

Also, language represents a factor that accounts for differences between ethnic groups, since it is known that some groups might be advantaged relative to others in acquiring the host-country language. This last consideration applies especially to Spain, which has attracted large numbers of immigrants from Latin America. Latin Americans presumably enjoy an advantage over other immigrants because they already possess Spanish language abilities (Portes, Aparicio, Haller, and Vickstrom 2010).

Besides these individual-level factors, institutional arrangements of school systems might be relevant factors for inequality in educational opportunity. Structural characteristics of educational systems can act as "sorting machines" by differentiating the student population and thus affecting students' opportunities to learn (Hao and Pong 2008). In particular, two of the main factors of differentiation often considered in the sociology of education are tracking and school private/public ownership (Kerckhoff 2001). Empirical studies provide evidence that students in general tracks or a private schools often have higher achievement than those in vocational tracks or a public schools (Van de Werfhorst and Mijs 2010). The existence of these between-school differentials might reflect the fact that the choice of school is not random. On the contrary, this choice is strongly associated with family background (Dronkers 2010): Offspring of upper social strata display higher propensity to enroll in better quality and higher reward schools in many countries, and Italy and Spain are no exceptions. Following this line of argument, school-type differentiation is expected to mediate the relationship between immigrant background and educational outcomes. Children of immigrants are more likely to end up in lower-performing schools or low ability tracks because they often originate from lower social strata. Of course, not only is socioeconomic background important but so too is adequate knowledge of the education system and access to information channels (Coleman 1988), two aspects that could further negatively affect the educational decisions of immigrant families and children.

Setting the Scene: Italy and Spain in Comparison

From emigration to immigration countries

Italy and Spain have traditionally been marked by high rates of emigration. Especially in the second half of the twentieth century, Italy and Spain were source countries of the "guest worker" recruitment needed by Northern European countries. During the past two decades this situation has reversed dramatically for both countries, making them two new and important destinations of international migration flows (Castles and Miller 2003; Colombo and Sciortino 2004; Ribas-Mateos 2004).

The beginning of the 1990s marked the start of this new immigration phase. Both countries experienced a rise in the number of migrants as part of the South-North migration trend, originating primarily from Sub-Saharan and North Africa (Ribas-Mateos 2004). After the fall of the "Iron Curtain," East-West migration from Central and Eastern Europe also accounted for a large part of the positive net immigration trend. During the 2000s the population of immigrants in these new immigration countries increased at much higher rates as compared to old immigration countries like Germany, the Netherlands, and France. Nowadays, Italy and Spain host about one-third of the total immigrant population among EU-15 countries, and in 2009 immigrants residing in Italy and Spain accounted for, respectively, 7 and 12.3 percent of their populations (OECD 2011). A consequent growth in both countries has occurred in immigrant student population, the vast majority of which is made up of first-generation and mixed-parent children, with second-generation children still marginal and mainly concentrated in younger age groups.

Immigration to Italy and Spain also displays similarities with regard to countries of origin. Relative to many old immigration destinations, Spain, and especially Italy, have welcomed

immigrants from a wider range of countries (Ribas-Mateos 2004). Until the 1990s, Moroccans represented the main group of immigrants in both countries. More recently, immigration from Romania has increased sharply, and Romanians have become the largest immigrant group in both. Some differences exist between the two countries, with Spain having a higher incidence of immigrants from Latin America (approximately 40 percent of its total immigrants), including heavy representation from Ecuador, Colombia, and Bolivia (Fullin and Reyneri 2011). In Italy most immigrants originate from Eastern Europe (Romanians, Albanians, Ukrainians, and Poles) and from Eastern Asia (mainly China, Philippines, and India).

Additional similarities between the two countries exist with respect to immigrant human capital. The two Mediterranean countries are generally characterized—relative to traditional receiving countries—by low-productivity economies, significant underground sectors, and a labor demand that is primarily oriented toward unskilled workers. These factors have attracted large numbers of labor migrants who are disproportionately concentrated in unskilled jobs with low salaries, although some—especially those from Eastern Europe—hold high educational qualifications (Bernardi, Garrido, and Miyar 2011; Fullin and Reyneri 2011).

The socioeconomic condition of immigrants in these two countries might have been exacerbated by two further institutional factors: weak welfare regimes and flawed immigrant-integration policies. First, Mediterranean countries are characterized by welfare regimes that heavily rely on family resources in place of state expenditure, providing low social protection for immigrants and others whose families lack the means to fulfill this role (Ferrera 1995). Second, the recent and fast growth of migratory inflows caught those countries ill-prepared to manage the integration of new immigrants and their children. Illegal entries and extraordinary amnesties are coupled with poor integration policies in Italy and Spain (Solé 2004).

The education systems in Italy and Spain

The education systems of the two countries have been established within different historical and political contexts. During the past three decades, however, both countries experienced comparable educational expansions (Ballarino, Bernardi, Requena, and Schadee 2009). Today they display similar outcomes on crucial indicators of population educational attainment, such as secondary-education completion and dropout rates (Eurostat 2011). According to the latest results from PISA 2009, the student populations also perform on average very similarly on achievement tests: in both cases significantly below the OECD average. Inequality in educational opportunity has slowly decreased over time in both countries (Ballarino, Bernardi, Requena, and Schadee 2009), and today they have similar socioeconomic gradients in children's educational outcomes (OECD 2010). Finally, the two countries make almost identical expenditures on education as a percentage of GDP (Eurostat 2011).

However, Italy and Spain differ in the formal structure of their educational systems at the secondary level. Although students in both countries enter compulsory education at the age of six, the systems diverge after the primary education level. Students in Italy continue in a common track (lower secondary education) until age 14, when they face their first transition into divergent tracks. These tracks (upper secondary education) include academically oriented and generalist schools, vocational schools, and an intermediate technical-type school, all of which give students subsequent access to tertiary education. An additional track consists of regional training courses, which do not provide access to tertiary education. This first decision point represents an important moment for the educational careers of students in the Italian educational system, and it is strongly associated with socioeconomic

and immigrant background. Children of immigrants, especially children who are themselves first-generation immigrants, are concentrated in vocational schools and regional training courses, even after controlling for social class (Azzolini and Barone 2012).

Whereas the Italian educational system sorts students into different tracks during compulsory education, the Spanish system provides a single compulsory track for students up to age 16, combined with optional programs for students who wish to continue their education after completing the compulsory component. Before age 16, the relevant source of school-type horizontal differentiation in Spain is given by the large private school sector. Whereas private schools in Italy serve only 5 percent of upper secondary school students, in Spain semi-private schools serve more than 26 percent of all secondary school students and fully-private schools serve an additional 5 percent.[2] The semi-private schools receive some public funding and are subject to many of the same regulations as public schools, but they may be harder for immigrant students to access (Zinovyeva, Felgueroso, and Vázquez 2008). The empirical literature has also documented that in many countries, including Spain, students enrolled in private schools are in a relatively advantaged position compared to those enrolled in public schools, although these differentials often disappear when controlling for family background (Cebolla-Boado and Medina 2011).

Research Questions

We first examine variation in mathematical and reading literacy by students' immigrant generational status in Italy and Spain. Drawing on the empirical evidence described above, we expect that in both countries second-generation students significantly outperform first-generation ones and that both groups significantly underperform natives. Also, we expect children of mixed parentage to perform better than first- and second-generation children. This group is often considered together with other children of immigrants, but we posit that having at least one native-born parent represents an advantage in terms of country-specific human and social capital employable for supporting children's educational development.

Second, we investigate how much of this variation is accounted for by family background. In "old" European immigration countries, educational-achievement differences between natives and children of immigrants can largely be accounted for by differing distributions of economic resources between native and immigrant households. Given the poor labor-market attainment of adult immigrants in Italy and Spain, we hypothesize that achievement gaps are substantially reduced when family socioeconomic background is held constant. At the same time, we surmise that the contribution of family background might not be as strong in new immigration countries as it has been in traditional ones. Although a substantial number of immigrant adults show low labor-market outcomes, recent immigration waves have exhibited relatively high educational levels in Italy and Spain, conceivably translating into higher possessions of educational and cultural resources and thus weakening the link between family socioeconomic background and children's achievement.

When turning to language spoken at home, we expect that ability in the host country's language reduces the educational achievement gaps for first-generation students and that the effect is stronger for reading competence than for math. Additionally, we expect to observe country differences in the contribution of language in explaining the immigrant/native gap because many immigrants in Spain are Latin Americans who are already fluent in Spanish.

[2]Private schools in Italy are also a very heterogeneous group. They include entities providing regional training courses as well as schools that attract children of affluent families with low scholastic outcomes (Bertola, Checchi, and Oppedisano 2007).

Finally, we investigate how the main factors of differentiation within the two educational systems (tracking in Italy and public versus private schools in Spain) mediate the association between migration background and performance. Children of immigrants are more likely than natives to be enrolled in underperforming schools even net of previous achievement. This higher risk is partially explained by their relatively poorer socioeconomic conditions. Disentangling the causal effects of school types from these selection effects is beyond the scope of this paper. Nonetheless, documenting how children of immigrants perform within the different segments of the two educational systems is of great importance because it sheds light on the heterogeneity of competences that students will bring to their lives after school.

Data, Variables and Analytical Strategy

Data

We use data from the Programme for International Student Assessment (PISA) collected in Italy and Spain in 2009. PISA assesses 15-year-old students' competences in three domains: reading, mathematics, and science, and it collects individual, family, and school background information through questionnaires administered to students and school officials. PISA samples are derived from a complex, two-stage stratified sampling procedure with schools serving 15-year-old students selected in the first stage and individual students selected in the second. The samples used in this article contain some missing values in our independent variables of interest, and we dealt with this through listwise deletion, removing all cases with any missing values on the variables used.[3] The only exception was language spoken at home, for which we kept the missing values as a separate category.

Dependent variables: Mathematics and reading competencies

As dependent variables we use students' performance on mathematics and reading tests. Reading literacy is defined as an individual's capacity to understand, use, and engage with written texts. Mathematical literacy is concerned with the ability of students to analyze, reason, and communicate ideas effectively as they engage mathematical problems in a variety of situations. The tests are aimed at measuring students' capabilities in different "real life" situations. For each test, the PISA data include five plausible values of student performance derived from a model of underlying ability based on the actual scores. For each test, the values are standardized across all countries in the first year when the test is administered as a major subject (the pooled OECD mean score is 500, with a standard deviation of 100), making cross-country and cross-test comparisons more meaningful.

Independent variables

We classify sampled students by *immigrant generational status* by combining information on students' and parents' places of birth (abroad vs. host country). We use a "strict" definition of immigrant generational status by identifying first- and second-generation immigrants as individuals with both parents born abroad. More precisely, we divide the sample into the following categories: natives (native-born children with both parents native-born), first generation (foreign-born children with both parents born abroad), second generation (native-born children whose parents are both foreign-born), and children of mixed parentage. We treat the mixed parentage group as a distinct category not only to avoid muddying the other two categories but also because of its quantitative relevance in the two countries.[4]

[3]To partially check for biases due to missing values on some of the independent variables used in the analyses, we replicated the models with both a stepwise deletion method and by imputing missing values and also including them as their own "missing" category for which we obtained estimates. These additional analyses did not yield substantially different results from those presented in this article.

[4]The vast majority of mixed-parentage children are native born. These children are considered together with the small fraction of those who were born abroad, since they do not differ significantly.

We measure *family* socioeconomic status and the availability of educationally relevant resources at home through four variables. First, we use parental education to capture the human capital possessed within the family. This variable has been coded categorically following the International Standard Classification of Education (ISCED), and ranges from ISCED 1 to ISCED 5a/6. Second, we use the highest occupational status of parents by including the International Socioeconomic Index of Occupational Status (ISEI). Third, to further capture the availability of cognitively stimulating resources at home we include a PISA-constructed index of educationally relevant resources available at home (e.g., a place to study, a personal computer, books). Finally, we add a binary variable that allows us to adjust for variations in the family structure. The variable takes the value one for nuclear families and zero for non-nuclear family types.

As a proxy for Italian and Spanish *language* proficiency, we include language spoken at home as a dummy variable, which takes the value zero if the student declares he usually speaks the host-country language (or a national dialect) and the value one otherwise.

Considering the existence of factors of differentiation in the two education systems that might shape inequality of educational opportunity, we include a set of variables at the *school* level. In the first place, we include a categorical variable indicating the specific track in which the student is enrolled. In Italy this variable is coded as following: academic schools, technical schools, and vocational schools (including vocational training courses). This variable is not included in Spain because it is a comprehensive system consisting of one integrated track for students up to age 16. Instead, we use school ownership as an indicator of horizontal differentiation of the education systems in Spain. We introduce school ownership as a dummy variable, with public schools as the reference category and semi- and fully- private schools together coded as one.

Finally, we further control for gender, age, region (in Italy), and the type of community in which the school is located (from rural areas up to large cities). In the models where we explore school-level factors, we additionally adjust our estimates for school socioeconomic and immigrant composition by taking the weighted average of the highest parental occupational status as well as the proportion of first-generation immigrants enrolled in each school.

Table 1 presents variable descriptions and coding for the measures used in our analysis, along with the descriptive outcomes for each group in percentages or means.

Table 1 indicates that children of immigrants in Spain and Italy are mostly of first-generation and mixed-parentage children. The first generation accounts for 4 percent of the PISA sample in Italy and around 8 percent in Spain. Similarly, mixed-parentage children account for almost 6 percent in both countries. In contrast, the second generation represents only about 1 percent. The distribution of the different groups reveals a common trait of new immigration countries and reflects the recency of immigration, with most children of immigrants still too young to be included in the PISA data.

What background characteristics do immigrant students of different generations bring into school in Italy and Spain? As seen in Table 1, on average, children of mixed couples originate from similar social backgrounds as natives, possessing almost identical educational resources at home. The picture changes when we consider first- and second-generation students. Parents of first-generation students hold less prestigious jobs than native parents, and this translates into fewer resources (evident in the index of home possessions) relevant for children's educational chances. Families of second-generation students posses higher amounts of relevant resources but still lag behind parents of the majority school population in Italy and Spain. At the same time, the average educational attainment of the parental

immigrant generation does not differ much from that of native Italians and Spaniards. The percentages of highly educated parents (ISCED 5 or more) are almost identical to those of the native population, confirming reports of the devaluation of foreign academic titles in the Italian and Spanish labor markets (Fullin and Reyneri 2011).

Remarkable differences between Italy and Spain appear when considering language spoken at home. In Italy, roughly two-thirds of first-generation students report that they do not speak the host country language, while that proportion is inverted in Spain with the majority of first-generation students reporting Spanish use. Among second-generation students in Spain, more than 70 percent report speaking the national language, compared with 55 percent in Italy. Mixed-parentage children remain almost identical to natives in the two countries. These findings reflect the larger presence in Spain of Latin Americans who speak primarily the same language as natives. The analysis of language use does not come without methodological caveats. In Italy, this information is missing for approximately 10 percent of the sample. Robustness checks reveal that the potential bias is small because missing cases are distributed roughly equally across groups. However, given that our sample of children of immigrants is already relatively small, we decided to keep the missing cases as a separate category in the analysis.

Table 1 also shows the distributions of students in different tracks in upper secondary education in Italy. In line with previous findings (Barban and White 2011), first- and second-generation students are clearly overrepresented in vocational tracks and underrepresented in the general tracks, while mixed-parentage children exhibit similar school choices as natives. Differentiation in the Spanish educational system appears through enrollment differences between private and public schools. The percentage of students attending a private school is larger for native respondents (33 percent) than for mixed-parentage children (29 percent), second-generation children (24 percent) or first-generation children (almost 18 percent).

Analytical strategy

In what follows, we first analyze the average reading and mathematics skills of natives and children of immigrants. We estimate mean student achievement following the approach recommended by PISA, using the five plausible values, final sampling weights, and 80 replicate sampling weights provided with the data. The use of plausible values is aimed at capturing an unbiased and continuous measure of student proficiency from discrete exam scores, while the weights account for the sampling structure of the survey and provide design-based measures of uncertainty (OECD 2009).

As a second step, we regress reading and mathematics scores on immigrant generational status using hierarchical linear models with levels for individual students and their schools.[5] We fit a series of model specifications, progressively adding covariates to assess how variations in family socioeconomic background, language spoken at home and school characteristics account for immigrant/native achievement gaps. We fit these models using the student- and school-level probability weights adjusted according to the approach suggested by Pfeffermann, Skinner, Holmes, Goldstein, and Rasbash (1998).[6]

[5]We estimated all multilevel models using adaptive quadrature and maximum likelihood estimation withStata's gllamm package. This allowed us to incorporate probability weights at each level and make empirical Bayes estimates of the school random effects. As a robustness check, we also replicated all analyses without probability weights using maximum likelihood estimation and restricted maximum likelihood estimation with Stata's xtmixed function as well as R's lme4 package. The results (available on request) were consistent across all estimation methods.

[6]We calculated the adjusted weights using the software described in Chantala, Blanchette, and Suchindran (2006). We fit every model using each of the plausible values as the dependent variable and then averaged the resulting parameter estimates. We did not use replicate weights, given the computational intensity of the multilevel model estimation.

Results

Average competencies of natives and children of immigrants

Figure 1 displays average scores in mathematics and reading of each immigrant generational status category.

The first takeaway point of Figure 1 is that Italy and Spain display very similar achievement and generational patterns. Natives tend to perform better than both first- and second-generation students, while they are not distinguishable from children of mixed parentage. More precisely, first-generation students systematically underperform all other groups in Italy and Spain in both mathematics and reading. The differences compared with natives are impressively large (between three- and four-fifths of a standard deviation) and are particularly pronounced with regard to reading competences in Italy.

Second-generation students' estimated means have higher uncertainty due to smaller sample size. Nonetheless, their disadvantage compared to natives is once again evident, as is their advantage relative to first-generation students. Finally, mixed-parentage students largely outperform both first- and second-generation students, especially in Italy, suggesting that having at least one native-born parent serves as a buffer against low educational performance.

How do family background and language contribute to immigrant/native gaps?

After showing how average skills vary across groups, we now test, first, whether these results hold even after controlling for school random effects and, second, to what extent existing explanatory hypotheses at the individual and family levels account for the observed differences. In Figure 2 we present the parameter estimates from a sequence of three multilevel models estimated separately for each country and subject. The symbols in Figure 2 show our point estimates of the coefficients for each immigrant generation group, with native students used as the reference category. Lines show the 95 percent confidence intervals around each estimate.[7]

The first model allows for school random intercepts and incorporates immigrant generational status, age, sex, region (in Italy), and area of residence. In both countries, first-generation students perform systematically worse than natives, while second-generation students display a smaller gap. The size of the gap for first-generation students in Spain is 65 points for mathematics and 55 points for reading. In Italy the gap is slightly smaller and, in any case, smaller in mathematics (36 points) than in reading (44 points).

Relative to the means presented above, the models here show that in Italy the differences between first-generation students and natives are significantly smaller, while in Spain they are essentially unchanged. This suggests that through multilevel modeling we were able to account for some relevant between-school variability in students' scores. The point is also confirmed by intra-class correlation, which is much higher in Italy than in Spain (see models in Appendix).[8] These findings also suggest that school factors might be relevant for explaining the disadvantage in Italy of first-generation students, who are strongly concentrated in vocational schools. We will return to this point in the next section, where we investigate the role played by school types in the two countries.

As far as second-generation students are concerned, we confirm their relative advantage over first-generation students and their disadvantage over natives. What emerges from the

[7]Tables with all estimates from these models are available online at http://globalnetwork.princeton.edu/.
[8]We checked that this reduction is not due to the demographic controls that are included in Model 1.

results presented in Figure 2 is that differences between first- and second-generation students are more pronounced in Spain than in Italy. Confirming our expectations, children of mixed parents systematically outperform children who have two foreign-born parents and perform essentially as well as natives, although a significant gap in mathematics is detected for children of mixed parentage in Spain.

Do these patterns change after modeling other predictors at the family level? Model 2 adds parental education and occupation, home possessions, and family structure to the analysis. As hypothesized, controlling for these measures of family background reduces the performance gap between natives and children of immigrants in Italy and Spain. The models in which these variables are included also have significantly lower variance at the school and individual level (see Appendix). The gap for both first- and second-generation students drops in Spain as well in Italy by roughly one-fourth. This reduction is significant only for first-generation students (at the 5 percent level in Spain and at the 10 percent level in Italy), while it is not significant for second-generation students, essentially because of small sample size. Drawing on previous research on Italy and Spain that notes lower returns on education for adult immigrants in the labor market (Bernardi, Garrido, and Miyar 2011; Fullin and Reyneri 2011), in additional models (not shown) we allowed for interactions between immigrant generational status and parental occupation and education to test whether such lower returns are transferred to their children. We did not find evidence supporting the existence of such a transfer, suggesting that children of immigrants have returns on their parents' socioeconomic backgrounds that are comparable to those of natives.

In Italy, the contribution of family background is slightly smaller with regard to reading competences, suggesting that linguistic hindrances might operate over and beyond socioeconomic factors, especially for first-generation students. However, the statistically weaker contribution of family background in Italy is also a consequence of the fact that schools in Italy are strongly segregated by socioeconomic status. To check for this, we estimate the same models without including schools as a level and found that the contribution of family background is larger, confirming that part of the role played by family background is indeed mediated by school factors. As shown in greater detail in section 6.3, the same does not hold for Spain.

Model 3 incorporates language spoken at home. Although students who speak the host country's native language at home score significantly better on the reading test than those who do not, the estimated gaps between immigrant and native students in Model 2 cannot be distinguished from those in Model 3 given statistical uncertainty. However, if we look just at our point estimates, the inclusion of the language variable mostly improves the estimated reading performance of first generation immigrant students relative to natives. This contribution is more pronounced in Italy than in Spain, and in both countries it is negligible for mathematics. In addition it is also negligible for second-generation and mixed-parentage children in both countries.

To conclude, in the two Mediterranean countries a sizable and highly significant gap between first-generation and native students persists even after controlling for the above-mentioned set of family-level variables and allowing for school random effects. Family background and language spoken at home explain about one-third of these gaps. However, while their contribution is almost identical in the two countries when looking at mathematical literacy, things change when turning to reading: In Italy the contribution of language spoken at home to the relative reading literacy of children of immigrants is slightly higher. Next, after accounting for family background and language spoken at home, differences between Italy and Spain in the gap for first-generation students in reading are no longer significant, whereas marked differences between the two countries persist in the

estimated gaps in mathematics.[9] Also second-generation students consistently underperform natives in the two countries. However, the gaps for first- and second-generation operate differently in Italy than in Spain: After accounting for both socioeconomic background and language, first- and second-generation students are indistinguishable in Italy, while second-generation students in Spain maintain a significant advantage over first-generation students.

How do immigrants' performances vary across schools?

After documenting variations in student performance by immigrant generational status and exploring the contribution of family factors, in this section we shift our focus to the role played by school institutional settings. We focus on tracking and school ownership because these are the main factors of differentiation in the two countries.

To investigate this differentiation, we fit two additional multilevel models allowing for tracking in Italy and school ownership in Spain as well as their interactions with immigrant generational status. Results of these additional models (shown in the Appendix) indicate that these school endogenous factors do not significantly affect the gap estimates— narrowing them only slightly—and the interaction parameters are insignificant. These results are robust even after controlling for a long list of additional school-level variables like streaming between classes, schools' autonomy in resources and assessment allocation, and student-teacher ratios (additional analysis not shown), a finding that is in line with previous studies (Mantovani 2008; Zinovyeva, Felgueroso, and Vázquez 2008; Dustmann C., Frattini, and Lanzara 2011). Given the different patterns of school participation of immigrants and natives within the two countries—especially in Italy, where we know that children of immigrants have a higher likelihood of enrolling in vocational schools even if they previously achieved high marks (Barban and White 2011)—we would have expected the gap to be lower in these schools than in general ones. Although the interaction parameters point in this direction, they are very small and insignificant. This might be explained partly by the fact that we control for socioeconomic background, which is the main explanatory factor of the differentiated school choices of natives and children of immigrants.[10] For the Spanish case an additional explanation might be the peculiarity of the semi-private schools noted above: We treat these as private schools in the analysis but they must comply with many of the same regulations as public schools.

Lastly, these findings do not mean that the school factors are not relevant at all. As mentioned above, intra-class correlation is particularly high in Italy, and our multilevel estimates of the gaps for first-generation students are substantially reduced compared to the simple differences between mean estimates. Moreover, this last model specification fits the data significantly better than previous models and explains a substantial part of the test score variance. Again, this is particularly true in Italy, where high school-type differentiation explains more than two-thirds of the total variance in test scores at the school level (see Appendix).

This high heterogeneity is clearly shown in Figure 3, which presents the results of a simulation where we set all individual characteristics at fixed values and let immigrant generational status and type of school vary.

[9]These between-country differences are robust even when breaking down first-generation students into different subgroups according to their age at arrival.

[10]To partially prove this, we investigated immigrants' and natives' probabilities to enroll in the different tracks and school types using probit and multinomial probit models. We found that immigrants have higher odds of enrolling in lower tracks in Italy and of enrolling in public schools in Spain, but that these differences decrease and sometimes even disappear when family background and language are held constant. This additional analysis is available upon request.

Figure 3 shows that school type differentiates natives and children of immigrants in much the same way. More precisely, tracking in Italy plays an important role in shaping students' achievement—with general schools performing at the top and vocational schools at the bottom—while no differences are found between public and private schools in Spain. Without attaching any causal interpretation to these between-school differences, Figure 3 sheds more light on the magnitude of internal differentiation of immigrants. For instance, first-generation students attending general schools in Italy are more similar to their native Italian classmates than to either immigrants or natives attending vocational schools. Accordingly, we observe that the relatively advantaged position of first-generation students in Italy compared to those in Spain seems to be driven by the outstanding performances of the former when attending general and technical schools rather than by the segregation of the latter into Spanish public schools.

Summary and Conclusion

This study investigated the educational achievement gaps between native and immigrant 15-year-old students in Italy and Spain. The two countries represent "new immigration countries" and have not yet been adequately covered by empirical research. With this paper we attempted to redress this shortcoming. We extended previous research by empirically testing the extent to which explanations widely established in old immigration countries also apply in these new immigration contexts.

Overall, our results indicate that within the two Mediterranean countries marked achievement gaps exist between natives and children of immigrants even after controlling for family and school characteristics. In line with international research, we also found a strong association between immigrant generational status and educational achievement. Second-generation students perform worse than natives but better than first-generation students. This confirms the importance of being raised in the host context rather than a foreign one, and of thus not having to adapt to a new country and school system. However, once family background and language use are added to the models, Italy deviates from this pattern, with only a small and insignificant estimated gap between first- and second-generation students in both mathematics and reading. This suggests that not only is children's nativity status important but so too is that of their parents. When parents lack familiarity with the host education system, their children's educational prospects are negatively affected, especially in countries where family influence on scholastic outcomes is very pronounced (Dalla Zuanna, Farina, and Strozza 2009). We should consider, however, that no information on country of origin is available in the data, and this might be a particularly important factor given that there is a high proportion of North-African students in Italy's population of second generation immigrants, while its first generation is dominated by Eastern Europeans, who have higher educational outcomes (Azzolini and Barone 2012).

Mixed-parentage children were found to outperform both first- and second-generation students and are essentially indistinguishable from natives. In other words, having at least one native-born parent born is an advantage, since it often gives the student access to greater country-specific human and social capital needed to foster the educational-achievement process. These findings underline the importance of distinguishing children of mixed parentage from those with two foreign-born parents. Quite often these groups are analyzed together, yet our findings suggest that their situations can be very different.

These generational variations are partially explained by differences in the occupational and economic integration of parents. Our findings highlight that in Spain and Italy, family background is a strong predictor of students' achievement and reduces the immigrant/native gaps by about one-fourth. This is an expected result, given the strong segregation of adult

immigrants into the lower positions of the occupational ladder in the two Southern European countries (Bernardi, Garrido, and Miyar 2011; Fullin and Reyneri 2011). The contribution of family background to the explanation of immigrant/native differences in Italy and Spain is greater than in Northern European receiving countries such as Sweden, Finland, or Denmark but still lower than in traditional immigration countries like Austria, Belgium, or Germany (OECD 2010).

Students who reported speaking a foreign language at home scored significantly lower on the reading test than others, and including the language variables in the models slightly reduces the magnitude of the disadvantage of first-generation students, especially in Italy. As indicated above, although we lack concrete information on country of origin, our findings suggest the importance of the presence of immigrants of Latin American ancestry in Spain who enjoy a relative linguistic advantage over other immigrants: Contrary to what happens in Italy, in Spain the disadvantage of first-generation students is larger in mathematics than in reading.

Regarding the organization of the education systems, our study indicates that this represents an important factor for 15-year-old students in Italy but not in Spain. In Italy the multilevel estimates of the gap for first-generation students are substantially smaller compared to the differences between simple mean estimates, suggesting that a substantial part of the gap is due to the higher concentration of immigrants in underperforming schools. As far as the specific contribution of tracking is concerned, our analysis indicates track choice is related to average student score but that immigrant/native gaps remain largely unaltered across school tracks when family background and language are modeled. Also, in Spain no significant differences are found between students attending public versus private schools after controlling for family background.

Because of the existence of different selection mechanisms for immigrants and natives into the different types of schools, we could not tackle the causes of these differences. Neither do we examine student choices or performance beyond age 15. More research is, therefore, needed to disentangle the roles played by all of the different institutional arrangements. Nonetheless, the descriptive analysis provided here serves as a valuable basis for the next steps and underscores the heterogeneity in competences between tracks in Italian upper-secondary education.

One of the most interesting results of this study is the larger mathematics gap of first-generation students in Spain compared to those in Italy. One potential explanation could be the existence of different immigrant selectivity between the two countries. Although we included a wide range of family background measures to reduce consequences of selectivity, our study still lacks concrete information on country of origin. Immigrants from Latin America represent a larger component in Spain than in Italy. Throughout this paper we have always assumed them to be at a relative advantage over other immigrants in Spain because they already possess the host language. At the same time, their advantage could be limited to linguistic skills. Adult immigrants from Latin America might be negatively selected in terms of human capital, ambition, and drive, as their costs of migrating to Spain are relatively low given that they already know the language and have co-ethnics networks at their disposal (Feliciano 2005). Partially supporting this speculation, Portes and colleagues (2010) point to low educational ambitions of children born in Bolivia, Ecuador, Colombia, and Peru who are the largest nationalities among Latin Americans in Spain. Accordingly, Zinovyeva and colleagues (2008) suggest that children of immigrants of Latin American ancestry benefit at the moment of arrival relative to other immigrants but then do not improve their educational achievement with time spent in the country, pointing out that their initial advantage is due only to Spanish language ability.

The example of immigrants of Latin American origin underlines once again that future research should directly investigate the existence of country of origin variation in the educational outcomes of immigrants. Future studies should also assign special attention to second-generation immigrants, a small but rapidly growing population in new immigration countries. Finally, research should investigate the remaining and unexplained disparities that persist between natives and children of immigrants in Italy and Spain even after controlling for individual and school-level factors. Examining these aspects will shed light on the phenomenon of educational performances of immigrants, which is not settled yet in the two countries.

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Appendix

The following tables present parameter estimates of multilevel models of student performance on the 2009 PISA tests of reading and math in Italy and Spain. All models were estimated with Stata's gllamm package, using the PISA final sampling weights adjusted for student and school levels according to the approach suggested by Pfeffermann, Skinner, Holmes, Goldstein, and Rasbash (1998). Results shown here are the means of the estimates of models using each of the five plausible values of student performance reported by PISA. In addition to the variables shown in the tables, the models for Italy also include regions as controls. Further details are provided in section 5 of the text.

Table 1

Weighted multilevel models of reading literacy in Spain (PISA 2009)

variable	M1	M2	M3	M4
First-Generation	−55.20* (2.47)	−41.57* (2.41)	−39.21* (2.46)	−37.76* (2.86)
Second-Generation	−25.34* (5.66)	−18.87* (5.59)	−16.58* (5.57)	−19.21* (6.23)
Mixed-Parentage	−4.28 (2.36)	−3.38 (2.27)	−3.10 (2.27)	−2.82 (2.82)
Age	18.25* (1.98)	18.62* (1.91)	18.58* (1.91)	18.37* (1.90)
Male	−27.60* (1.16)	−28.30* (1.13)	−28.25* (1.13)	−28.33* (1.12)
SmallTown	−0.75 (7.08)	−0.58 (5.40)	−0.51 (5.39)	0.24 (4.17)
Town	8.87 (7.03)	5.45 (5.36)	5.38 (5.34)	2.04 (4.22)
City	31.89* (7.03)	22.22* (5.33)	21.83* (5.32)	10.06* (4.44)
LargeCity	46.27* (10.23)	34.44* (7.37)	33.68* (7.34)	19.05* (6.35)
ISCED2		4.43 (2.68)	4.33 (2.68)	4.07 (2.66)
ISCED3b-c		−6.54 (4.00)	−6.41 (3.98)	−6.95 (3.95)
ISCED3a-4		16.93* (2.61)	16.87* (2.60)	16.22* (2.59)
ISCED5b		12.48* (2.71)	12.52* (2.68)	11.88* (2.67)

variable	M1	M2	M3	M4
ISCED5a-6		20.40* (2.83)	20.58* (2.81)	19.07* (2.80)
HighestISEI		0.77* (0.04)	0.78* (0.04)	0.73* (0.04)
HomePossessions		11.20* (0.84)	10.99* (0.84)	10.67* (0.84)
NuclearFamily		5.83* (1.77)	5.98* (1.77)	6.19* (1.77)
ForeignLanguage			−9.87* (2.46)	−10.79* (2.46)
LanguageMissing			−21.91* (5.42)	−20.67* (5.38)
Perc.Immigrants				6.39 (11.45)
MeanISEI				1.56* (0.17)
PrivateSchool				2.22 (2.49)
PrivateXFirst-Gen				−3.06 (5.01)
PrivateXSecond-Gen				15.93 (12.45)
PrivateXMixed				−0.90 (4.60)
Mean School Int.	202.45* (32.04)	148.22* (30.54)	149.16* (30.52)	87.77* (31.30)
School Var.	1039.44	688.75	682.22	550.80
Student Var.	5293.15	4982.06	4975.19	4978.50
N	22599	22599	22599	22599
Deviance	577528	573612	573533	573249

Table 2

Weighted multilevel models of math literacy in Spain (PISA 2009)

variable	M1	M2	M3	M4
First-Generation	−65.12* (2.78)	−49.48* (2.65)	−49.92* (2.73)	−46.90* (3.12)
Second-Generation	−30.47* (6.07)	−23.09* (5.91)	−23.10* (5.93)	−24.44* (6.65)
Mixed-Parentage	−8.66* (2.55)	−7.27* (2.45)	−7.29* (2.45)	−6.95* (3.00)
Age	15.69* (2.14)	16.17* (2.03)	16.09* (2.03)	15.91* (2.02)
Male	18.20* (1.21)	17.38* (1.18)	17.39* (1.18)	17.34* (1.18)
SmallTown	−3.02 (7.44)	−2.78 (5.89)	−2.80 (5.88)	−2.02 (5.15)
Town	1.07 (7.26)	−2.25 (5.72)	−2.27 (5.70)	−4.88 (5.07)
City	25.68* (7.34)	15.65* (5.82)	15.60* (5.81)	5.49 (5.40)
LargeCity	30.74* (10.34)	18.25* (7.92)	18.22* (7.91)	6.22 (7.89)
ISCED2		8.28* (2.78)	8.32* (2.78)	8.11* (2.76)
ISCED3b-c		−4.71 (4.27)	−4.53 (4.28)	−4.95 (4.26)
ISCED3a-4		19.33* (2.67)	19.37* (2.67)	18.80* (2.65)
ISCED5b		9.56* (2.83)	9.62* (2.82)	9.08* (2.80)
ISCED5a-6		24.04* (2.94)	24.03* (2.94)	22.70* (2.91)
HighestISEI		0.81* (0.05)	0.81* (0.05)	0.76* (0.05)
HomePossessions		13.27* (0.91)	13.22* (0.92)	12.93* (0.92)
NuclearFamily		10.82* (1.93)	10.74* (1.93)	10.90* (1.92)
ForeignLanguage			1.00 (2.59)	0.19 (2.62)
LanguageMissing			−22.35* (5.60)	−21.23* (5.58)

variable	M1	M2	M3	M4
Perc.Immigrants				−13.94 (13.65)
MeanISEI				1.60* (0.20)
PrivateSchool				−3.28 (2.95)
PrivateXFirst-Gen				−9.74 (6.19)
PrivateXSecond-Gen				9.41 (13.57)
PrivateXMixed				−0.95 (5.10)
Mean School Int.	232.13* (34.68)	168.30* (32.53)	169.68* (32.55)	108.72* (33.51)
School Var.	1213.57	821.97	818.43	686.19
Student Var.	5950.23	5542.42	5539.27	5541.62
N	22599	22599	22599	22599
Deviance	583519	579149	579113	578866

Table 3

Weighted multilevel models of reading literacy in Italy (PISA 2009)

variable	M1	M2	M3	M4
First-Generation	−44.14* (2.54)	−37.17* (2.62)	−30.61* (3.34)	−27.18* (4.98.)
Second-Generation	−26.91* (4.58)	−21.34* (4.50)	−17.91* (4.57)	−17.35* (6.60)
Mixed-Parentage	−1.17 (1.62)	−0.66 (1.61)	−0.57 (1.62)	−0.24 (2.28)
Age	8.90* (1.56)	9.01* (1.53)	8.99* (1.53)	8.82* (1.51)
Male	−22.31* (1.03)	−23.64* (1.04)	−23.12* (1.04)	−21.98* (1.02)
SmallTown	13.07 (11.89)	13.03 (11.31)	13.46 (11.01)	10.44* (4.55)
Town	31.54* (11.43)	29.64* (10.89)	29.58* (10.59)	11.32* (4.07)
City	39.49* (12.34)	36.26* (11.74)	35.98* (11.43)	8.53 (4.58)
LargeCity	16.97 (21.99)	14.97 (20.92)	14.58 (20.59)	−0.76 (10.19)
ISCED2		11.12* (4.44)	10.77* (4.45)	9.96* (4.41)
ISCED3b-c		19.47* (4.52)	18.76* (4.51)	17.32* (4.48)
ISCED3a-4		19.20* (4.35)	18.79* (4.36)	17.25* (4.32)
ISCED5b		−3.44 (4.70)	−2.99 (4.68)	−4.35 (4.65)
ISCED5a-6		12.77* (4.53)	12.73* (4.53)	10.91* (4.49)
HighestISEI		0.35* (0.04)	0.33* (0.04)	0.28* (0.04)
HomePossessions		4.27* (0.64)	4.22* (0.63)	3.70* (0.63)
NuclearFamily		0.06 (1.39)	−0.06 (1.37)	−0.02 (1.36)
ForeignLanguage			−10.77* (3.73)	−10.01* (3.72)
LanguageMissing			−23.67* (1.44)	−23.22* (1.42)
Perc.Immigrants				−25.38 (20.43)
MeanISEI				2.00* (0.21)
Technical				−40.25* (3.24)
Vocational				−90.63* (4.58)
Lower Sec				−134.71* (18.29)
TechXFirst-Gen				−2.44 (6.22)

variable	M1	M2	M3	M4
TechXSecond-Gen				−1.78 (10.20)
TechXMixed				−2.34 (3.74)
VocXFirst-Gen				−6.49 (6.16)
VocXSecond-Gen				−2.73 (11.27)
VocXMixed				2.23 (4.09)
LSXFirst-Gen				42.39 (25.08)
LSXSecond-Gen				44.88 (56.60)
LSXMixed				4.14 (31.98)
Mean School Int.	350.86* (28.47)	320.48* (28.37)	324.02* (28.08)	290.69* (27.78)
School Var.	3773.64	3330.87	3190.57	740.10
Student Var.	3653.17	3600.41	3562.05	3579.50
N	29573	29573	29573	29573
Deviance	1241941	1239841	1238514	1233305

Table 4

Weighted multilevel models of math literacy in Italy (PISA 2009)

variable	M1	M2	M3	M4
First-Generation	−36.93* (2.52)	−27.96* (2.63)	−26.74* (3.50)	−25.35* (5.36)
Second-Generation	−25.84* (4.60)	−19.44* (4.52)	−18.06* (4.63)	−19.60* (7.10)
Mixed-Parentage	−1.09 (1.66)	−0.07 (1.64)	−0.24 (1.63)	−0.62 (2.38)
Age	6.72* (1.60)	6.62* (1.57)	6.64* (1.56)	6.48* (1.55)
Male	26.78* (1.07)	25.63* (1.05)	26.18* (1.05)	27.71* (1.07)
SmallTown	13.65 (9.07)	13.25 (8.60)	13.60 (8.34)	10.41 (5.70)
Town	27.82* (8.06)	25.77* (7.62)	25.63* (7.35)	8.39 (4.91)
City	27.06* (9.17)	23.91* (8.66)	23.54* (8.37)	−1.48 (5.65)
LargeCity	2.82 (20.83)	0.90 (19.98)	0.39 (19.66)	−13.60 (12.46)
ISCED2		11.55* (4.32)	11.24* (4.33)	10.21* (4.32)
ISCED3b-c		15.60* (4.45)	14.95* (4.43)	13.26* (4.42)
ISCED3a-4		12.15* (4.26)	11.81* (4.26)	10.05* (4.24)
ISCED5b		−10.56* (4.66)	−10.12* (4.66)	−11.55* (4.65)
ISCED5a-6		5.45 (4.44)	5.47 (4.44)	3.45 (4.42)
HighestISEI		0.38* (0.04)	0.37* (0.04)	0.32* (0.04)
HomePossessions		5.87* (0.65)	5.87* (0.65)	5.36* (0.65)
NuclearFamily		0.62 (1.47)	0.44 (1.45)	0.42 (1.44)
ForeignLanguage			−2.24 (3.71)	−1.74 (3.71)
LanguageMissing			−23.99* (1.55)	−23.37* (1.54)
Perc.Immigrants				−24.20 (21.04)
MeanISEI				1.96* (0.28)
Technical				−25.56* (5.04)
Vocational				−78.35* (5.74)

variable	M1	M2	M3	M4
Lower Sec				−137.40* (20.25)
TechXFirst-Gen				−1.84 (6.41)
TechXSecond-Gen				4.31 (11.35)
TechXMixed				−0.75 (3.77)
VocXFirst-Gen				−0.70 (6.35)
VocXSecond-Gen				−0.01 (10.16)
VocXMixed				3.41 (4.16)
LSXFirst-Gen				45.07 (23.86)
LSXSecond-Gen				58.49 (34.76)
LSXMixed				12.99 (26.07)
Mean School Int.	361.42* (27.91)	337.43* (27.66)	340.55* (27.34)	300.02* (28.55)
School Var.	3439.65	3081.80	2948.13	1090.69
Student Var.	3831.75	3771.34	3734.39	3739.78
N	29573	29573	29573	29573
Deviance	1247638	1245543	1244257	1240724

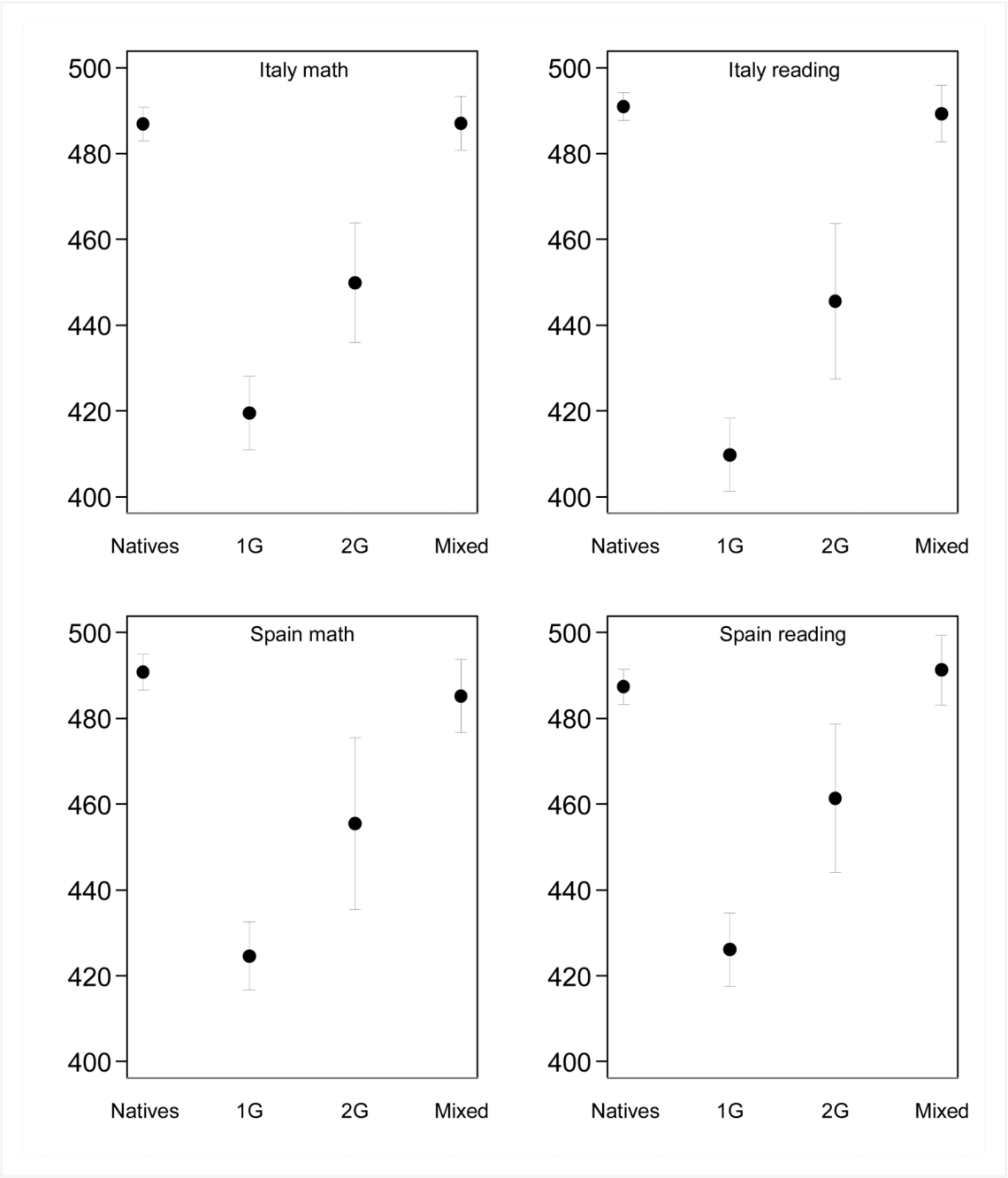

FIGURE 1. Mathematical and Reading Literacy of Natives and Children of Immigrants in Italy and Spain (PISA 2009)

Note: Mean scores of native, first generation (1G), second generation (2G), and mixed-parent students. Circles show point estimates calculated using final sampling weights and all five plausible values; lines show 95% confidence intervals calculated using all 80 replicate sampling weights and all five plausible values.

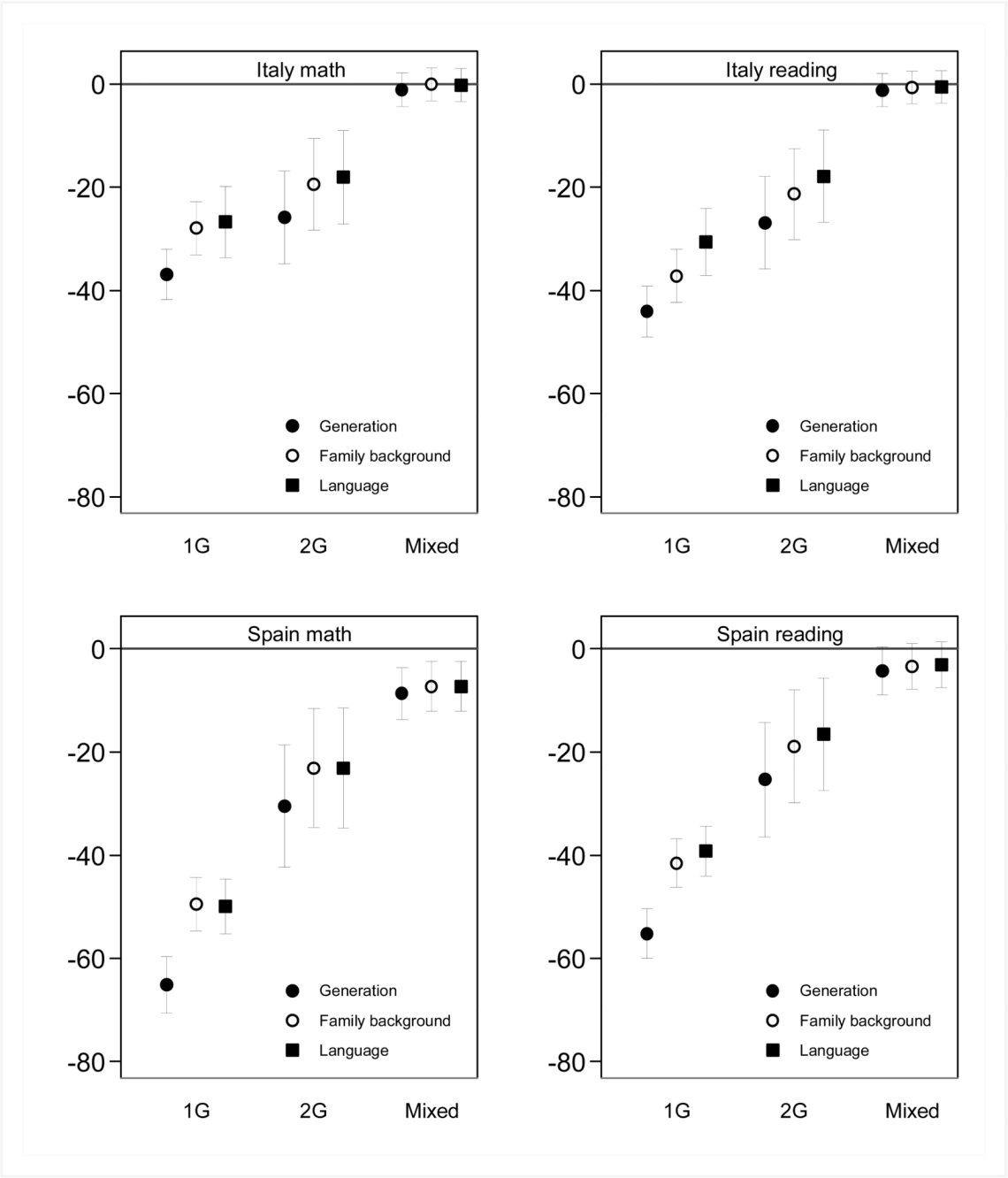

FIGURE 2. Achievement Gaps between Natives and Children of Immigrants in Mathematics and Reading Competences in Italy and Spain (PISA 2009)

Note: Estimated difference in score for first generation (1G), second generation (2G), and mixed-parent students as compared to natives in models 1 (closed circles), 2 (open circles), and 3 (squares) with 95% confidence intervals (lines). Model 1 includes immigrant generational status, age, sex, region (in the case of Italy) and area of residence as covariates. Model 2 incorporates the highest parental occupation and education, home possessions, and family structure. Model 3 adds language spoken at home. All models include school random intercepts, use all five plausible values and include student and school weights.

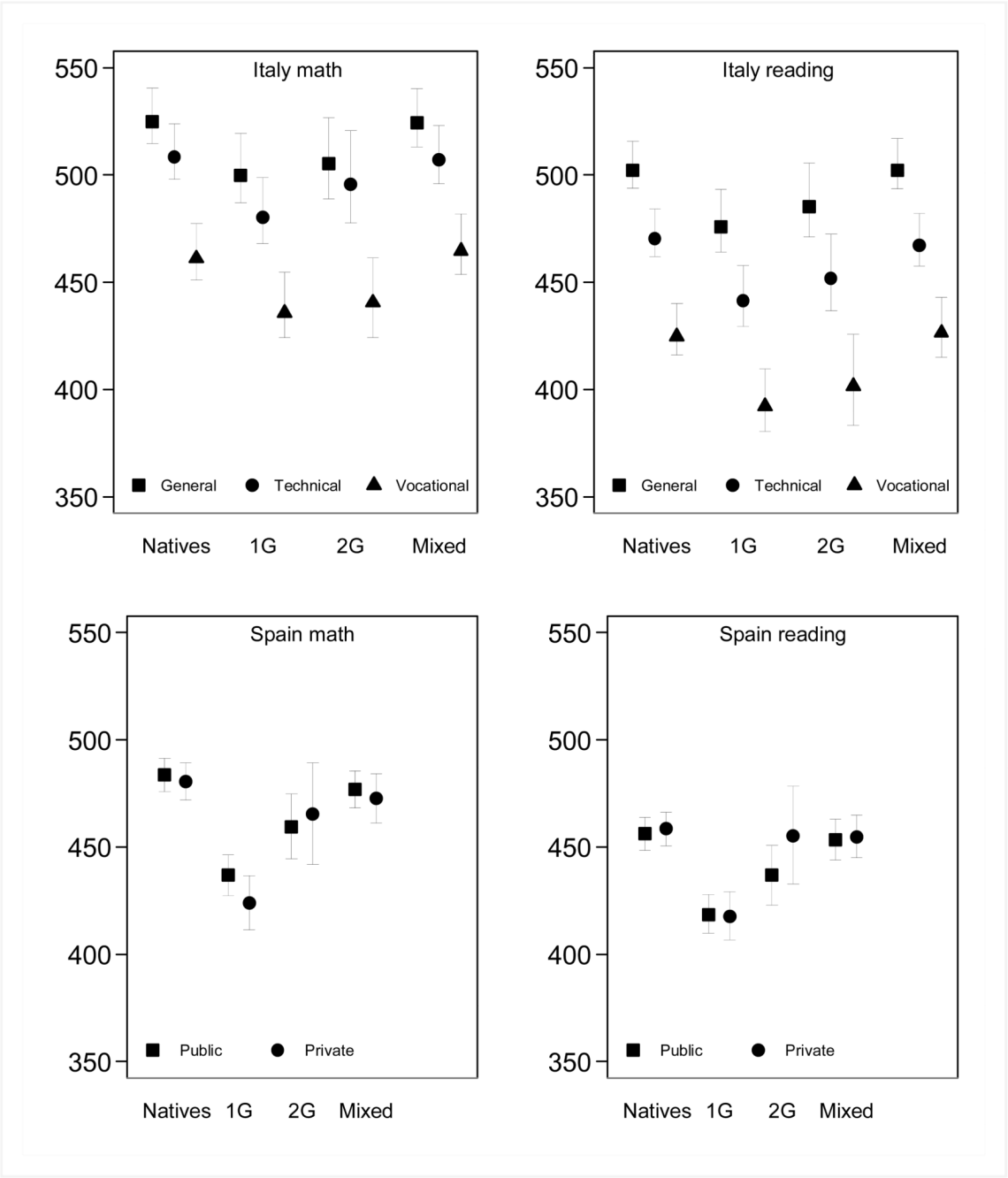

FIGURE 3. Predicted Scores in Mathematics and Reading Competences by Immigrant Status and School Type in Italy and Spain (PISA 2009)

Note: Predicted score, by generational status and school type, of hypothetical male student who is 15.7 years old, speaks an official language of his country of residence, has at least one parent with a secondary education (but no parents with higher education), has a parental occupation status index of 47, has a home possession index of 0, lives in a nuclear family, and attends a town-based school in which 4% of students are first generation immigrants and the mean socio-economic index of students is 47. Symbols are predicted scores with 95% confidence intervals (lines). Models included school factors and interactions between

tracking and school type and immigrant generational status. All models allow for school random intercepts, use all five plausible values and include student and school weights.

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TABLE 1

Descriptive Statistics for Italy and Spain: Means or Percents (standard deviations)

		Italy				Spain			
		Natives	**1st generation**	**2nd Generation**	**Mixed couples**	**Natives**	**1st generation**	**2nd Generation**	**Mixed couples**
Family background									
Parental educational level (%)	ISCED[a] 1	1.3	6.4	6.4	0.6	9.7	10.4	11.2	5.7
	ISCED 2	23.2	15.3	22.5	16.9	20.6	16.7	23.6	14.2
	ISCED 3b/c	6.2	7.2	3.8	5.9	2.7	1.1	1.0	2.8
	ISCED 3a/4a	37.0	37.8	29.1	38.9	23.6	28.9	18.7	27.6
	ISCED 5b	5.8	8.5	7.5	8.9	12.5	10.6	11.9	15.5
	ISCED 5a/6	26.6	24.8	30.7	28.9	30.9	32.3	33.7	34.2
Home possessions index	Min (−6.9)	0.1	−0.8	−0.6	0.0	−0.1	−0.8	−0.4	−0.1
	Max (3.7)	(0.8)	(0.8)	(0.9)	(0.8)	(0.8)	(0.7)	(0.8)	(0.8)
Parental occupational status	Min (16)	47.6	35.3	40.8	47.6	45.9	38.1	44.2	47.2
	Max (90)	(16.3)	(12.6)	(17.8)	(15.9)	(17.0)	(14.4)	(17.0)	(16.1)
Family structure (%)	Nuclear	88.8	79.0	85.6	84.8	87.3	76.3	78.4	75.9
	Single parent family	11.2	21.0	14.4	15.2	12.7	23.7	21.6	24.1
Language (%)	Survey country	88.7	22.3	54.9	87.4	97.6	70.5	71.6	95.9
	other	0.2	63.5	27.5	3.3	1.3	29.1	27.6	3.8
	Missing	11.2	14.2	17.5	9.2	1.2	0.4	0.8	0.4
School characteristics									
School ownership (%)	Public	-	-	-	-	66.9	82.2	75.8	71.0
	Private	-	-	-	-	33.1	17.8	24.2	29.0
Track	General	46.2	16.3	33.0	43.9	-	-	-	-
	Technical	29.7	26.5	26.5	31.8	-	-	-	-
	Vocational	23.4	41.7	35.5	23.0	-	-	-	-
	Lower Sec	0.6	15.5	5.1	1.3	-	-	-	-
Controls									
Gender	Female	49.3	48.5	43.9	49.1	49.5	51.6	51.9	53.4
Age	Min (15.3)	15.7	15.7	15.7	15.7	15.9	15.8	15.8	15.8
	Max (16.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)

		Italy				Spain			
		Natives	**1st generation**	**2nd Generation**	**Mixed couples**	**Natives**	**1st generation**	**2nd Generation**	**Mixed couples**
	None	0.0	0.2	0.1	0.0	0.1	0.2	0.1	0.1
Class proportion immigrant	All	(0.1)	(0.3)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
School socioeconomic composition	Min (22.5)	47.2	41.9	46.2	47.2	45.4	43.1	44.2	46.1
	Max (71.6)	(8.4)	(7.6)	(9.2)	(8.6)	(8.9)	(6.2)	(7.6)	(8.5)
School community	Village	1.2	2.8	3.5	1.2	4.4	1.6	4.9	2.9
	Small town	15.4	21.3	15.8	18.1	27.9	20.1	27.0	23.1
	Town	52.0	44.2	35.5	51.7	33.4	37.1	35.5	35.1
	City	23.1	23.2	27.0	19.6	26.4	26.5	16.3	27.3
	Large city	8.3	8.5	18.2	9.4	7.9	14.8	16.4	11.6
Country									
Sample									
Share		88.5	4.0	1.3	6.3	84.4	8.4	1.0	6.2
N		25,989	1130	340	2114	19,182	1,677	250	1,490

Source: PISA, 2009

Note: All estimates based on final sampling weights. Standard errors are in parentheses and are based on replicate sampling weights.

[a]ISCED = International Standard Classification of Education

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