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Abstract

Residential proximity to schools is a relatively unexplored topic, especially as concerns its link to socially disadvantaged and immigrant-origin students. Such students may be more likely to attend the nearest school to their home, since their (families') knowledge of school system is weak and school selection depends more on convenience rather than on an evaluation of multiple schools' pros and cons. This paper examines if, and to what extent, home-school distance is a crucial factor in differentiating native and immigrant-origin students' educational experiences. Analyses – carried out in two major cities in Northern Italy (Milan and Bologna) and referring to students enrolled in the compulsory and comprehensive final year of lower secondary education in the 2014/15 school year – focus on minimum and actual home-school distances, the share of students engaging in "flight" from the nearest school, and on the appeal exerted by schools on culturally advantaged families. Results show that native and immigrant-origin students' school proximity is almost the same. Nonetheless, natives are more likely to attend schools that are farther from home; noteworthy differences are detectable in some disadvantaged sub-municipal areas. Native families, especially in Milan, are more likely to "flee" towards non-state schools, which display a particularly strong appeal towards native families featuring high parental education status.

Keywords: home-school distance; immigrant-origin students; parental level of education; lower secondary education; Italy

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Residential proximity to schools

This study examines home-school distance among native and immigrant-origin (lower secondary) student populations in two major Italian cities: Milan and Bologna. Residential proximity to schools in urban environments is, potentially, a highly consequential issue, insofar as differential distances may be linked to unequal access to educational opportunities and experiences. We intend to explore how home-school distances vary among native and immigrant-origin students, how they may be used to determine whether families choose not to enrol their offspring in geographically convenient schools, and the ensuing implications. The specific research goals we pursue can be divided into two subsets. The first focuses on students, or on home-school distances and choice decisions recorded at the individual/family level. Are schools more readily available (i.e., closer to home) to one group rather than another? Do actual school choices reflect or magnify these potential gaps in ease of access to education provision? The second subset is school-centred and concerns how schools exert differing levels of appeal towards culturally advantaged families.

Home-school distance has been explored in a variety of studies with divergent approaches and goals. One common perspective focuses on the association between home-school proximity and commute mode and on ensuing health implications: when a school is relatively close to a student's residence, there is a greater likelihood that the youth will walk or cycle to school and thus engage in beneficial physical exercise (Chillón et al. 2015). Similarly, such distances can play a role in promoting or hindering young people's independent mobility in urban settings: shorter distances help promote active and autonomous travel; vice versa, longer distances and travel times can contribute to development of time management skills (Lopes, Cordovil and Neto 2018). Some approaches focus on urban planning issues (including the location of school buildings) and underline how shorter distances entail greater environmental sustainability (Boussauw, Van Meeteren and Witlox 2014). School proximity also has more general consequences on social

integration: nearby schools facilitate participation in extra-curricular events (such as sports, club activities and the like), higher levels of connectedness with the local community, lower transportation costs, and lower degrees of commuter stress; on the other hand, longer distances may require collective modes of transportation (such as buses or car-pooling), providing opportunities for interaction with fellow commuters. From the narrow standpoint of educational performance, shorter distances leave more time for homework and promote regular attendance, whereas longer distances may generate chances of engaging in reading activities (Cullen, Jacob and Levitt 2005; Ledwith 2009; Thomas 2016).

Many of these distance-related benefits and drawbacks are obviously connected to travel modes and times and, perhaps less evidently, to factors pertaining to social inequality (Andersson, Malmberg and Östh 2012). This brief overview suggests that there is no "ideal" distance between homes and schools (Nelson et al. 2008). The situation is further complicated by the fact that residential proximity to schools is entangled with a host of issues, including residential and school segregation, the territorial distribution of schools and the latter's characteristics (including their status as private schools, potentially characterised by selective admissions procedure and/or non-negligible tuition costs), parents' commitment and ability to retrieve pertinent evidence and make informed decisions, other family-based resources (both cultural and material), perceptions and attitudes involving available schools' academic standards and curricular specialisation, school choice constraints and opportunities, policies implemented by local authorities, and their interplay (Bonal and Bellei 2018a; 2018b; Wilson and Bridge 2019).

The geographically uneven distribution of foreign-origin populations in a receiving society is often mentioned as a crucial factor responsible for school segregation on ethnic or immigrant-origin bases. Research in metropolitan areas in the United States has stressed the presence of ghettos, featuring a prominent concentration of poor and racially and/or ethnically identified individuals and accounting for the proliferation of "ghetto schools", typically attended by students residing nearby (Rivkin 1994; Clapp and Ross 2004; Frankenberg 2005).

Ethnic segregation in educational contexts has received less attention in Europe (and elsewhere) than in the U.S., although globalisation, major migratory flows and increasing social inequality in urban contexts have led to a "renaissance" in school segregation studies, reflecting the topic's dynamism and complexity (Bonal and Bellei 2018a; 2018b). As in the U.S., residential selection as a strategy for attending "good" schools is more common when families' choices are constrained by school catchment policies and in large cities. Furthermore, well-educated and affluent families are able to avoid so-called "black schools" by implementing "school flight" strategies (Ichou and van Zanten 2019), that may rely on identifying nominally persuasive justifications: having an older child enrolled elsewhere; preferring a more distant school offering a unique curriculum; exploiting other conveniences (e.g., schools located close to grandparents' homes or parents' workplaces). Moreover, affluent native families are more likely to avoid schools' official catchment basins by "fleeing" towards private, fee-based schools (Betts and Fairlie 2003; Saporito 2003), which tend to be less numerous and more sparsely distributed (thus entailing, on average longer home-school distances).

The positive relationship between residential and school segregation is not entrenched: a high concentration of immigrant-origin students in certain schools may also occur in absence of residential segregation. This is especially true in many European countries, where: residential segregation is moderate (Musterd 2005); residential proximity to schools is often formally irrelevant, since assignment to educational institutions is typically not residence-based and/or children are, by and large, free to attend any school (Fekjær, Birkelund 2007; Bonal, Zancajo and Scandurra 2020); many urban settlements are small, schools are relatively close to one another and easily reachable (Gramberg 1998). These intertwined factors explain why school segregation may be consistent with no (or weak) residential segregation on ethnic or immigrant-origin bases.

The link between home-school distance, on the one hand, and residential and school segregation is subject to potentially divergent pressures and thus makes it difficult to formulate expectations. If schools are evenly distributed within cities and of equivalent (perceived) quality,

one might not record significant differences in home-school distances between privileged and underprivileged students, regardless of segregation patterns. But even if these (perhaps unrealistic) assumptions were not to hold true, however, one could expect to observe higher home-school distances among disadvantaged students residing in areas not serviced by nearby schools, and/or – on the contrary – among advantaged students opting for "quality" schools that are not close to home.

The Italian case

The dearth of research on residential and school segregation in Italy (Oberti 2007) is mainly due to the fact that immigration is a relatively new phenomenon in Italy; only since the 1990s, and especially after the turn of the century[1], have there been significant migratory inflows.

Most studies on residential segregation in Italy have a local focus and concentrate on specific cities featuring a substantial foreign population. On the whole, scholars emphasise the absence of actual ghettos and the presence of milder forms of ethnic concentration. In Rome, although immigrants tend to settle in areas with larger concentrations of people sharing their ethnic background, clustering varies according to immigrants' nationality and does not generate a severe imbalance with respect to the native population (Pisati 2007). The same conclusion is drawn in a study of Naples: chain migration helps explain migrants' distribution in neighbourhoods – especially for some immigrant groups – but ethnic segregation is not detectable (Mazza, Gabrielli and Strozza 2017). Arbaci's study (2008) – conducted in a set of Mediterranean cities (including Milan) – detects low levels of ethnic spatial segregation, even if they are consistent with social residential marginalisation. Arbaci and Malheiros (2010) examine segregation indices for the most relevant immigrant groups in a set of Southern European cities and find that their concentration is quite low in Italy (Rome, Turin and Milan), in spite of some differences among ethnic groups and between earlier and more recent migrant cohorts.

Such outcomes might be due to the promotion of social housing policies aimed at favouring a social mix. Italian urban centres and peripheries have been traditionally characterised by a general socio-economic *mixité* (based on the coexistence of home-owners and renters, affluent and poor households in the same area) and, more recently, by a greater dispersal of immigrants in urban and suburban areas (Zajczyk 2005; Bergamaschi and Castrignanò 2017). Immigrants' residential choices are more often driven by their socio-economic conditions rather than nationality. Immigrants' overrepresentation among lower social classes affects their residential status, reducing their housing market opportunities and increasing their demand for accessible rental housing (Strozza et al. 2016). High incidence of foreign populations in small areas is exceptional, limited to a few underprivileged census units (Pisati 2007; Bergamaschi 2012) or single streets or buildings located in poor areas (Cancellieri, Marzadro and Ostanel 2015).

Even though residential segregation may be relatively marginal in Italy, some forms of school concentration are detectable. More specifically, immigrant-origin students are neither equally distributed along the peninsula nor among schools. A higher concentration of foreign populations in the more economically developed Northern regions leads to a higher concentration of pupils with migratory backgrounds in those areas' schools. Immigrant-origin students are more numerous in primary and lower secondary schools, since these institutions comprise the compulsory and comprehensive levels of the Italian education system. Upper secondary education is split into three major tracks (academic, technical and vocational): native and upper-class children are more likely to attend an academic track (leading to higher education), whereas individuals from disadvantaged families and/or with a migratory background are more likely to opt for the vocational or, to a lesser extent, technical tracks (Azzolini, Mantovani and Santagati 2019). These forms of school segregation might be defined "structural", since they are determined by exogenous features, including the distribution and the socio-demographic characteristics of immigrant families, and the organisation of the education system.

An additional type of potential school segregation, strictly connected to students' (and their families') educational choices, is also active. Since the late 1990s, the Italian education system has undergone several reforms aimed at reinforcing schools' organisational autonomy, including the abolition of residence-based school assignment criteria with regards to compulsory and comprehensive primary and lower secondary schools (law no. 289/2002). Although they are no longer binding, catchment basins continue to exist in order to help municipal authorities pursue an appropriate quantitative distribution of students among schools. These basins may provide guidance to families selecting a school, especially for underprivileged groups incapable or unwilling to explore other more substantive aspects of educational supply.

Barberis and Violante, in a study of four metropolitan areas in Italy, find no "clear-cut component to map school segregation" (2017: 11): Bologna, more specifically, has a relatively low level of school segregation; Milan has undergone a process of de-concentration albeit in the presence of native "flight" from peripheral areas. A more-detailed effort aimed at exploring the relationship between residential and school segregation in Italy is Pacchi and Ranci's study (2017) focusing on primary and lower secondary schools in Milan.[2] They investigate whether students – according to their migratory status and geographic distribution – attend "natural" schools, as defined by catchment basins and, if not, which school they actually choose. Their findings stress that, although a social and ethnic mix characterises the entire city[3], school segregation is stronger than residential segregation. In fact, the mobility of native students among schools is very high both in primary and upper secondary school (56-57% opt for a non-catchment school). More precisely, native families are more likely to adopt two distinct "flight" strategies in order to avoid schools with a high concentration of disadvantaged and/or immigrant-origin students. The first strategy is to opt for an officially recognised but non-state school[4] instead of a state school. This strategy is particularly widespread among pupils from native middle-upper class families residing in the wealthiest areas and those from native families residing in suburbs featured a high housing density of foreigners. The second strategy is applied within the public education system and is more

frequent in disadvantaged, peripheral areas, especially when poor socio-economic conditions and higher concentrations of foreign populations converge: native families are more likely to enrol their children in a more distant, non-catchment school. Cordella (2008) reports comparable findings in an analysis of mobility of lower-secondary students residing in a very poor Milan neighborhood.

Similar strategies are also identified by Piolatto (2019) in his research on residential and school segregation and lower secondary education. His study suggests that "mobile" students are more likely to be natives and belong to upper-class families, but not to a statistically significant degree. A preliminary exploration among youths attending lower secondary schools in Bologna (Santangelo, Gasperoni and Mantovani 2018) highlights a stronger tendency among immigrant-origin pupils to attend the closest school to home.[5]

The extant research on residential and school segregation in Italy suggests that both phenomena are still relatively limited and not a source of particular concern. Nonetheless, families' freedom of choice does appear to generate some school segregation, and native upper-class parents seem to be more capable of adopting strategies not based on mere geographical convenience.

Goals, data, variables

Research goals

This study uses home-school distance in a variety of ways. Firstly, it reflects *ease of access* to educational provision and, thus, of related differences among social groups within the context of the distribution of lower secondary schools on Milan's and Bologna's territories. Secondly, home-school proximately is a tool for determining whether families' decision-making leads to enrolling their children in a "distant" school and thus sheds light on *school choice* behaviour.[6]

As mentioned previously, this study's first subset of goals focuses on *students'* (or families') circumstances. An initial goal is descriptive in nature and aims to ascertain whether immigrant-origin and native students enjoy the same opportunities in terms of ease of access to public

educational opportunities. Exploration of this topic relies on the concept of *minimum home-school distance*. If educational services are uniformly distributed within a city, there should be no difference between the minimum distance between natives and non-natives. The analysis will also explore the additional distance to the second-closest state-run school, which reflects the minimum cost of forgoing enrolment in the most proximate school.

A second "student-related" goal is to explore *actual home-school distance* and the gap between this distance and the above-mentioned minimum distance. If the two do not coincide, families have not enrolled their children in the closest school. In other words, home-school distance makes it possible to explore whether families enrol their children in schools that are not closest to home, forgoing what could be considered the default option. One could expect Italian families to opt for a "non-default" school (i.e., not the closest to home) to a greater degree than do immigrant-origin ones: the latter – due to weaker familiarity with local schools and lower levels of education – have less resources to make more discerning decisions rather than choose the school closest to home. Moreover, we explore whether the relationship between migratory status and this aspect of school choice changes once one controls for other potentially relevant variables, including, most notably, the cultural endowment of families (as operationalised via parents' level of education) and area of residence.

A second subset of goals focuses on *schools* and uses a specially developed index classifying schools as appealing or repulsive as a function of the family cultural background of enrolled students. The aim is ascertain whether "appealing" schools (i.e. institutions attracting more culturally advantaged families) tend to coincide with those having a lower incidence of immigrant-origin students, and – conversely – "repulsive" schools accommodate a comparatively higher share of the latter students. Furthermore, the index will help determine if non-state schools are more appealing than state-run ones.

Analyses focus on Milan and Bologna, selected on the basis of several characteristics. As concerns shared traits, the two cities are capitals of Northern regions – respectively, Lombardy and

Emilia-Romagna – where the incidence of foreign-origin populations is most relevant in both absolute and (especially) relative terms. The cities' school systems feature a (predictably) high incidence, again in both absolute and percentage terms, of immigrant-origin students (Table A1, online appendix). Both are characterised by a low-to-medium socio-economic and ethnic degree of residential segregation (Santangelo, Gasperoni and Mantovani 2018; Cordini, Parma and Ranci 2019; Piolatto 2019); in both cities peripheral areas tend to host a greater proportion of less-educated residents (see below, Table 1).

On the other hand, the two cities have significantly different sizes (Milan is a metropolitan area with over 1.3 million people, whereas Bologna is a large town with 400 thousand people; Milan is 2.75 times more densely populated than Bologna) and feature differing territorial distributions of lower secondary schools. State and non-state schools are comparatively numerous in Milan and more evenly spread across the city (Figure 1: the boundaries highlighted in the maps correspond to municipal administrative districts), and this may facilitate school mobility simply because there are more educational opportunities (Cognetti 2014). Furthermore, the greater availability of non-state schools may favour upper-class natives' flight. In Bologna, on the other hand, lower secondary schools are less numerous and more geographically concentrated in the town centre (Figure 2).

[Figure 1 near here] [Figure 2 near here]

Data and variables

Data in this article are provided by the Italian National Institute for the Evaluation of the Educational System for Schooling and Training (INVALSI), the Ministry of Education, University and Research (MIUR), and the 2011 ISTAT (Italian Statistical Bureau) population census.

The INVALSI database includes information about students enrolled in the final year of lower secondary education, in state and officially recognised schools, in Milan and Bologna (in the 2014/15 school year) and provides (self-reported) information on gender, migratory status and

parents' level of education. The second database (MIUR) provides students' home addresses and schools' addresses. All these addresses were geo-referenced by the authors through the QGIS geographic information system and the MMQGIS plug-in. The general population census (ISTAT) was used to associate socio-economic characteristics (unemployment rate, percentage of higher education graduates, percentage of immigrant-origin population) of basic census territorial units with the geo-referenced addresses.

[Table 1 near here]

The database consists of 7,388 students attending 104 lower secondary schools (of which 37 non-state institutions) in Milan and 1,917 students attending 28 schools (8 non-state) in Bologna (Table 1). The two groups feature a balanced gender make-up and similar compositions in terms of parental education, with a prevalence of well-educated mothers or fathers (43-42%) over less-educated ones (21-22%). Milan displays a higher incidence of immigrant-origin students (21.8%, versus 15.7% in Bologna), whereas Bologna shows a greater balance between first-generation (G1) and second-generation immigrants (G2). The greater incidence of G2s in Milan reflects the fact that migratory flows toward that city have a longer history. Quite unfortunately, no information is available on the specific areas of origin of non-native students. As expected, migratory status and parental level of education co-vary: immigrant parents are appreciably less educated than native parents (evidence not displayed here).

In the following student-centred analyses, home-school distance and school choice (the operational definitions of which are described in the sections devoted to findings) are explored in their relationships with other variables, especially migratory status, parental education and area of residence. *Migratory status* takes on three values: natives/Italians (students born in Italy to at least one Italian-born parent, plus students born abroad to Italian-born parents), G2s (students born in Italy with both parents born abroad or students born abroad with one Italian parent and the other born abroad) and G1s (students born abroad to two parents also born abroad).

Parental level of education is operationalised by considering the highest educational credential achieved by either parent. The variable encompasses three categories: low (no parent attained an upper secondary diploma); intermediate (at least one parent earned such a diploma, but none completed tertiary education); high (at least one parent earned a tertiary degree). This variable reflects *cultural* resources available to students. (INVALSI also provides a more encompassing socio-economic status index, but it was discarded: use of the socio-economic index would have drastically decreased the number of valid cases due to a high incidence of missing data on this variable.) Educated parents are more familiar with schooling and more likely to assess teachers' expertise regardless of their occupational status. This is particularly relevant as regards immigrant parents, who are more likely to suffer from a mismatch between their level of education and their occupational/financial situation. More precisely, many immigrants are often employed in demanding, dirty, dangerous and low-paid jobs, even if they hold an upper secondary or university qualification (which, if earned in the country of origin, may not be recognised in the receiving country: Fellini, Guetto and Reyneri 2018; Gabrielli and Impiccatore 2021; Muñoz Comet and Arcarons 2021; Belfi et al. 2021).

As regards *area of residence*, ISTAT provides the following information for each census unit: number of residents; number of residents aged 10-14; incidence of university graduates; unemployment rate; incidence of foreigners. The 13 Milanese areas of residence and the 8 Bolognese areas displayed in Figure 3 derive from an aggregation of contiguous census units on the basis of similarities with respect to the above-mentioned characteristics. The aggregation also takes into account the boundaries of administrative units, the territorial distribution of lower secondary schools, and the absolute number of immigrant-origin students living in the area (Table 2). Unsurprisingly, areas with comparatively higher shares of foreign residents tend to display lower levels of education. Figure 3 also displays the incidence of immigrant-origin students in the dataset, which varies from school to school, with the most notable feature being their extremely low presence in non-state schools.

[Figure 3 near here] [Table 2 near here]

As far as the school perspective is concerned, for each school an "attractiveness" index (*A*) was developed in the following way. Firstly, a set of students was identified comprising all students in the dataset for whom the school is one of the *three* closest to home (subset 1)[7] and all students actually enrolled in the school but not belonging to subset 1 (subset 2). Secondly, for each school, *A* was calculated in the following way:

$$A = ACAF - ACDF$$

where *ACAF* is the *appeal* exerted by the school on *culturally advantaged families* (in which at least one parent has completed tertiary education) and *ACDF* the *appeal* exerted by the school on *culturally disadvantaged families* (in which no parent has completed upper secondary education), defined as follows:

ACAF = (no. of enrolled students from culturally advantaged families in subset 2 – no. of students enrolled elsewhere but from culturally advantaged families in subset 1) / no. of students from culturally advantaged families in subsets 1 and 2

ACDF = (no. of enrolled students from culturally disadvantaged families in subset 2 – no. of students enrolled elsewhere but from culturally disadvantaged families in subset 1) / no. of students from culturally disadvantaged families in subsets 1 and 2

The numerators of both *ACAF* and *ACDF* do not take into account enrolled students for whom the school is one of the three closest to home, whereas the denominators do include these students; also, the index does not consider families in which parents have an intermediate educational status. *ACAF* varies between the values of –1 (when *all* culturally advantaged families in subset 1 opt to enrol their children elsewhere and subset 2 contains no students from culturally advantaged families) and +1 (when *all* enrolled students from culturally advantaged families come from subset 2 and subset 1 contains no students from culturally advantaged families). The same

applies for *ACDF* once one replaces culturally advantaged families with disadvantaged ones. Thus, *A* may vary between the (unrealistic) extreme values of –2 (when the school draws *all* of its students from non-local culturally deprived families and there are no local culturally deprived families) and +2 (when the school draws *all* of its students from non-local culturally advantaged families and there are no local culturally advantaged families). Figures 7 and 8 (below) display the actual values taken by schools on the *A* index.

Thirdly, in order to classify each school into one of three groups (distinctly for each city), two threshold values were identified (for each city): the lower threshold is equal to the mean value of *A* for the given city's schools minus one-half the value of *A*'s standard deviation; the higher threshold is equal to the mean value of *A* plus one-half the value of its standard deviation. Schools with an *A* greater than the second threshold were classified as "appealing"; those with an *A* lower than the first threshold were classified as "repulsive"; remaining schools were labelled "neutral".[8]

Findings

Minimum home-school distance

The first analysis goal concerns the extent of potential differences in minimum home-school distances between Italian and immigrant-origin families in Milan and Bologna. As expected, the widespread territorial distribution of state schools in Milan does not put immigrant-origin students at a particular disadvantage (Table 3). Italian and immigrant-origin families have, on average and respectively, a state school at 0.56 and 0.58 km from home. The longest mean distances between students' homes and the nearest state schools are observed in peripheral and comparatively vaster areas (Baggio / San Siro, Loreto / Monza / Padova, Grattosoglio / Barona, and South-East) and yet remain well under the 1-km threshold; nor are there any areas in which the differences between native and immigrant-origin families can be deemed significantly detrimental to the latter. If one observes the additional distance individuals would need to travel in order to attend the second most

geographically convenient state school, again the two mean values are practically identical: 0.39 km for Italians and 0.42 km for immigrant-origin youths.

[Table 3 near here]

Bologna's smaller surface area fails to compensate for its fewer schools. Mean home-state school distances are greater (0.72 km for Italian and 0.63 for immigrant-origin families) than in Milan. On average, immigrant-origin youths reside (slightly) nearer to a state school than natives. "Flight" from the closest state school is more costly in Bologna, for it requires travelling an additional distance of 0.65 km for Italians and 1.0 km for G1s/G2s. Longer distances are observed in the more peripheral and/or vast areas: San Vitale, West, Costa-Saragozza / Colli / Murri. Immigrant-origin students residing in Lame / Corticella are particularly penalised should they not want to attend the closest school to home. Bologna's Centre and Bolognina areas display comparatively low distances due to a greater concentration of schools in those areas.

In both cities, students living in areas featuring a relatively high incidence of less-educated residents need to travel longer distances to reach a state school. Similarly, students living in areas featuring a relatively high incidence of foreign residents need to travel longer distances to reach a state school (in Bologna this is true if one omits the outlier Bolognina area, featuring a high incidence of foreign residents and located, as mentioned above, near many state schools).

Actual home-school distance and incidence of "flight"

The distance travelled by students to the schools they actually attend is significantly higher than the minimum distance reported in the previous section (Table 4). In Milan native and immigrant-origin pupils live, on average, 1.28 and 1.26 km from their actual schools, versus 0.56 and 0.58 km, respectively, from the closest schools (Table 3); in other words, students travel over twice the distance they need to. In Bologna the situation is similar: means actual home-school distances of 1.34 and 1.28 km, respectively for natives and immigrant-origin students, versus mean minimum distances of 0.72 and 0.63 km.

In both cities, children of well-educated parents tend to travel further than offspring of less-educated parents, both in absolute (greater distances) and relative (ratio between actual and minimum distance) terms, but the differences are not very pronounced. Patterns vary somewhat at the sub-municipal level, and some areas feature noteworthy differences. In Milan's Grattosoglio / Barona area immigrant-origin students travel longer distances than natives (an additional 750 metres); the opposite is true for Isola / Buenos Aires (native students travel an extra 590 metres). In Bologna the largest area-level difference concerns the West, where immigrant-origin students travel almost 400 metres more than their native peers. In both cities there is a positive relationship between actual home-school distance and incidence of less-educated residents. In other words, students residing in culturally disadvantaged areas are more prone to flight.

[Table 4 near here]

The observed differences are arguably not large in substantive terms: 1 km corresponds to an approximately 12-minute walk, and the mean divergences between native and immigrant-origin subgroups and between actual and minimum distances are almost all well below this threshold. (The distances operationalised here refer to geodesic distance and therefore do not take into account physical obstacles and real-life pedestrian and vehicular routes. The "real-life" distances and travel times are almost certainly appreciably higher than the ones reported here.) In any case, the lack of convergence between actual and minimum distances points to the fact that many pupils do not attend the school closest to their residence.

Table 5 reports the incidence of students *not* attending the school closest to home. More precisely, all students fall into two groups: attendees of the closest school are those who are enrolled in the institution nearest home, regardless of its state or non-state nature, plus those who are enrolled in the nearest state-run school; all others are non-attendees of the closest school.[9]

In Milan, immigrant-origin individuals are appreciably more likely (11 percentage-point difference) than Italians to be enrolled in the most geographically convenient school, whereas in Bologna the difference is practically negligible (less than 3 percentage points). In Milan (but not in

Bologna) the probability of "fleeing" the most proximate school appears to be influenced to a much stronger extent by families' cultural resources: households with less-educated parents are less likely to engage in flight than well-educated parents.

[Table 5 near here]

Within each city considerable variability can be observed across areas, both in the overall tendency to choose the school closest to home and in the differences between Italians' and immigrant-origin students' preferences. In almost all Milan areas immigrant-origin pupils tend to make the "easy" choice to a greater degree than natives; in other terms, native families are more likely to "flee". Flight is particularly more widespread among native students, compared to immigrant-origin ones, in the Navigli / XXII Marzo, Maggiore / Bovisa, Centre, Isola / Buenos Aires, and South-East areas. Among the latter, however, only Maggiore / Bovisa and the South-East feature a comparatively high incidence of foreign residents. On the whole, a *negative* relationship emerges between incidence of foreign residents, on the one hand, and, on the other, native families' tendency (in absolute terms and relative to immigrant families) to engage in educational mobility.

Bologna displays greater variability across areas: some show no difference related to migratory status, others express a greater tendency to attend the nearest school among natives, and in others an opposing pattern prevails. The San Donato area, in particular, features an appreciable discrepancy between native and immigrant-origin families' tendency to "flee" the closest school. On the whole, areas with a higher incidence of foreign residents feature a *greater* likelihood of Italian families' not enrolling in the nearest schools.

About one-sixth of Milan students attend a non-state school, with some areas – Centre, Washington / Pagano, and Isola / Buenos Aires – featuring incidences above 20% (Table 5); on the whole, resorting to non-state schools is more widespread in areas with lower rates of resident foreigners. In Bologna only one-ninth of students attend a non-state school; areas with a higher incidence of foreign residents display a higher propensity to enrol in non-state schools (again, as long as Bolognina is omitted from the analysis). Native families resort to non-state schools more

frequently than immigrant-origin ones (and G2s do so more extensively than G1s), as do – to a greater degree – families with greater cultural endowments.

In order to shed more light on the educational mobility choices, a logistic regression model has been developed (separately for each city) to estimate the likelihood of students' *not* attending the school nearest to home rather than another school: the models' dependent variable takes on the value 0 when the student attends the school closest to home (as defined above); the value 1 in all other cases. The models' covariates include students' migratory status, parental level of education, area of residence, student gender, type of school attended (state or non-state), as well as interaction terms between migratory status and area of residence and between parental level of education and area of residence (Table A2 in online appendix).

[Figure 4 near here]

Figure 4 displays, for each city's area of residence, the mean marginal effects of *migratory status* on the likelihood of not enrolling in the school closest to home.[10] The point estimates confirm trends emerging from Table 5 and suggest that migratory status does not have much of an effect on families' propensity to flee from the nearest school. Native families living in Milan's South-East and Città Studi / Corsica areas are significantly more likely to flee from the nearest school with respect to G1s, whereas the opposite is true in the Dergano / Bicocca and Grattosoglio / Barona areas; three of these four areas have an incidence of foreign residents very similar to the city-wide mean. Native families living in Milan's Maggiore / Bovisa (high incidence of foreigners), Navigli / XXII Marzo and Centre (low incidence of foreigners) areas are significantly more likely to flee from the nearest school with respect to G2s. In Bologna, among families living in the San Donato area there is a significantly greater likelihood to avoid the nearest school among Italian families vis-à-vis G1s, whereas the opposite holds true in the West area. No significant differences can be detected among native and G2 families in Bologna.

[Figure 5 near here]

The mean marginal effects of *parental educational status* on the likelihood of closest-school avoidance are shown in Figure 5. Results point to the fact that families' cultural endowment exerts some influence on flight propensity, at least in Milan. In that city, compared to families with lower educational status, culturally advantaged families manifest a significantly greater tendency to engage in educational mobility in 7 of 13 areas. In Bologna, on the other hand, only one of 8 areas (Lame / Corticella) expresses a similar pattern. Indeed, in the city's historical centre culturally advantaged families are decidedly *less* prone to flee nearby schools than disadvantaged families are.

School appeal

The remaining analyses focus on the perspective of schools (66 in Milan and 21 in Bologna), as stated previously. The presence of immigrant-origin students varies between 1 and 64% in Milan and between 0 and 46% in Bologna (with median values of 21 and 13%). The incidence of children of less-educated parents (i.e., with no upper secondary education qualifications) varies between 0 and 51% in Milan and between 0 and 34% in Bologna (medians of 18 and 19%). In both cities one predictably detects a *positive*, and similarly strong, relationship between incidence of immigrant-origin students and share of children from culturally disadvantaged families (results not shown here).

We now turn to individual schools' cultural appeal, according to the A index described above. Schools were classified as appealing (i.e., attracting culturally advantaged families and repelling culturally disadvantaged ones), repulsive or neutral. Figure 6 displays the location of appealing and repulsive schools (and omits neutral ones) in Milan and Bologna. Of the 66 Milan schools considered, 17 are appealing, 19 are repulsive, and 30 are neutral. Among the 21 Bologna schools considered, 11 are neutral, 6 are repulsive and only 4 are appealing. In Milan, the appealing schools display a relatively high degree of geographical dispersal; although some areas remain distant from appealing schools, the latter are located in both areas with few foreign residents and areas with a high incidence of immigrants. In Bologna, appealing schools are concentrated at the

edges of the city's centre; although two appealing schools are located in the Bolognina area, on the whole the map highlights the location of appealing schools in comparatively "immigrant-free" neighbourhoods. Another obvious, albeit unsurprising, finding emerging from Figure 6 is the overlap between appealing schools and non-state schools (yet Milan also features a repulsive non-state school).

[Figure 6 near here]

Does schools' characterisation as appealing or repulsive have a link with their being attended by immigrant-origin students? Figure 7 displays the association between schools' values on the *A* index (where higher values reflect greater attractiveness) and the incidence of G1s and G2s. Milan's schools clearly show a greater variability, with respect to Bologna's, on both the *A* index and the incidence of immigrant-origin pupils. In other words, Bologna's schools tend to resemble each other, as regards these two features, to a greater extent than Milan's.

[Figure 7 near here]

Perhaps the most striking finding is the patently negative relationship between the two variables in both cities: a school's attractiveness tends to rise as its share of immigrant-origin pupils decreases. The relationship appears stronger in Milan. In both cities, non-state schools tend to be both appealing and dealing almost exclusively with the educational needs of native students. Indeed, if non-state schools are not taken into account, the relationship between cultural attractiveness and incidence of immigrant-origin students weakens appreciably in Milan and vanishes completely in Bologna.

In both cities, most schools feature relatively minor native-immigrant differences in the mean actual home-school distance. However, if one examines the relationship between schools' value on the *A* index and the home-school distance travelled by natives (Figure 8), a positive relationship emerges in both cities. Non-state schools are predictably associated with non-low travel distances.

[Figure 8 near here]

Concluding remarks

As argued in the introductory section, home-school proximity is an important, underexplored topic, that provides insights for many policy-relevant areas, including urban planning, transport management, health, socialization, youth autonomy, and social integration. The latter area is particularly relevant as concerns student populations' make-up in terms of native and immigrant origins, familial cultural background, and their links to residential and school segregation.

It is worth noting that the Covid-19 pandemic has affected the importance of home-school distance in different ways. To a greater degree than in other economically developed countries, Italian schools have been shuttered for long periods of time and heavily resorted to distance-learning. Paradoxically, this might render home-school distance more irrelevant, at least in the short term. Yet distance-learning introduces other sources of inequality, based on access to digital technologies, that might disproportionately penalise immigrant-origin and other disadvantaged students. More importantly, a primary reason for school shutdowns in Italy is the fear that congestion of public means of transportation could promote contagion. This could lead to more long-lasting effects, as underprivileged families may prefer close-to-home schools in their future choices.

On the whole, it appears that equitable access to educational opportunities and families' decision-making do vary according to migratory status and areas' incidence of foreign residents, but not in a strong nor systematic manner, and with significant variations linked to local realities. This may depend on comparatively mild residential and school segregation, weak differentiation of schools' (actual or perceived) quality or other unobserved factors pertaining to integration policies. Of course, such a conclusion is tempered by some limits inherent to the study. All immigrant-origin students are here grouped together and differentiated only on the basis of first- and second-

generation status, but this subgroup is in all likelihood internally no less diverse (and arguably *more* so) than the native sub-group.

As far as home-school distance is concerned, in Bologna students travel greater distances in order to reach the nearest state school than do students in Milan. This result is only partially unexpected. Indeed, even though Milan has a wider area, schools are more numerous and more evenly distributed in the territory, favouring ease of access for both native and immigrant-origin students as well as the collocation of appealing schools. In both Milan and Bologna students residing in peripheral areas need to travel greater distances to reach the closest school; more importantly, there is a negative correlation between schools' appeal and their share of immigrant-origin students.

Findings also highlight both the role of parents' level of education and the differences between the two cities. In both contexts, well-educated parents tend to enrol their offspring in non-state schools. In Milan "flight" in general is more widespread than in Bologna and more dependent on families' cultural resources. Results in Bologna are shaped by the unbalanced territorial allocation of schools and the specific characteristics of the Bolognina area.

Unfortunately, our analyses do not take into account other school characteristics (beyond their state / non-state status), yet it is reasonable to expect that specific schools may exert an appeal (with repercussions for home-school distance) on the basis of distinctive curricular content or other traits that might entice students who do not reside in the vicinity.

It should be noted that in the 2018 Programme for International Student Assessment, across 9 participating OECD countries 58% of parents (of 15-year-old students) considered home-school distance as an "important" or "very important" reason for choosing a school; safe school environment, good school reputation, active and pleasant school climate, attendees' academic achievement and foreign language instruction were all deemed more crucial choice factors (OECD 2019a: 148-149). However, the share of Italian parents conferring a major role to distance was the lowest observed in any country (31%). This finding could reflect an important cultural distinction

and/or perhaps a comparatively widespread availability of schools in geographic terms, due to which parents express little concern for distance.[11]

Another potentially exceptional trait of the Italian school system concerns teachers' self-perception as regards managing multicultural teaching and suggests that the Italian school system is comparatively well-equipped to deal with the integration of immigrant-origin students. According to the most recent edition of the Teaching and Learning International Survey, among lower secondary school teachers from 31 OECD countries who report having already taught classrooms with students from different cultures, 67% feel they can cope with the challenges of teaching a culturally diverse class. The incidence of Italian teachers who share the same belief is 80%. Italian teachers are also significantly more likely to report that teaching in a multicultural or multilingual setting was included in their recent professional development activities (OECD 2019b: 32). On the school performance of immigrant-origin students, see Gabrielli, Di Bartolomeo and Strozza 2021; Triventi and Vlach 2021).

Further efforts are needed in order to attain more detailed knowledge about factors influencing the choice to forego geographically convenient schools and educational immobility. The analyses shown here rely on general institutional characteristics and just a handful of individual and family characteristics, while ignoring others (see, for example, Cebolla Boado & González Ferrer 2021 for the influence of family structure). A deeper understanding of educational decision-making should accommodate – preferably via a mixed-method, case-study approach – actual travel distances, times, and modes; location of parents' workplaces and grandparents' homes; criteria used by parents in choosing schools; strategies adopted by school authorities in order to attract or deter (deliberately or unwittingly) immigrant-origin students (e.g., classroom sorting, teacher-classroom assignments, foreign language courses, cultural mediation services: FGA 2011).

Notes

1. Since 2012, the increase of foreign population has been persistent but moderate, due to the effect of the 2008 economic crisis and the increase in the number of foreign-origin individuals achieving Italian citizenship (Fondazione ISMU 2012; 2017).
2. See also Cordini, Parma and Ranci (2019) as regards primary schools in Milan. Other similar efforts not completely focused on school segregation are Torri and Vitale (2008); Mingione et al. (2008); Rimoldi and Terzera (2017).
3. Actually, a (relatively problematic) centre/periphery segregation divide can be observed: foreigners are more concentrated in some suburban areas, but migratory experience does not necessarily coincide with socio-economic disadvantage.
4. Officially recognised schools are non-state schools and may be supported by local public authorities or private actors. On the basis of law no. 62/2000, these schools are "officially recognised" by the Ministry of Education, and educational credentials awarded by these institutions are formally considered equivalent to those of state schools.
5. The cited study is based on the same data-base used here, but focuses only on the city of Bologna and uses qualitative analyses when focusing on school profiles.
6. It is important to reiterate that lower secondary schooling is compulsory and features a basically undifferentiated curriculum across different schools.
7. The index contemplates *three* schools because three is the lowest value ensuring that almost all schools would have at least one state school among their competitors.
8. The setting of the two thresholds at one-half standard deviation below and above the mean reflects a criterion commonly used in the definition of overeducation (Morrison and Lichter 1988; Ortiz and Kucel 2008).

   Schools with less than 50 enrolled students and/or for which no information for parental education status was missing for over 60% of pupils were not considered in this set of analyses, leading to the exclusion of 38 schools in Milan and 7 in Bologna.
9. Only the closest school is considered in that the additional travel distance required from the nearest to the second most proximate school is, on average, greater than the additional distances recorded for the following rank orders: setting a different threshold would mean defining relatively "difficult" choices as "non-flight". The reasoning applied here is, thus, different from the one used in developing the A index.
10. Similar results obtain if schools' state / non-state status – which can arguably be interpreted as an intervening variable – is omitted from the model.
11. This may be due, in part, to the fact that 15-year-olds typically attend track-specific upper secondary schools and that parents probably incorporate track considerations into their decisions to a much greater degree than proximity of schools; yet Italian upper secondary education's track structure is hardly unique and does not appear to adequately justify the difference.

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Figure 1. Incidence of foreigners in the population and location of (state and non-state) lower secondary schools in Milan

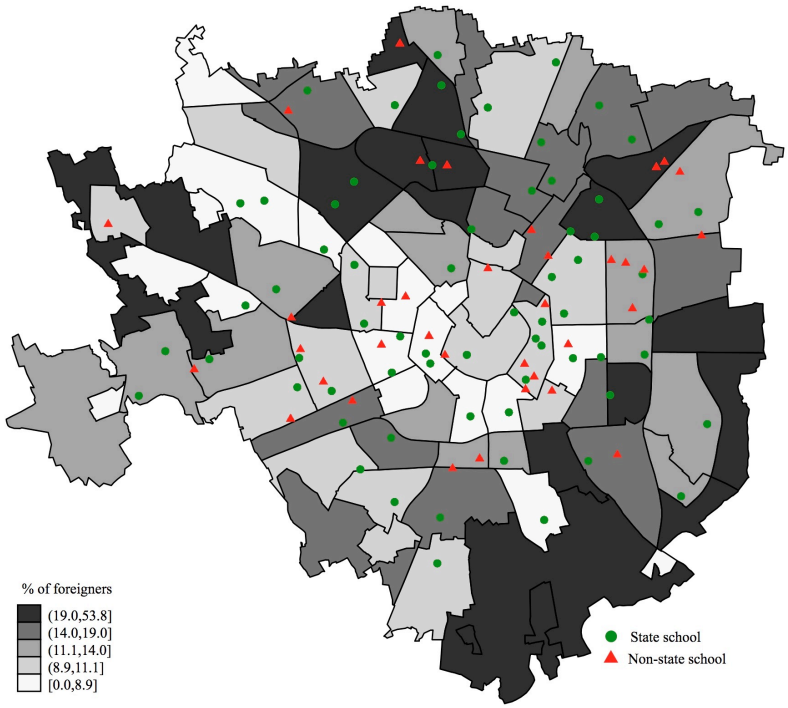


Figure 2. Incidence of foreigners in the population and location of (state and non-state) lower secondary schools in Bologna

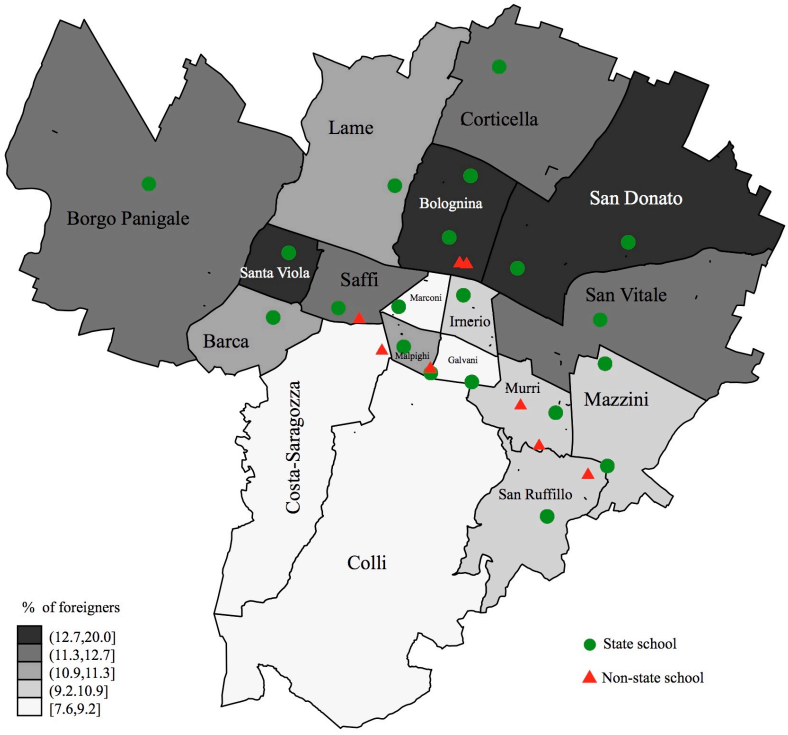


Figure 3. Sub-municipal areas used in following analyses and incidence of immigrant-origin students in schools (size of location symbols proportional to incidence in immigrant-origin students in corresponding schools, according to dataset) in Milan and Bologna

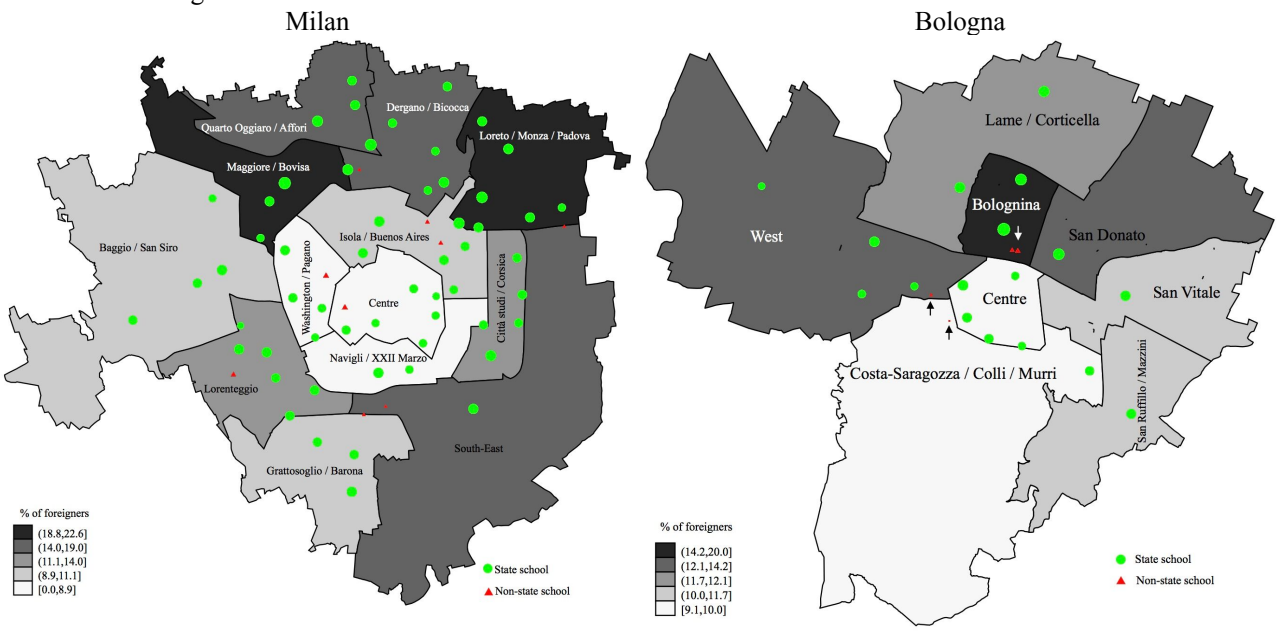


Figure 4. *Estimated likelihood of attending a school other than the one closest to home, by area of residence and migratory status (reference category: Italian): mean marginal effects and 95% confidence intervals*

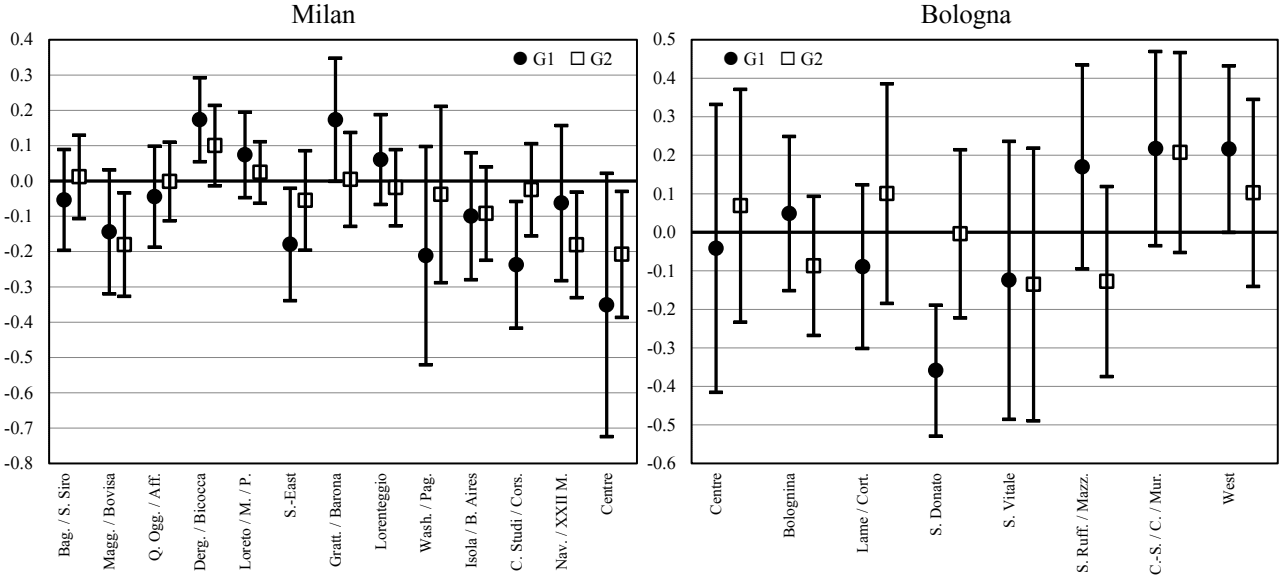


Figure 5. *Estimated likelihood of attending a school other than the one closest to home, by area of residence and parental level of education (reference category: low): mean marginal effects and 95% confidence intervals*

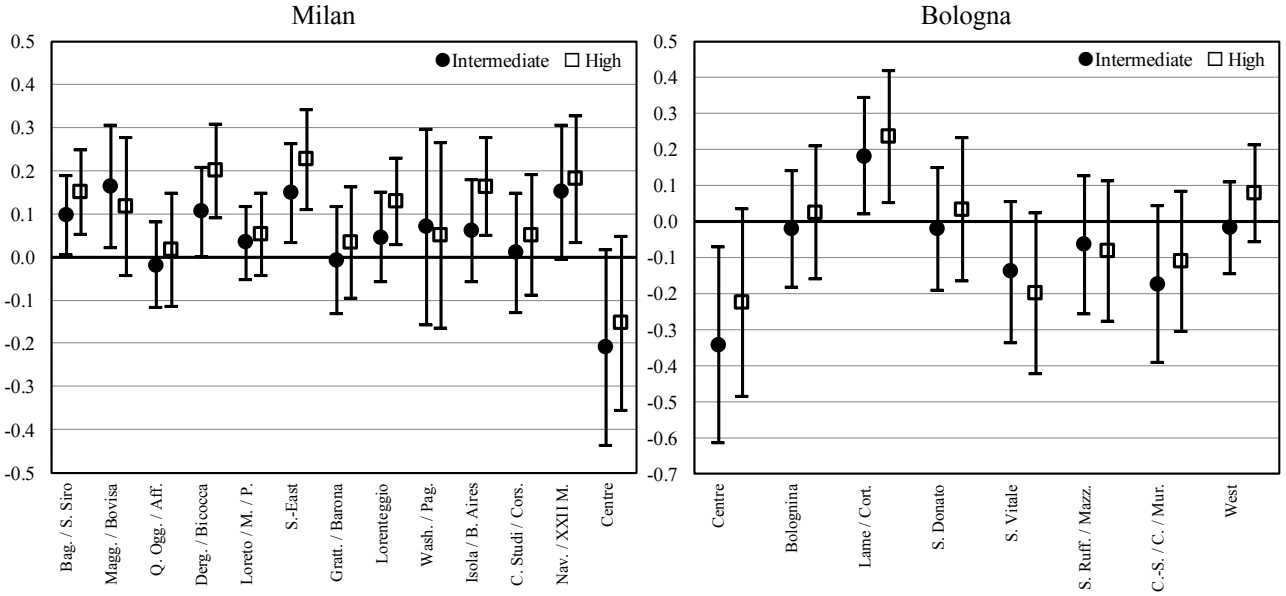


Figure 6. *Location of appealing and repulsive schools, and their type (state or non-state), in Milan and in Bologna (neutral schools not displayed)*

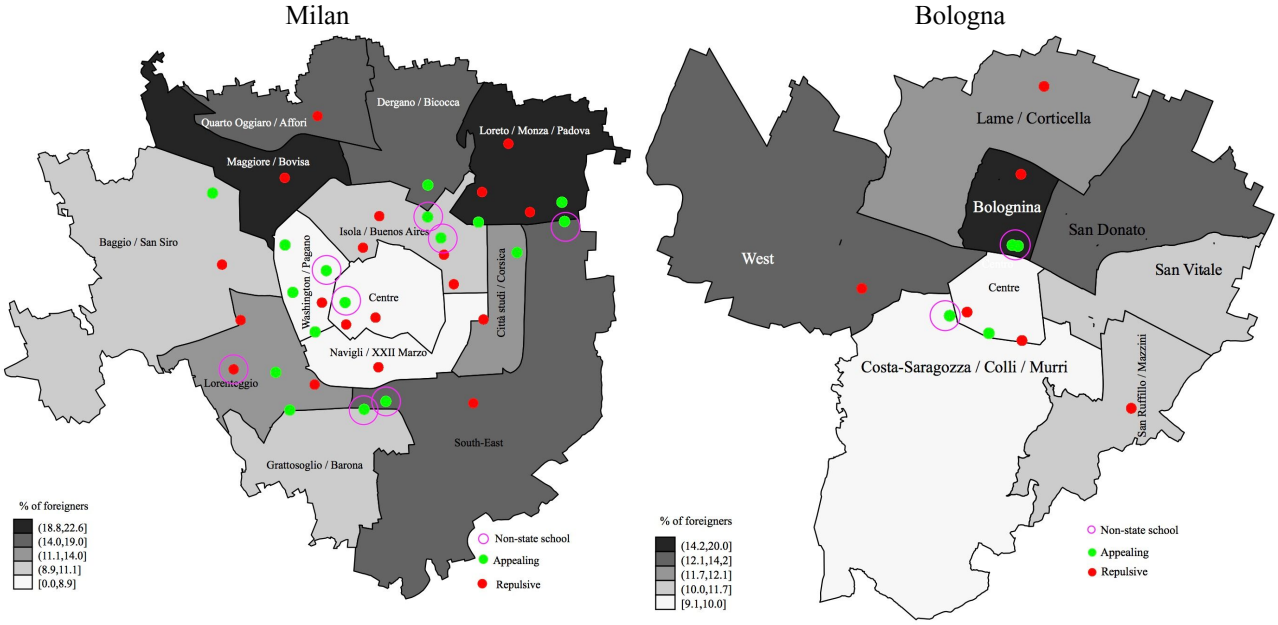


Figure 7. *Relationship between school's attractiveness (A index) and incidence of immigrant-origin students, in Milan and in Bologna*

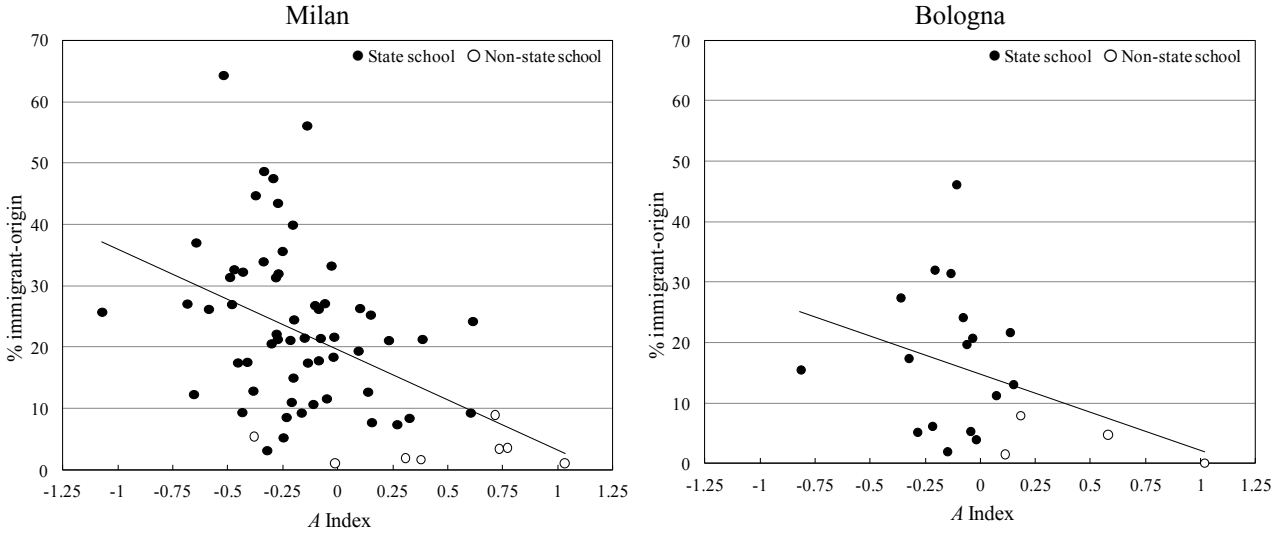
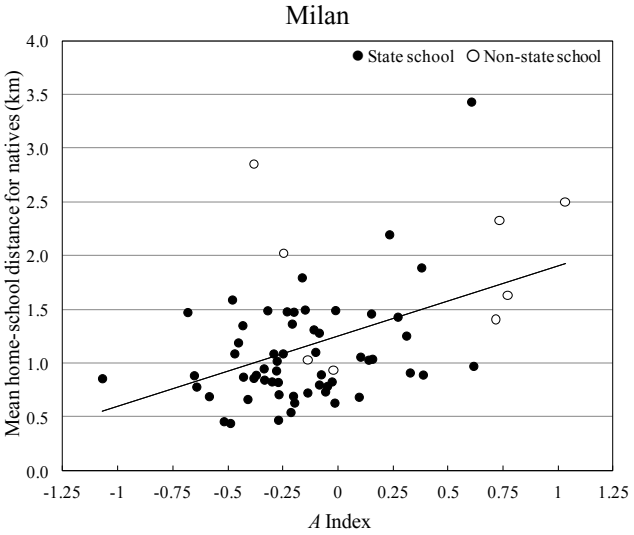
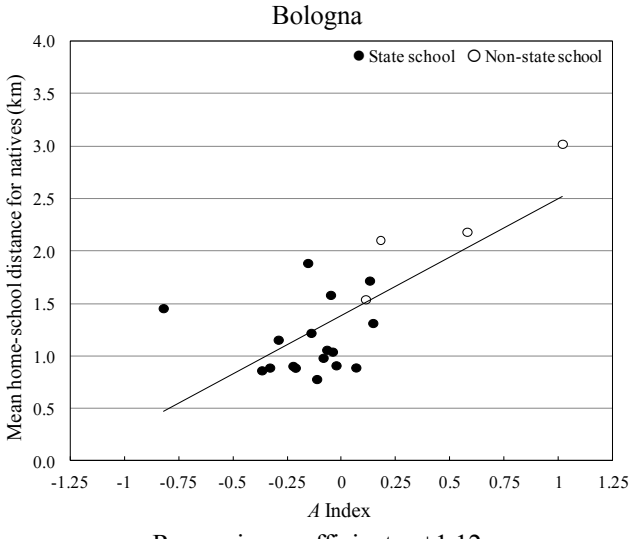


Figure 8. *Relationship between school's attractiveness (A index) and home-school distance for native students, in Milan and in Bologna*



Regression coefficient = +0.65
Correlation coefficient = +0.44



Regression coefficient = +1.12
Correlation coefficient = +0.71

Table 1. *Characteristics of students included in the INVALSI dataset: gender, migratory status, parents' level of education and attended schools*

	Milan		Bologna	
	Absolute values	% values	Absolute values	% values
Gender [a]				
Male	3,735	50.5	975	50.9
Female	3,653	49.5	942	49.1
Migratory status [a]				
Italian	5,851	79.2	1,615	84.3
First-generation immigrants (G1)	574	7.8	152	7.9
Second-generation immigrants (G2)	963	13.0	150	7.8
Parents' level of education [a]				
Low	1,518	20.5	414	21.6
Intermediate	2,716	36.8	696	36.3
High	3,154	42.7	807	42.1
Total	7,388	100.0	1,917	100.0
Number of schools [b]				
State schools	67	64	20	71
Non-state schools	37	36	8	29
Total	104	100.0	28	100.0

[a] Source: INVALSI.
[b] Source: MIUR.

Table. 2. *Resident population and students attending lower secondary schools in Milan and Bologna by area*

City and area	Population Census 2011[a]					Lower secondary education[b]							
			Level of education					Immigrant-origin			Parental education		
	Residents	% Foreigners	% High	% Interm.	% Low	Schools	Students	% All	% G2s	% G1s	% High	% Interm.	% Low
Milan													
Baggio / San Siro	139,803	12.5	15.0	34.2	50.7	9	730	17.7	10.4	7.3	29.9	44.4	25.8
Maggiore / Bovisa	55,612	22.6	17.4	36.0	46.6	4	300	33.7	20.3	13.3	27.7	43.7	28.7
Quarto Oggiaro / Affori	78,151	18.8	10.8	33.4	55.7	7	528	32.0	20.8	11.2	17.1	45.8	37.1
Dergano / Bicocca	97,888	15.8	19.3	36.5	44.3	7	622	23.2	13.3	9.8	32.3	41.8	25.9
Loreto / Monza / Padova	126,064	20.8	19.5	36.4	44.1	10	835	33.5	19.8	13.8	29.1	44.9	26.0
South-East	117,517	16.0	18.9	35.5	45.6	8	523	20.1	11.5	8.7	37.7	38.4	23.9
Grattosoglio / Barona	61,542	11.7	13.9	32.7	53.4	4	386	27.2	18.4	8.8	32.9	36.0	31.1
Lorenteggio	107,895	13.0	20.6	36.2	43.2	11	686	22.0	13.6	8.5	42.0	37.6	20.4
Washington / Pagano	68,753	8.5	40.9	33.8	25.3	7	402	8.2	3.0	5.2	69.2	23.1	7.7
Isola / Buenos Aires	144,250	12.8	33.9	34.3	31.8	7	807	12.6	8.6	4.1	55.1	31.6	13.3
Città Studi / Corsica	76,294	13.4	29.1	35.0	35.9	8	486	20.2	12.8	7.4	46.3	39.7	14.0
Navigli / XXII Marzo	105,815	8.5	37.1	32.3	30.5	6	688	10.6	7.6	3.1	65.7	25.9	8.4
Centre	62,539	10.0	45.4	31.2	23.4	16	395	11.9	10.1	1.8	77.7	17.0	5.3
Total	1,242,123	14.2	24.5	34.6	40.9	104	7,388	20.8	13.0	7.8	42.7	36.8	20.5
Bologna													
Centre	50,720	10.0	42.8	32.8	24.5	6	187	11.2	*4.3*	*6.9*	62.6	29.4	8.0
Costa-Saragozza / Colli / Murri	59,786	9.1	35.5	33.0	31.5	4	345	7.3	*3.8*	*3.5*	69.9	22.0	8.1
San Ruffillo / Mazzini	57,925	10.1	21.4	33.7	44.9	4	206	15.5	*6.8*	*8.7*	40.8	36.9	22.3
San Vitale	32,574	11.7	25.5	33.6	40.9	1	137	16.8	*8.8*	*8.0*	38.7	38.7	22.6
San Donato	30,557	14.2	16.6	30.3	53.1	2	194	28.9	*16.5*	*12.4*	23.2	36.6	40.2
Lame / Corticella	31,366	12.1	14.4	33.5	52.1	2	236	17.8	*11.9*	*5.9*	31.4	43.6	25.0
Bolognina	32,764	20.0	19.7	33.3	47.1	4	213	30.1	*11.3*	*18.8*	28.6	43.2	28.2
West	75,482	12.2	16.9	33.0	50.1	5	399	9.8	*5.3*	*4.5*	33.1	42.6	24.3
Total	371,174	11.9	25.0	33.0	42	28	1,917	15.7	*7.9*	*7.8*	42.1	36.3	21.6

[a] Source: ISTAT (2011).
[b] Source: INVALSI.

Table 3. *Mean distance (in kilometres) between home and the nearest state school and between home and the second nearest state school in Milan and Bologna by area of residence, migratory status and parental level of education*

City and area	Migratory status						Parental level of education								
	Italian			Immigrant-origin			High			Intermediate			Low		
	Distance nearest school	Distance 2nd nearest school	Diff.	Distance nearest school	Distance 2nd nearest school	Diff.	Distance nearest school	Distance 2nd nearest school	Diff.	Distance nearest school	Distance 2nd nearest school	Diff.	Distance nearest school	Distance 2nd nearest school	Diff.
Milan															
Baggio / San Siro	0.73	1.18	0.45	0.79	1.18	0.39	0.71	1.13	0.41	0.76	1.20	0.44	0.73	1.21	0.48
Maggiore / Bovisa	0.52	0.91	0.39	0.43	0.79	0.36	0.47	0.88	0.40	0.52	0.89	0.37	0.47	0.85	0.37
Quarto Oggiaro / Affori	0.48	0.95	0.47	0.50	0.98	0.48	0.48	1.00	0.52	0.49	0.95	0.46	0.49	0.96	0.47
Dergano / Bicocca	0.51	0.93	0.42	0.50	0.87	0.37	0.49	0.88	0.39	0.52	0.91	0.39	0.52	0.95	0.43
Loreto / Monza / Padova	0.72	1.16	0.44	0.63	1.09	0.46	0.62	1.05	0.43	0.72	1.16	0.44	0.71	1.21	0.50
South-East	0.65	1.15	0.50	0.65	1.21	0.56	0.64	1.14	0.50	0.66	1.18	0.52	0.66	1.19	0.53
Grattosoglio / Barona	0.61	1.20	0.59	0.79	1.49	0.70	0.69	1.29	0.60	0.60	1.24	0.64	0.70	1.30	0.60
Lorenteggio	0.56	0.82	0.26	0.60	0.82	0.22	0.53	0.77	0.24	0.58	0.84	0.26	0.60	0.87	0.27
Washington / Pagano	0.40	0.82	0.42	0.46	0.82	0.36	0.39	0.82	0.43	0.43	0.84	0.41	0.37	0.81	0.44
Isola / Buenos Aires	0.50	0.85	0.35	0.49	0.91	0.42	0.49	0.82	0.33	0.52	0.91	0.39	0.50	0.88	0.38
Città Studi / Corsica	0.50	0.83	0.33	0.48	0.84	0.36	0.53	0.85	0.32	0.47	0.82	0.35	0.46	0.82	0.36
Navigli / XXII Marzo	0.52	0.80	0.28	0.49	0.86	0.37	0.52	0.80	0.28	0.52	0.82	0.30	0.48	0.85	0.37
Centre	0.47	0.74	0.27	0.49	0.80	0.31	0.46	0.73	0.27	0.51	0.81	0.30	0.50*	0.74*	0.24*
Total	0.56	0.95	0.39	0.58	1.00	0.42	0.53	0.89	0.36	0.59	0.99	0.40	0.59	1.03	0.44
Bologna															
Centre	0.38	0.73	0.35	0.33*	0.75*	0.42*	0.36	0.72	0.36	0.37	0.76	0.39	0.46*	0.75*	0.29*
Costa-Saragozza / Colli / Murri	0.81	1.30	0.49	0.69*	1.33*	0.64*	0.83	1.30	0.47	0.77	1.34	0.57	0.75*	1.28*	0.53*
San Ruffillo / Mazzini	0.67	1.29	0.62	0.69	1.14	0.45	0.69	1.29	0.60	0.65	1.30	0.65	0.68	1.15	0.47
San Vitale	0.84	1.11	0.27	0.78*	1.06*	0.28*	0.83	1.01	0.18	0.82	1.07	0.25	0.86	1.16	0.30
San Donato	0.70	1.38	0.68	0.66	1.44	0.78	0.79	1.32	0.53	0.70	1.36	0.66	0.63	1.49	0.86
Lame / Corticella	0.77	1.45	0.68	0.73	2.06	1.33	0.77	1.89	1.12	0.79	1.89	1.10	0.70	1.90	1.20
Bolognina	0.52	0.99	0.47	0.49	1.01	0.52	0.49	0.89	0.40	0.53	1.01	0.48	0.51	1.00	0.49
West	0.83	1.74	0.91	0.68	1.51	0.83	0.79	1.65	0.86	0.82	1.75	0.93	0.85	1.73	0.88
Total	0.72	1.37	0.65	0.63	1.63	1.00	0.71	1.30	0.59	0.70	1.41	0.71	0.70	1.43	0.73

* = values based on low number of cases (≤ 30).

Table 4. *Mean actual home-school distance (in kilometres) in Milan and Bologna by area of residence, migratory status and parental level of education*

City and area	Natives	Immigrant-origin			Parental level of education		
		All	G1	G2	High	Intermediate	Low
Milan							
Baggio / San Siro	1.68	1.86	1.77	1.93	1.91	1.57	1.72
Maggiore / Bovisa	1.22	0.83	0.79	0.86	1.20	1.19	0.84
Quarto Oggiaro / Affori	1.11	1.14	0.70	1.38	1.22	1.12	1.07
Dergano / Bicocca	1.11	1.22	1.13	1.28	1.18	1.21	0.96
Loreto / Monza / Padova	1.40	1.16	1.14	1.17	1.44	1.29	1.23
South-East	1.57	1.81	1.79	1.82	1.72	1.69	1.34
Grattosoglio / Barona	1.29	2.04	2.00	2.07	1.47	1.46	1.56
Lorenteggio	1.04	1.07	0.94	1.15	1.08	1.05	0.96
Washington / Pagano	0.88	1.03	1.18*	0.94*	0.81	1.16	0.79
Isola / Buenos Aires	1.48	0.89	0.84	0.92	1.59	1.30	0.87
Città Studi / Corsica	1.38	1.21	1.09	1.29	1.52	1.24	1.05
Navigli / XXII Marzo	1.17	1.08	0.89*	1.16	1.19	1.07	1.17
Centre	0.91	0.76	0.90*	0.74	0.87	0.95	1.06*
Total	1.28	1.26	1.18	1.31	1.31	1.28	1.18
Bologna							
Centre	0.73	0.84*	0.49*	1.05*	0.75	0.76	0.59*
Costa-Saragozza / Colli / Murri	1.20	1.35*	1.44*	1.24*	1.21	1.14	1.37*
San Ruffillo / Mazzini	1.39	1.06	1.19*	0.96*	1.59	1.19	1.11
San Vitale	1.71	1.51*	1.39*	1.64*	2.07	1.33	1.59
San Donato	1.54	1.21	1.01	1.48*	1.64	1.42	1.35
Lame / Corticella	1.79	1.48	1.49*	1.47*	2.18	1.65	1.32
Bolognina	1.11	1.04	1.10*	1.01	1.13	1.02	1.13
West	1.39	1.78	1.86*	1.69*	1.61	1.31	1.37
Total	1.34	1.28	1.28	1.27	1.41	1.26	1.28

* = values based on low number of cases (≤ 30).

Table 5. *Incidence of students not attending the school closest to home in Milan and Bologna by area of residence, migratory status and parental level of education, and incidence of students attending a non-state school (percentage values)*

City and area	Natives	Immigrant-origin			Parental level of education			Non-state school
		All	G1	G2	High	Intermed.	Low	
Milan								
Baggio / San Siro	58.2	51.9	47.2	55.3	64.7	57.7	47.3	8.5
Maggiore / Bovisa	48.7	26.7	27.5	26.2	47.0	48.9	24.4	10.7
Quarto Oggiaro / Affori	49.6	42.0	37.3	44.6	51.1	47.9	44.4	19.5
Dergano / Bicocca	56.9	59.7	62.3	57.8	64.7	58.5	47.2	16.7
Loreto / Monza / Padova	59.8	53.6	49.6	56.4	63.0	57.9	51.6	15.0
South-East	58.4	40.0	33.3	45.0	65.5	54.7	37.6	13.2
Grattosoglio / Barona	43.4	44.8	55.9	39.4	48.8	42.5	40.0	11.1
Lorenteggio	64.1	61.6	65.5	59.1	69.4	61.6	55.0	11.7
Washington / Pagano	52.3	42.4	25.0*	52.4*	52.9	52.7	35.5	28.9
Isola / Buenos Aires	65.5	45.1	45.4	44.9	70.1	58.4	43.9	20.7
Città Studi / Corsica	66.8	53.1	38.9	61.3	68.9	61.1	55.9	10.5
Navigli / XXII Marzo	64.4	41.1	47.6*	38.5	64.8	61.2	41.4	13.8
Centre	60.9	40.4	28.6*	42.5	60.6	50.8	52.4*	30.1
Total	59.1	48.4	46.9	49.3	63.2	56.1	45.3	15.8
Attending non-state schools	18.7	4.9	1.2	7.1	20.8	15.9	5.1	
Bologna								
Centre	41.6	42.9*	37.5*	46.1*	44.4	30.9	60.0*	10.2
Costa-Saragozza / Colli / Murri	46.9	60.0*	61.5*	58.3*	49.0	42.1	53.6*	16.8
San Ruffillo / Mazzini	45.4	40.6	57.1*	27.8*	50.0	39.5	43.5	13.1
San Vitale	69.3	65.2*	66.7*	63.6*	69.8	64.2	74.2	13.9
San Donato	56.5	33.9	18.7	54.2*	57.8	47.9	47.4	6.2
Lame / Corticella	47.4	33.3	28.6*	42.9*	58.1	44.7	28.8	10.6
Bolognina	62.4	51.6	58.3*	47.5	67.2	57.6	53.3	16.4
West	38.9	51.3	57.1*	44.4*	47.0	36.5	37.1	6.8
Total	48.3	45.7	44.1	47.3	52.2	44.3	45.7	11.6
Attending non-state schools	13.5	1.3	0.0	2.7	20.3	7.5	1.5	

* = values based on low number of cases (≤ 30).

Online appendix: tables

Table A1. *Resident and school populations in Italy by region*

	Resident population[a] (31 Dec. 2014)			School population[b] (2014/15 school year)		
	Total	Foreigners	% Foreigners	Total	Foreigners	% Foreigners
Valle d'Aosta	128,298	9,075	7.1	18,617	1,533	8.2
Piedmont	4,424,467	425,448	9.6	591,783	75,786	12.8
Lombardy	10,002,615	1,152,320	11.5	1,411,553	201,633	14.3
Milan	*1,337,155*	*248,304*	*18.6*	*190,466*	*36,379*	*19.1*
Trentino-Alto Adige	1,055,934	96,149	9.1	149,385	18,093	12.1
Veneto	4,927,596	511,558	10.4	715,441	92,841	13.0
Friuli-Venezia Giulia	1,227,122	107,559	8.8	161,760	19,233	11.9
Liguria	1,583,263	138,697	8.8	196,827	23,252	11.8
Emilia-Romagna	4,450,508	536,747	12.1	613,898	95,241	15.5
Bologna	*386,181*	*57,979*	*15,0*	*52.128*	*9,331*	*17,9*
NORTHERN REGIONS	27,799,803	2,977,553	10.7	3,859,264	527,612	13.7
Tuscany	3,752,654	395,573	10.5	508,927	65,917	13.0
Umbria	894,762	98,618	11.0	123,397	17,463	14.2
Marche	1,550,796	145,130	9.4	222,617	26,613	12.0
Lazio	5,892,425	636,524	10.8	830,658	77,605	9.3
CENTRAL REGIONS	12,090,637	1,275,845	10.6	1,685,599	187,598	11.1
Abruzzo	1,331,574	86,245	6.5	186,665	13,371	7.2
Molise	313,348	10,800	3.4	42,603	1,503	3.5
Campania	5,861,529	217,503	3.7	1,020,832	22,155	2.2
Puglia	4,090,105	117,732	2.9	650,756	16,692	2.6
Basilicata	576,619	18,210	3.2	85,769	2,562	3.0
Calabria	1,976,631	91,354	4.6	309,094	13,163	4.3
Sicily	5,092,080	174,116	3.4	806,778	24,387	3.0
Sardinia	1,663,286	45,079	2.7	225,224	5,144	2.3
SOUTHERN REGIONS	20,905,172	761,039	3.6	3,327,721	98,977	3.0
Italy	60,795,612	5,014,437	8.2	8,872,584	814,187	9.2

[a] Authors' analyses of ISTAT data. Source: https: demo.istat.it.
[b] Source: Fondazione ISMU (2017).

Table A2. *Logistic regression model estimating the likelihood of students' attending a school other than the one closest to home, in Milan and Bologna (regression coefficients, standard errors, significance levels; reference categories in parentheses)*

Milan	β	S.e.	Bologna	β	S.e.
Gender (male): female	+0.05	0.05	Gender (male): female	–0.16	0.10
Migratory status (native)			Migratory status (native)		
– First generation (G1)	-0.22	0.29	– First generation (G1)	–1.60***	0.49
– Second generation (G2)	+0.05	0.25	– Second generation (G2)	–0.02	0.45
Type of school (state): non-state	+1.51***	0.09	Type of school (state): non-state	+2.19***	0.21
Area (Bag. / S. Siro)			Area (San Donato)		
– Loreto / Monza / Padova	+0.16	0.23	– West	–0.82*	0.34
– South-East	-0.30	0.26	– Costa-Saragozza / Colli / Murri	–0.14	0.47
– Gratt. / Barona	-0.36	0.26	– San Ruffillo / Mazzini	–0.38	0.42
– Lorenteggio	+0.26	0.25	– San Vitale	+1.25*	0.64
– Magg. / Bovisa	-0.59°	0.33	– Lame / Corticella	–1.18**	0.42
– Q. Oggiaro / Affori	-0.19	0.23	– Bolognina	+0.04	0.40
– Dergano / Bicocca	-0.32	0.25	– Centre	+0.31	0.62
– Isola / Buenos Aires	+0.05	0.27			
– Washington / Pagano	-0.36	0.46			
– Centre	+0.93°	0.56			
– Navigli / XXII Marzo	-0.09	0.33			
– Città Studi / Corsica	+0.59°	0.32			
Migratory status × area interaction			Migratory status × area interaction		
– G1 × Loreto / Monza / Padova	+0.11	0.36	– G1 × West	+2.48***	0.67
– G1 × South-East	-0.51	0.45	– G1 × Costa-Saragozza / Colli / Murri	+2.51***	0.77
– G1 × Gratt. / Barona	+0.92*	0.47	– G1 × San Ruffillo / Mazzini	+2.29**	0.75
– G1 × Lorenteggio	+0.56	0.42	– G1 × San Vitale	+1.04	0.92
– G1 × Magg. / Bovisa	-0.39	0.50	– G1 × Lame / Corticella	+1.24°	0.67
– G1 × Q. Oggiaro / Affori	+0.04	0.42	– G1 × Bolognina	+1.82**	0.67
– G1 × Dergano / Bicocca	+0.98*	0.42	– G1 × Centre	+1.43	0.95
– G1 × Isola / Buenos Aires	-0.20	0.48			
– G1 × Washington / Pagano	-0.66	0.78			
– G1 × Centre	-1.27	0.99			
– G1 × Navigli / XXII Marzo	-0.05	0.55			
– G1 × Città Studi / Corsica	-0.76	0.48			
– G2 × Loreto / Monza / Padova	+0.05	0.31	– G2 × West	+0.43	0.67
– G2 × South-East	-0.27	0.38	– G2 × CS / Colli / Murri	+0.88	0.76
– G2 × Gratt. / Barona	-0.03	0.37	– G2 × San Ruffillo / Mazzini	–0.52	0.73
– G2 × Lorenteggio	-0.13	0.34	– G2 × San Vitale	–0.59	0.89
– G2 × Magg. / Bovisa	-0.83*	0.43	– G2 × Lame / Corticella	+0.42	0.74
– G2 × Q. Oggiaro / Affori	-0.05	0.34	– G2 × Bolognina	–0.34	0.59
– G2 × Dergano / Bicocca	+0.37	0.36	– G2 × Centre	+0.30	0.77
– G2 × Isola / Buenos Aires	-0.44	0.37			
– G2 × Washington / Pagano	-0.20	0.57			
– G2 × Centre	-0.89*	0.45			
– G2 × Navigli / XXII Marzo	-0.79*	0.40			
– G2 × Città Studi / Corsica	-0.16	0.38			
Parental education (low)			Parental education (low)		
– Intermediate	+0.39*	0.19	– Intermediate	–0.08	0.35
– High	+0.62**	0.21	– High	+0.13	0.41
Parental education × area interaction			Parental education × area interaction		
– Intermediate × Loreto / Monza / Padova	-0.26	0.26	– Intermediate × West	+0.01	0.44
– Intermediate × South-East	+0.20	0.31	– Intermediate × Costa-Sarag. / Colli / Murri	–0.62	0.57
– Intermediate × Gratt. / Barona	-0.42	0.32	– Intermediate × San Ruffillo / Mazzini	–0.17	0.52
– Intermediate × Lorenteggio	-0.20	0.29	– Intermediate × San Vitale	–0.71	0.71
– Intermediate × Magg. / Bovisa	+0.30	0.37	– Intermediate × Lame / Corticella	+0.85°	0.50
– Intermediate × Q. Oggiaro / Affori	-0.47°	0.28	– Intermediate × Bolognina	–0.01	0.49
– Intermediate × Dergano / Bicocca	+0.03	0.29	– Intermediate × Centre	–1.34°	0.71
– Intermediate × Isola / Buenos Aires	-0.15	0.31			
– Intermediate × Washington / Pagano	-0.12	0.50			
– Intermediate × Centre	-1.34*	0.61			
– Intermediate × Navigli / XXII Marzo	+0.22	0.37			
– Intermediate × Città Studi / Corsica	-0.35	0.36			
– High × Loreto / Monza / Padova	-0.40	0.29			
– High × South-East	+0.30	0.32	– High × West	+0.18	0.50
– High × Gratt. / Barona	-0.49	0.34	– High × Costa-Sarag. / Colli / Murri	–0.58	0.58
– High × Lorenteggio	-0.06	0.30	– High × San Ruffillo / Mazzini	–0.47	0.57
– High × Magg. / Bovisa	-0.11	0.42	– High × San Vitale	–1.19	0.77
– High × Q. Oggiaro / Affori	-0.55	0.34	– High × Lame / Corticella	+0.85	0.58
– High × Dergano / Bicocca	+0.21	0.31	– High × Bolognina	–0.03	0.58
– High × Isola / Buenos Aires	+0.08	0.32	– High × Centre	–1.06	0.72
– High × Washington / Pagano	-0.42	0.49			
– High × Centre	-1.33*	0.58			
– High × Navigli / XXII Marzo	+0.12	0.37			
– High × Città Studi / Corsica	-0.40	0.37			
Constant	-0.18	0.16	Constant	+0.22***	0.26
N		7,388	N		1,917
Pseudo R^2		0.070	Pseudo R^2		0.098

P values: *** <0.001; ** < 0.01; * < 0.05; ° < 0.10