Mobility, Commuting and School Segregation in a Multiethnic City

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Extended Abstract

During the first decade of the 21ˢᵗ Century, Spain experienced a vast demographic shift due to the intensive arrival of inflows from abroad. The societal changes linked to the new demographic dynamics reverted the population decrease directly linked to aging (Gozálvez 2010), while contributing to the sub-urbanization of the major cities at territorial level (Bayona and Gil-Alonso 2012).

Barcelona -the second largest Spanish city- and its metropolitan area represented one of the main attraction nodes for the newly arrived. In almost ten years, the foreign population in the city of Barcelona reached 282,794 people –17.5 percent of the residents- in 2010, from 32,217 (2.1 percent) in 1998. As we might expect, the composition and the structure by age of the immigrant population did not remained unchanged. If pioneer migrants were mostly concentrated at working ages between 25 and 45 years, the share of the underage increased in time due to family reunion procedures or family formation among migrants (Domingo et al 2010; Aparicio 2007). The increased pressure on the demand for goods and services – including education- contributed to new residential and mobility dynamics between the city and the peripheries.

It has been traditionally argued that the pace for relocation and mobility of the foreign population is significantly higher than that of natives. However, as Carrasco et al (2012) argue, the residential movements performed by Spaniards throughout one academic course represent on average 40 percent of the live enrollment. Therefore, the mobility of natives affecting the enrollment of children at compulsory schooling ages should not be underestimated with respect to that performed by non-nationals. Even when this fact could also be the result of school-choice decisions, individual incentives, as well as the existing connection between mobility and school segregation have not been studied for the Spanish case.

The aim of this research article is to shed some light on the relation between mobility, commuting and school segregation in a multiethnic city as Barcelona. We will explore the distribution and interactions across the ten districts in which the city is organized, as well as with respect to the neighboring municipalities. More specifically, the proposed investigation is aimed at answering three main research questions. Firstly, what is the effect of residential mobility in school segregation? Secondly, to what extent student mobility in the metropolitan area is due to residential changes and commuting? Lastly, are there differential strategies by origin –such as foot voting- leading to new and relatively stable types of multiethnic schools?

Data and methods:

For the analysis of the enrolled population, we will use the Non-University Enrollment Statistics of the Catalan Department of Education. The database contains the basic demographic characteristics of the enrolled population by educational center for the academic year 2007/08. This restricted administrative dataset is organized by center and allows retrieving the educational stage in which pupils are enrolled, as well as the schools' funding source.

The analysis will be constrained to population enrolled at compulsory education – on average from 6 to 16 years-of-age. In terms of the territorial dimension of the database, we have compiled the exact spatial distribution of the centers considered. As a result, 453 schools –of which 51.2 per cent are publicly funded- and around 200 thousand individuals will be studied. As the Non-University Enrollment Statistics allows us to depict the national origin of the enrolled population, we will be able, then, to analyze differences between continental groups and main nationalities, instead of constraining the analysis for non-nationals as an aggregate. For the academic year considered, the enrolled population of foreign origin represents 11.5 percent of the pupils, with Ecuadorians (4,706 pupils) and Peruvians (2,143 pupils) as main origins.

Figure 1. Proportion of enrolled students of foreign origin by District, educational level and sector*. Barcelona, academic course 2007/08.
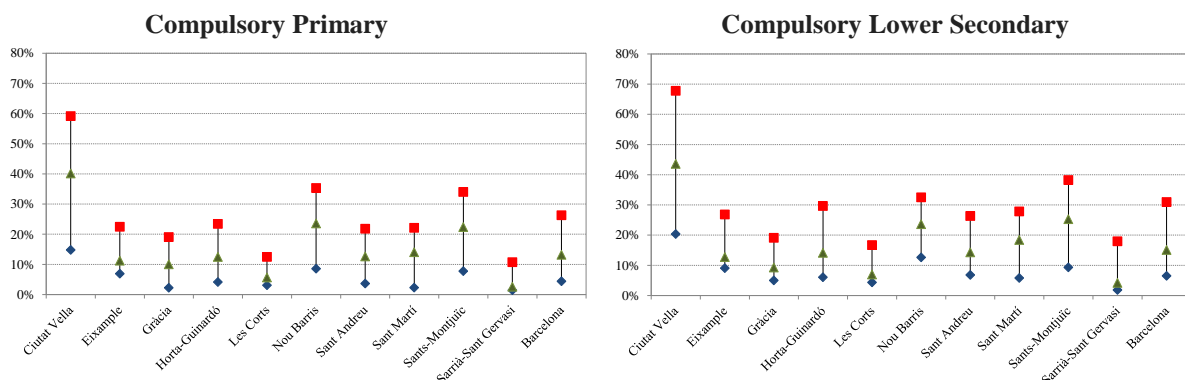
* Educational sectors: Public (red), State-Sanctioned (blue) and Total (green).
Source: Author's elaboration based on the Non-University Enrollment Statistics (Catalan Department of Education).

The study of the residential segregation in Barcelona will be based on the Continuous Register data provided by the Catalan Statistical Institute (Idescat). It encompasses data from the official resident population in a municipality and contains information on age, sex and nationality at census tract level. According to the database provided, at January 1 2008, the municipality of Barcelona was divided into 1,482 census tracts of approximately 1,090 inhabitants. At that time, the foreign population accounted for 16.9 percent -273,175 people- of the 1,615,908 total inhabitants of the city. For consistency purposes, the segregation scores will be estimated for the aggregate and also for the resident population at compulsory schooling ages.

As Glaeser and Vigdor (2001) argue, there are some questions that must be considered prior to the calculation of segregation indexes. First, what is the appropriate sub-area to use? Second, how do we define a city? Third, what is the appropriate definition of the groups to be

considered? With respect to the first one, we will consider census tracts for the residential segregation whereas schools for school segregation calculations. The main advantage of census tracts is that their definition –particularly in the main cities and metropolitan areas- has not significantly changed during the last years, remaining invariant in most of the cases. In regard to school strata, the distribution and organization of compulsory education has not suffered significant changes during the last ten years.

The main concern to metropolitan areas is to what extent aggregated measures will reflect disparities at micro level. As metropolitan areas include both central city and suburb areas, segregation measures should be estimated separately in order to avoid underestimated results. We will thus constrain our first analysis to the city of Barcelona –at aggregate and district levels- regardless the enrollment of children from the neighboring municipalities. Subsequently, the interaction with the neighboring municipalities will be considered. In addition to the main nationalities, the analysis will include the following origin groups: European Union 15 (EU-15), Rest of Europe, America, Africa and Asia and Oceania.

To perform the analysis, we will conduct first a descriptive analysis of the basic socio-demographic characteristics of the enrolled and the resident populations. Later, we will estimate the segregation index (Duncan and Duncan 1955) and the modified isolation index (Stearns and Logan 1986; Massey and Denton 1988) for the territorial dimensions and groups mentioned above. Based on the location of the center in which pupils are enrolled and their declared place of residence, we will establish the mobility of students. Approximately 13 percent of the enrolled population declares a municipality of residence other than Barcelona. Of them, only six percent is of foreign origin. Subsequently, we will analyze to what extent the daily movements performed are affecting the school segregation in Barcelona.

Figure 2. Differences between residential and school dissimilarity index scores. Barcelona, 2008.
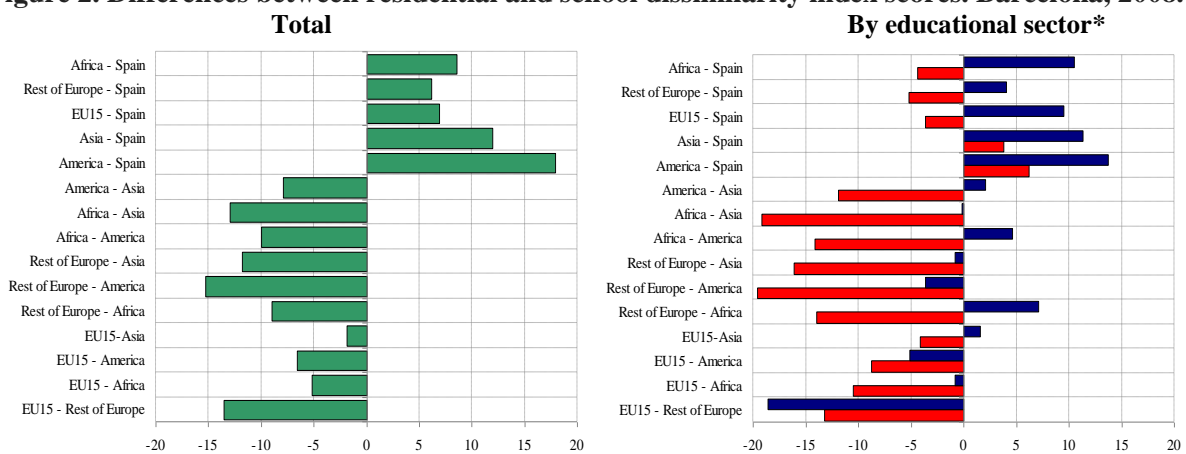
* Public (red) and State-Sanctioned (blue)
Source: Author's elaboration based on the Non-University Enrollment Statistics 2007/08 (Department of Education) and the Continuous Register 2008 (Idescat).

Preliminary findings

The heterogeneous distribution of the foreign population across the territory leads to their concentration and segregation at school and residential level. In spite of the proximity enrollment criteria that should be fulfilled, the existing divergence of the residential and school segregation scores for the same ages show that the spatial interactions among groups

significantly diverge. Moreover, the existing paradox between low residential and high school segregation index scores is even steeper once origin and educational sector is accounted for. Figure 2 depicts the differences between the residential and school dissimilarity index scores at compulsory schooling ages. Negative results indicate that residential dissimilarity scores are greater than school dissimilarity at the same territorial level. These results might suggest the existence of *white flight* strategies or mechanisms to avoid the diversity experienced at residential level in those centers with higher concentrations of foreign pupils.

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