Goals and Gaps: Educational Careers of Immigrant Children *

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Abstract

We study the educational choices of children of immigrants in a tracked school system. We first show that immigrant boys in Italy enroll disproportionately into vocational high schools, as opposed to technical and academically-oriented high schools, compared to natives of similar ability. Immigrant girls, instead, choose similar schools as native ones. We then estimate the impact of a large-scale, randomized intervention providing tutoring and career counseling to high-ability immigrant students. Male treated students increase their probability of enrolling into the high track to the same level of natives, also closing the gap in terms of grade retention. There are no significant effects on immigrant females, who exhibit similar choices and performance as native ones in absence of the intervention. Increases in academic motivation and the resulting changes in teachers' recommendation regarding high school choice explain a sizable portion of the effect, while the effect of increases in cognitive skills is negligible. Finally, we find positive spillovers on immigrant classmates of treated students, while there is no effect on native classmates.

Keywords: tracking, career choice, immigrants, aspirations, mentoring

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1 Introduction

Migrant flows have grown considerably over the past decades, increasingly involving families with children. In 2012, 12 percent of 15-year-old students in the average OECD country had an immigrant background (OECD, 2015). The growing number of immigrant students has profoundly changed the challenges that schooling systems have to face in order to ensure skill development in a diverse student population and promote social cohesion. The ethnic gap in achievement test scores and socioemotional abilities increases substantially during childhood (Fryer Jr and Levitt, 2004; Heckman et al., 2006; Cunha and Heckman, 2007). The problem is exacerbated in schooling systems characterized by stratification in high school tracks, as early tracking may lead to the educational segregation of children from disadvantaged backgrounds in schools characterized by lower quality of education. This could ultimately have long term effects on the skills and occupational careers of children from immigrant families, reducing social mobility and creating unequal opportunities (Guyon et al., 2012; Brunello and Checchi, 2007).

This paper documents the extent of educational segregation of immigrant students and evaluates the effectiveness of an innovative program aimed at steering high-achieving immigrants towards high schools that fit their academic potential. We do so in the context of Italy, where the schooling system is characterized by tracking in the transition from middle to high school. While uncommon in the Anglosaxon world, this type of stratification is the norm among OECD countries, with the age of selection varying from 10 to 16 and an average of three high school tracks per country (OECD, 2013).

We start by showing that immigrants tend to choose vocational over technical or academic-oriented curricula, relative to native students with similar ability. We denote this phenomenon as 'educational segregation'. Importantly, we are able to control for students' ability using a standardized test administered at the beginning of middle school. The gap in high school choices is greater for male immigrants and it mirrors an analogous differential in failure rates and in the track recommendations received from teachers. The gap in track choice for boys persists along the entire distribution of ability, while for girls it is found at the low end of the distribution but not at the high end: medium and high-achieving immigrant girls choose the same tracks as native ones of comparable ability. This gender pattern is consistent with evidence from various countries that boys increasingly lag behind in educational attainment and that the female-male educational advantage is larger for low-socioeconomic status (SES) families (Autor et al., 2016).

We then estimate the impact of an innovative program called "Equality of Opportunity for Immigrant Students" (EOP henceforth) that provided tutoring and career counseling to immigrant children displaying high academic potential. The curriculum of EOP included a number of meetings who helped students reflect on their aspirations and their potential through a series of psychological exercises based on Social Cognitive Career Theory (Lent et al., 1994). This paradigm views career development as a choice subject to contextual influences and constraints, so goals and self-efficacy are as important as cognitive skills in

shaping individual careers. Importantly, treated students were never advised to choose one track (e.g., academic or vocational) over the others: they were only encouraged to weigh their talents and aspirations while making their decision.

We evaluate the effects of EOP leveraging random assignment of the program across schools as well as unique data on students' careers, cognitive and soft skills, and parental background. The program was offered in 70 schools randomly chosen from a sample of 145 in Northern Italy, with the remaining 75 serving as controls. We obtained restricted-use data on educational careers and standardized test scores for all students in treated and control schools from the Italian Ministry of Education. Based on this information, we selected the 10 immigrant students with the highest standardized test scores in grade 6: in treatment schools these students were invited to participate in EOP through grades 7 and 8; in control schools they were not offered such program.[1]

We find that EOP was remarkably successful in reducing educational segregation. Treated males have a 44 percent lower probability to be retained and a 12 percent higher probability of attending an academic or technical high school (as opposed to a vocational one) relative to males in the control group. Indeed, treated immigrant males chose more demanding schools in the same proportion as native males of comparable ability. In other words, EOP completely closed the immigrant-native track choice gap at the end of grade 8. The effects are in the same direction but smaller and not significant for girls (for whom no educational segregation had been identified in the first place). Therefore, EOP increases immigrants' enrollment into technical or academic schools only when counterfactual enrollment rates lie below those of comparable native students.

To shed light on the mechanisms underlying these effects, we collected data on academic performance and on psychological traits. We find that male treated students display an improvement in cognitive skills, as measured by their standardized test score at the end of grade 8. Importantly, their soft skills also improve: they have higher aspirations and more confidence in their own abilities, and they perceive that environmental barriers will play a smaller role in their future choices, relative to the control group. All these improvements seem to have been internalized by teachers, who recommend treated boys for more demanding high schools. No effect is found on teachers' recommendations for treated girls, whose academic performance and aspirations were unaffected by the program. Following the approach of Heckman et al. (2013), we decompose the impact of EOP on (males') educational choices into experimentally induced changes in these observed mediating factors and changes in other (unmeasured) factors. We find that changes in aspirations and in teachers' recommendations induced by the treatment explain a sizable portion of the effect on track choice, while the effect of increases in test scores is negligible. Overall, these factors jointly explain 84 percent of the increase in the probability of choosing the high track,

[1] For the sake of exposition, in the rest of the paper we refer to these two groups as "treated" and "control", though we really mean "assigned to treatment" and "assigned to control". In other words, we present intention-to-treat estimates. We assess compliance with treatment assignment in Section 5.1.

suggesting that other (unmeasured) factors account for a minor part of changes in educational choices.

We also distinguish between the effects of the two main components of EOP –career counseling and academic tutoring– exploiting discontinuous changes in the amount of academic tutoring around fixed thresholds of pre-program standardized test scores. We fail to detect significant changes in the outcomes of interest around such thresholds, suggesting that the effect of EOP can largely be attributed to career counseling. This last finding is consistent with the results of the decomposition analysis, i.e., that changes in motivation play a greater role than changes in test scores in explaining track choice.

Our administrative data allow us to follow all students in our sample through the first two years of high school. This is important in order to assess the longer term effects of EOP on students' educational careers, particularly the risks associated with enrolling into more demanding high school tracks. Reassuringly, treated students are no more likely to be held back in a grade, nor to have to take make-up exams after the summer (as opposed to being directly admitted to the next grade). They are also no more likely to drop out. Therefore, treated students did equally well as control ones, despite attending (on average) more demanding high schools.

Finally, we find evidence of positive spillovers of the intervention on immigrant classmates of treated students, while there is no effect on native classmates.

Our work is related to several strands of literature. The first comprises evaluations of interventions aimed at reducing inequality in educational achievement and opportunities. Several interventions have targeted low achieving students and provided a combination of information on school options and mentorship on soft skills. Some of these programs were successful in reducing grade retention and high school dropout rates (e.g., Goux et al., 2017; Martins, 2010); others had zero or negative effects (Rodriguez-Planas, 2012). Our program can be seen as complementary to the ones cited above, as it targets a different population –high achieving students– with the aim of aligning their potential to more ambitious goals.[2] In this respect, the framing of our intervention is comparable to programs that help low income students apply to better colleges (e.g., Hoxby and Turner, 2015; Bettinger et al., 2012), with the important difference that we work with a younger population that ends up being stratified within compulsory schooling. Indeed, in educational systems characterized by early tracking, high school choice constitutes the most critical juncture in students' careers.[3]

A second strand of literature looks at the role of soft skills. Heckman et al. (2006), Heckman and Kautz (2012), and Kautz et al. (2014) stress the importance of personality traits and motivations as factors that reduce social problems and are highly valued in the labor market. In addition, low aspirations and

[2]Different types of interventions have targeted students' inaccurate beliefs about their chances of succeeding in competitive academic environments. Bobba and Frisancho (2016) provided students with feedback on their performance in a (mock) exam for admission to selective high schools in Mexico, while Goodman (2016) estimates the effect of mandated exams on selective college admission in the US.

[3]In contrast to this early stratification, Goldin and Katz (2009) refer to the US system as "open and forgiving".

high perceived socioeconomic barriers can lead students to choose less demanding educational paths, perpetuating a negative cycle (Dalton et al., 2014; Genicot and Ray, 2014; Mookherjee et al., 2010). Recent contributions show that students from disadvantaged backgrounds often lack ambition and suffer from negative stereotypes, both at the high end (Hoxby and Avery, 2012) and at the low end (Guyon and Huillery, 2016) of the ability distribution. Our paper corroborates these findings for high ability students with an immigrant background and – importantly – shows that it is possible to modify aspirations and soft skills through a program that combines academically relevant information with psychological tools.[4]

Finally, our work speaks to the literature on tracking within education systems.[5] Some of the existing evidence points to the positive effects of tailored instruction (Duflo et al., 2011) and to a lack of negative consequences of school stratification in the long run (Dustmann et al., 2017). Other authors find that postponing school stratification or increasing the proportion of seats in academic tracks leads to improved educational outcomes (Malamud and Pop-Eleches, 2011; Guyon et al., 2012). Brunello and Checchi (2007) also show that parental background has stronger effects on labor market outcomes when tracking starts earlier. Our goal is not to assess what would be the effects of postponing or modifying high school tracking. Rather, we show that –within an existing tracking system– it is possible to reduce the mismatch between ability and high school choice for a population that may be particularly misinformed and disadvantaged: immigrant students.

The remainder of the paper is organized as follows. Section 2 describes the institutional setting and provides evidence of the educational segregation of immigrant children in Italy. Section 3 illustrates the components of the intervention and our evaluation design. Section 4 describes the data and section 5 the results. Finally, Section 6 concludes discussing the policy implications of our findings.

2 Institutional background

2.1 Immigrants in Italian schools

Immigration is a relatively recent phenomenon in Italy. The number of (legal) foreign residents increased from 781,000 to 5 million between 1990 and 2015 – 1.4 and 8.3 percent of total residents, respectively. The majority of immigrants in Italy come from low and middle income countries, and are characterized

[4] Alan and Ertac (forthcoming) show that non-cognitive skills such as patience and self-control are malleable. In particular, they show that a treatment targeted at improving intertemporal decision making in a classroom environment through training of teachers has significant impacts on experimental and real-life outcomes.

[5] For a review, see Betts (2011). Differently from systems where tracking takes the form of sorting higher ability students into specialized instruction (e.g., gifted programs, Card and Giuliano, 2016) or into magnet schools (e.g., Pop-Eleches and Urquiola, 2013) – within the same type of education – our context is one where tracking involves sorting into high schools with very different curricula and differential access to college.

on average by lower socioeconomic background than native households.[6] They are also younger and have more children than natives, so the share of foreigners among students is higher than their share in the total population.

At the beginning of the 2016/17 school year, immigrant children represented 10.8 percent of students in primary school, 9.7 percent in middle school, and 7.2 percent in high school (see Appendix Figure A.3). We observe a decline in immigrants' presence from middle to high school, reflecting higher dropout rates of immigrants in later grades compared to natives. Importantly, the share of immigrant students also differs between different types of high schools. Immigrants represent 12.5 percent of the student population in vocational schools, 8.5 percent in technical schools, and only 4.1 percent in academic schools. As we detail in the next section, these three types of high schools offer very different educational and employment opportunities.

2.2 Secondary education in Italy

Italian pupils normally enter formal schooling the year they turn 6 and the compulsory schooling age is 16. Pre-university education comprises five grades in elementary school, three grades in middle school, and five grades in high school. At the end of middle school, students must choose among three different types of high schools: vocational schools (*istituto professionale* and *formazione professionale*), technical schools (*istituto tecnico*), and academically-oriented schools (*liceo*). Students are free to enroll in whatever track they choose, and there is no tracking by ability.

The three tracks have the same duration, 5 years, but differ widely in terms of curriculum, difficulty, and prestige.[7] Vocational schools focus on practical training in specialized manual, low-skilled jobs (e.g., plumber or hairdresser), while devoting a limited amount of time to general education. They are meant to prepare students for immediate employment at the end of high school. Technical and academic schools offer instead a comprehensive curriculum in math, humanities, and science. In principle, academic schools are primarily intended for students who want to pursue a university degree, whereas technical schools complement theory with practical training in specific non-manual jobs (e.g., accountant or graphic designer). Although enrollment in college is possible from all tracks, very few students who attended vocational education decide to obtain further education.[8] In practice, both academic and technical schools offer much better educational and employment prospects than vocational schools. Therefore,

[6] Figure A.1 in the Appendix shows the number of immigrants by nationality in 2015 (first 20 nationalities). Figure A.2 compares the income distribution across immigrant and native families, respectively.

[7] Regarding duration, the only exception to the 5-year rule is a sub-track of the vocational track (*formazione professionale*) that lasts 3 years.

[8] Enrollment in college is not possible for students in the sub-track of the vocational track (*formazione professionale*) that lasts 3 years. In the 2015-16 school year, less than 4 percent of students enrolled in college had attended a vocational track. Furthermore, students who enroll in college after vocational school tend to take longer to complete college and to dropout at higher rates.

we define vocational schools as the "low-track", and we group technical and academic schools together into the "high-track".

Appendix Table A.1 compares average outcomes by track four years after graduation, separately by gender and for native vs. immigrant students.[9] Panel A shows that only 14.5 percent of Italians graduated from vocational schools, with no relevant differences by gender. They exhibit a much lower probability of pursuing tertiary education compared to high-track graduates: 20.5 percent, as opposed to 70.4 percent. College dropout rates in university also differ dramatically between the two groups, at 30.6 and 11.8 percent, respectively. In light of these figures, employment rates and salaries four years after graduation are not really informative about labor market prospects, as only a selected group of high-track graduates has already entered the labor market. However, we can compare the share of those "Not in Education, Employment or Training"(NEET), which reaches 29 percent among low-track graduates, 10 percentage points higher than among other graduates. This is particularly surprising, as in principle vocational schools should prepare students for immediate employment. Finally, graduates from vocational schools also have a higher probability – about one third – of regretting their choice. These figures are fairly similar by gender.

Panel B of Appendix Table A1 shows comparable statistics for immigrant students. Conditional on completing the same high school track, educational and occupational outcomes are remarkably similar to those experienced by natives. Also among immigrants, graduates from vocational schools exhibit lower enrollment into (and higher dropout rates from) tertiary education, as well as a higher prevalence of NEETs. A stark difference emerges, however, when we compare high school choice: 37 percent of immigrants (42 percent among males) graduate from the low track, compared to the aforementioned 14.5 (15.6 for males) of natives. In light of the (worse) outcomes experienced on average by low-track graduates, the over-representation of immigrants in this group raises concerns about immigrants' future career opportunities and, eventually, their prospects for successful integration and upward social mobility.

Of course, enrollment rates and outcomes across groups largely reflect endogenous sorting by ability and socioeconomic background. Below we provide a more informative comparison of transitions to high school between immigrants and natives, exploiting a unique dataset that matches administrative data on educational careers with standardized test scores and information on parental background.

2.3 Educational segregation

As we discuss in detail in Section 4.1, Italian students take a series of standardized tests of proficiency in reading and math at various points of their careers. These tests are known as INVALSI, from the name of

[9]The source of these data is the "Survey on Educational and Professional Paths of Upper Secondary School Graduates", conducted in 2015 by the Italian National Statistical Institute (ISTAT) on a representative sample of about 26,000 students graduating from high school in 2011.

the agency that administers them. The tests are identical for all students in a given grade and are blindly scored, so results are fully comparable across schools. Throughout the paper, we use the standardized test score obtained in grade 6 (INVALSI6) as a proxy of students' ability at the beginning of middle school.

Using a unique dataset that matches the above scores with students' educational careers, we can compare the average probability of enrolling into the high track for native and immigrant students conditioning on their initial ability.[10] Figure 1 plots the probability of enrolling in a "high track" (academic or technical) by quintile of INVALSI6, separately for male and female students (left and right panel, respectively).

[Insert Figure 1]

Squares (connected by a black line) refer to native students, while circles (connected by a grey line) to immigrants. Not surprisingly, the probability of choosing the high-track is increasing in INVALSI6 for all groups. However, such probability remains significantly lower for immigrant males than for native ones. The gap is larger in the upper part of the ability distribution, reaching 16 percentage points (or 17 percent of the mean) in the top quintile.[11] By contrast, the gap between immigrant and native females is much smaller and it is negligible in the upper part of the ability distribution.

The literature has documented an educational gender gap in favor of girls during teenage years, possibly related to gender roles and norms imposing social control of daughters and more lax regulations for sons (Lopez, 2003). This gap is particularly pronounced among minorities.[12] The focus of our paper is not on the gender gap in high school enrollment, but on the gap between natives and immigrants: in particular, we investigate how psychological factors and academic performance contribute to differences in track choice, and test if the native-immigrant gap can be reduced through a specific policy. The fact that this gap differs between boys and girls, as shown in Figure 1, will help understand the differential impact of our intervention across genders.

[10] As we explain in Section 4, this dataset was constructed for the evaluation of our intervention, which took place in five large cities of Northern Italy. The data used in Figure 1 are those from schools in the control group, which were unaffected by our intervention.

[11] Appendix Table A.2 shows that the gap in educational choices between native and immigrant males persists when conditioning in addition on family background, as measured by parents' education, employment status, and occupation.

[12] Among others, Jackson and Moore III (2008) document that in the US black males lag behind black females on a range of key educational outcomes, e.g., high school graduation. Autor et al. (2016) investigate the potential reasons for this and show evidence that family disadvantage disproportionately inhibits boys compared to girls (as opposed to explanations invoking a genetic or biological advantage of girls at birth or a pure neighborhood effect).

3 The intervention

The intervention we evaluate was developed in collaboration with the Italian Ministry of Education and three bank foundations.[13] The program was called "Equality of Opportunity for Immigrant Students" (EOP) and aimed at aligning the goals and aspirations of high-achieving immigrant students with their ability, in order to favor congruous educational choices at the end of middle school. The intervention took place during the last two years of middle school (grades 7 and 8) and was administered in a randomized fashion in five large cities of Northern Italy: Milan, Turin, Genoa, Brescia, and Padua.

The first dimension of targeting involved the definition of the school sample: schools were eligible to receive the program if they had at least 20 immigrant students, where 'immigrant' was defined as being a citizen of a country with lower GDP than Italy.[14] In the five cities there were 145 such schools: 70 were randomized into the treatment group and 75 in the control group.[15]

The second step was the definition of the target students. Because the goal of EOP was to reduce mismatch in track choice for high-achieving immigrants, within each school we selected the high-achievers as the 10 immigrant students with the highest standardized test score in grade 6 (INVALSI6). In the treatment schools these 10 students took part in the EOP program while in the control schools they did not. In both sets of schools, these top 10 immigrant students were surveyed and their academic performance and school choices were followed through administrative records. In our empirical analysis we will thus compare outcomes between the 10 immigrant students with the highest INVALSI6 scores in treated and control schools.

The EOP program consisted in a career choice consultancy that was developed based on Social Cognitive Career Theory (Lent et al., 1994). This paradigm views career development as a choice subject to contextual influences and constraints. Under this view, goals and self-efficacy are as important as cognitive skills in shaping individual careers.[16] Specifically, "persons with adequate skills but weak self-efficacy beliefs in a particular performance domain may prematurely rule out that domain from further occupational or academic choice consideration" (Brown, 2002). The goal of EOP was to help high-achieving immigrant students to identify educational and occupational goals congruous with their talents and to strengthen self-efficacy beliefs. It should be stressed that the approach was not to unconditionally push students towards high tracks, but to make them aware of existing opportunities and of their own

[13] The program was financed by three philanthropic institutions operating in Northern Italy, namely Fondazione CARIPLO, Compagnia di San Paolo, and Fondazione Cassa di Risparmio di Padova e Rovigo.

[14] This excludes from the program immigrant children from high income European countries, for whom no educational segregation exists.

[15] Randomization at the school level lowers the risk of spillovers from the treated to the control group, compared to randomization at the individual-level. To enhance comparability between the two groups of schools we stratified randomization by province and school size.

[16] Self-efficacy can be defined as people's beliefs about their capabilities "to organize and execute courses of action required to attain designated types of performances" ; see Bandura (1986), p. 391.

skills and resources, so they could make more informed choices.

The protocol involved a total of 13 meetings and the program guidelines required participants to attend at least 75 percent of the meetings. All meetings were administered by career counselors with graduate degrees in psychology and significant experience in career choice guidance for secondary school, especially with immigrant children. Some of the meetings were one-to-one, while others were in groups.

Students had five (one-to-one) meetings with a counselor and worked on tasks that prompted them to reflect on their goals, the personal resources needed to achieve such goals, and whether they already had or they needed to develop such resources. Examples of the tasks that students worked on include: (i) Think about your past life, indicate five study experiences and five other experiences that you have completed successfully. Consider now such experiences one by one and briefly indicate where and with whom it happened, what you did and which personal resources helped you doing well in that thing - your knowledge, skills, personality traits, motivations and everything you believe it was important to have; (ii) Choose a number of professions that interest you. For each of them, indicate which resources are needed (knowledge, skills, personality traits, motivations, ...) and divide them into "I have it" and "I need to develop it"; (iii) List the results you would like to achieve with your job, from the most to the least important.

Five other meetings were held in groups, where counselors provided treated students in each school with information about the Italian education system as well as peer guidance through videos displaying success stories of older immigrant students.

Two further meetings, respectively at the beginning and at the end of the intervention, were intended for parents. In the first meeting counselors described the content of the program, while in the second meeting they shared with parents aspirations and barriers perceived by students. Parents also received a brochure, translated into their mother tongue, summarizing the main options for secondary education in Italy.[17]

Finally, towards the end of the intervention career counselors met with teachers and discussed the educational path and high school track chosen by the students involved in the intervention.

[Insert Figure 2]

Figure 2 shows the timeline of the intervention and the realization of the main outcomes of interest. In grade 6 we selected the eligible students on the basis of the standardized test score they got that year. EOP meetings started at the beginning of grade 7 and continued through grade 8, until the month of March. By the month of January of grade 8, students receive a formal "recommendation" by their teachers about the high school track that teachers deem most appropriate for them. This recommendation is not binding

[17] While it would be very interesting to disentangle the role that parents play in high school choice (e.g., Dustmann, 2004; Giustinelli, 2016), it was not possible to survey parents within our experiment.

but it serves as a signal to the students and their families. In February all students have to pre-register for the high school they wish to attend through a web portal of the Ministry of Education. This choice can later be modified (though this is not very common), so we use the high school track in which students actually enroll at the end of grade 8 as our variable of interest.

A potential concern with an intervention like EOP is that participants who enroll in the high-track as a result of the program would subsequently experience difficulties in completing this (more demanding) high school. For this reason, the counseling and career choice module was accompanied by a module on Cognitive Academic Language Proficiency (CALP). CALP was not aimed at improving students' knowledge or their cognitive skills but, rather, at teaching them a method for studying several subjects – Italian grammar, geography, algebra, and geometry. Since the main motivation of the CALP module was to decrease the risk of subsequent failure for immigrant students enrolling in demanding tracks, students with a lower INVALSI6 were offered a higher number of CALP meetings. Specifically, students scoring below 65 out of 100 in INVALSI6 were invited to 29 meetings (55 hours tutoring). This group constituted 66 percent of all treated students. Students scoring between 65 and 80 (30 percent of the treatment group) were invited to 17 meetings (32 hours tutoring); finally, students scoring above 80 (4 percent of treatment group) were not invited to CALP sessions.

Due to ethical concerns we could not implement a fully factorial design; in particular we could not have a treatment arm that received career counseling without CALP. As explained above, it was considered that encouraging students to pursue ambitious goals without endowing them with the tools for succeeding in demanding high schools may have created a risk of harm. However, we can still assess the relative effectiveness of CALP by exploiting the different cutoffs for the number of CALP meetings described above. We do this in Section 5.2.

4 Data

4.1 School choice and academic performance

The first challenge in constructing the dataset for our analysis was to match information on school careers provided by the Ministry of Education (MIUR) with standardized test scores collected by the Institute for the Evaluation of the Italian Schooling System (INVALSI), an independent public agency that monitors students' performance. This had never been done before and required a new protocol for collaboration among the two organizations. In fact, in order to preserve the anonymity of standardized tests scores, INVALSI and MIUR use different codes to identify each student and only the school has the crosswalk to match the two codes. The protocol of our study involved obtaining the match of INVALSI and MIUR records for all students completing grade 6 in 2012 (17,369 students in total) from the 145 middle schools

in our sample.[18]

Administrative data from school registry

From the MIUR administrative registry we take the following variables that we use as outcomes for each student: (i) track choice at the end of grade 8; (ii) track recommended by teachers half-way through grade 8; (iii) grade retention for all grades between 6 and 9 (included); (iv) number of retakes taken after the summer of grade 9;[19] and (v) teachers' assessment of student's behavioral conduct during grades 8 and 9.

The registry also contains some information on students' background, in particular: citizenship, country of origin, date of birth and, of course, school and class attended throughout their careers.

INVALSI tests

Since 2010, INVALSI administers standardized reading and math proficiency tests to all students at the end of grades 2, 5, 6, 8, and 10. Such tests resemble those administered by the OECD Programme for International Student Assessment (PISA) to representative samples of 15-year old students. They consist of a series of questions including multiple choice as well as open ended questions, the exact structure of the test varying by grade.[20] Importantly, the test is identical for all students in a given grade, it is administered on the same day (at the end of the school year), and it is blindly scored, so results are fully comparable across schools in Italy. This is crucial for the purposes of our analysis, because it allows us to compare the educational choices of immigrant and native students holding constant their academic proficiency.

We use two test scores for the cohort of students who were in grade 6 in 2012. The first is the standardized test score for grade 6 (INVALSI6), which we include as a regressor in all specifications to control for students' initial ability. The second is the test score for grade 8 (INVALSI8), which is one of our outcomes, as we want to test if EOP led to an improvement in academic performance.

4.2 Soft skills

We complement the above datasets with original survey data on soft skills collected at the end of grade 8. The goal of this survey is to allow us to better understand what mechanisms shape career-related interests and high school track choice. The survey was administered to all treated students and to a random 50

[18] As described in detail in the next section, our sample is representative of mid-to-large sized schools in urban areas of Northern Italy. Unfortunately, similar data are not publicly available for the entire student population.

[19] While through middle school pupils are either admitted to the next grade or retained, in high school they can also be admitted to the next grade conditional on re-taking (and passing) after the summer an examination in one or more subjects in which they were deficient during the year.

[20] In general, math questions are related to calculus, geometry, probability and algebra, while reading questions are related to text comprehension and grammar.

percent sample of control schools.[21] The questionnaire was developed by a team of psychologists based on Social Cognitive Career Theory and includes three main sections: (i) Goals. This comprises both educational (e.g., university degree, diploma or less) and occupational targets (e.g., blue collar, white collar, managerial or entrepreneurial jobs) that the student aims to achieve; (ii) Self-efficacy. This section includes a student's own assessment of the extent to which he or she possesses the skills and resources required to achieve the goals stated above, as well as broad notions of self esteem; (iii) Barriers. A series of questions elicit students' perceptions of environmental barriers, be they related to economic constraints, racial prejudice, or family preferences that differ from a student's own plans.

Following Thompson (2004), we summarize the individual variables described above into interpretable aggregates using factor analysis. This method extracts latent factors from subsets of psychological measures by maximizing (minimizing) the correlation across measures within (between) subsets. The measures associated with each factor and their respective loadings are reported in Appendix Table A.4. As discussed in Heckman et al. (2013), this approach is particularly suited for decomposing treatment effects between different mediating factors, as we do in Section 5.2.

4.3 Sample and randomization check

Our working sample at the inception of EOP comprises 1,217 students: 597 in treated schools and 620 in control ones.[22]

[Insert Table 1]

Table 1 reports average characteristics of the treatment and control group at the start of our intervention. We distinguish between individual student characteristics (Panel A) and family background (Panel B). Half of the students in our sample are girls, 56 percent are first generation immigrants, and 26 percent were born before 1999 (the typical birth year of the cohort in our study). About 35 (33) percent of their mothers (fathers) have not completed high school, 46 (50) percent have a high school diploma, and 19 (17) percent have post-secondary education. Unemployment rates are about 8 percent for mothers and 10 percent for fathers. The share of mothers only working at home is 38 percent, while that of fathers

[21] We chose not to administer the survey to half of the control schools because we wanted to be able to test if filling in a questionnaire on goals and perceived barriers may constitute a 'treatment' in itself. In Table A.3 we show that students in control schools involved and not involved in the soft skills questionnaire do not systematically differ in terms of high-school choice, grade retention, and test scores in grade 8.

[22] By construction, the sample should have comprised 1,451 students, that is, $10 \times (70 + 75) = 1{,}450$ but in one school the 10th and 11th students obtained the same INVALSI6 score and were both eligible for the program. For 70 students it was impossible to match the MIUR and INVALSI identifiers, which reduced the sample to 1,381 students. In addition, some students were retained in grade 6, moved to another school, or dropped out between the moment when they took the INVALSI6 test and the beginning of grade 7, leading to the above sample of 1,217. Appendix Table A.5 shows that missingness is not selective across treatment and control schools.

is negligible. Among those working outside the home, 35 (57) percent of mothers (fathers) have a blue collar job, and 32 (18) percent a white collar job. Importantly, none of the student or family characteristics differ significantly between the treatment and control sample, indicating that our randomization was successful.

[Insert Figure 3]

Turning to the baseline academic performance of the students, Table 1 shows that the mean of the standardized test score INVALSI6 is 60.93 in the treatment group and 60.71 in the control one (not significantly different). To get a more complete picture, Figure 3 plots the distribution of INVALSI6 across three groups of students in our 145 schools: native students, all immigrant students, and the 10 immigrant students with the highest score (i.e., our treated and control groups). Although immigrants generally exhibit lower schooling performance than native students, the top 10 immigrant students in each school are comparable to natives in the medium-upper part of the distribution. As we previously showed in Figure 1, however, these immigrants choose high school tracks that are less prestigious (and less demanding) than those chosen by natives with comparable ability, particularly males.

5 Results

In this section we estimate the impact of EOP on educational choices and grade retention, separately for males and females, and we decompose treatment effects into several mediating factors. In addition, we estimate impacts on longer term outcomes and spillover effects on non-eligible students in treatment schools, comparing them to non-eligible students in control schools.

5.1 Educational choices and grade retention

In Table 2 we estimate the impact of EOP on high school track choice. The dependent variable is a dummy equal to 1 for students who choose the high track (which comprises academic and technical high schools) and 0 for those who choose the low track (vocational schools). The explanatory variable of interest is EOP, an indicator for whether a student attends a middle school that has (randomly) been selected to receive our intervention. The coefficient of this dummy should thus be interpreted as the intention-to-treat (ITT) effect of being assigned to treatment group. Odd-numbered columns condition on treatment only, while the specifications in even-numbered columns also include a squared polynomial in INVALSI6, a dummy for first generation immigrants, and province fixed effects. In all cases we cluster standard errors at the school level, the unit of randomization.

[Insert Table 2]

According to the univariate regression in column 1, assignment to EOP increases the probability of choosing the high track by 5 percentage points, on a baseline rate of 75 percent. As expected, given random assignment, such estimate is largely unaffected when controlling for student characteristics and province (column 2). However, the average effect masks important differences by gender. EOP increases males' enrollment into the high track by 8 to 9 percentage points, up from a baseline rate of 67.4 percent (columns 3 and 4). This is a 12 to 13 percent increase over the mean. By contrast, there is no effect on female students, who start, however, from a baseline enrollment rate of 82.4 percent (columns 5 and 6).

[Insert Figure 4]

Panel A of Figure 4 compares enrollment in the high track for high-achieving immigrant students randomized into the control group (leftmost bar), treatment group (middle bar) and for a group of native students with comparable ability in the first year of middle school (rightmost bar). Specifically, we match each immigrant student in our sample with one native student who obtained an identical score in INVALSI6. By construction, these three groups of students had the same standardized test score in the first year of middle school. The figure shows that two years later the immigrant boys who received EOP make similar choices compared to natives who started off like them, while the untreated immigrants have a significantly lower probability of choosing the high track. EOP thus prevented the type of educational segregation that we documented in section 2.3. Interestingly, Figure 4 confirms that immigrant girls make similar choices as native girls even in the absence of intervention.

Taken together, the evidence in Figure 1, Table 2, and Figure 4 highlights a remarkable feature of the intervention: EOP influences educational choices only when counterfactual enrollment rates into the high track lie below those of comparable native students. Therefore, EOP seems to align immigrant students' goals and aspirations to those of native students when there is an initial misalignment, as opposed to just pushing all immigrant students towards the high track. This is a very desirable feature of EOP, as it lowers concerns that treated students may end up is schools that are too difficult for them. In Section 5.3 we provide direct evidence in this respect.

[Insert Table 3]

Table 3 and Panel B of Figure 4 convey similar evidence for grade retention in grade 7 or 8. Although grade retention was not the primary outcome of interest of the intervention, it is arguably an important one. Indeed, grade retention is surprisingly high among male immigrant students in our sample: absent the intervention, it reaches 8.5 percent, as compared to only 4.2 percent for native males with a similar INVALSI6 score. This gap disappears in EOP schools, whereas there is neither a significant gap nor an effect for female students. In both respects, the effect on grade retention across genders is very similar to that on high school choice.

Overall, the results in Tables 2 and 3 point to sizeable and statistically significant effects induced by (random) assignment to the intervention for male immigrant students. Since there is one-sided non-compliance with treatment assignment, the average treatment-on-the-treated (ATT) effects on the subset of compliers are even larger. To assess the magnitude of the ATT, it is useful to start by describing the pattern of meetings attendance.

[Insert Figure 5]

Figure 5 shows that the pattern is quite heterogeneous, with more than 40 percent of immigrant boys and girls attending at least 87.5 percent of the meetings, another 20 percent attending between 75 and 87.5 percent of the meetings, and the remaining fractions attending less. Interestingly, about 15 percent of the students who were assigned to treatment ended up attending less than 12.5 percent of the meetings. Given this heterogeneity, there is no unambiguous way of defining treatment status. For this reason, in Table 4 we experiment with three alternative definitions.

[Insert Table 4]

In Panel A, we classify as treated all students attending at least one meeting (85 percent of the total sample). In Panel B we restrict the definition to students attending at least 75 percent of the meetings, in accordance with the program guidelines discussed in Section 3, which recommended attending at least this fraction. When adopting these definitions, the ATT effects on males range between a 9.4 to 12.5 percentage point increase in enrollment in the high track, and a 4.3 to 5.7 percentage point decrease in grade retention.

In Figure 6 we characterize compliers with treatment assignment, defining the treatment as in Panel B of Table 4, by the ratio of the first stage effect within specific sub-samples to the overall first stage (Angrist et al., 2016). Compliers are slightly more likely to be female, equally likely to be first and second generation immigrants, and more likely to be in the right grade ('Not late') given their age. The bottom panels of Figure 6 show that while female compliers are more likely to be from the top part of the initial ability distribution, male compliers are more likely to be from the bottom part, thus more in need for support.

[Insert Figure 6]

In Panel C of Table 4 we measure treatment 'intensity' by the fraction of meetings attended. The corresponding ATT estimate suggests that one standard deviation increase in the number of meetings attended increases enrollment into the high track by 4.2 percentage points and reduces grade retention by 1.9 percentage point for males. Of course, this estimate rests upon the assumption that the effect increases linearly with the number of meetings.

More generally, all three approaches in Table 4 recover the ATT effect only under strong (and untestable) assumptions about the relationship between number of meetings attended and treatment intensity. For this reason, in the rest of the paper we focus on the intention-to-treat (ITT) effect of EOP.

[Insert Table 5]

In Table 5 we examine heterogeneity of the ITT effect along additional dimensions beside gender; results for males and females are presented in columns 1-4 and 5-8, respectively. In columns 1 and 5 we interact assignment to EOP with a quadratic polynomial in the INVALSI6 score. The effect of EOP is the highest for students in the medium-upper part of the performance distribution (0.35 and 0.62 standard deviations above the mean for males and females, respectively). As for socioeconomic background, the negative coefficient on the interaction term between EOP and mother's education (columns 2 and 6) suggests that the effect is driven by students from disadvantaged families.[23] Instead, the effect does not differ between first vs. second generation immigrants (columns 3 and 7), nor between immigrants from EU vs. non-EU countries (columns 4 and 8). These results highlight the importance of addressing inequality of opportunity in educational choices that may be generated by differential access to information and support for low SES students.

5.2 Mechanisms

The results presented so far suggest that EOP had a strong effect on educational choices and grade retention of males, whereas the average effect was not significantly different from zero for females, although the effect was positive for females with low socioeconomic background. We next explore the mechanisms through which EOP impacted on such outcomes.

Personality and cognitive skills

[Insert Table 6]

In Table 6 we report the effects of EOP on the cognitive and personality skills described in Section 4.2.[24] Starting with personality skills, the intervention substantially increased students' aspirations, especially for males (+0.29 standard deviations) whereas the effect is weaker for females. EOP also reduced students' perceptions that their choices would be limited by barriers such as financial constraints, prejudice, or family plans. The effect is sizeable (a reduction in the index of barriers of 0.42 standard deviations) and virtually identical between males and females.[25]

[23] We obtain analogous results when measuring parental background using father's education.

[24] The sample differs across columns because questionnaires measuring personality skills were administered only to a 50 percent random sample of control students, see Section 4.2.

[25] Appendix Table A.6 shows that the effect is generally significant for the different psychological measures aggregated into the main principal components, even after we account for multiple hypothesis testing (last column).

Turning to cognitive skills, EOP increases the standardized test score in grade 8 (INVALSI8) for male students but not for females. The magnitude of the effect is $+0.16$ standard deviations, and is very similar for math and reading.

[Insert Figure 7]

Figure 7 compares the entire distribution of continuous intermediate outcomes – INVALSI8, aspirations, and perceived barriers – across treated, control, and native students who had the same standardized test score in grade 6. Overall, EOP produced sizeable effects on personality skills (reduced perception of barriers for both boys and girls, increased aspirations for boys), and it significantly improved cognitive skills of boys.

These changes in cognitive and personality skills induced teachers to revise their recommendations at the end of grade 8 (see the bottom-right panel of Table 6). On average, the probability that teachers recommend the high track is 12.3 percentage points higher for immigrant students in EOP schools, on a baseline of 46.4 percent in control schools. Interestingly, the change is substantially higher for male students: 17.2 percentage points, compared to 7.7 percentage points for female students. This is comforting, as teachers seem to update their beliefs based on *actual* changes in motivation and performance – greater for males, lower for females – as opposed to revising recommendations for all students involved in EOP.

Decomposing the treatment effect

Following Heckman et al. (2013), we decompose the treatment effect on educational choices into experimentally induced changes in the mediating factors in Table 6 and changes in other (unmeasured) factors. Assume the following linear model for the potential outcome when randomized into the treated ($d = 1$) and into the control group ($d = 0$):

$$Y_d = \tau_d + \sum_{j \in J} \alpha_d^j \theta_d^j + \beta_d \mathbf{X} + \varepsilon_d, \;\; d \in \{0,1\}, \tag{1}$$

where Y is a dummy for choosing the high track, τ is the intercept, $\Theta = (\theta^j : j \in J)$ is the set of observed mediating factors (cognitive skills, personality traits, and teachers' recommendation), $\mathbf{X}$ is a vector of pre-program variables unaffected by the treatment (initial test score INVALSI6, generation of immigration, and province fixed effects), and ε_d is an error term. With the exception of $\mathbf{X}$, all variables and coefficients in equation (1) are allowed to depend on treatment assignment. In particular, τ_d captures the effect of experimentally induced changes in other (unobserved) determinants of Y, in addition to the observed mediating factors in Θ.

Separately identifying the components of the treatment effect attributable to τ_d and Θ, respectively, requires further assumptions as experimental variation allows us to consistently estimate the effects of EOP on measured factors and final educational decisions, but not the relationship between the former

and the latter. Heckman et al. (2013) assume independence of observed and unobserved factors in the no-treatment state, conditional on the vector $\mathbf{X}$ of pre-treatment characteristics. Maintaining this assumption and imposing the additional testable restriction that coefficients do not vary with treatment assignment (respectively, $\alpha_d^j = \alpha$ for all j and $\beta_d = \beta$) allows us to decompose the effect of EOP as:

$$E(Y_1 - Y_0) = \sum_{j \in J} \alpha^j E\left(\theta_1^j - \theta_0^j\right) + (\tau_1 - \tau_0), \tag{2}$$

where $E(Y_1 - Y_0)$ is the average treatment effect; $E\left(\theta_1^j - \theta_0^j\right)$ is the average change induced in the j-th observed factor, and α^j is the associated effect on educational choices; finally, $(\tau_1 - \tau_0)$ is the effect due to other unmeasured factors. In Appendix Table A.7 we test and do not reject the structural invariance assumptions on α^j for all j and β.

[Insert Table 7]

Table 7 shows decomposition (2) for the effect of EOP on males' educational choices.[26] Changes in personality skills explain about one third of the overall effect (column 1). However, this effect is entirely driven by aspirations, whereas perceptions of barriers do not seem an important mediating factor. This is consistent with the fact that males and females experience a similar decrease in perceived barriers, but educational choices change only for males. In column 2 we add schooling performance, as measured by the standardized test score in grade 8, as an additional mediating factor, and in column 3 we further add teachers' recommendation. Teachers' expectations on students' performance have been shown to play a crucial role in affecting academic performance and choices.[27]

Indeed, we find that aspirations and teachers' recommendation are the most important factors, jointly explaining about two thirds of the treatment effect on educational choices. Improvements in schooling performance play a less crucial role, and the effect of perceived barriers remains not significantly different from zero. Overall, experimentally induced changes in measured skills and teachers' recommendation jointly explain 82 percent of the increase in the probability of choosing the high track, suggesting that other (unmeasured) factors account for a minor part of changes in educational choices. We obtain very similar results when we employ the alternative decomposition method by Gelbach (2016), see Appendix Table A.8.

Overall, these results confirm that EOP increased enrollment of high-achieving immigrants into the high track mainly by raising their educational and occupational aspirations. They suggest, in addition,

[26] We only present results for males because treatment effects on females are not significantly different from zero.

[27] This phenomenon has been widely documented since the seminal work by Rosenthal and Jacobson (1968) as the Pygmalion and Golem effect, according to which respectively high expectations leads to an improvement in performance and low expectations lead to a decrease in performance. In particular, children of minority groups seem to have a greater advantage from positive expectations of teachers.

that changes in aspirations and performance are incorporated into teachers recommendations, which may further amplify program effects.

Career counseling and academic tutoring

A related question concerns the relative importance of the two components of the intervention: motivational and career counseling (the Social Cognitive Career Theory module) and specialized help for studying (the CALP module). Ideally, one would want to disentangle the contribution of each of these two components using a multi-arm treatment design. As explained in Section 3, however, ethical reasons prevented us from delivering the motivational treatment without also delivering help for studying.

As an alternative strategy, we compare outcomes between students in EOP schools that scored below and above the cutoff used to determine the number of meetings. In particular, while virtually every treated student was invited to 17 CALP meetings in grade 8, the students who had scored below 65 in the entry level test (INVALSI6) were invited to 12 additional CALP sessions in grade 7. This rule provides an ideal regression discontinuity design to isolate the effect of (additional) CALP meetings from the effect of the career orientation module. It does not allow to simulate a counterfactual in which CALP was not provided at all (extensive margin), but at least it sheds some insight on the intensive margin.

[Insert Figure 8]

Indeed, the top three graphs in Figure 8 show that students with a score below 65 attended on average 5.5 more CALP meetings than students with a score above 65, whereas there are no differences in the number of other meetings. At the same time, the remaining graphs show that there is no significant discontinuity in the probability of choosing the high track or grade retention, nor are there significant differences in cognitive and personality skills between students on one side or the other of the cutoff. Therefore, neither final nor intermediate outcomes are significantly affected by an increase in the number of CALP meetings.

To conclude, EOP seems to operate mostly through motivational and career counseling, as opposed to specialized help for studying. These findings dovetail nicely with the evidence in Table 6 on aspirations being the main mediating factor, with a relatively smaller (though still significant) role of improvements in cognitive skills and school performance.

5.3 Longer term effects

The results presented so far confirm that EOP increased the probability of enrolling into academic and technical schools (high track) after grade 8. A potential concern is that such schools may prove too demanding for immigrant students from a disadvantaged background, even when considering students with relatively high ability. The reason is that immigrant students may face additional constraints compared to

Italian students of similar ability. Examples of such constraints involve the lower degree of embeddedness in social networks that could help with studying challenging subjects, as well as financial constraints in paying for private tutoring (a practice sometimes used by Italian families when their children struggle in school).

[Insert Table 8]

In Table 8 we address this concern estimating the effect of (assignment to) EOP on performance during the first two years of high school. We consider four different outcomes. The first is the probability of being admitted to grade 10, the second year of high school (columns 1-2). The second is the number of make-up exams students need to take during the summer in order to avoid repeating the grade (typically no more than three exams).[28] The third outcome is the probability that a student drops out before completing grade 10 (columns 5-6), and the last outcome is the probability of changing school between grade 9 and 11 (columns 7-8).

For all these outcomes, we find that treated students are no more likely to experience difficulties compared to the control group. If anything, they are more likely to be admitted to grade 10, less likely to fail courses and less likely to drop out, although the estimated coefficients are not statistically significant.[29] It is worth stressing that the lack of a significant effect should not be seen as a shortcoming: given that our treated students were more likely to enroll in demanding high schools, the fact that they are doing as well as the control group (and if anything better, given the pattern of coefficients in Table 8) is actually a positive result.

5.4 Spillover effects

Our last piece of evidence relates to spillover effects. Any change in the achievement and educational choices of treated students may influence their peers – particularly those sharing the same immigrant background (Sacerdote et al., 2011). This may occur through several channels. Treated students could serve as role models to other students in their social network (Patacchini and Zenou, 2016). This may be particularly relevant in our context, because we showed that EOP had a strong impact on aspirations and barriers perceived by treated students. Another channel could be cognitive skills: given that EOP improved the academic performance of immigrant boys, this may have positive spillovers on their classmates. Another potential source of peer effects is time use. The fact that treated students spend more

[28] The sample in columns 3-4 is smaller than in columns 1-2 because it only comprises students who did not fail outright and who did not dropout from high school. If a student is below the Pass level in many subjects, the decision of the school is typically to fail this student rather than give make-up exams after the summer.

[29] Ideally, we would also like to estimate the longer term effects on cognitive skills, as measured by the standardized test score in grade 10 (INVALSI10). Unfortunately, it is not possible to match MIUR registries for middle school students with their INVALSI tests in high school.

time studying or attending EOP sessions implies that they have less time to spend with their friends doing other (possibly less productive) activities.

We estimate the effect of EOP on treated students' classmates exploiting random assignment of the intervention across schools. Specifically, we include in the sample only classmates of treated and control students and estimate the following equation:

$$Y_{ics} = \alpha + \beta TreatedInClass_{cs} + \gamma \mathbf{X}_{ics} + \delta \mathbf{Z}_{cs} + u_{ics} \tag{3}$$

where i denotes the student, c the class, and s the school. $TreatedInClass_{cs}$ is a dummy equal to 1 if the student belongs to a class with at least one treated student, and 0 if he/she belongs to a class with at least one control student (i.e., a class in a control school that contains at least one immigrant student whose INVALSI6 score was among the top 10 of the school). In this way, the sample used in the regression contains students from classes that are comparable in terms of having high-achieving immigrant students among them, some of which received EOP and others not. X_{ics} includes all the individual characteristics in our baseline specification (gender, dummy for first generation immigrants, and second degree polynomial in INVALSI6); Z_{cs} is a vector of controls at the school and class level (school size, class size, and percentage of immigrants in the class).

[Insert Table 9]

Table 9 shows the effect of being in the same class with a treated student on native (columns 1-3) and immigrant classmates (columns 4-6). Immigrant males who are in the same class with a treated student experience a decrease in grade retention (Panel B), whereas immigrant females in the same class with a treated student are more likely to enroll in the high track at the end of middle school (Panel A). Interestingly, the effects are comparable in size to those observed for the treated student themselves. This can be rationalized by observing that, by construction, non-treated immigrant classmates are selected to have lower academic performance at the beginning of middle schools (they were not among the top 10 immigrants of the school in terms of INVALSI6). It is thus possible that immigrant students down in the ability distribution are very responsive to (even indirect) treatment effects. This interpretation is reinforced when observing that immigrant females in the mid-to-lower part of the distribution make different choices from comparable native females in the absence of the intervention, whereas this is not the case for immigrant females in the upper part of the distribution (see Figure 1). Therefore it should not be surprising that, while EOP did not affect track choice of treated females (who were selected to be high performing and already made comparable choices to natives), it had an impact on non-treated females, for whom a 'choice gap' existed compared to natives of similar ability.

Why are male immigrant classmates not affected in terms of track choice (Panel A, column 5)? Our interpretation is that they are too far from the margin at which a demanding high school would become

a preferable choice. This can be seen for example when comparing soft skills of immigrant boys and girls who did not qualify for the program. Female immigrant classmates of students eligible for EOP have aspiration levels that are closer to those of treated male students compared to other male immigrant classmates.[30] Therefore, they may be closer to the threshold beyond which the choice of a demanding high school is affected. At the same time, the sizeable and significant reduction in the likelihood of grade retention for male immigrant classmates (Panel B, column 5) suggests that spillover effects did operate at that (lower) margin.

One last comment relates to native students. Columns 1-3 of Table 9 show that there are no significant differences in outcomes between the non-immigrant classmates of treated and control students. This finding is consistent with previous evidence that peer effects are particularly strong within groups with a similar background (see, e.g. Sacerdote et al., 2011).

Overall, the positive spillovers on immigrant classmates uncovered by our analysis have significant implications when assessing the success and cost-effectiveness of the intervention. We briefly discuss the latter in the concluding section.

6 Conclusions

Educational segregation is a significant risk in societies where school tracking occurs at an early age. This risk disproportionately affects students whose parents have less information about or are less integrated in the local education system, such as children of immigrants. We show that it is possible to reduce the mismatch created by early tracking through an innovative counseling program that provides a mix of soft skills training and academic tutoring. The program, known as EOP and implemented in a random sample of middle schools in Northern Italy, targeted high-achieving immigrant students selected on the basis of their test performance in grade 6. Two years later, immigrant boys assigned to treatment were 12 percent more likely than control ones to enroll in academic or technical high schools (as opposed to vocational ones). The program virtually closed the gap between native and immigrant boys in high school choice. No effect was found for girls, for which no mismatch was detected in the first place.

Thanks to detailed data on cognitive and non-cognitive outcomes, we are able to explore the channels through which the effect operates. Treated boys see improvements in grade 8 standardized test scores, as well as in motivation and aspirations, and perceive fewer barriers in their future. Also, teachers are more likely to formally recommend treated boys for demanding high school tracks. A variance decomposition

[30] From the survey data on control schools, we caculated the average standardized level of aspirations of different subgroup of immigrant students. 'Control' boys and girls (that is, immigrants whose INVALSI6 was among the top 10) have an average of -0.11 and 0.13, respectively. Their immigrant classmates (not top 10) have an average of -0.26 if males, and -0.13 if females. Hence, in terms of average academic motivation, female immigrant classmates are closer than male classmates to students selected for the program. Elective affinity in soft skills may ease the diffusion of positive spillover effects of the program through friendship network (Rapallini and Rustichini, 2016).

exercise suggests that most of the impact on high school choice is mediated by aspirations and teachers' recommendations.

The significance and magnitude of our effects is noteworthy when compared to existing evidence from randomized field experiments that study partial derivatives of the human capital production function, recently summarized by Kautz et al. (2014) and Fryer Jr (2016). For instance, the latter shows that, among school interventions, only "high-dosage" tutoring (defined as "being tutored in group of 6 or fewer students for 4 or more days per week") has significant effects.[31] Our EOP treatment can be considered as "low dosage", given the above definition, yet its impact on treated boys is 0.188 standard deviations for math achievement and 0.139 standard deviations for reading.

Having established that EOP had sizeable and significant impacts, it is important to know if it is also cost-effective. A full fledged cost benefit analysis is not possible at this stage: on top of the challenge of quantifying non-pecuniary benefits and costs, students involved in our experiment have not yet completed secondary school and therefore lifetime earnings profiles are not observed (Heckman et al., 2017). The computation of the lifetime rate of return of EOP is therefore naturally based on assumptions about long-term outcomes such as college enrollment, earnings and unemployment. Although EOP may potentially have strong effects on health and criminal behavior, we present conservative estimates focusing our cost-benefit analysis only on social benefits coming from higher income taxes and public savings on unemployment insurance (Heckman et al., 2010; Eisenhauer et al., 2015). We examine the sensitivity of social rates of returns to a plausible range of assumptions. Appendix Table B.1 reports our calculations. Extrapolating the long-term benefits first only on those treated individuals who were directly affected through a reduction in grade retention or a change in their high-school choice toward a more demanding track, we estimate social rates of return between 3 and 5 percent. However, including the positive spillovers on the immigrant classmates of treated students (that we estimated in section 5.4), we estimate that the lifetime rate of return of EOP is between 7 and 9 percent, close to the historical return on equity.

Our finding that soft skills played a more important role than improved test performance in determining high school choice suggests that scaled down versions of the program may be even more cost effective. For example, one could reduce the number of meetings with academic tutors and explore forms of delivering the information and motivational components of the program through teachers as opposed to dedicated counselors, to reduce costs. We leave this to future work.

[31] Fryer Jr (2016) finds that high-dosage tutoring leads to a meta-coefficient of 0.309 standard deviations for math achievement (with a standard error of 0.106) and 0.229 standard deviations for reading achievement (with a standard error of 0.033).

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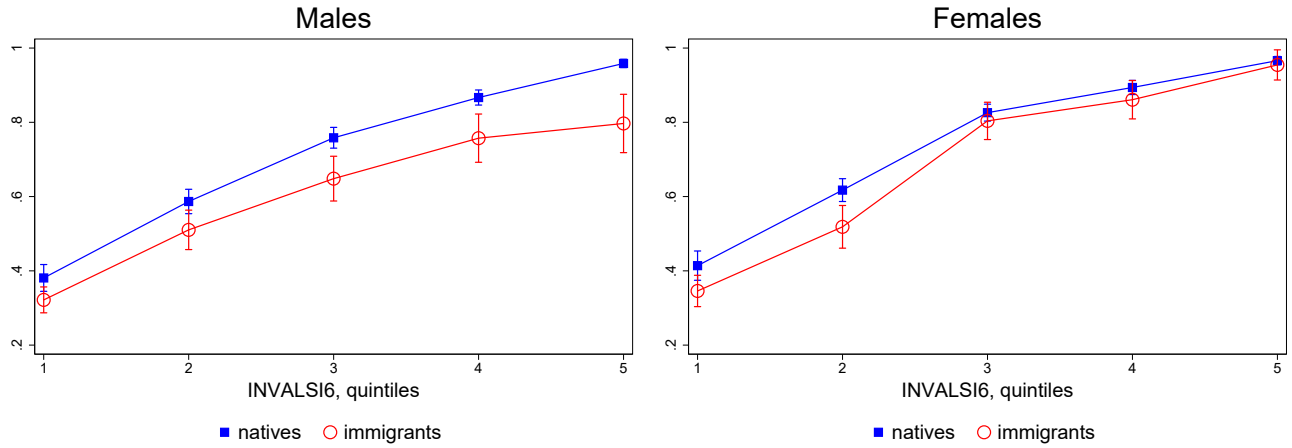
Figures

Figure 1: Probability of enrolling in the high track at the end of middle school, by quintile of standardized test score in grade 6 (INVALS6)



Notes: This figure compares the probability of enrolling in the high-track between immigrant and native students, by quintiles of performance in the standardized test in grade 6 (INVALSI6). The sample includes all students in the 75 control schools.

Figure 2: Time Line

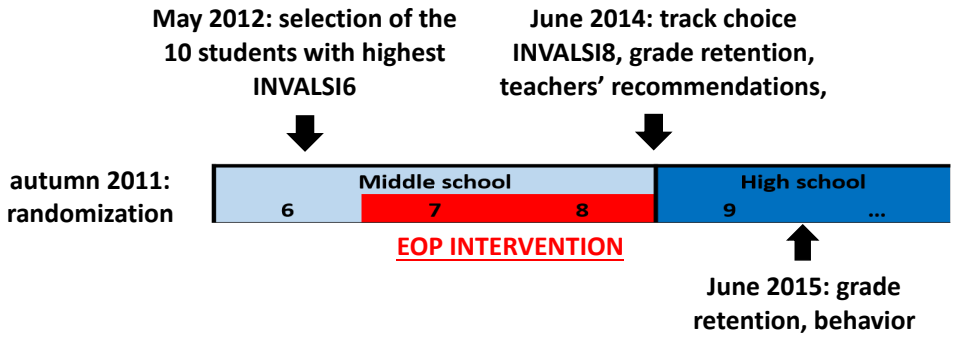
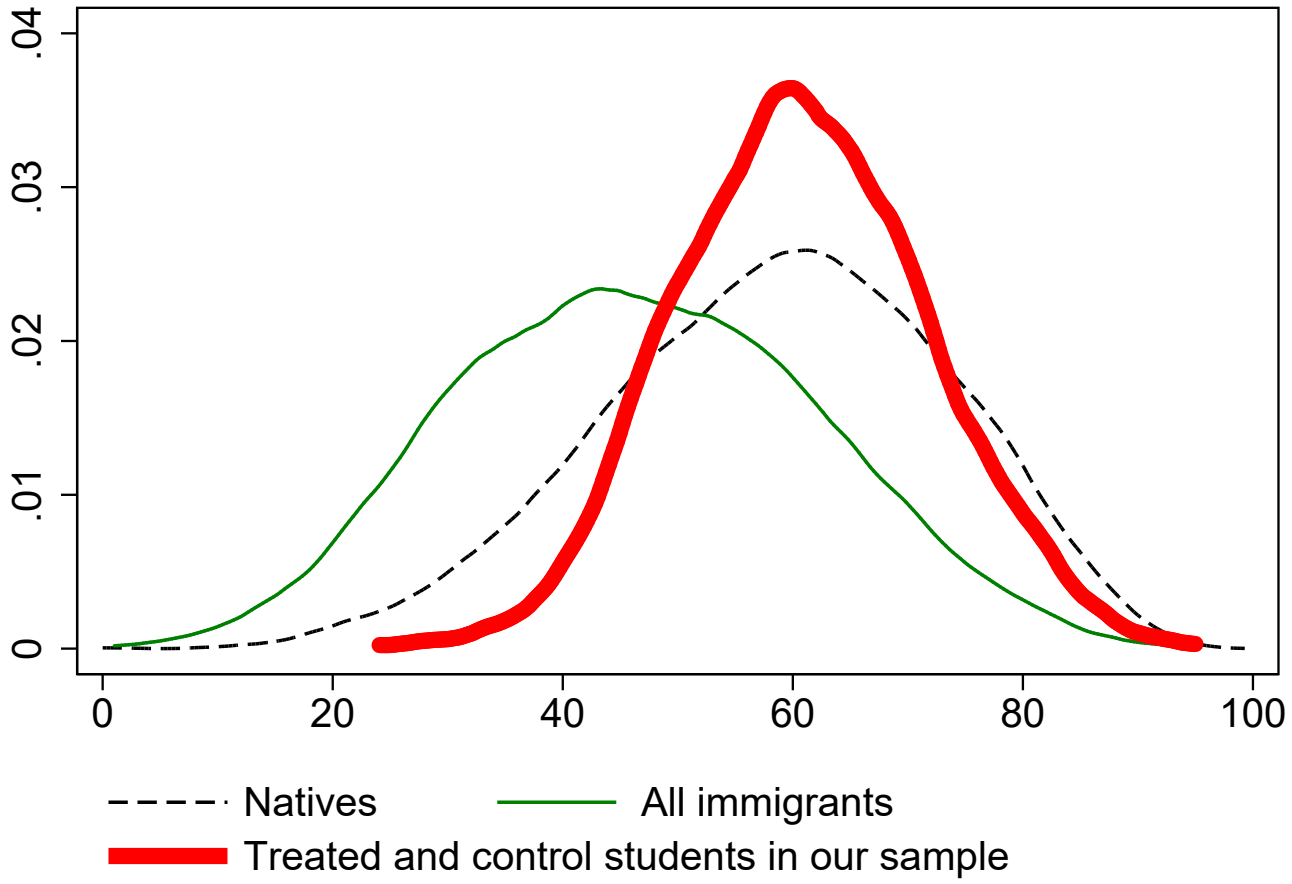
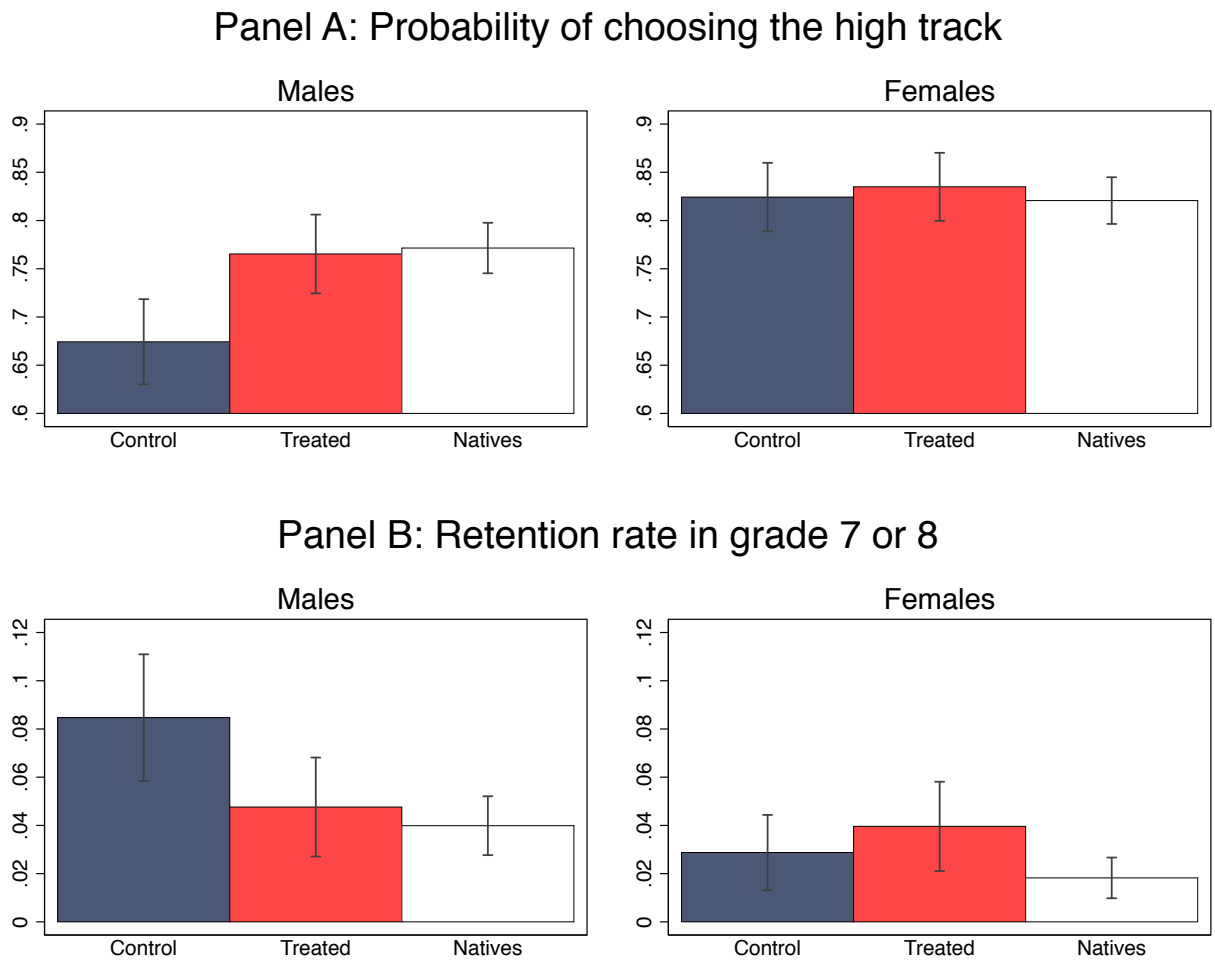


Figure 3: Distribution of standardized test score in grade 6 (INVALS6)



Notes: This figure compares the distribution of standardized test score in grade 6 (INVALSI6) across native students, immigrant students, and treated and control students in our sample.

Figure 4: Track choice and grade retention of immigrants and comparable natives



Notes: These graphs shows the average probability (and associated confidence intervals) of choosing the high-track (top graphs) and being retained in grade 7 or 8 (bottom graphs) for treated students, control students, and a group of Italian students that are comparable in terms of schooling ability. Specifically, we match each immigrant student with a native student obtaining exactly the same score in INVALSI6.

Figure 5: Meetings attendance of immigrant students assigned to EOP

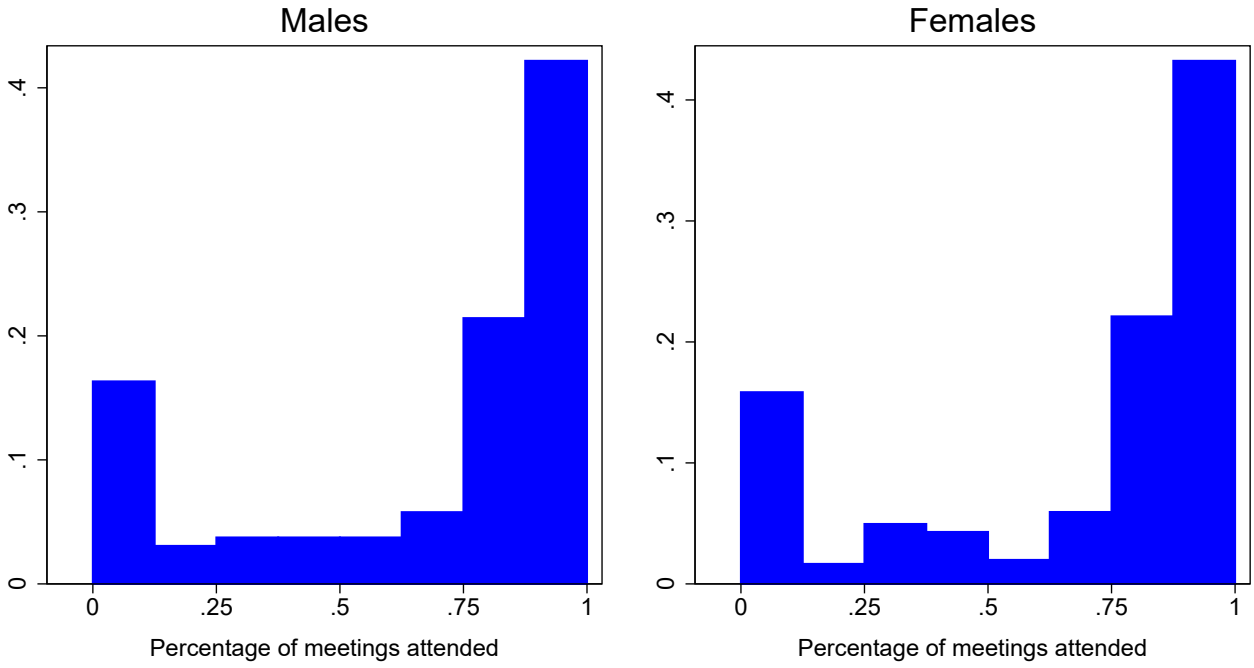
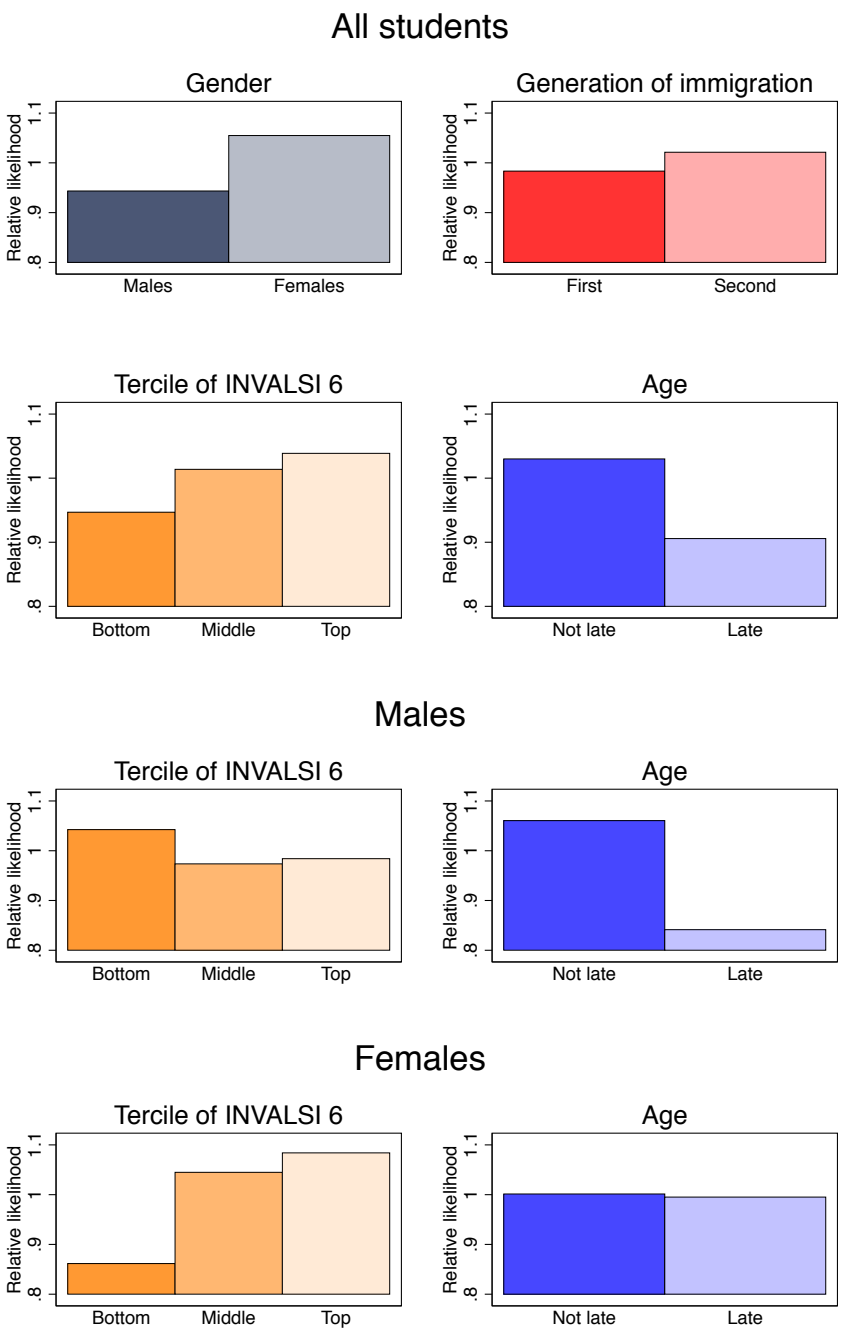
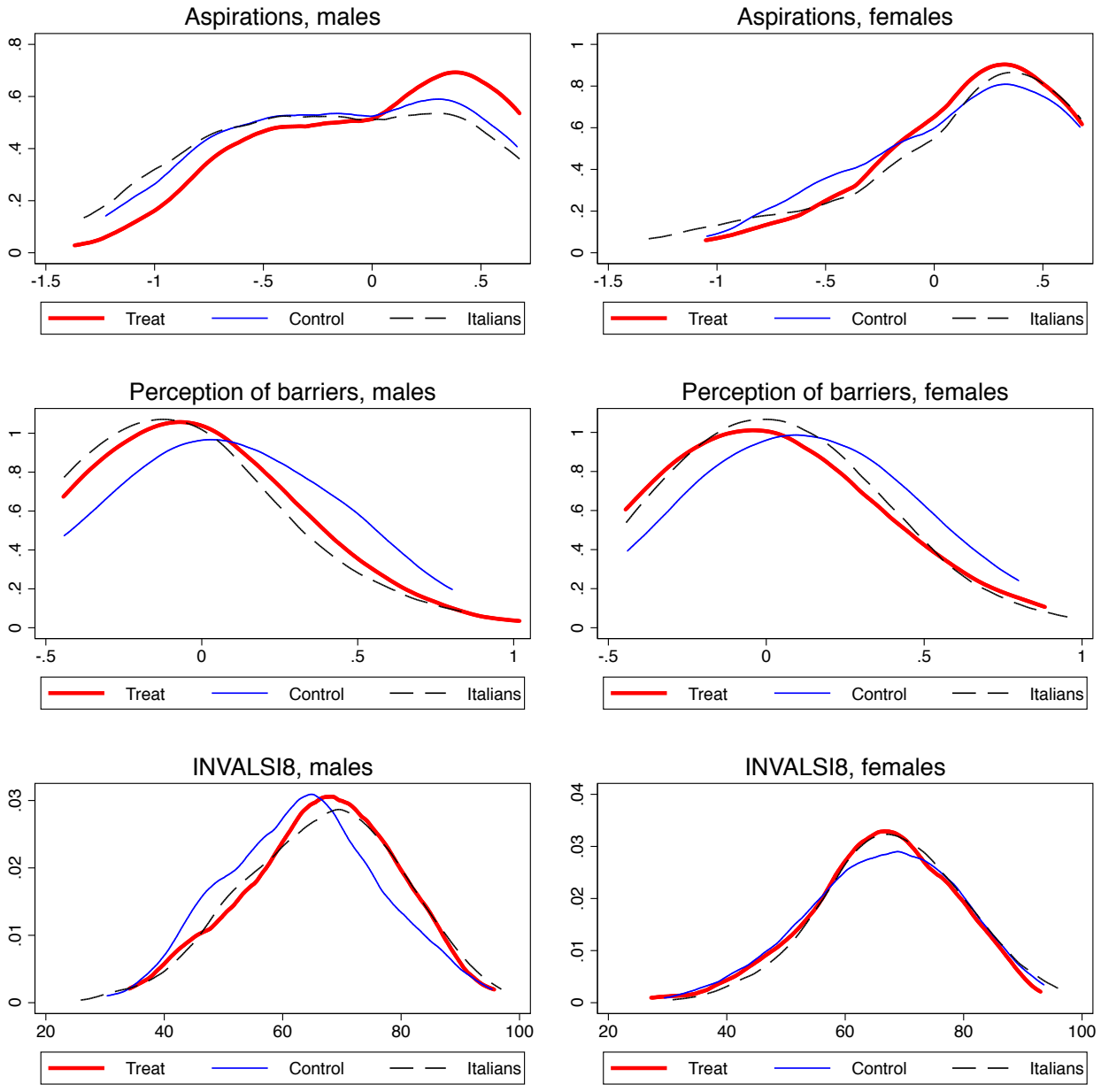


Figure 6: Compliers' characteristics



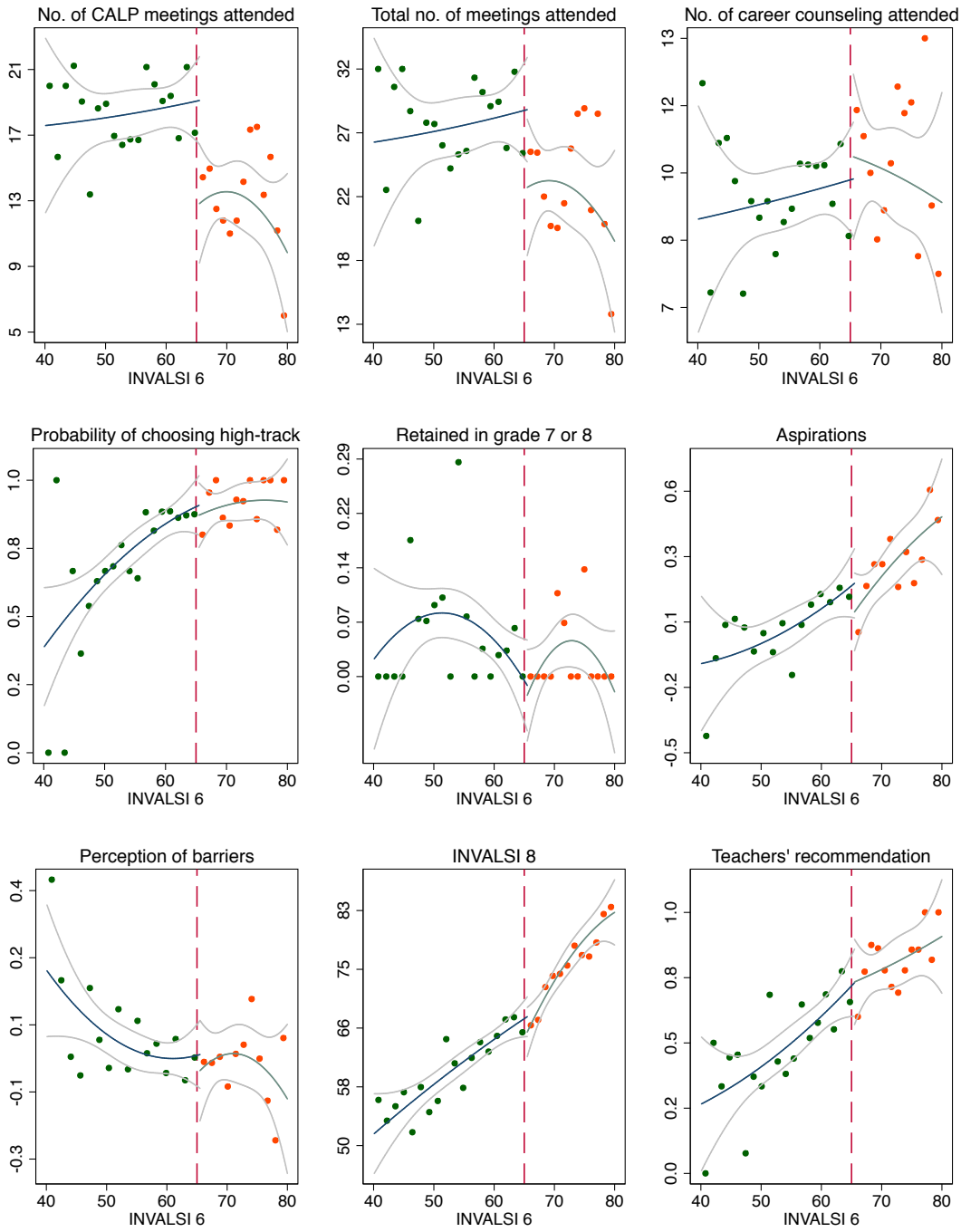
Notes: This figure shows compliers' characteristics ratios, i.e. the ratio of the first stage for student of a specific type (e.g., female/male) to the overall first stage. The instrument is the assignment to EOP and the endogenous variable is the probability of attending at least 75% of meetings. The figure illustrates the relative likelihood of compliers' gender, generation of immigration, tercile of INVALSI 6, and age.

Figure 7: Distribution of cognitive and personality skills across treated, controls, and comparable native students



Notes: These graphs shows the distribution of aspirations, perception of barriers, and INVALSI8 across treated students, control students, and a group of Italian students that are comparable in terms of schooling ability. Specifically, we match each immigrant student with a native student obtaining exactly the same score in INVALSI6.

Figure 8: Effect of additional CALP meetings, regression discontinuity estimates



Notes: These graphs plot the number of meetings attended – distinguishing between career counselling and CALP modules – and treated students' outcomes against standardized test scores in grade 6 (INVALSI6). The vertical line indicates the cutoff score below which treated students are offered additional CALP meetings.

Tables

Table 1: Treated and control students, balance test

		Full Sample	Treated	Controls	Difference	P-value	Std. Difference
Panel A: Student characteristics							
Female		0.506	0.508	0.505	0.003	[0.93]	-0.006
Test score in grade 6 (INVALSI6)		60.82	60.93	60.71	0.224	[0.86]	0.005
First generation immigrant		0.555	0.547	0.561	-0.014	[0.73]	0.028
Born before 1999		0.257	0.242	0.273	-0.031	[0.25]	0.071
Brescia		0.179	0.165	0.194	-0.029	[0.67]	0.076
Genova		0.067	0.074	0.06	0.014	[0.75]	-0.056
Milan		0.496	0.476	0.516	-0.04	[0.65]	0.080
Padua		0.055	0.064	0.047	0.017	[0.68]	-0.074
Turin		0.203	0.223	0.184	0.039	[0.58]	-0.097
Panel B: Family characteristics							
Mother	Less than high school	0.350	0.348	0.352	-0.004	[0.93]	0.008
	High-school	0.464	0.481	0.447	0.034	[0.36]	-0.068
	Some post-secondary education	0.186	0.172	0.201	-0.029	[0.30]	0.075
	Blue collar	0.351	0.354	0.347	0.007	[0.86]	-0.015
	White collar	0.184	0.181	0.187	-0.006	[0.86]	0.015
	Unemployed	0.082	0.091	0.073	0.018	[0.48]	-0.066
	At home	0.384	0.374	0.393	-0.019	[0.65]	0.039
Father	Less than high school	0.332	0.330	0.335	-0.005	[0.91]	0.011
	High-school	0.499	0.505	0.495	0.01	[0.81]	-0.020
	Some post-secondary education	0.168	0.165	0.17	-0.005	[0.87]	0.013
	Blue collar	0.567	0.555	0.577	-0.022	[0.56]	0.044
	White collar	0.315	0.333	0.296	0.037	[0.29]	-0.080
	Unemployed	0.099	0.093	0.106	-0.013	[0.53]	0.043
	At home	0.020	0.019	0.021	-0.002	[0.85]	0.014

Notes: This table shows the number and characteristics of treated and control students in our sample. P-values for difference in means are reported in square brackets. The last column also reports the standardized difference between group averages.

Table 2: The effect of EOP on educational choices

Dependent variable: Choosing the high-track (= 1 if choose high track)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All immigrants		Male immigrants		Female immigrants		All immigrants	
EOP	0.051*	0.043*	0.091**	0.080**	0.011	0.009	0.091**	0.077**
	(0.027)	(0.024)	(0.037)	(0.035)	(0.034)	(0.031)	(0.037)	(0.034)
Female X EOP							-0.080*	-0.067
							(0.046)	(0.043)
Constant	0.750***	0.683***	0.674***	0.651***	0.824***	0.720***	0.674***	0.621***
	(0.019)	(0.038)	(0.028)	(0.048)	(0.022)	(0.049)	(0.028)	(0.041)
Mean dep. var. control	0.750	0.750	0.674	0.674	0.824	0.824	0.750	0.750
Observations	1,217	1,217	601	601	616	616	1,217	1,217
Controls	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.004	0.087	0.010	0.086	0.000	0.100	0.024	0.105

Notes: This table shows the effect of EOP on immigrant students' educational choices the end of middle school. The dependent variable is a dummy equal to 1 for students choosing the high-track (academic or technical schools) and equal to zero otherwise. EOP is a dummy equal to 1 for students in schools assigned to the treatment group and equal to zero for schools assigned to the control group. Specifications in columns (2), (4), (6), and (8) control in addition for a squared polynomial in INVALSI6, a dummy equal to 1 for first generation immigrants, and province fixed effects. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

Table 3: The effect of EOP on grade retention

Dependent variable: Grade retention (= 1 if repeat a grade)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All immigrants		Male immigrants		Female immigrants		All immigrants	
EOP	-0.013	-0.013	-0.037*	-0.037*	0.011	0.009	-0.037*	-0.035*
	(0.016)	(0.016)	(0.021)	(0.021)	(0.019)	(0.019)	(0.021)	(0.020)
Female X EOP							0.048**	0.044*
							(0.024)	(0.023)
Constant	0.056***	0.073***	0.085***	0.097***	0.029***	0.048	0.085***	0.097***
	(0.010)	(0.028)	(0.016)	(0.028)	(0.010)	(0.043)	(0.016)	(0.030)
Mean dep. var. control	0.056	0.056	0.085	0.085	0.029	0.029	0.056	0.056
Observations	1,217	1,217	601	601	616	616	1,217	1,217
Controls	No	Yes	No	Yes	No	Yes	No	Yes
R-squared	0.001	0.017	0.006	0.022	0.001	0.023	0.009	0.024

Notes: This table shows the effect of EOP on immigrant students' grade retention during middle school. The dependent variable is a dummy equal to 1 for students retained in grade 7 or 8, and equal to zero otherwise. EOP is a dummy equal to 1 for students in middle schools assigned to the treatment group and equal to zero for schools assigned to the control group. Specifications in columns (2), (4), (6), and (8) control in addition for a squared polynomial in INVALSI6, a dummy equal to 1 for first generation immigrants, and province fixed effects. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

Table 4: Effects of EOP, average treatment-on-the-treated (ATT)

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.:	Choosing the high-track			Grade retention		
	All	Males	Females	All	Males	Females
Panel A: Treatment = 1 if attended at least one meeting						
ATT	0.051*	0.094**	0.010	-0.015	-0.043*	0.011
	(0.028)	(0.041)	(0.036)	(0.018)	(0.024)	(0.022)
Constant	0.682***	0.648***	0.720***	0.073***	0.098***	0.047
	(0.038)	(0.049)	(0.049)	(0.028)	(0.028)	(0.043)
Panel B: Treatment = 1 if attended at least 75% of meetings						
ATT	0.067*	0.125**	0.013	-0.020	-0.057*	0.014
	(0.037)	(0.054)	(0.047)	(0.024)	(0.032)	(0.029)
Constant	0.679***	0.641***	0.720***	0.074***	0.101***	0.047
	(0.038)	(0.050)	(0.049)	(0.027)	(0.028)	(0.043)
Panel C: Treatment = fraction of meetings attended						
ATT	0.064*	0.119**	0.013	-0.019	-0.055*	0.014
	(0.036)	(0.052)	(0.045)	(0.023)	(0.031)	(0.028)
Constant	0.681***	0.645***	0.720***	0.074***	0.100***	0.048
	(0.038)	(0.049)	(0.049)	(0.027)	(0.028)	(0.043)
Observations	1.217	601	616	1.217	601	616

Notes: This table shows the average-treatment-on-the-treated effect of EOP on immigrant students' educational choices (columns 1-3) and grade retention during middle school (columns 4-6). The ATT is computed as the ratio of the reduced form effect of EOP on such outcomes and the first stage effect on three alternative measures of compliance with treatment assignment: attending at least 1 meeting (Panel A), attending at least 75% of meetings (Panel B), and fraction of meetings attended (Panel C). All specifications control for a squared polynomial in INVALSI6, a dummy equal to 1 for first generation immigrants, and province fixed effects. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

Table 5: The effect of EOP on educational choices, heterogeneity

Dependent variable: Choosing the high-track								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Males				Females			
EOP	0.100**	0.138*	0.077*	0.068*	0.022	0.145**	0.026	-0.008
	(0.042)	(0.074)	(0.046)	(0.040)	(0.040)	(0.070)	(0.044)	(0.036)
EOP*INVALSI6	0.038				0.117*			
	(0.057)				(0.064)			
EOP*INVALSI6, squared	-0.055				-0.095**			
	(0.036)				(0.048)			
EOP*Highly educated mother		-0.136				-0.196***		
		(0.089)				(0.074)		
EOP*First Gen. Immigrant			0.005				-0.031	
			(0.065)				(0.057)	
EOP*EU country				0.045				0.074
				(0.084)				(0.069)
Highly educated mother		0.206***				0.191***		
		(0.064)				(0.053)		
EU country				0.036				-0.085
				(0.066)				(0.055)
INVALSI6	0.180***	0.186***	0.199***	0.199***	0.142***	0.188***	0.197***	0.198***
	(0.042)	(0.029)	(0.029)	(0.030)	(0.045)	(0.040)	(0.039)	(0.039)
INVALSI6, squared	-0.024	-0.048***	-0.054***	-0.055***	-0.000	-0.039	-0.044	-0.043
	(0.027)	(0.018)	(0.019)	(0.019)	(0.037)	(0.031)	(0.030)	(0.029)
First Gen. Immigrant	-0.036	-0.038	-0.038	-0.052	-0.004	-0.009	0.010	0.010
	(0.034)	(0.035)	(0.050)	(0.038)	(0.029)	(0.028)	(0.041)	(0.030)
Constant	0.641***	0.580***	0.652***	0.659***	0.713***	0.622***	0.711***	0.726***
	(0.050)	(0.061)	(0.054)	(0.049)	(0.048)	(0.058)	(0.050)	(0.049)
Mean dep. var. control	0.674	0.674	0.674	0.674	0.824	0.824	0.824	0.824
Observations	601	601	601	601	616	616	616	616
R-squared	0.088	0.137	0.086	0.089	0.109	0.133	0.101	0.104

Notes: This table shows the heteroeneity of the effect of EOP on immigrant students' educational choices the end of middle school. The dependent variable is a dummy equal to 1 for students choosing the high-track (academic or technical schools) and equal to zero otherwise. EOP is a dummy equal to 1 for students in middle schools assigned to the treatment group and equal to zero for schools assigned to the control group. Highly educated mother is a dummy equal to 1 for students' whose mother has at least a high-school diploma. EU is a dummy equal to 1 for immigrants from EU-member countries. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

Table 6: The effect of EOP on mediating factors

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.	Aspirations		Perception of barriers		INVALSI8	
EOP	0.171**	0.291***	-0.417***	-0.389***	0.076*	0.164***
	(0.076)	(0.104)	(0.081)	(0.122)	(0.040)	(0.052)
Female*EOP		-0.170		-0.032		-0.165**
		(0.125)		(0.163)		(0.064)
Constant	-0.049	-0.283**	0.240**	0.159	-0.318***	-0.404***
	(0.105)	(0.117)	(0.104)	(0.122)	(0.058)	(0.060)
Mean dep. var. control males	-0.209	-0.209	0.252	0.252	-0.129	-0.129
Mean dep. var. control females	0.248	0.248	0.420	0.420	0.057	0.057
Observations	687	687	687	687	1,094	1,094
R-squared	0.117	0.158	0.056	0.061	0.439	0.445
Dep. var.	INVALSI8, math		INVALSI8, reading		Teachers' Recomm.	
EOP	0.083	0.188***	0.069	0.139**	0.123***	0.172***
	(0.051)	(0.066)	(0.044)	(0.062)	(0.046)	(0.053)
Female*EOP		-0.204**		-0.126		-0.095
		(0.079)		(0.082)		(0.060)
Constant	-0.280***	-0.286***	-0.357***	-0.522***	0.393***	0.303***
	(0.075)	(0.073)	(0.067)	(0.076)	(0.041)	(0.042)
Mean dep. var. control males	0.008	0.008	-0.266	-0.266	0.371	0.371
Mean dep. var. control females	0.023	0.023	0.090	0.090	0.578	0.578
Observations	1,094	1,094	1,094	1,094	1,217	1,217
R-squared	0.383	0.388	0.293	0.320	0.125	0.150

Notes: This table shows the effect of EOP on several mediating factors. Aspirations and perception of barriers are the two principal components extracted from the psychological measures collected through students' questionnaires. The individual variables included in each index and their loading factors are reported in Appendix Table A.4. INVALSI8 is the score obtained in the standardized test at the end of middle school (grade 8). Teachers' recommendation is a dummy equal to 1 when the teacher recommends to enroll in the high-track and equal to zero otherwise. All specifications control for a squared polynomial in INVALSI6, a dummy equal to 1 for first generation immigrants, and province fixed effects. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

Table 7: Decomposition of the effect of EOP on high-school choice, male students

	(1)		(2)		(3)	
	Explained	p-value	Explained	p-value	Explained	p-value
Aspirations	0.0413	[0.0005]	0.0359	[0.002]	0.0357	[0.001]
Barriers	-0.0095	[0.5756]	-0.006	[0.722]	-0.0024	[0.882]
INVALSI8			0.013	[0.103]	0.0101	[0.178]
Teachers' recommendation					0.0333	[0.046]
Total explained	0.0318		0.0429		0.0767	
EOP effect on choosing high-track	0.091		0.091		0.091	

Notes: This table decomposes the effect of EOP between changes in personality skills (aspirations and perception of barriers), increased schooling achievement (as measured by INVALSI8) and teachers' recommendations. As explained in Section 5.2, the decomposition follows the method devised by Heckman et al. (2013). Bootstrap standard errors clustered at school level generated from 1,000 iterations.

Table 8: Effect of EOP on long-term outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Outcomes in grade 9				Outcomes in grade 10			
Dep. var.	Admitted to grade 10		Re-take courses		Dropout		Change school	
EOP	0.014	0.034	-0.099	-0.146	-0.034	-0.057	0.000	-0.005
	(0.032)	(0.042)	(0.072)	(0.115)	(0.027)	(0.039)	(0.022)	(0.034)
Female*EOP		-0.033		0.084		0.045		0.009
		(0.057)		(0.146)		(0.050)		(0.043)
Constant	0.380***	0.300***	0.346***	0.429***	0.343***	0.406***	0.161***	0.169***
	(0.044)	(0.048)	(0.126)	(0.150)	(0.038)	(0.041)	(0.043)	(0.047)
Mean dep. var. control males	0.411	0.411	0.251	0.251	0.365	0.365	0.119	0.119
Mean dep. var. control females	0.578	0.578	0.075	0.075	0.211	0.211	0.100	0.100
Observations	933	933	918	918	1,157	1,157	881	881
R-squared	0.054	0.077	0.025	0.028	0.063	0.083	0.011	0.011

Notes: This table shows the effect of EOP on immigrant students' outcomes in the first two years of high school, indicated above each column. EOP is a dummy equal to 1 for students in middle schools assigned to the treatment group and equal to zero for schools assigned to the control group. All regressions control in addition for a squared polynomial in INVALSI6, a dummy equal to 1 for first generation immigrants, and province fixed effects. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

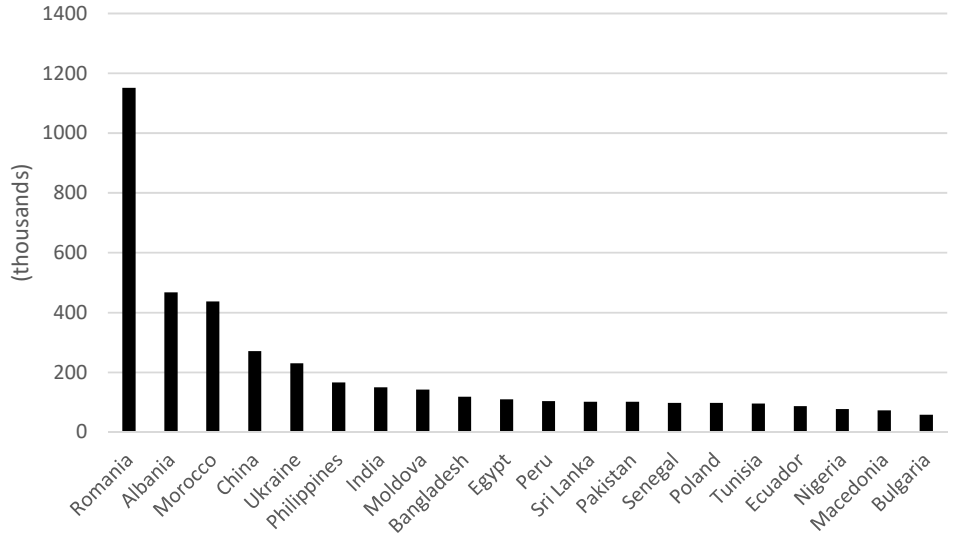
Table 9: Peer effects in EOP schools

	(1)	(2)	(3)	(4)	(5)	(6)
	Native classmates			Immigrant classmates		
	All	Males	Females	All	Males	Females
Panel A - Dependent Variable: Choosing the high-track						
EOP class	0.001	0.008	-0.006	0.038	-0.009	0.091**
	(0.013)	(0.015)	(0.017)	(0.029)	(0.041)	(0.038)
Mean dep. var.	0.767	0.755	0.780	0.421	0.423	0.419
Observations	8,429	4,247	4,182	1,308	686	622
R-squared	0.197	0.205	0.193	0.097	0.096	0.125
Panel B - Dependent Variable: Retained in grade 7 or 8						
EOP class	-0.002	-0.005	0.002	-0.042*	-0.064**	-0.019
	(0.007)	(0.009)	(0.007)	(0.023)	(0.032)	(0.027)
Mean dep. var.	0.044	0.053	0.035	0.148	0.192	0.099
Observations	8,429	4,247	4182	1,308	686	622
R-squared	0.047	0.040	0.066	0.046	0.049	0.053
Panel C - Dependent Variable: INVALSI8						
EOP class	-0.017	-0.012	-0.021	-0.026	0.023	-0.069
	(0.030)	(0.034)	(0.032)	(0.062)	(0.077)	(0.081)
Mean dep. var.	0.129	0.139	0.119	-0.961	-0.960	-0.965
Observations	7,533	3,736	3,797	1,007	500	507
R-squared	0.591	0.603	0.580	0.330	0.349	0.319
Panel D - Dependent Variable: Teachers' raccomandation						
EOP class	-0.011	-0.012	-0.010	0.031	0.003	0.062
	(0.037)	(0.038)	(0.039)	(0.038)	(0.039)	(0.052)
Mean dep. var.	0.597	0.574	0.621	0.207	0.210	0.205
Observations	8,429	4,247	4,182	1,308	686	622
R-squared	0.223	0.235	0.218	0.115	0.130	0.112

Notes: This table shows the effect of being in the same class with an immigrant student randomized into the intervention on several outcomes of interest, indicated in the title of each panel. The sample includes only classmates of treated and control students. The main expanatory variable, EOP class, is a dummy equal to 1 for the classmates of treated students. All regressions control in addition for all the individual characteristics in our baseline specification (dummy for first generation immigrants, second degree polynomial of test score in grade 6, and province fixed effects) as well as for class size, percentage of immigrants in the same class, and school size. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

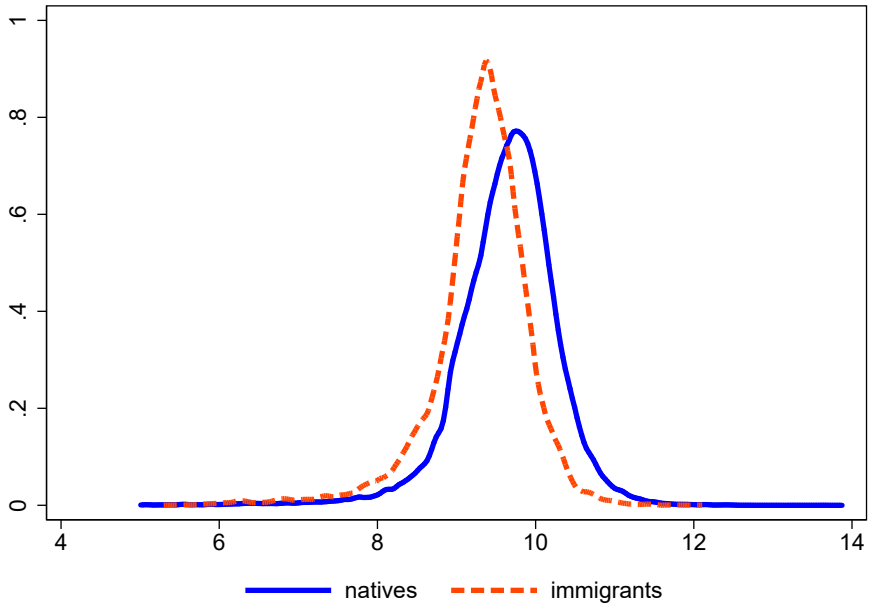
Appendix Figures

Figure A.1: Immigrants in Italy by nationality, 2015



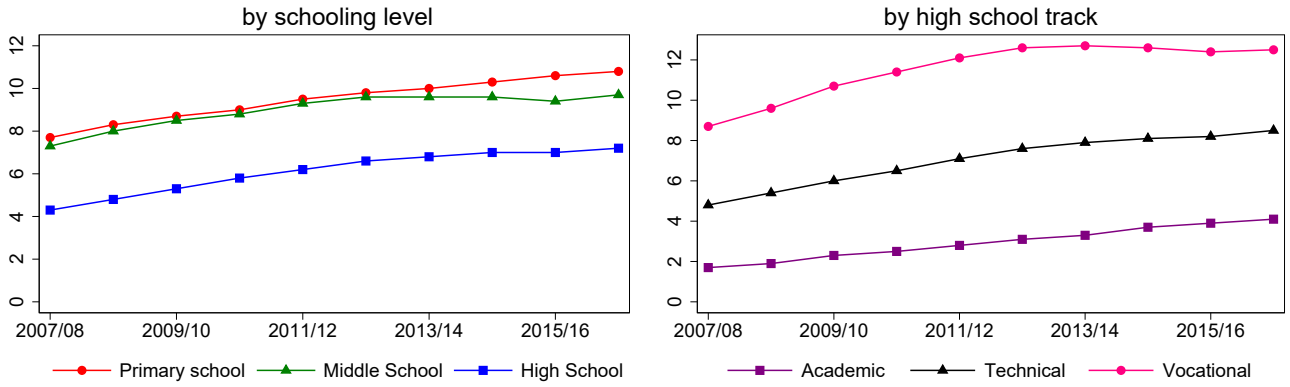
Source: ISTAT, "Demografia in Cifre", several years (www.demo.istat.it).

Figure A.2: Distribution of (log) income across native and immigrant families in Italy



Notes: This graph shows the distribution of (log) disposable income per equivalent adult at constant 2010 prices. *Source:* European Union Statistics on Income and Living Conditions (EU-SILC), 2007-2014.

Figure A.3: Percentage of immigrants over total students in Italy, by schooling level and high school track



Source: MIUR, "'Portale dei dati sulla scuola"' (dati.istruzione.it), several years.

Appendix Tables

Table A.1: Educational and occupational outcomes 4 years after graduation, by high-school track

	all students		males		females	
	high track	low track	high track	low track	high track	low track
Panel A: Native students						
Percentage of graduates by track	85.5	14.5	84.4	15.6	85.5	13.5
Ever enrolled into university	0.704	0.205	0.650	0.158	0.754	0.256
	(0.003)	(0.004)	(0.006)	(0.006)	(0.004)	(0.007)
Dropout rate in university	0.118	0.306	0.145	0.353	0.097	0.274
	(0.003)	(0.011)	(0.005)	(0.018)	(0.003)	(0.014)
Not in Employment, Education or Training (NEET)	0.199	0.291	0.189	0.264	0.208	0.320
	(0.003)	(0.005)	(0.005)	(0.007)	(0.004)	(0.007)
Regretting high school choice	0.267	0.318	0.266	0.304	0.269	0.333
	(0.003)	(0.005)	(0.005)	(0.007)	(0.004)	(0.008)
Panel B: Immigrant students						
Percentage of graduates by track	62.8	37.2	57.4	42.6	66.3	33.7
Ever enrolled into university	0.655	0.291	0.686	0.172	0.637	0.390
	(0.03)	(0.022)	(0.049)	(0.027)	(0.037)	(0.032)
Dropout rate in university	0.150	0.257	0.231	0.307	0.100	0.238
	(0.028)	(0.037)	(0.06)	(0.074)	(0.028)	(0.043)
Not in Employment, Education or Training (NEET)	0.264	0.294	0.237	0.238	0.280	0.340
	(0.027)	(0.022)	(0.045)	(0.03)	(0.035)	(0.031)
Regretting about high school choice	0.269	0.331	0.325	0.290	0.238	0.365
	(0.028)	(0.023)	(0.049)	(0.032)	(0.033)	(0.032)

Notes: This table shows average educational and occupational outcomes of students graduating from high school in year 2011 by gender and high school track; separate figures for native and immigrant students are presented in panel A and B, respectively. Standard errors are reported in parentheses.

Table A.2: Immigrant students' probability of choosing the high-track, controlling for socio-economic background

Dependent variable: Choosing the high-track						
	(1)	(2)	(3)	(4)	(5)	(6)
	Males			Females		
Immigrant	-0.086***	-0.078***	-0.066***	-0.048***	-0.048***	-0.027
	(0.021)	(0.021)	(0.021)	(0.018)	(0.018)	(0.018)
Low-educated Mother		-0.164***	-0.134***		-0.173***	-0.136***
		(0.027)	(0.028)		(0.024)	(0.025)
Mid-educated Mother		-0.033*	-0.015		-0.064***	-0.046***
		(0.018)	(0.018)		(0.018)	(0.018)
Low-educated Father		-0.056**	-0.085***		-0.035	-0.038
		(0.023)	(0.024)		(0.024)	(0.024)
Mid-educated Father		0.031*	-0.005		0.041**	0.024
		(0.018)	(0.017)		(0.017)	(0.017)
Mother bluecollar			-0.044*			-0.057***
			(0.022)			(0.021)
Mother home/unemployed			-0.049			-0.118***
			(0.036)			(0.032)
Father bluecollar			-0.018			-0.032
			(0.026)			(0.024)
Father home/unemployed			0.000			-0.015
			(0.020)			(0.018)
Constant	0.711***	0.819***	0.855***	0.746***	0.845***	0.870***
	(0.009)	(0.017)	(0.017)	(0.008)	(0.016)	(0.017)
Observations	3,927	3,927	3,927	3,819	3,819	3,819
R-squared	0.213	0.244	0.252	0.204	0.227	0.234

Notes: This table shows how immigrant status influences the probability of choosing the high-track. The dependent variable is a dummy equal to 1 for students choosing the high-track. The main explanatory variable is a dummy equal to 1 for immigrant students. The sample includes all students in control schools. All regressions control in addition for a second degree polynomial of test score in grade 6 (INVALSI6), a dummy for first generation immigrants, and province fixed effects. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

Table A.3: The effect of completing the questionnaire on soft skills in control schools

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Demanding High-School		Grade Retention		Std Test Score grade 8	
School Questionnaire	-0.016	-0.004	0.008	0.007	-0.061	-0.085
	(0.039)	(0.057)	(0.021)	(0.033)	(0.100)	(0.125)
Female*School Questionnaire		-0.029		0.004		0.035
		(0.069)		(0.036)		(0.140)
Female		0.167***		-0.058**		0.168
		(0.050)		(0.025)		(0.111)
Constant	0.759***	0.676***	0.052***	0.081***	0.004	-0.081
	(0.027)	(0.042)	(0.014)	(0.023)	(0.069)	(0.087)
Observations	620	620	620	620	552	552
R-squared	0.000	0.031	0.000	0.015	0.001	0.015

Notes: This table tests whether control students in schools selected for the questionnaire differ in their high-school choice, grade retention and performance in the standardized test score from students in the control schools not selected for the questionnaire. The dependent variable is a dummy equal to 1 for students choosing the high-track in columns 1 and 2, a dummy equal to 1 if students are retained in grade 7 or 8 in columns 3 and 4 and the standardized value for the test score in columns 5 and 6. Standard errors clustered by school are reported in parentheses. *, **, and *** denote statistical significance at the 90%, 95%, and 99% confidence level, respectively.

Table A.4: Principal component analysis, factor loadings

First principal component: Aspirations		
	Loadings	std. err.
Goal University	1	.
Self efficacy University	1.649	0.050
Self efficacy White collar	0.753	0.030
Self efficacy Manager	0.631	0.030
Second principal component: Perception of barriers		
	Loadings	std. err.
Barriers economic	1	.
Barriers family ideas	1.339	0.087
Barriers prejudice	0.837	0.063
Barriers family plans and marriage	1.001	0.074
Barriers self esteem	0.947	0.072

Notes: This table shows estimated factor loadings for the two principal components extracted from psychological measures; Satorra-Bentler robust standard errors are also presented. Measurements are categorical variables in a scale from 1 to 4. "Goal University" is the answer to the following question: *Thinking about your future, do you want to achieve an university degree?*. The measurements related to "Self efficacy" are the answers to the following questions: *Independently from your educational aim but thinking about your abilities, do you think you could get a university degree/ white collar job/ managerial job?*. The measurements related to "Barriers" are the answers to the following questions: *Do you think the following barriers could be an obstacle in the achievement of your educational aims? Economic resources/ The needs and ideas of your family/ Racial prejudice/ Family plans (children, marriage)/ Not feeling good enough*.

Table A.5: Initial vs. working sample

	Treated	Controls	Difference	P-value	Std. Difference
Initial sample	700	751			
Fraction missing match MIUR-INVALSI	0.043	0.053	- 0.010	[0.72]	-0.049
Number of students with available MIUR-INVALSI	670	711			
Fraction dropped between INVALSI6 and start of EOP	0.109	0.128	- 0.019	[0.51]	-0.059
Final sample	597	620			

Notes: This table shows the sample size of treated and control students in our sample. P-value for difference in means are reported in parenthesis. The last column also reports the standardized difference between group averages.

Table A.6: Treatment effect on soft skills (by survey question)

ITT on	Coefficient	p-value	p-value FWER
Group 1: aspirations			
Goal University	0.087	0.073	0.082
Self efficacy University	0.201	0.018	0.054
Self efficacy Whitecollar	0.215	0.001	0.007
Self efficacy Manager	0.150	0.027	0.062
Group 2: perception of environmental barriers			
Barriers economic	-0.182	0.008	0.019
Barriers family ideas	-0.203	0.002	0.007
Barriers prejudice	-0.280	0.000	0.001
Barriers family formation and marriage	-0.087	0.177	0.177
Barriers self esteem	-0.274	0.000	0.001

Notes: Robust standard errors clustered at school level. All regressions include generation of immigration, province and squared test score. P-values are adjusted for multiple hypothesis testing using the free step-down resampling method (Westfall and Young, 1993) to control the family-wise error rate (FWER). Measurements are categorical variables in a scale from 1 to 4. "Goal University" is the answer to the following question: *Thinking about your future, do you want to achieve an university degree?*. The measurements related to "Self efficacy" are the answers to the following questions: *Independently from your educational aim but thinking about your abilities, do you think you could get a university degree/ white collar job/ managerial job?*. The measurements related to "Barriers" are the answers to the following questions: *Do you think the following barriers could be an obstacle in the achievement of your educational aims? Economic resources/ The needs and ideas of your family/ Racial prejudice/ Family plans (children, marriage)/ Not feeling good enough*.

Table A.7: Specification test, Males

Outcome: Choosing the high-track	(1)		(2)		(3)	
Mediating factors: $H_0 : \alpha_1^j = \alpha_0^j$	Test Statistic	p-value	Test Statistic	p-value	Test Statistic	p-value
Aspirations	1.50	[0.14]	1.34	[0.18]	1.68	[0.10]
Barriers	1.14	[0.26]	1.04	[0.30]	0.49	[0.63]
INVALSI8			0.14	[0.89]	0.60	[0.55]
Teachers' recommendation					0.60	[0.55]
Controls: $H_0 : \beta_1^i = \beta_0^i$	Test Statistic	p-value	Test Statistic	p-value	Test Statistic	p-value
INVALSI6	0.72	[0.47]	0.55	[0.58]	0.88	[0.38]
INVALSI6 sq.	1.58	[0.12]	1.49	[0.14]	1.39	[0.17]
First generation immigrant	0.96	[0.34]	0.86	[0.39]	0.74	[0.46]
Prov BS	1.53	[0.13]	1.33	[0.19]	0.46	[0.65]
Prov GE	1.10	[0.28]	1.00	[0.32]	1.32	[0.19]
Prov MI	0.29	[0.77]	0.06	[0.96]	0.51	[0.61]
Prov PD	0.60	[0.55]	0.33	[0.75]	0.17	[0.86]
Prov TO	0.98	[0.33]	0.98	[0.33]	0.31	[0.76]
F-test	1.37	[0.21]	1.28	[0.26]	1.35	[0.23]

Notes: The first panel tests whether the treatment group regression coefficients in equation 2 are the same as the control group coefficients: $H_0 : \alpha_1^i = \alpha_0^i$, for each potential channel θ. The second panel tests whether the treatment group regression coefficients are the same as the control group coefficients: $H_0 : \beta_1^i = \beta_0^i$, for each potential control variable $\mathbf{X}$. In column (1), we consider only two mediating factors, i.e. aspirations and barriers, while in column (2) we include also the achievement test scores and in column (3) teachers' track recommendation.

Table A.8: Decomposition of the effect of EOP on high-school choice, male students (Gelbach, 2016)

	(1)		(2)		(3)	
	Explained	p-value	Explained	p-value	Explained	p-value
Aspiration	0.0354	[0.034]	0.0291	[0.042]	0.0264	[0.046]
Barriers	0.0046	[0.602]	0.0067	[0.446]	0.0042	[0.620]
Cognitive skills			0.0178	[0.085]	0.0105	[0.190]
Teachers' recommendation					0.0385	[0.011]
Total explained	0.0400	[0.032]	0.0537	[0.010]	0.0796	[0.001]
EOP effect on choosing high-track	0.091		0.091		0.091	

Notes: This table decomposes the effect of EOP between changes in personality skills (aspirations and perception of barriers), increased schooling achievement (as measured by INVALSI8) and teachers' recommendations. The decomposition follows the method devised by Gelbach (2016).

Appendix B: Cost Benefit Analysis

Table B.1: Cost Benefit Analysis

	Scenario 1	Scenario 2	Scenario 3
Parameters			
Discount rate	3%	3%	3%
Tax rate	28%	28%	28%
Higher salary per month (euros)	500	500	650
Lower unemployment probability	4%	4%	6%
Unemployment insurance benefit per month (euros)	1000	1000	1300
Number of beneficiaries	60	125	125
Costs and Benefits			
Total costs (thousand euros)	2,177	2,177	2,177
Higher taxes on wage (thousand euros)	3,344	7,006	9,108
Lower unemployment insurance (thousand euros)	955	2,002	3,904
Internal Rate of Return	2.8%	6.6%	8.8%

Notes: Although EOP program has potentially strong effects on health and on reduction of crime rates, we present conservative estimates focusing our cost-benefit analysis only on social benefits coming from higher income taxes and public savings on unemployment insurance. In the first scenario, we consider potential benefits only on 10% of students directly treated by EOP. In the second scenario, keeping all other assumptions constant, we consider also the additional spillovers on 5% of classmates of treated students (close to the share who did not fail the school year or decided to attend a more demanding track compared to classmates of control students). In the last scenario, we slightly reduce the unemployment probability, we slightly increase the expected average higher salary per month and the expected unemployment insurance benefit.