Education and social reproduction: The impact of social position, school segregation and residential segregation on educational performance in Athens

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Abstract

The paper explores the relation of educational performance with social and urban inequalities in the Athens Metropolitan Area of the mid 2000s. It draws on discussions about education as a mechanism of social reproduction and on work about education inequalities in Greece, and in particular in Athens, where a socially more diversified secondary education than in the rest of the country leads to a rather open, but at the same time socially unequal higher education. The democratization of higher education has substantially increased during the 1980s and 1990s, but was accompanied by a clearer social demarcation amongst Faculties and Departments, and by the considerable losses of social mobility prospects suffered by the lower tier of higher education diplomas. The paper focuses on the crucial transition from secondary to higher education, relating the performance of candidates in the national admissions examination to the social position of their families, to the types of secondary schools they attended and to the social profile of the areas where they live.

Introduction

Education, inequality and segregation

Educational mechanisms are fundamental in reproducing social inequality. This is not easily perceptible and when it becomes it is not necessarily considered a problem. Following a classical liberal or neoliberal approach social inequality is justified as the just reward of drive and talent. Modern liberalism mitigates this position involving the need for equal opportunities. A socialist approach, on the contrary, is much less inclined to consider inequality as an expression of unequal talent and drive and much more as the outcome of uneven social conditions; and equal opportunities are considered impossible within unequal societies, equality being a prerequisite for equal opportunity (Baudelot, Establet 2009). In policy terms, however, things are less clear, especially during the era of neoliberal ideological and political hegemony when educational policies formulated and implemented by Conservative and Socialist parties have often been quite similar.

The democratization of education in the modern era permitted initially to open occupational and power positions outside hereditary privilege. In the long run, this has been an incremental process leading to longer years in formal learning, a growing average education level and an increasing participation rate of lower social classes at all education levels (Moore 2004). The social diffusion of

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education made possible the massive increase of social mobility, stratified, however, by the unequal social acquisition of increasingly demanding educational qualifications. It is not clear to what extent the ever increasing years in education serve the real needs of social and economic development rather than create the conditions for a socially unequal insertion in professional life (Duru-Bellat 2006). Education is caught in a tension between its educational function and its social reproduction function implemented through the unequal access to increasingly longer educational trajectories and exclusive options (Duru-Bellat 2009; Felouzis 2012). Eventually, what appears as the just reward of personal merit in education is, to a large extent, a social construct. The socially unequal outcomes to which leads the systematic social differentiation of educational achievement are disguised and, thus, legitimated as the outcome of personal merit (Duru-Bellat 2009; Dubet et al. 2010).

The tension between the educational and social reproduction functions varies amongst different periods and contexts. Social mobility deriving from educational skills increases in periods of economic growth and broader transformations (e.g. in the long postwar boom and the rise of the service economy) and plummets when growth declines. Social selectivity through education usually increases when social mobility chances are reduced. Nonetheless, the social reproduction function of education is not related to growth in an unequivocal manner. It is mainly related to regulation regimes and the way they handle redistributive justice in both growth and decline conditions.

National education systems manage social selectivity in various ways. A unique curriculum throughout secondary school, as in most Scandinavian countries, is in principle less selective compared to socially differentiated curricula from an early age, like in Germany or the Netherlands; or to options representing privileged paths to the occupational elite, like the filières to the Grandes Écoles in France (Felouzis 2009). Diversity in curricula is often accompanied by other forms of school segregation. In mixed (public/private) systems, high profile private institutions may be free to choose their clientele only amongst those who can afford them leading to blunt forms of school segregation, like the renown public schools (i.e. private) in the UK; in systems where public schools dominate, middle class education strategies may engender school segregation in more intricate ways (Ball 2003; Power et al. 2003; van Zanten 2001 and 2009; Merle 2012). In this case, school segregation is often relying on residential segregation to produce socially (and sometimes racially) segregated schools following the application of catchment area rules. This is certainly the case of White middle-class suburbs in the US, but it may also be the side effect of gentrification, when gentrifiers adopt specific schools in the areas they invade and manage to displace locals from them (Butler et al. 2013).

The last wave of educational policies in many countries was driven by the idea of promoting parental choice. These policies are in fact related to the growing size and internal diversity of the middle classes and to their (actual or presumed) political support for more 'consumer choice' in education. The reforms of New Labour ('Excellence in Cities', 'Educational Priority Areas', 'Five-year Strategy') increased parental choice and, therefore, enhanced the margins for, and at the same time legitimated, middle class strategies (Oria et al., 2007), while it is expected that pro-choice policies to boost educational attainment eventually increase educational inequality (Power et al., 2003; Seppänen, 2003; Bosetti, 2004; Denessen et al., 2005; Riddell, 2005; Butler and van Zanten, 2007; Dubet et al., 2010; Dronkers et al., 2010; Merle, 2012). More parental choice

characterizes also recent education policies in the US, like G.W.Bush's NCLB (no child left behind) or Obama's RTTT (race to the top) and the proliferation of Charter schools that "have contributed to the privatization and non-profitization of urban schools across the country" (Patterson, Silverman, 2013). The relaxation of catchment areas in France, following pro-choice policies, had ambiguous social consequences in respect to its objectives. Parental choice was advertised as a tool for working class and other underprivileged families to access better schools than those in their areas; it eventually served families from classes that are more informed and more driven by educational objectives (Oberti et al., 2012; Merle, 2012). In the UK, where parental choice was already present, stricter observation of catchment area rules seem to reinforce the relation between school and residential segregation by reducing the distance for eligibility to good schools (Hamnett, 2013).

Residential segregation and school segregation are therefore closely related: social groups are unevenly distributed in residential space and in schools in ways that usually reproduce their respective advantage or disadvantage. On the other hand, residential segregation is important *per se* for social reproduction due to its assumed impact on living conditions and on chances of social mobility. There has been a substantial growth in the literature addressing the impact of segregation, i.e. the neighborhood or area effect. This literature has mainly been developed in the US (Ellen and Turner 1997) focusing, among other things, on issues related to education, like the lack of role-models, related to the absence of successful middle class groups; the forms of social capital that constrain rather than enable social mobility, and the poor quality of services (e.g. schools) (Atkinson and Kintrea 2001: 2278).

The central issue is whether there are specific spatial effects on peoples' lives and life prospects "over and above non-spatial categories such as gender and class (...)" (Atkinson and Kintrea 2001: 2277). These additional effects may originate from the different socio-demographic composition of neighborhoods, from their intrinsic quality—e.g. the quality of their environment or of the locally provided services—and from neighborhoods' comparative status, ranging from privileged to stigmatized (Buck 2001). The question of neighborhood effects is further complicated by the fact that they may refer to different spatial scales, they may be negative or positive and they are not necessarily the same for different class categories. According to Gordon and Monastiriotis (2006 and 2007) neighborhood effects in education performance in the UK appear more important as a middle class advantage than as a disadvantage of working class groups. Further research from the UK (Buck 2001, Atkinson and Kintrea 2001, Buck and Gordon 2004) and Netherlands (Ostendorf et al. 2001) reveals a relatively low, but significant level of neighborhood effects compared to individual/household characteristics. Musterd et al. (2006) found effects of varying magnitude from a number of European city neighborhoods that were not always what was expected according to the local welfare regime.

The neighborhood effects literature is unevenly developed geographically, and this partly reflects the unevenness of these effects in different contexts. Enforced spatial isolation, as in the black ghetto, obviously reduces opportunities for social mobility to a much higher degree (Massey and Denton 1993, Wilson 1987) than spatial separation in comparatively low segregation environments and relatively evenly serviced residential areas, as in Dutch cities. In the latter, neighborhood effects may be found to be of considerably less importance for social mobility than the personal/household characteristics of the relatively isolated and deprived groups (Ostendorf et al. 2001, Musterd et al. 2003). Neighborhood effects in South European cities can be expected to be somewhere in-between due to the contradictory influence of, on the one hand, the absence of highly segregated areas and groups and, on the other, the relatively poor and unevenly distributed social services.

Both urban and educational inequalities are not only expressions of social inequality, but also mechanisms that contribute to reproduce it. School and residential segregation usually work in tandem: areas with better schools attract more middle-class residents that eventually improve local schools' performance increasing further their attraction. High levels of residential segregation usually induce high levels of school segregation. The opposite, however, is not necessarily true. Low levels of residential segregation are not necessarily combined with low levels of school segregation. As we will see in the following, the relation between the two in Athens is more complex.

Educational inequality and residential segregation in Athens

The question of school choice was never high on the Greek sociopolitical agenda. Choice for upper and upper-middle classes was always present under the form of private schools; and private education was not perceived –at least until the mid 1970s when democratic rule was durably reestablished in Greece–as a blunt instrument of class reproduction since it provided a combination of educational innovation and democratic spirit (ref???). For middle and lower-middle classes choice was present in the relaxed observation of catchment area rules and the use of false addresses by parents wishing a different school from the one their child is ascribed to. In these conditions the relation between school and residential segregation was also relaxed. This is witnessed by the very low rates that the quality of local schools played in choosing where to live according to surveys in the mid 1980s (Maloutas, 1990) and the early 2000s (Maloutas et al., 2006).

Residential segregation in Athens is relatively reduced both in class and ethnic terms for a host of reasons related to its urbanization model (Allen et al. 2004) to the local welfare system and the role of family networks, to the workings of the housing market and the structure of housing supply, to the reduced recruitment of foreigners at the high-end of its labour market etc. (Maloutas 2007a; Maloutas et al. 2012). Affluent families are thus hindered from relocation strategies to good school areas and induced to rely more on school segregation in order to gain educational advantage.

The Greek educational system is characterized by a homogeneous curriculum including the first stage of secondary (Gymnasium) that concludes the nine years of compulsory education and by a dominant general option in its second stage (General Lyceum, comprising 69% of enrolment in 2007-8) compared to a smaller (31%) vocational option (UNESCO, 2012).

In Athens, more than anywhere else in Greece, there is an important private segment operating in secondary education (8,5%) without financial assistance from the State. According to Dronkers et al. (2010) Greece and the UK are the only EU countries where private schools do not receive public funds. Most private schools perform better than average and especially the few elite schools that also offer options (like International Baccalaureate) related to prospective studies abroad. Public schools are much more socially mixed and of variable

performance.

The transition from secondary to higher education is organized through a national admissions examination. Performance in these examinations, tempered by performance in graduating from secondary school, gives access to Departments and Faculties following their demand and prestige. Mere access to higher education is long outdated as a crucial element of social division. Our focus is on distinct paths within higher education and therefore we consider performance not only in terms of score but also as a concrete outcome related to different ranges of occupational and social futures. We analyze how this performance relates to the social position of candidates' families, to the type of secondary schools they attended, to the social profile of candidates' residential areas and to their demographic features (age and sex). The object is to illustrate and roughly measure the function of social reproduction in this socially selective transition process to higher education.

The foundational work of Tsoukalas (1977) stressed the democratic character of Greek secondary and tertiary education, in terms of the massive access provided to students of lower social origin and of the important wave of social mobility it has supported for quite a long period; Frangoudaki (1985) discussed the 'hypertrophy' of higher education as an important factor that led to its internal social diversification, which Lambiri-Dimaki (1974) had already depicted.

Kontogiannopoulou-Polydorides (1999) showed that, since the 1960s, the chances of candidates from families of professionals and office employees were much higher than those from farmers and the working class; and that, at least since the 1980s, these inequalities are not limited to the acquisition of degrees, but are closely related to the unequal ways that graduates with similar degrees fare subsequently in the labor market. Thanos (2011) drew similar conclusions regarding the important differences amongst socio-professional categories in terms of access to different types of higher education Departments and Faculties.

Panayotopoulos (2000) showed that the Faculties of Medicine, Law and most Schools of the National Technical University of Athens (especially Architecture and Mechanical Engineering) are reserved, to some extent, for upper and uppermiddle social strata, while those of Theology or Education are mainly relegated to lower and lower-middle ones. Maloutas (2007b) confirmed that highly demanded Faculties and Departments, like Medicine and Law, remain very unequally accessible by students from different social backgrounds. Moreover, they harbor a far higher rate of endogenous reproduction (i.e. within the family's occupational line) compared to other occupations requiring university degrees.

Sianou-Kyrgiou (2008) stressed the importance of extra-curricular preparation for the admissions examination to higher education. Candidates massively participate in this preparation, sometimes for several years before the event. The process is privately organized on collective or individual basis and the cost is high, especially for its most competitive forms. The cost as well as the socially uneven awareness of the importance and the workings of this preparation lead to systematic social differences that mitigate the socially equalizing impact –in principle– of the predominantly public character of secondary education.

Hadjiyanni and Valassi (2009) claim that the rapid development of postgraduate studies and the unequal prospects offered by different types of institutions, academic disciplines and specialities have created new social inequalities

and/or reinforced existing ones. They conclude that the attenuation of inequalities in accessing higher education during the last decades has been counterbalanced by increasing inequality at the postgraduate level.

The 'democratization' of higher education did not necessarily lead to more social justice. Thus, researchers shifted their interest to inequalities within higher education and revealed new divisions and hierarchies (Sianou-Kyrgiou, 2010), confirming that the education system produces and reproduces inequality in changing forms of social division that may be increasingly difficult to identify (Bourdieu, 2000).

The issue and the data

The dataset we used to assess unequal access to higher education comprised a very large number of variables on all secondary education graduates in Greece for the school year 2004-05. ⁶ The record of every graduate and candidate for higher education relates him/her to a specific secondary school and to its features (type of school, average performance in the admissions examination, quality attributes in terms of infrastructure and teaching personnel etc.) as well as to the school's catchment area. These features are also related to candidates' performance. We used a single performance index: the 'general grade of access' (=average grade obtained by each candidate in all the main subjects examined X 70% + graduation grade from secondary education X 30%) ranging from 0 to 2.000. Our dataset comprised the records of over 32.000 candidates that graduated from 447 secondary schools in Athens Metropolitan Area.

Individual performance was also measured by the position of the Faculty/Department of higher education, where each candidate was admitted. We used a clustered ranking of Faculties and Departments following the social profile of students' parents in recent years (see next section). This score was used as a proxy for candidates' social profile, assuming that during the second part of the last decade the social construction of enrollment by Faculty and Department through the examination mechanism remained relatively stable. The proxy was eventually used as an independent variable in a multivariate model to explain performance in the admissions examination (see last section).

Social background

The main lacuna in our dataset is the absence of information on candidates' socioeconomic background. This is especially important since we assume that family socioeconomic background is probably the main parameter explaining unequal access to higher education. This assumption derives from the literature mentioned in the previous section, but we have also been able to control it using recent data and thus to complement our dataset. The Hellenic Statistical Authority (ELSTAT) published data on the education level of both parents of students enrolled in the different higher education Faculties and Departments for 2009 and 2010

(http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/A1403/Other/A1403_

⁶ The dataset was produced by the ITYE (Computer Technology Institute and Press 'Diophantus') as part of the task "Mining knowledge from data of the educational community", component of the project "Technical Counsel – Ministry of Education 2006-07".

SED34_TB_AN_00_2010_09E_F_GR.pdf), as well as on their profession (http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/A1403/ Other/A1403_SED34_TB_AN_00_2010_10E_F_GR.pdf). We have used these data to cluster all Faculties and Departments into seven hierarchical categories (cluster 1 containing the highest rate of parents from higher education and professional categories and cluster 7 the lowest [table 1]).⁷ We introduced this new variable to our dataset and added an eighth category for those secondary school graduates who either did not apply for admission to higher education or were not successful in the examinations (assuming that their parents' professional hierarchy and education level were even lower, following the correlation pattern in the other clusters).

Table 1 Socio-educational profile of higher education Faculties and Departments clusters following the education level of students' parents and the profession of students' father (percentages). Final Cluster Centers

parents	(Cluster of Faculties and Departments						
	1	2	З	4	5	6	7	all
Higher education (F+M)	55.9	42.5	34.1	23.4	23.2	14.6	13.0	26.8
Compulsory to post- secondary (F+M)	39.1	49.9	56.4	64.7	60.3	66.8	65.1	59.6
Less than compulsory (F+M)	5.0	7.6	9.5	11.9	16.5	18.6	21.9	13.7
Managers-Professionals (F)	52.0	39.4	27.3	21.1	25.4	12.8	13.7	24.6
Intermediate professions (F)	30.2	35.9	44.2	46.8	33.4	48.9	34.1	41.1
Working-Class (F)	12.0	16.7	20.4	22.8	28.9	27.3	39.5	24.5
N of Depts and Facs	36	55	66	86	51	97	54	445
N of admitted (2005)	1475	2115	4047	5018	1887	4976	3092	22610

F =Fathers; M = Mothers

Our assumption about the importance of family socioeconomic background for admission to most demanded Faculties and Departments is corroborated by the strong correlation between students' performance and the hierarchy of Faculties and Departments we produced based on parents' socio-educational profiles (R= -.0785).

Figure 1 Comparative chances of candidates originating from different educational family backgrounds to get admitted to Faculties and Departments clustered according to the socio-educational profile of students' parents (2010)

⁷ We used a k-means cluster analysis to group Departments and Faculties. Three variables for parents' education (percentage of parents with higher education and post-graduate degrees; with compulsory [nine years] to post-secondary professional education; with less than compulsory education) and three for fathers' profession (percentage of managers and professionals; intermediate professions; working-class [skilled and unskilled workers]) were used for this clustering.



Higher socio-educational groups maintain a systematically uneven access to the best segments of higher education through their systematically higher performance in admissions examination –the magically unequal distribution of educational merit in favor of higher social strata according to Duru-Bellat (2009). According to Sianou-Kyrgiou and Tsiplakides (2011) the outcome in terms of chosen paths within higher education is socially unequal even when performance is similar.

We calculated the socially uneven chances to get admitted in each of these clusters of Faculties and Departments by comparing –using the 2001 population census– the percentage of enrolled students from a different socio-educational background in each of the seven clusters to the distribution of education levels in the whole population aged between 40 and 75 to roughly correspond to the expected age of students' parents. Figure 1 shows that candidates from a highly educated family background have over four times more chances than the average candidate to get admitted to one of the most demanded Faculties or Departments (1st cluster) and over 34 times more than the candidate from poorly educated family background. The range of inequality decreases as we move

down the clustered hierarchy of Faculties and Departments. The higher social strata seem to lose interest in the less prominent part of the hierarchy (their chances compared to those of candidates from poor educational background decrease from 34 times [1st cluster] to 2 [6th and 7th clusters]) while those of candidates from intermediate educational backgrounds decrease less steeply and remain much higher than those of the less privileged candidates even at the end of the clustered hierarchy (respectively from 7 times [1st cluster] to 3 [6th and 7th clusters]).

School

The second parameter we assumed had some importance in explaining uneven access to higher education is the quality of secondary schools. One way to assess this quality is to measure the average performance of their students in the admissions examination. This measure, however, does not necessarily or entirely reflect the quality of schools *per se* (i.e. the quality of educational work, the state of the infrastructure or the organization efficiency), as differences in performance amongst schools may be due to the uneven social profile of their clientele.

The correlation between candidates' performance in the admissions examination and the average performance of the school they attended is important (R = .362). This means that 13% of the variance in candidates' performance (R^2 = .131) is explained by school's performance.

Good private schools are renown for their performance as well as for their social selectivity (Valassi 2012 and forthcoming). However, there is also a small lower tier of private schools with low educational performance and a different social profile. On the other hand, a number of evening schools –mostly public– accommodate working students, either from lower socioeconomic environments or mature students returning to the classroom and having to work at the same time. These schools account for 3,2% of the student population and have usually a low rate of admission to higher education. The bulk of secondary schools are daytime public schools, which account for 88,3% of the student population. Among these a limited number of 'experimental' schools used to select students on performance and to implement innovative education methods (Lambias 2009). Although the promotion of experimental schools has been tampered on both accounts, they continue to have a systematically higher performance amongst public schools. They account for 3,3% of the student population.

We produced a hierarchical variable (table 2) taking into account schools' public or private status, their daytime or evening operation and their experimental or regular character. Where necessary, we subdivided these categories according to average school performance in the admissions examination to higher education. The outcome was a 9-category variable.

This hierarchical variable is significantly correlated with the hierarchy of higher education Faculties and Departments where candidates were eventually admitted (R = -.333).

Table 2 Number of students in last year of secondary education and average performance in the admissions examination to higher education by type of school in Athens (2005)

type of school	Number of students	%	Average performance
evening school	1014	3.2	876
private – low performance	495	1.6	944
public – low performance	7572	23.5	973
public – mid-low performance	11029	34.5	1109
public mid-high	3631	11.3	1192
public – high performance	5006	15.6	1276
public experimental	1048	3.3	1323
private – medium performance	1212	3.8	1404
private – high performance	1011	3.2	1543
total	32018	100.0	1142

Figure 2 shows that there are substantial differences in the access to higher education depending on the type of secondary school. More than 80% of those who graduated from high performance private schools had access to highly or averagely demanded Departments and Faculties (clusters 1 to 4) and only 4,2% were not admitted. On the contrary, those graduating from evening schools were not admitted at a rate of 75% and only 15% had access to a highly or averagely demanded Faculty or Department.

Figure 3 shows the percentage composition of the student population in the different clusters of Faculties and Departments in terms of the type of school they come from. The overwhelming importance of students from public schools (figure 4) leads to a somehow equilibrated composition within most clusters. The majority of students originate from public and relatively low performance schools in all clusters. Even in the most exclusive cluster of Faculties and Departments, more than 40% originate from such schools, while only 32% originate from high and medium performance private and experimental public schools, and this is reduced to 23% for cluster 2.

This double sided picture shows clearly that social elites and upper middle classes have privileged, but not exclusive, access to higher education in Greece; thus, they often use more exclusive complementary strategies, like studies abroad to academically and often financially demanding institutions in Western Europe and the US.

Figure 2 Percentage distribution of candidates from different secondary school types to the hierarchical clusters of higher education Faculties and Departments and to the non-admitted (2005)



Figure 3 Percentage distribution of students in the different hierarchical clusters of higher education Faculties and Departments according to the type of secondary school they graduated from (2005)





Figure 4 Number of candidates in the admissions examination to higher education by type of school and type of residential area in Athens (2005)

The broad area of studies which candidates select during the last two years of secondary school in view of the admissions examination is another distinctive feature: 'science', 'technology' and 'humanities' account respectively for 13%, 51% and 36% of enrolment (2004-5). Average performance differs amongst these options leading to different success rates (87%, 69% and 67% respectively). The 'science' option is much more present in high-performance private schools (27%) against approximately 10% in the bulk of schools at the lower end of the school type hierarchy.

Neighborhood

The next parameter we wished to consider was the neighborhood effect. With the available data it was impossible to attempt this properly, since the absence of information on the social background of each candidate did not permit to assess the difference in performance for the same social group of candidates in different types of neighborhood. Moreover, it was impossible to address the different parameters related to neighborhood effects in a comprehensive manner, i.e. the the combination of the social composition of neighborhoods, the quality of their natural and social environment and their image (Buck, 2001; Atkinson and Kintrea, 2001; Lupton, 2003). We limited our investigation, therefore, to the simple impact of residential areas' social profiles on candidates' performance.

At first sight, the area of residence seems to matter even though the correlation of candidates' performance with several attributes conveying neighborhoods' social profile is not particularly high ($R \approx .150$ to .200) (table 3).

In table 3 all area attributes –mostly those assumed related to difference in social rank– are significantly correlated with candidates' performance in the admissions examination. Higher indices appear for occupational or other groups at the extremes of the social hierarchy contrasting with groups around the

middle as well as with variables related to location (central/suburban/peripheral area), to housing tenure and to immigrant presence.

Table 3 Correlation indices (Pearson) between candidates' performance and average school performance in the entrance examinations to higher education and social features of the areas corresponding to each school (2005)⁸

	Candidates'	Average school performance
Percentage of people aged 18-24 in higher education	.199**	.518**
Percentage of large employers and higher grade managers and professionals (ESeC 1)	.197**	.520**
Composite index of areal deprivation ⁹	196**	516**
Percentage of working-class occupations (ESeC 8)	193**	510**
Percentage of graduates of higher education in adult population	.193**	.504**
Socioeconomic type of residential area ¹⁰	192**	504**
Percentage of people with less than compulsory education in the adult population	184**	477**
Percentage of people with more than 40sqm of housing space per capita	.179**	.471**
Percentage of people with less than 15sqm of housing space per capita	171**	453**
Percentage of employees in the lower services (ESeC 7)	134**	354**
Percentage of immigrants	063**	181**
Percentage of intermediate professions (ESeC 3)	.056**	.145**
Central / suburban / peripheral area	.035**	.116**
Percentage of people in rented accommodation	031**	101**
Ν	30103	32018

⁸ We considered the neighborhood from an everyday life point of view, estimating that a distance less than 1,500m constitutes a pedestrian itinerary in which most daily activities, such as going to school, can be managed on foot or within a short driving distance. In order to estimate the optimal distance within this limit, and after consecutive measures, we concluded that 900m was the radius around each school providing maximum coverage of the metropolitan area and minimum overlapping (i.e. minimum attribution of the same census tract to different schools).

⁹ The composite index of deprivation is the sum of the hierarchical positions (cluster identities) of census tracts based on a number of variables divided in three broad areas: Social (class and ethnic) composition, education and housing (Koutouzis et al. 2012).

¹⁰ The socioeconomic type of residential areas was determined using a K-means clustering of census tracts into five groups following the percentage of four major categories of the European Socioeconomic Classification (ESeC, see Rose and Harrison, 2007): (1) Large employers, higher professionals and managers, (2) Lower professionals and managers, (8) Lower technical occupations and (9) Routine occupations.





Average school performance is correlated to area attributes much more than individual performance since all standard deviation within schools disappears;

¹¹ The typology was produced by the hierarchical clustering (AHC) of the coordinates of Athenian census tracts on the first three axes of a principal components analysis (PCA) on eight ESeC categories' residential location.

schools that perform better are usually situated in neighborhoods of higher social profile (map 1). Table 3 indicates the positive correlation of neighborhoods with a higher social profile to candidates' performance. This is expected independently of potential neighborhood effects, since neighborhoods with a higher social ranking contain a larger percentage of middle and uppermiddle class groups who systematically perform better in education. The correlation between the social type of neighborhoods and candidates' performance may be considered rather low. This could be attributed to the relatively low level of residential segregation in Athens, compensated by middle class strategies of school segregation (Maloutas, 2007b).



Figure 5 Average and expected performance in the admissions examination to higher education by school type and by social type of residential area in Athens (2005)

The available data offer some negative indication about the existence of positive effects in the better-off residential areas. Figure 5 shows the average performance of candidates in the admissions examination to higher education by broad social type of residential area. This performance is shown for all candidates, and separately for those originating from public or private schools. It also shows the predicted value of this performance based on its relation with the composite index of deprivation (see footnote 9) in the areas around the 447 schools, where more than 32.000 candidates completed their last year in

secondary education. Therefore, the expected values express what the average performance in each broad social type of residential area would be according to the relation between performance and social profile. Comparing the actual with the expected performance for all candidates in different social settings we observe no substantial difference, except in upper class areas. This may lead to the conclusion that, potentially, there is a positive neighborhood effect in those areas, and that would be consistent with similar observations elsewhere (Gordon and Monastiriotis, 2006 and 2007). However, this higher than expected performance in upper class areas is clearly related to the concentration of privileged private schools, which attract students from a broad range of upper-middle and socially mixed areas. The systematically higher performance of candidates from upper class areas seems, therefore, much more related to the concentration of private schools and school segregation rather than to some form of neighborhood effect.

For the much larger number of candidates from public schools (figure 4), performance decreases as we move from lower to higher social types of areas, possibly indicating the existence of a neighborhood effect that operates counter intuitively. However, this is probably the effect of draining good (i.e. middle class) students by private schools from all types of areas. This draining culminates in the higher status areas, where it seems that both the number and socio-educational function of public schools becomes residual under the overwhelming presence of renowned private schools.

School type	Mean [*]	N	Std. Dev.	Area type	Mean [*]	N	Std. Dev.
private low	944.4	443	491.1	lower	1014.2	2585	410.8
evening school	875.5	304	417.5				
public low	972.9	7207	400.0				
public mid-low	1109.1	10565	406.5	lower-middle	1081.2	11937	414.0
public mid-high	1192.2	3494	405.0	mixed	1176.0	9296	429.7
public high	1275.8	4841	412.1	upper-middle	1225.6	5141	428.3
public experim.	1323.4	1036	406.4				
private medium	1403.9	1205	383.4				
private high	1543.2	1008	325.3	upper	1409.5	1144	400.7
Total	1141.9	30103	428.9	Total	1141.9	30103	428.9

Table 4 Candidates' average performance by school type and social type of residential area (2005)

*Maximum possible score = 2000

Another way of controlling the assumption that school segregation is more significant than residential segregation for educational performance is by comparing performance in similar segments of the school and the residential area hierarchies.

Table 4 shows that there is a comparable number of candidates for higher education who either graduated from high performance private schools (1.008) or who live in the highest social type (upper) of residential area (1.144);

obviously a number of these candidates fall into both categories. However, those in high performance private schools do clearly better (>10% difference on average) than the residents of areas with the highest status.¹² Private school candidates form a more coherent group in terms of performance (smaller standard deviation) than those from upper class areas who comprise also candidates from residual public schools. The same applies to the next level where we can compare the 5.141 candidates living in upper-middle class residential areas with the 7.072 who attended medium performance private schools, high performance and experimental public schools. The weighted performance of the latter (1.304,6) is 6,5% higher than the performance of those living in upper-middle class areas. Differences become less important (1-2%) between middle performance secondary schools and lower middle class or socially mixed residential areas. They increase again at the other end of the social hierarchy, where 7.954 candidates graduating from low performance schools have fared worse by 4,8% (967,6 weighted average) than the 2.585 candidates that attended schools in areas at the lower end of the social hierarchy.

In sum, table 4 offers a clear indication of a wider performance range within the hierarchy of schools than within the hierarchy of residential areas, corroborating the assumption of a higher degree of segregation within the former than the latter. Moreover, the much higher difference of scores at the upper –compared to the lower– end of the social hierarchy may be an indication that school segregation, as the outcome of middle and upper middle-class strategies, practically functions more as an advantage to higher social groups than as a direct disadvantage to lower ones.

Demographic features

Table 5 Mean performance at the admissions examination by age of candidate (2005)

age of candidate	Mean	Ν
expected age	1194.8	23705
1 year delay	974.5	4214
2 years delay	864.2	892
3-5 years delay	892.2	549
6-9 years delay	916.9	334
10 years delay or more	898.9	259
Total	1142.8	29953

Candidates in the admissions examination are normally 18 years old. Sometimes they are older: if they failed to be admitted on their first attempt; if they were not satisfied with the Department/Faculty they were admitted to and chose to retry for another; if they opted to finish first with their military service (boys) or were delayed in completing secondary school. The correlation between candidates' performance and their delay in taking the examination (R = -.142) means that there is a non-negligible negative effect of this delay on performance (table 5). Delay is related to social position: Students from schools in lower social status areas take the examination at the expected age at a rate of

¹² In fact, the difference is even higher since high performance private schools are mostly situated in high status residential areas and their students are necessarily assigned collectively to upper class areas –even though students in these schools are attracted from different and socially diverse parts of the city.

70% against 90% for those from schools in upper social status areas.

In the late 1920s the participation of women in the student population was 4,9% (Katsikas and Kavadias, 1994, 123) against 59,8% in 2010 (ELSTAT, 2010). For several years now, girls have been performing better in higher education. Our data show that there is a positive correlation between girls and performance in the admissions examination (R = .058); they also reveal that a larger number of girls have taken this examination (17.246 versus 14.785 boys in 2004-05 for the Athens Metropolitan Area).



Figure 6 Percentage of candidates admitted in each cluster of higher education Faculties and Departments following the admissions examination by gender (2005)

The average score for girls in the examination (1.164,6) is 4,5% higher than the score for boys (1.114,5). This applies to every cluster of Faculties and Departments; boys obtained a higher average score only amongst the candidates that failed.

Following their higher scores, more girls were admitted to all clusters of Faculties and Departments, with higher gender differences observed at the middle of the hierarchy (figure 6).

Regression model

A stepwise linear regression was used to model the combined effect of all possible variables contained in our dataset on candidates' performance in the admissions examination (dependent variable). The model was calculated both for candidates from all schools and for those uniquely from public schools. A high R² resulted for the two models (.64 and .62 respectively). Eight independent variables were retained in the first model and six in the second.

Table 6 Correlation coefficients (R) for the dependent and the independent variables retained by the stepwise regression model (all schools)

	DV	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Candid. perform. in adm. exam Dep. Variable Social clusters of Depts and Facult. (1) Average school perform. (2) Studies orientation (3) Delayed candidature (4) Gender (5) School's particip. rate to adm. exam (6) Type of secondary school (7) Composite neighb. deprivation	1 785 ^{**} .362 ^{**} 254 142 ^{**} .058 .201 ^{**} .332 ^{**}	1 330 .215 .175 076 227 333	1 093 183 .010 .469 .877	1 090 .215 095 094	1 009 442 ^{***} 185 ^{***}	1 .051 ^{**} .012 [*]	1 .475 ^{**}	1	1
index (8)	196	.201	516	.033	.056	.022	1//	492	1

Correlation is significant at the 0.01 level Correlation is significant at the 0.05 level

Table 7 Model coefficients for stepwise linear regression. Dependent variable: Athenian candidates performance in admissions examination to higher education (2005)

a) All schools

Model	Standardized Coefficients	t	Sig.	Correl	ations
	Beta			Zero-order	Partial
(Constant)		51.177	.000		
Social clusters of University Depts and Faculties	724	-192.922	.000	786	744
Average school performance	.145	15.228	.000	.362	.088
Studies orientation	096	-26.407	.000	254	151
Delayed candidature	045	-12.428	.000	142	072
Gender	.034	9.613	.000	.057	.055
School's participation rate to admissions exam	.028	6.389	.000	.200	.037
Type of secondary school	039	-4.453	.000	.332	026
Composite neighborhood deprivation index	.016	3.980	.000	197	.023

a. Dependent Variable: Candidate performance in admissions examination

a) Public schools

Model	Standardized Coefficients	t	Sig.	Correla	ations
	Beta			Zero-order	Partial
(Constant)		58.114	.000		
Social clusters of University Depts and Faculties	718	-182.260	.000	771	741
Average school performance	.124	27.476	.000	.297	.164
Studies orientation	103	-26.375	.000	246	158
Delayed candidature	051	-13.659	.000	135	082
Gender	.036	9.329	.000	.059	.056
Composite neighborhood deprivation index	.023	5.238	.000	158	.032

a. Dependent Variable: Candidate performance in admissions examination

The first independent variable (the social hierarchy of Faculties and Departments) –a proxy for the social profile of candidates– offers an overwhelmingly large part of the explanation regarding the variance of candidates' performance. The systematic reproduction of socially uneven positions 'explains' thus approximately 60% of the performance variance in the admissions examination to higher education.

The much lower contribution of the other independent variables retained in the model is due to their significantly lower correlation with the dependent variable as well as to important correlation amongst them (table 6) that reduces further their effective contribution. The latter is witnessed by their reduced partial correlation (table 7), i.e. their covariance with the dependent variable when all other independent variables remain constant, reducing the value of their simple correlation by the part explained by these other variables.

The model confirms the explanatory role of social inequality for educational performance, through the reproduction of the social hierarchy of higher education Faculties and Departments by the systematically unequal performance of candidates belonging to different social groups. A part of the explanatory potential of school types and school performance appears collinear with social hierarchy and is, therefore, discarded by the model. The remaining part is substantial, however, especially for the model limited to candidates from public schools, where the effective unequal performance among schools seems to play a much more important role than for all candidates.

Demographic features also retain some importance in the model. Gender appears to contribute with its full potential due to its weak correlation with all other independent variables. Delayed candidature remains a substantial explanatory parameter, curtailed however due to its uneven social profile.

Finally, the quality of the neighborhood, expressed by the composite index of neighborhood deprivation, offers the smallest contribution to this explanatory model and appears more important when only candidates from public schools are considered. This may be interpreted as revealing a relatively low level of potential neighborhood effects that become stronger when private education is removed from the picture, withdrawing thus the major component of school segregation triggered by the strategies of social elites and upper middle-class groups that mitigate the effect of residential segregation on educational performance.

Conclusion

The dataset of candidates' performance in the 2005 national admissions examination to higher education –produced by the ITYE (Computer Technology Institute and Press 'Diophantus')– gave us the opportunity to investigate and roughly measure the social reproduction function of the transition to higher education in Greece. We focused on the Athens Metropolitan Area, where school segregation and residential segregation are much more developed than anywhere else in Greece and, therefore, where we could most effectively relate them to the process of social reproduction through educational performance.

We have taken into account all crucial parameters for the transition from secondary to higher education contained in this dataset in order to model the statistical explanation of educational performance. The result was clear: the combined effect of different variables within a linear multivariate model indicated social position as the main explanatory variable for candidates' performance in the national admissions examination, followed by the statistically significant (but much less important) contribution of school type, school performance, study area option, gender and age; the social type of neighborhood emerged as last and least. The margin for personal merit, independent of social position, lies therefore somewhere within the 37% of variance not explained by the model.

Greek education has a number of features that support the claims about its democratic character: a single curriculum in the first part of secondary school and a relatively atrophic vocational option in its second part which, respectively, delay and restrain social selection; a predominantly public education system accounting for more than 90% of secondary and for the totality of higher education; a substantial and growing participation of lower-middle and working class groups to higher education (even to highly demanded Faculties and Departments); a long history of uninterrupted social mobility through education during most of the postwar period. In fact, lower social groups have not been excluded from higher education and its benefits in terms of social mobility for a long time; this permitted and made politically viable the acceptation by these groups of the educational privilege enjoyed by the elites and the upper middle classes, through its disguise as personal merit.

At the same time, however, Greek society remains highly unequal and educational mechanisms contribute substantially in reproducing inequalities. Privileged groups follow educational strategies to create advantage for their children: investment in private schooling; selection of better schools within the public sector; investment in continuously longer education; investment in studies abroad and in highly rated institutions and degrees. These strategies seldom involve residential relocation, which would be rather ineffective within a context of limited residential segregation.

The structure of the educational system may be, to some extent, the reflection of a weakly polarized social structure, a situation that has probably changed significantly in the last 15 years and during the ongoing crisis. The waning social mobility for lower social classes undermines the broad social compromise based on massive aspirations to middle-class positions. Recent educational policies (reduced resources for education, reduction of enrolment in higher education etc.) will further destabilize this compromise as they clearly drive towards more social inequality and so does the impact of the crisis: with more than 60% youth unemployment – affecting the highly educated as well– educational achievement looks increasingly futile, especially to those with degrees that used to support social mobility through 'modest' public employment. At the same time, however, the demand for degrees is not declining. Degrees in the crisis act as protective shields: in the process of determining redundancies in the public sector, degree holders may not be immune, but they are better protected than the rest. Educational achievement continues to provide social advantage, even if this mainly defensive and comparative. Its function in reproducing and legitimating social hierarchy becomes stronger, while the illusions about the effective importance of personal merit remain largely unaffected.

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