

Unraveling school segregation causes and effects towards an Italian urban model

The project aims to understand the peculiarities of school segregation in Italian urban contexts, with the wider goal of suggesting a pattern applicable to Southern European cities. As already highlighted in the literature, school segregation has become more relevant in these contexts because of the increased immigration flows and the reduction in Italian families' fertility rates over the last three decades. The now significant quota of foreign students has highlighted a significantly different distribution of their presence in the school systems. This is added to a more long-established unequal distribution based on socio-economic backgrounds.

Based on this, the research questions of the project are the following:

- What are the impacts of the demographic changes in the population on the school distribution of pupils? What are the main expected future trends (projections)? RQ1
- What are the degrees and shapes of school segregation in Italian urban contexts? RQ2
- What is the relationship between school and residential segregation in Italian urban contexts? RQ3
- Which are the home-to-school mobility patterns existing in urban contexts characterized by significant levels of foreign presence? And what are the different outcomes in school composition and their drivers? RQ4
- In a free choice institutional setting, why constraints to the choice can either act stronger or softer in territories with similar composition in terms of population? (RQ5).
- What are the consequences of school segregation? Can the territory act as a mediator in the size of the school effect? RQ6

The project starts by understanding the impact of the demographic changes in the population on the school distribution of pupils providing both trends and projections (RQ1). Since the 1980s, the growing presence of families with a foreign background positively impacted the fertility levels in Italy, thanks to their higher fertility rates especially among the first generation of immigrant women (e.g., 2.82 in 2002, vs 1.21 among Italian women) (Strozza, Conti & Tucci 2021). This has further contributed to the increase in the absolute and relative presence of foreign children in the school-age population. However, it has to be noticed that the fertility rate of the foreign population shrank among second-generation immigrants. This has led to a more heterogeneous situation in terms of fertility behaviours among the immigration populations. Furthermore, the recent Great Recession also contributed to lower fertility rates among immigrant populations. The decreasing fertility of foreign women has been a signal of the cultural assimilation of the foreign population with respect to family, education, gender and work-related attitudes and values. As a result, even though the fertility rate remained higher among foreign women compared to Italian women (1.89 in 2020, vs 1.17 among Italian women), the rapid increase in the relative presence of foreign students in schools stalled and became more stable.

Once established how these trends have changed and are likely to change the profile of schools' intakes, the project will examine the degrees and shapes of school segregation in several Italian urban contexts (RQ2) especially focusing on the relationship between school and territory (RQ3). We will take into consideration both ethnic and socio-economic dynamics of segregation, especially considering that residential concentrations of foreigners are often intertwined with the presence of low-income families. In a quasi-market system, where households are ideally free to choose the school they prefer, we expect to find cases in which the school mirrors the catchment area residential composition, but also cases in which there is no such match. The goal will be to identify some types of school /territory relationships and their distribution over different urban fabrics. We will take into

consideration lower secondary schools: this grade has been in fact significantly neglected in the study of school segregation, despite the fact that here we can observe dynamics leading to segregation at the entrance into the mandatory system (i.e. school choice, white flight...) and at the transition from the comprehensive education system towards the tracking (teachers' guidance, households' choice of tracks for the upper secondary level...).

Once assessed the distribution of the school populations and how it diverges from territorial distributions, we will select two cities as case studies (according to the criteria detailed below) and here we will conduct an analysis of the flows, to understand the

home-to-school mobility pattern existing in each of the two urban contexts, the different outcomes in school composition and their main drivers (RQ4). In fact, home-to-school mobility, determined by parents' choice, plays a pivotal role in shaping the composition of each school in terms of socio-economic and ethnic profiles, which can therefore differ from the profile of schools' CA.

However, the choice is constrained by several factors. First, especially in the lower grades, proximity remains a significant criterion given that children are still not autonomous at this age and their social life is easily linked to the school and the neighbourhood (extra-school activities, friends, supporting network). The importance of the local dimension is even stronger for families with fewer resources.

Secondly, the educational landscape also plays a role in expanding or limiting families' choice through the so-called geographies of education: ethnic and social composition of students' body, schools' reputations; schools' performances in academic achievements, the underlying levels and trends of residential segregation; and the spatial distribution of schools in urban space. As for the composition of schools' intakes, given that ethnic and socio-economic dimensions often overlap, it is even more complex to understand if segregation dynamics are connected to one or the other feature, or both.

Finally, choice is also constrained by the resources parents can mobilize in terms of social, human and social capital. Households have also different expectations from school and the educational system in general that significantly differ according to their educational level and financial resources. To sum up, the framework composed of the institutional setting, school offer and households' resources lead to several outcomes in terms of school composition and degrees of school segregation. This project aims to disentangle the drivers of the different outcomes.

Because of the choice mechanisms and constraints just described, residential segregated areas generally result in segregated schools, also in quasi-market systems where the freedom of choice is promoted, such as the Italian cities, as the link between territory and school is still strong disadvantaged areas of the cities (Cordini et al 2019). On the contrary, it is less predictable what occurs in schools located in mixed territories: here in fact, we can find both mixed schools, mirroring the heterogeneity of the CA, and segregated schools (with a significantly higher concentration of foreign with respect to the city average but also to the CA). In this case, the hypothesis is that households' agency strongly mediates the relationship between territory and school affecting significantly the outcomes in terms of school composition. By mixed territories, we mean territories in which the average composition in terms of foreign presence and socio-economic backgrounds reflects the city average. In particular, we want to understand why constraints to the choice act in a stronger or softer way in territories with similar composition in terms of population (RQ5). Our guiding hypothesis is that school offers could act as a further driver of the choice. By school offer, we mean the set of opportunities that households can actually access and take into consideration when they choose: territories can differ in the number, type and characteristics of schools nearby, considering that proximity criteria set some boundaries to the set of possible choices. By type of school, we mean the status such as private, public or subsidized school, but also the type of pedagogical offer (Montessori, Steiner, Senza Zaino, international curricula). The offer differs also in terms of extra-curricular activities (labs, sports, etc) and academic performances. For instance, we expect that mobility would increase in the presence of well-performing schools located in the surrounding territories of CA, considering both public and private offers. At the same time, mobility

would decrease when the local school is popular and/or well-performing or when the offer in surrounding territories is very limited or less attractive.

Finally, the project will focus on the effects of school segregation by studying if school ethnic and socio-economic composition have an impact on students' academic achievement, and whether territory mediates in some way these effects (RQ6). Sociological literature has stressed the importance of school ethnic composition on students' academic achievement. Most studies have gauged that attendance of a segregated school exerts a negative effect on students' grades and outcomes on achievement tests.

Nonetheless, this relationship should be considered suspicious, since results are somewhat controversial: some researchers stress that a high school proportion of immigrant(-origin) students penalizes all pupils' grades, but minority students are more hindered, others confirm a strong negative effect on minority students, whereas the effect on native ones is insignificant, still others consider ethnic concentration in school problematic for educational outcomes only if the level of segregation is quite high (more than 40% ethnic minority pupils), and finally some authors conclude that a higher quota of minority students in school reduces natives' test scores, but the size of the estimated effect is small and varies according to students' parental background and across countries. Although these inconsistencies, most surveys – performing multivariate analyses – explain the gap between natives and immigrant(-origin) students' achievement pointing the finger more at the student body's socio-economic composition rather than at the ethnic school segregation. Having the chance of analysing different schools in similar territories (always both in terms of ethnic and socio-economic composition) we can develop this analysis by looking at whether the school effect is somehow mediated by the territory. The questions addressed are the following: is the mixed school located in the mixed territory performing better than the segregated school located in the mixed territory? Is parents' satisfaction different in the two schools?

Research tasks and methodology

The research design foresees a mixed-method approach, applying quantitative and qualitative research techniques in an integrated manner. On one hand, statistical analyses will be used on available relevant micro-data (Invalsi micro-data on students' learning tests which also includes students' characteristics; local governments' school registers where available, local government data population by neighbourhoods) to estimate segregation levels and some its ecological drivers (INVALSI is the National Institute for the Evaluation of the Educational and Training System).

On the other hand, semi-structured interviews with a series of key figures (parents, teachers, principals) will be also carried out to shed light on parents' choices (or lack of) and schools' strategies and offer.

Demographic changes and their impacts on the composition of the school-age population (WP1)

In the first step of the project, a demographic analysis will provide a description of the population dynamics behind the rise of the issue of school segregation, at national, regional, and local levels. Past trends and future projections will be considered regarding, for example, the total and age-specific fertility trends of the native and foreign population, and the distribution of the family compositions in the native and foreign population. For this aim, we will use vital statistics and survey data from Istat, together with local administrative open-access data.

At the national level, the analyses will describe the change - over time - in the consistency, composition and socio-economic characteristics of the foreign population compared to the Italian one, with a specific focus on the school-age groups (task 1_WP1). Then, a between-regions comparison will allow us to picture how these paths overlap with population dynamics at the sub-national level, with a specific focus on contrasting the Northern with the Southern regions (task 2_wp1): this will allow to contrast populations with higher or lower presence of immigrants. On the

same line, at an intermediate level, the urban with the rural areas will be also contrasted within region (task 3_wp2). Additionally, a comparison between regional capitals will be also conducted (task 3_wp1).

Because data will be collected from several data sources at different territorial levels, a database will be also produced (task 4_wp2). Finally, because two case-studies will be conducted on two urban areas (see WP4) analyses at the sub-urban level (neighbourhoods) will be also provided, in order to describe how the same population structures and dynamics overlaps with specific features of the educational landscape and the students' segregation.

Next to the description of the past demographic trends and the present situation, projections of possible future school segregation patterns will be also provided, by integrating the administrative data (i.e., their projections) with the results and data coming from the other WPs of this project. This operation is particularly relevant for both contexts with and without a high presence of foreign populations. The former allows us to project the current situation to see if it will level up or will further exasperate the risks of school segregation. The latter allows us to understand which other urban contexts could potentially face school segregation dynamics in the coming years.

Analysis of school segregation and territory-school configurations (WP2)

The focus on schools starts with an in-depth analysis of the distribution of students with a migratory background and with a low socio-economic status in lower secondary schools of selected urban contexts (regional capitals) in order to develop a comprehensive understanding of the spread of the phenomenon in Italy and also to what extent the two type-based segregation overlap, or they occur separately (RQ2).

Following a literature review on methods of measuring school segregation (task 1_WP2), comparable indices of segregation at the city level will be estimated using INVALSI and MIUR data (task 2_WP2). These indices will be computed at different time-spans (21st century) to understand existing trends. The main indexes to be used are:

- Dissimilarity: indicates the share of people belonging to a group who should move to achieve an equal distribution (among the groups considered) within the city. Literature usually regards as medium to high segregation levels above 30% for socio-economic backgrounds and above 40% for the ethnic dimension.
- Isolation: it indicates the “extent to which minority members are exposed only to one another”.
- Exposure: it indicates the degree of potential contact, or possibility of interaction, between minority and majority group members.

A second step, based on ad-hoc Invalsi (integrated with local administrative data where available), will focus on the comparison of the share of foreigners and children coming from low-income families in each state school (as private schools don't have catchment areas) compared to the corresponding areas of competence (based on home to nearest state school distance) (task 3_WP2). When dealing with ethnic segregation, the analysis will be also broken down by major groups to highlight potential different dynamics as some are emerging in the fertility behaviour as previously shown.

This analysis of residential and school segregation will show the existing configurations of the relationship between the composition of the population in schools and related territories.

This step will also clarify whether there is a geographical pattern in how these configurations are distributed all over the cities. This is relevant for two of the objectives of this project. On the one hand, it allows to estimate if, and to what extent, school segregation is related to residential segregation in Italian urban contexts (RQ3). On the other hand, it can suggest some preliminary reflections about the different outcomes (in terms of school intake composition) in similar territories. This analysis will be also the basis for the selection of the two cities as case studies (task 4_wp2), which will follow these requirements:

- significant rates of foreign presence in lower-secondary schools at the city level
- similar rates of foreign presence in lower-secondary schools at the city level
- similar rates of residential segregation (ethnic and socio-economic based)
- presence of mixed territories with different outcomes in terms of school composition (that are the specific typologies we would like to investigate)

The drivers of school choices (WP3)

Focusing on the two selected cities (task 1_wp3), home-to-school mobility patterns will be studied in detail. We will explore what factors explain school segregation within these urban contexts and to what extent territorial segregation and school choice determine the distribution of school population (RQ4).

After profiling the socio-economic levels of the CAs (using census data, municipal registers, and other local sources) and of the local

school offer available (based on INVALSI, ministerial and local government data), statistical methods will be applied to shed some light on which aspects are linked to the gaps between territorial and school segregation (task 2_WP3). Territories and schools' profiles will be used to explain which factors are most associated with the presence of a differential between the share of foreign and lower-class students found in schools compared to that of the CAs (RQ4).

Such analysis identifies some of the main potential drivers of the different configurations in terms of concentration and segregation and sheds some light on the drivers of mobility and school segregation (RQ5). However, it does not identify the reasons underlying parents' choice, but mostly their spatial outcomes and the potential drivers.

To fill this gap a qualitative approach is adopted. The project will analyse mixed territory/mixed schools and mix territory/segregated schools. Based on these requirements, specific schools and territories mirroring the high variability existing in terms of the composition of both will be selected (task 3_wp3).

Specifically, for each city we will identify one case in which the situation in the school and surrounding territory is specular, meaning mixed territory and mixed school (with the same rate of foreigners and the same composition in terms of socio-economic profiles), and another mixed territory where instead the local school shows a higher concentration of foreigners and children with a low socio-economic background compared to the territorial one.

In-depth semi-structured interviews will be proposed to 2 key actors (task 4_wp3):

a) parents as main decision-makers: the goal is to investigate the main factors and criteria that guided parents' choice (both those who have chosen the CA school and those who have opt out). Both foreign and Italian parents will be interviewed. Parents that have made the choice recently will be privileged as they should have a better memory of the decision-making process and their evaluations should be less affected by the experience they have about the school.

b) principals, teachers and other educational staff, in order to understand the offer features mobilized to attract households.

For each school/territory a minimum of 25 interviews to parents (including those not opting for the CA school), 1 to the principal and 4 to teachers/staff will be conducted, resulting in 60 interviews in each city case. This number of interviews will be consistent with the scope of representing the different patterns of choice strategies that contribute to shaping different outcomes starting from very similar territories and the features of the school offer related to that specific territory.

The aim of the interviews will be to understand the actual set of schools that has been taken into consideration by households with different socio-economic and ethnic profiles, the characteristics of the schools or of the territories that have shortened or extended the set of options considered, the resources that different profiles of households can mobilize to extend their set of options and to apply

a choice. The final purpose is to understand which factors, mostly belonging to school offer and households' profile, interpose between the residential distribution of the population and the outcome in school composition.

Effects of school segregation (WP4)

The relevance of the study of school segregation stands in its potential consequences on the pupils involved (RQ6). The analysis will focus on two aspects:

- a) the potential presence of the so-called "school effect" on students' academic performances.
- b) students' future educational trajectories

The first one will explore if, and to what extent, school ethnic composition may have an impact on students' academic achievement, and if such an impact varies according to the student's ethnic origin as well. In order to fulfil this aim, multilevel analysis will be performed by resorting to INVALSI dataset. Students' academic achievement is the dependent variable, and it will be gauged through INVALSI yearly standardized tests in literacy and mathematics. Models will include the main socio-demographic characteristics of the student at the individual level (gender, grade, socio-economic status of origin - INVALSI SES indicator - and immigrant status), the main classes' characteristics at the second level (class dimension, proportion of foreigners, average standardized class score in literacy or in mathematics) and the main school's characteristics at the school level, such as: school dimension, the proportion of female students, school socio-economic level and level of ethnic school segregation. The latter dimension is, of course, the one of major interest for us. This analysis will be conducted at the national level and then with ad hoc focuses on main Italian cities (Task 1_WP4).

The Invalsi questionnaire administered to a sample of students attending grades 8 will be also used to highlight if there are differences between the scores obtained in the Invalsi tests and the marks given by the teachers (task 2_WP4). In particular, for students in grade 8, it will be possible to test if there is a relationship between scores obtained and educational expectations (the educational degree they aspire to get) and whether segregated and non-segregated schools lead to different students' educational expectations on a territory basis (task 3_WP4). This analysis will be conducted on a national basis.

Moreover, since we are focusing on schools located in similar territories, in the two case studies we can also assess whether the territory acts as a mediator, softening the negative school effect in the case of the segregated ones (task 4_wp4). In other words, if we find that the performance of the segregated school is lower than the performance of the non-segregated school, then we can state that the composition of the school has an impact regardless of the features of the surrounding territory. On the contrary, whether school performance is similar only in mixed territory with segregated and non-segregated schools, we can hypothesize the existence of a "territory effect" that mediates the school effect, making it softer.

Outcomes and dissemination (WP5)

The project will produce different products to reach differentiated target audiences:

- a) an edited book or a special issue in a scientific journal to disseminate results among the scientific community
- b) a series of policy briefs summarizing the main outcomes and their policy implications to sensitize policymakers at both local and national levels on the issue.
- c) at least 3 open access publications on peer-reviewed journal
- d) papers to be presented at national and international conferences

A mid-term workshop will be organized to discuss preliminary findings. Results will be then presented at a final international conference.