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An Olympic opportunity

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Abstract
We use a unique natural experiment in which families were randomly selected to live in the Olympic Village, constructed for the 2004 Athens Olympic Games, to assess the impact of improved neighbourhood conditions on academic achievement. Comparing 12–17-year-old students who relocated and attended the new schools with non-selected applicants from the same origin schools across Attica, we find a positive, gender-neutral, and significant effect of moving on overall performance. Educational gains, primarily in language courses, are concentrated among students who previously performed poorly, indicating a "fresh start" effect.

Keywords: social experiment; housing; neighborhoods; neighbourhoods; peer effects; education
JEL codes: H43, I18, I38, J38

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1. Introduction

Housing, a basic human need according to the United Nations Declaration of Human Rights, is at the heart of the American Dream and the European Welfare State. The US federal government and US states spend dozens of billions annually on housing assistance, while EU governments spend even more on social housing programs, including rent and loan subsidies, tax breaks, and new construction, provided to low- and middle-income families on favourable terms. But demand for housing in cities has soared, and the associated rise in rental costs, coupled with modest homeownership among the younger generation, features prominently in the ongoing public discourse on the cost-of-living crisis, which has fuelled citizens' resentment toward the political system.[5] Calculations by professional bodies suggest a social housing gap of about 1 million houses in continental Europe, with social housing waiting lists swelling: in France alone, there are more than 2.5 million pending applications (Housing Europe, 2025). In response to soaring costs and their evident political ramifications, the EU, its member states, and other advanced economies have made the construction of new housing a top priority. Beyond housing's relevance today, providing decent shelter in a safe neighborhood has long been considered a *sine qua non* for realizing the potential of young children (Shonkoff and Phillips, 2000; Hills, 2007). However, the literature on social housing, discussed below, yields inconclusive evidence on its impact on education, income, health, crime, and opportunity. In addition, due to the multitude of factors influencing families' housing decisions, distinguishing between spatial sorting and the causal effects of new constructions and neighborhoods is challenging.

In this paper, we exploit a unique natural experiment of randomized selection of about 2,300 low- and middle-income families to live in the Athens Olympic Village (henceforth, OV), the largest housing project in Europe in the mid-2000s, to identify the effects of new housing in a new neighborhood with high-quality infrastructure (new clinic and schools, athletic facilities, modern landscape) on students' educational performance. Within the provisions of organization and hosting of the 2004 Olympic Games in Athens, a new master-planned community was created from the grassroots - an Olympic Village - in the northern suburbs of Athens, where

[5] Del Pero *et al*. (2016) report survey estimates showing that one in three residents in OECD member countries feels "heavily burdened" by the costs of housing, a doubling share relative to before the Great Financial Crisis. The share of households in the bottom quintile of the income distribution that rely on subsidies, renting, or other housing support ranges from about 50% in Germany, Austria, Sweden, and the Netherlands to about 10% in Slovakia, Hungary, Poland, and Estonia. Moreno-Monroy et al. (2020) report that about 30% of household disposable income for bottom-quintile residents in the OECD is spent on rent, with the share exceeding 40% in Chile, New Zealand, Greece, Sweden, and the United States.

the sporting facilities lay, to provide hospitality to the athletes. The OV was built by the Workers Housing Organization, a government agency, outside the city's heavily developed areas, at the footsteps of mountain Parnitha, featuring a modern architectural design, good athletic facilities, a clinic, and new schools. As planned, the newly constructed houses were handed over to the organization's beneficiaries, low- and middle-income working families, totalling about 10,000 people, after the 2004 Olympic and Paralympic Games.

1.1 Results Preview

The random assignment of students (families) to the new housing, in a pleasant environment at the outskirts of a large metropolitan area, provides a natural setup to identify the effects of social housing on educational performance, disentangled from the effects of family background and endogenous choice of residence, which reflects hard-to-observe family features such as valuation of amenities, proximity to work, maintenance of friendships, among others. We track and compare the performance (grades) of students who switched to OV schools with that of students whose families were in the pool of applicants (lottery) but were not selected, both before and after the former relocated to the OV. The difference-in-differences specifications, which account for students' hard-to-observe ability and family characteristics and conditions for general trends in performance, reveal three takeaways. First, the analysis shows a significantly positive gender-neutral effect on students' overall performance (0.24 standard deviation in GPA)[6] from moving with their families to the new modern neighbourhood. The relocation dividend on secondary education grades is especially strong for language courses (about one standard deviation) and in the last three years of secondary schooling, when Greek students prepare for the competitive and stressful national exams that determine admission to public universities. Second, the performance boost is particularly strong and evident in all courses (Languages, Mathematics, and Sciences) for students whose performance was below the class median before the relocation. This robust regularity suggests that the move triggered a fresh start for low-performing students (a 0.47 standard deviation increase in GPA) but had little effect on students already performing well. Reducing disparities in academic achievement is critical for ensuring equal educational opportunities and fostering social mobility (Murnane and Levy, 1996; Reardon, 2011). This new beginning was not hampered by competition from students who had previously adjusted and benefited from better conditions, or pupils from more

[6] Grades are measured on a 0–20 scale. Standardized effects are computed by dividing the estimated treatment coefficient by the standard deviation of the dependent variable in the relevant estimation sample. For overall grades, this corresponds to 0.648/2.701, yielding 0.24.

affluent families who had an advantage in using local resources. Third, to further shed light on the mechanisms underlying the average effect on student performance, we explore how it varies across origin neighborhoods' living conditions, as reflected in mean income, urbanization, and pollution. There is little heterogeneity, suggesting that the fresh start effect from moving to a significantly more pleasant environment with better infrastructure dwarfs any additional benefits or disruption costs.

1.2. Related Literature

Our paper is part of empirical research examining the impact of social housing, often in city peripheries, on low- and middle-income families. The literature provides mixed evidence, partly reflecting the considerable heterogeneity of programs across the world, opposing theoretical mechanisms, and the challenges of accounting for sorting, individual abilities, and households' preferences (see Chyn and Katz, 2021, for a discussion).[7] On the one hand, studies of the *Gautreaux* program, which assisted African-American households in Chicago's high-density public housing in relocating to less segregated communities, find that parents' and children's outcomes were markedly better for those who moved to the less-segregated suburbs as compared to households that stayed in the ghettos (e.g., Rosenbaum, 1995), especially in the long-run (Chyn, *et al*., 2025). A broader literature on place-based effects presents compelling evidence on neighborhoods' causal impact on children's outcomes, but mainly for early-life moves (e.g., Chetty and Hendren, 2018; Chyn, 2018; see Chyn and Katz (2021) for an overview). Most relevant to our work are studies of the *Moving to Opportunity* (MTO) program, a randomized housing mobility project entailing 4,604 families in five US cities (Chicago, New York, Los Angeles, Boston, and Baltimore). Katz, *et al.* (2001), Ludwig, *et al*. (2001), Orr (2003), Kling, *et al*. (2007), among others, find small and not always significant effects of the relocation to a better neighborhood on adult earnings and employment, despite improvements in self-reported well-being and better health. Besides, relocating students showed no progress across a wide range of educational performance measures, such as achievement scores, self-reported school performance, and college attendance. Chetty, *et al.* (2016) show that moving early in life, before 13, into low-poverty neighborhoods is associated

[7] Identifying social-environmental externalities has proven very difficult because individuals and families tend to sort across neighborhoods for reasons likely correlated with the underlying determinants of the outcomes studied, such as education, health, and employment. It is thus difficult to disentangle the externality that the social environment exerts on individual outcomes from individuals' own abilities and skills, precisely because of self-selection. Harding *et al*. (2023) find that selection bias significantly influences the outcomes of conventional non-experimental studies examining the impact of neighborhood effects on adult economic outcomes. Two influential reviews by Ellen and Turner (1997) and Durlauf (2004) both suggest that statistical analysis of observational data provides only limited support for the importance of neighborhood effects.

with significantly higher income in adulthood (30% higher than the control group). However, moving during secondary education leads, if anything, to lower income, suggesting non-negligible disruption effects.

On the other hand, many studies that rely on experimental variation find tiny or even negative effects of social housing programs. Using plausibly exogenous variation in housing assistance generated by public housing demolitions in Chicago, Jacob (2004) finds no significant differences in test scores or dropout rates between relocating and staying-behind children. In the same vein, Oreopoulos (2003) examines the long-run labour market outcomes of adults who were assigned, when young, to substantially different public housing in Toronto and finds that neighborhood quality plays little role in the youth's eventual earnings and unemployment, suggesting that family influence is significantly more important than neighborhood characteristics. Van Dijk (2019) examines the lottery-driven impact of the Netherlands' public housing program, Europe's largest, on various socio-economic outcomes. While the average effect of the housing program is negative, there is considerable heterogeneity, with moves to high-income neighborhoods generating upward mobility for low-socio-economic-status participants. Likewise, Barnhardt, *et al*. (2016) find no impact on family income or human capital of a social program in Gujarat, India, which, through a lottery, provided slum dwellers with superior housing on the outskirts of the city.

Our paper contributes to this body of research by providing experimental evidence from a large European social housing project on the short-term impact on children's school performance. In contrast to the aforementioned studies, our analysis reveals positive effects from relocating to a better environment, driven by low-achieving students who get a fresh start in the new schools. Compared to earlier works, the OV program we study has some interesting features. First, there was full participation, minimizing concerns stemming from imperfect or even low take-up. Besides, although the adults and children who moved to the OV were randomly selected, they were not explicitly participating in a randomized experiment, such as the MTO or the STAR programme in Texas that could have biased their behaviour (see Krueger, 1999). Second, the selected families were fairly representative of Attica's population without homeownership, as the key requirements for parents were employment, having children, and not owning a home. This feature not only contrasts with other programs, like MTO, Gautreaux, or in developing countries, targeting underprivileged racial groups or slum dwellers, but is also more relevant to the ongoing policy debate on the appropriate policies to deal with the costs of housing in developed countries (Saiz, 2023). Lastly, the large scale of the number of people involved:

approximately 2,300 families (out of 18,000 beneficiaries participating in the lottery) and 10,000 inhabitants, including about 3,500 school-age children.

Structure. The rest of the paper is organized as follows: Section 2 first provides background on the Olympic Village's construction and the lottery for assigning apartments to low-income households, and then discusses the data and presents some preliminary descriptive evidence. Section 3 lays out the empirical framework, reports baseline estimates, and examines heterogeneity across individual features, gender, past performance, and move timing. Section 4 delves into the mechanisms, exploring differential effects across pre-move neighborhood features. Section 5 summarizes and discusses policy implications.

2. The Athens Olympic Village. Background and Data.

2.1 The Olympic Village

In contrast to previous cities hosting the Olympic Games, the Athens OV's construction was entrusted to the Workers Housing Organization (WHO), a government agency responsible for social housing.[8] Olympic Village 2004 S.A., a WHO subsidiary, was founded to design, construct, and manage the OV with a dual mandate. First, to host the athletic delegations participating in the 2004 Olympic and Paralympic Games. Second, to ensure its post-Olympic Games utilization for WHO beneficiaries in Attica.

The OV, which at the time was the largest urban-residential project in Greece, costing about 300 million euros, was built in the north-west of the Attica Prefecture, at the foot of Mountain Parnitha (Figure 1, Panel A), outside the town plan boundaries, on an area of 1,240 acres. The architectural design ensured a pleasant, healthy, and modern residential environment, unlike that of typical housing projects (Figure 1, Panel B). The OV settlement is landscaped in four zones. The Green Zone, in the middle, comprises small squares, open spaces for walking, playgrounds, and leisure facilities. The Residential Zone, located on either side of the Green zone, comprises 366 apartment complexes with 2,292 housing units. The buildings are two-, three-, or four-story, with 19 distinct apartment types to avoid uniformity. The Urban Center Zone in the West primarily comprises public-use buildings: two-day nursery facilities, three

[8] For decades, the WHO had not developed new housing in Attica, prioritizing the countryside (due to lower land costs). As such, the Ministry of Labor, the WHO supervising department, came up with a plan for the WHO to fund the OV so that, after the end of the Games, its facilities and new dwellings would pass to its beneficiaries.

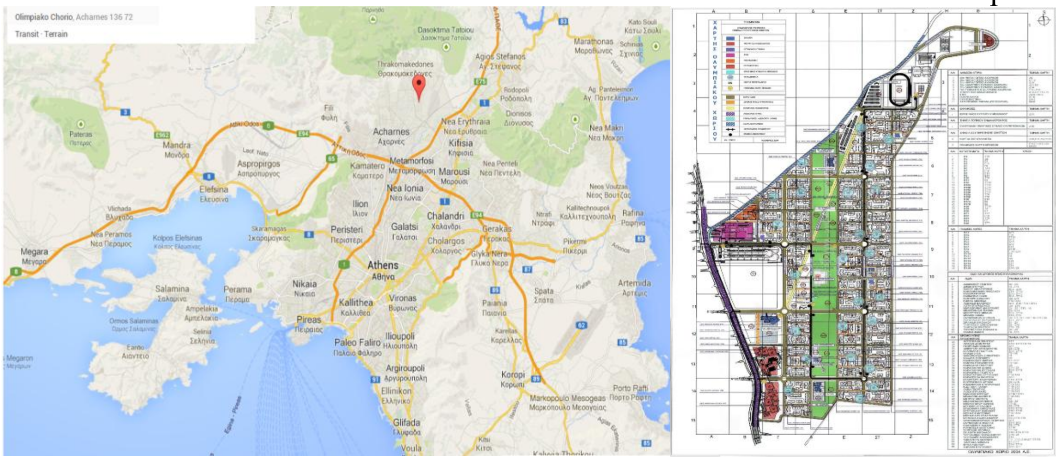
kindergartens, two elementary schools, a junior school, and a high school.[9] There is also a Polyclinic Medical Center for primary health care and rehabilitation. The Athletic Center Zone in the North includes an athletic and football stadium, a swimming pool, two indoor gymnasiums, and four tennis courts. After the Olympic Games, the OV apartments were given to WHO applicants through a lottery. Approximately, 18,000 WHO beneficiaries, mainly salaried employees of the public or private sector, as well as a small fraction of pensioners (5%) residing in Attica, participated in the lottery. Roughly, 2,000 beneficiaries were randomly selected.[10] Each household received a housing unit, bringing the total to approximately 10,000 inhabitants. The families were granted government-guaranteed loans on very favourable terms and eventually acquired ownership. Families couldn't rent or sell until they repaid the loans. Families entered the OV in 2006.

Tabulations of the questionnaires (Zamani *et al*., 2011) completed by lottery participants before receiving the apartments suggest somewhat larger household sizes than in Greece and Attica, with 30% of households having four members, 10% five, 10% six, and about 5% having more than seven. In two-thirds of households, both parents had jobs; in 21%, one parent had a job; and in just 18 families, both parents were unemployed. 60% of households were low-income, with incomes below 15,000€; a third were middle-income (15,000-30,000€); and about 7.5% had incomes exceeding 30,000€. 45% of the beneficiaries had a degree from a public university or private college, 25% were high school graduates, and about 12% and 20% had less than 9 years of formal education.

[9] All of these facilities are public schools, with teachers and principals chosen centrally by the Ministry of Education. Through in-person meetings with the secondary school's headmaster and teachers, we also confirmed that there was no specific selection that led them to work there.
[10] There was also a special category that included beneficiaries with families with five or more children or who were severely handicapped. 276 apartments were allocated to these beneficiaries without a lottery. We exclude these families and students from the analysis.

FIGURE 1: OV LOCATION AND ARCHITECTURAL PLAN

Panel A: OV location in Attica Panel B: OV architectural plan



Notes: Panel A shows the location of the Olympic Village in Attica. Panel B shows the architectural plan of the village.
Source: Google maps (panel A) and the architectural plan (panel B).

2.2. Data

Outcomes. The Greek education starts with six years of primary education (ages 6 to 11). The next six years of secondary education (ages 12 to 17) are divided into the first three grades ("*Gymnasio*", denoted as A, B, and C) and the following three grades ("*Lykeio*", denoted as D, E, and F). As children in primary education typically do not receive grades, we collected student performance data (end-of-year grades) by course from secondary schooling. We report results with the overall average (GPA),[11] the mean among *Language* subjects (averaging grades in ancient Greek, modern Greek, and history) and *Sciences* (mathematics, physics, chemistry, geography, and biology). We also examine Modern Greek and Mathematics, as these courses are taught at every grade level.

Treatment Groups. We collected grades for students whose parents moved to the OV from all secondary education grades, from the first year of the OV operation, 2006-07, to the 2011-12 school year. For students transferring to OV schools in grades B, C, E, and F, we also collected information about their previous school.[12] We visited each of these (origin) schools and collected students' performance data (grades) before moving to the OV (as there is no central registry of students' grades at the Ministry of Education). Through in-person visits and

[11] The academic year for all grades is split into three terms; at the end of each one, the students are graded. The average of the three periods plus the end-of-year (school-level) exam grade is the total performance.
[12] That means we did not research the previous schools of those treated students first, moving to OV in the first grades (i.e., A or D) of the first or second level. For these students, the original school was not listed in the OV records, so we could not track them.

requests to school principals, we obtained information from about half (47%) of the schools of origin. Of the 266 students moving to OV schools in grades B-F from other Attica schools, we obtained grades for 124 students from 310 (origin) schools.[13] These 124 students, with a total of 358 student-grade observations, constitute the "treatment" group. In some specifications, we include children observed only in OV schools, for whom we lack data from their earlier school, mainly because they entered the first grade of secondary school.

Control Groups. We also collected academic performance data from the schools of origin for all the classmates of the treated students, both before and after the treated student switched schools. These 2,301 students (with 6,394 student-grade observations), classmates of students who moved to the OV, constitute the "general control" group. From the overall pool of classmates, we identified 162 students (corresponding to 435 student-grade observations) whose parents entered the lottery but were not selected to move to the OV.[14] We refer to this group as the "matched control," as it consists of children from the same schools and classes as treated students, whose parents participated in the lottery but were not chosen.

Preliminaries. Table 1 gives summary statistics on students' performance for all groups we consider in the analysis: (i) moving to OV children, who switched schools (Panel A, "treated group"); (ii) children in the OV schools, for whom we lack data from their earlier school (panel B, "only OV"); (iii) children from the same schools as the OV children, whose parents participated in the lottery, but were not drawn (Panel C, "matched control"); (iv) and children from the same school as the moving students (Panel D, "general control"). Some noteworthy regularities emerge. First, there are no significant differences in the educational performance of the students of the control and treatment groups *before* the latter move; differences in overall GPA and by subject are slightly negative, as OV students come from relatively blue-collar working families, but statistically insignificant from zero, in line with the lottery randomization (Appendix Table A1, Panel A). Second, students transferring to OV schools experience better academic performance, driven primarily by language courses. Overall, the GPA increases by 0.05 standard deviations, whereas for language-related subjects, such as modern Greek, the increase is 0.38 SD. Third, the increase in OV students' overall grades is more pronounced

[13] Despite having official permission from the Greek Ministry of Education for this research, some headmasters refused to provide us with the data. As shown in Appendix Table A1, Panel B, there are no significant differences in academic performance between OV students for whom we obtained data before their move and those for whom we did not, suggesting that (origin schools') headmasters' decision not to share the data is orthogonal to students' performance.

[14] This identification was accomplished by matching the applicant's surname and home address from the WHO records with corresponding information in the school enrolment data.

than that observed among either the "matched control" or the "general control" students, who experience a *decline* of about 0.10 (0.09) standard deviations. Appendix Figure A1 shows the distribution of grades for treated students before and after moving to the OV, as well as for the matched control. Panel A illustrates a rightward shift in the overall grade distribution with twin peaks. The rightward shift in the distribution is more apparent for the language index (Panel B), particularly for modern Greek (Panel C). In contrast, there are no noticeable differences in sciences (Panel D), and mathematics (Panel E).

TABLE 1: SUMMARY STATISTICS

	Before				After					
	Mean	Std. Dev.	Obs	Students	Mean	Std. Dev.	Obs	Students	Δ	p-value
A. Treated group										
Language Index	13.4	3.1	179	124	14.2	2.7	179	124	0.785	0.011
Modern Greek	13.6	2.9	179	124	14.7	2.8	179	124	1.098	0.000
Science Index	13.1	3.4	179	124	12.7	2.9	179	124	-0.401	0.228
Mathematics	12.7	3.7	179	124	12.4	3.2	179	124	-0.231	0.530
Overall average	14.4	2.7	179	124	14.5	2.3	179	124	0.127	0.632
B. Only OV										
Language Index					13.5	3.1	680	311		
Modern Greek					14.1	2.9	680	311		
Science Index					11.9	3.4	680	311		
Mathematics					11.4	3.5	680	311		
Overall average					13.8	2.7	680	311		
C. Matched Control										
Language Index	14.4	3.0	214	162	14.2	3.2	221	162	-0.224	0.452
Modern Greek	14.6	2.9	214	162	14.5	3.2	221	162	-0.047	0.873
Science Index	13.9	3.4	214	162	13.6	3.5	221	162	-0.339	0.313
Mathematics	13.4	3.7	214	162	13.3	4.1	221	162	-0.071	0.851
Overall average	15.1	2.7	214	162	14.8	2.8	221	162	-0.281	0.286
D. General Control										
Language Index	14.3	3.1	3203	2301	14.2	3.1	3191	2301	0.114	0.142
Modern Greek	14.4	2.9	3203	2301	14.5	3.0	3191	2301	-0.033	0.655
Science Index	13.9	3.4	3203	2301	13.7	3.4	3191	2301	0.222	0.009
Mathematics	13.4	3.7	3203	2301	13.2	3.9	3191	2301	-0.182	0.056
Overall average	15.1	2.7	3203	2301	14.9	2.7	3191	2301	-0.235	0.001

Notes: The table presents summary statistics of raw grades for treated and control students before and after moving to the OV. Panel A shows results for treated students for whom we collected grades both before and after the move to the OV. Panel B shows results for students for whom data is only available after moving to the OV. Panel C reports results for the matched control group, consisting of students whose families entered the lottery but were not selected. Panel D reports results for the general control group, which includes all classmates of the treated students, regardless of whether their families entered the lottery (but were not selected) or did not enter at all.
Source: Authors' calculations based on school data. The data were hand-collected and are not publicly available.

3. Methodological approach and results

3.1. Empirical Methodology

To quantify the impact of the OV (new) neighborhood, we employ a difference-in-differences framework and compare the performance of students in the treatment and matched (and general) control group before and after the move to the new settlement (OV):

$$performance_{it} = \alpha_i + \beta\ post_t \times treat_i + \lambda_{tg} + \varepsilon_{it} \qquad (1)$$

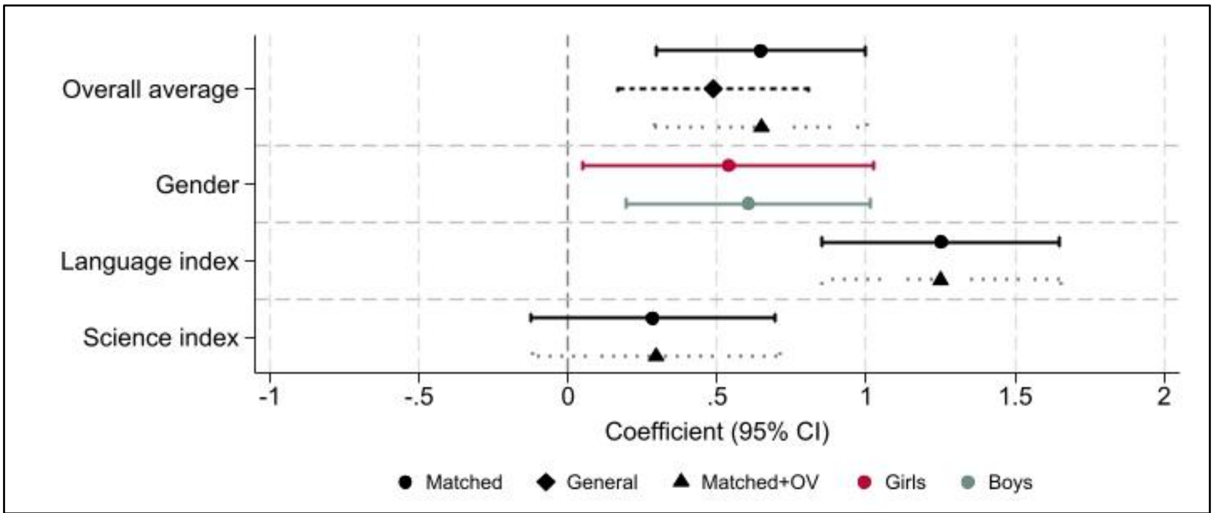
where $performance_{it}$ denotes student's i grades in year t; $treat_i$ is an indicator that equals one for students who moved into the OV (treatment group) and zero for students from the same schools as the moving to OV children before their switch (control); $post_t$ is a binary indicator that takes the value one after the student switches to the OV school. $\lambda_{t,g}$ are grade × year fixed effects that account for grade-specific trends in performance. Student fixed effects, a_i, account for time-invariant individual features, such as ability (by subject) and household characteristics, related to income, aspirations, and the valuation of education. ε_{it} is a random error term, assumed to be orthogonal to potentially relevant factors for achievement, $E(\varepsilon_{it}|Post_t, Treat_i) = 0$. The parameter β captures the impact of the switch to the OV. We estimated the specification for the mean grades, separately for science and language subjects, using OLS and clustering standard errors at the initial school level. All schools in Greece, and hence those in both the "control" and "treatment" groups, are centrally administered by the Ministry of Education, which recruits them through a nationwide system. Schools throughout the country follow the exact same curriculum and books, their operating costs are covered by a central budget, and teacher/pupil ratios are very similar across all schools of Attica.

3.2 OV Effect

Figure 2 presents the baseline OLS estimates that approximate the average treatment effect (ATE) of moving to the OV (Table A2 in the Appendix presents the corresponding coefficient estimates). Students' performance who moved to the OV compared to those in the matched control group, with or without the data from treated students for whom we only have performance information after they moved to the OV (OnlyOV students), or compared to those in the general control, is consistently better. The first specification suggests that after moving to the OV, students experience an increase of about 0.65 in their overall high-school grades (on a 0-20 scale), corresponding to a 0.24 standard deviation increase. The increase is more pronounced for the Language index, with the estimate implying gains of 1.25 points, about a

0.4 standard deviation increase. The estimates for the Science index imply minor and statistically insignificant from zero gains. These are significant educational short-term effects, not typically observed in the MTO literature (e.g., Sanbonmatsu *et al*., 2006, or Kling, *et al*., 2007). It is important to note that, in contrast to studies such as the Gautreaux Program or the population examined by Barnhardt, *et al*. (2016), our sample comprises a much more representative cross-section of the largest urban region in Greece, with residents relocating to a new neighbourhood altogether and at the same time.

FIGURE 2: OLYMPIC VILLAGE'S IMPACT ON STUDENTS' PERFORMANCE



Notes: Standard errors clustered at the initial school level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on school data. The data were hand-collected and are not publicly available.

3.3 Heterogeneity

We then examine heterogeneity to elucidate the underlying mechanisms.

Gender. First, we look at gender differences, as they feature prominently in the Moving to Opportunity literature, with studies reaching, however, contradictory findings.[15] As we can see in Figure 2, there is no evidence of differential responses between boys and girls who moved to the OV and their classmates whose families participated in the OV lottery but did not move to the new settlement. The positive overall average performance effect is observed for both boys and girls, with the same underlying heterogeneity of gains primarily attributable to language.

[15] Sanbonmatsu *et al*. (2006) and Kling *et al*. (2007) report that boys and girls responded differently to neighborhood relocation, with girls benefiting more in terms of mental health and safety. In contrast, boys show improved behavior and educational outcomes.

Earlier Performance. An open question from earlier research concerns whether the effects differ systematically between students with higher and lower *ex ante* achievement; for example, Chetty, *et al*. (2016) find that the impacts of moving to a better neighborhood vary systematically by children's age and their initial academic achievement. We thus assign treated students to low- and high-performance categories based on their average performance prior to switching and then re-estimate the difference-in-differences specifications. Table 2, column (1), reveals that students below the median performance in their previous school experience the most significant improvement, with their overall grades increasing by 1.3 points, half a standard deviation. The increase in grades for relatively high-performing students is tiny, and the coefficient is statistically indistinguishable from zero. This heterogeneity is present in *all* courses. Low-achieving students experience non-negligible improvements not only in language by 1.8 (0.59 SD) (as the overall results suggested), but also in science and mathematics by 1.1 (0.32 SD). The OV housing initiative had a substantial positive impact on the academic performance of the most vulnerable children. These results reveal a fresh-start effect for underperforming children, who appear to benefit most from relocating to a better neighborhood and a new school environment. This conclusion contrasts with MTO studies (Sanbonmatsu *et al*., 2006), which indicate that better neighborhoods do not affect pupils' test scores, even among students with poor performance before relocation. This finding is significant as it demonstrates that the average treatment effects in Figure 2 do not capture a general grade inflation across the newly established OV schools, since teachers in the OV schools did not have access to information regarding students' prior academic performance.

Timing of the Move. We then investigate whether there are differential effects for students moving between the first three grades of secondary education (*Gymnasio*) and the last three grades (*Lykeio*), when Greek students prepare for the demanding nationwide exams to gain admission to public universities. The results in Table 2 reveal that the gains (overall and across language and science courses) are larger from the latter three grades, even though there are significant gains for language courses in the first three grades.

Dynamics. Lastly, we examine the dynamics of the treatment effect by splitting the ATE coefficient into a "year one" and a "two years+" effect. The positive effects on the overall average are more pronounced in the initial year and then decay, in line with a fresh start, which then decays further (although it still boosts performance). The specifications indicate a more persistent performance boost for the language subjects index, driven by modern Greek.

TABLE 2: OV IMPACT BASED ON PRIOR PERFORMANCE HETEROGENEITY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable	Overall average	Language Index	Science Index	Overall average	Language Index	Science Index	Overall average	Language Index	Science Index
Treat × Post × High	0.0579	0.693**	-0.511*						
	(0.240)	(0.289)	(0.270)						
Treat × Post × Low	1.268***	1.815***	1.102***						
	(0.202)	(0.212)	(0.265)						
Post × Treat × Gymnasio				-0.142	0.662***	-0.415*			
				(0.188)	(0.243)	(0.230)			
Post × Treat × Lykeio				2.054***	2.314***	1.540***			
				(0.221)	(0.267)	(0.325)			
Post × Treat × Year1 (D=1 if 1st year after treatment)							0.817***	1.403***	0.441**
							(0.189)	(0.210)	(0.217)
Post × Treat × Year2+ (D=1 if 2+ years after treatment)							0.0222	0.712**	-0.286
							(0.304)	(0.291)	(0.382)
Mean of dependent variable (control group)	14.31	13.82	12.70	14.308	13.817	12.696	14.308	13.817	12.696
SD of dependent variable (control group)	2.70	3.06	3.44	2.702	3.064	3.441	2.702	3.064	3.441
H0: low vs high is zero (p-value):	0.000	0.001	0.000						
H0: gymnasio vs lykeio is zero (p-value)				0.000	0.000	0.000			
H0: First vs. Second year onwards is zero (p-value)							0.011	0.010	0.062
Observations	1,473	1,473	1,473	1,473	1,473	1,473	1,473	1,473	1,473
R-squared	0.091	0.109	0.117	0.158	0.130	0.130	0.082	0.110	0.095
Total number of students (treated and non treated)	597	597	597	597	597	597	597	597	597
Number of treated students	435	435	435	435	435	435	435	435	435
Student FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Grade × Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of clusters	95	95	95	95	95	95	95	95	95

Notes: The table reports regression results by subject on students. We split the treated students into two categories (low and high) and created binary indicators based on their average academic performance before switching. The table reports regression results on how the treatment effect evolves over time. We report effects for the first year of treatment and for the second year onwards. Standard errors clustered at the initial school level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on school data. The data were hand-collected and are not publicly available.

4. Mechanisms. Mitigating and Amplifying Neighborhood Features

We also investigated potential heterogeneity in the impact of relocation on children who moved to OV with respect to neighborhood characteristics.

Specification. To analyse the differential in the treatment impact based on the moving to OV students' previous neighborhood characteristics, we extend our empirical model as follows:

$$performance_{it} = \alpha_i + \beta_1 post_t \times treat_i + \beta_2 post_t \times I_i + \beta_3 post_t \times treat_i \times I_i + \lambda_t \times \lambda_g + \varepsilon_{it} \quad (2)$$

where I_i is a binary variable indicating whether the neighborhood is above the median (and for robustness, the 75th percentile) of the distribution of the relevant proxy of neighborhood "living conditions quality", as reflected in income, pollution, population density, and proximity. As above β_1 captures the average effect of moving to the OV, while β_3 quantifies the additional impact of neighborhood characteristics on treated students. Table 3 presents estimates for four neighborhood characteristics.

Income. First, we investigate whether students from lower-income neighborhoods fare better or worse than those from more affluent ones after moving to the new neighborhood. We use declared income data by postal code from the Ministry of Finance to calculate the distribution of students across Attica's neighborhoods, from which all moving students originated. Median household income was 22,310€, and the 25th percentile was 19,314€ in 2011. Table 3, columns (1) and (2), report the OLS estimates. The treatment effect coefficient is about 0.75-0.8 and highly significant. In contrast, the estimate of the interaction term is small and statistically indistinguishable from zero, indicating no significant heterogeneity in neighborhood income.

Pollution. Second, we examine whether students who switch from more heavily polluted neighborhoods experience greater gains in educational achievement. We collected data on SO_2 (sulphur dioxide) concentrations, a highly hazardous pollutant, primarily emitted from the industrial processing of metals, and ranked the neighborhoods of origin for all moving students.[16] Column (3) examines the differential effect for areas above the median, whereas column (4) uses the 75th percentile as the threshold. There is no evidence of heterogeneity as pupils from more and less polluted neighborhoods benefit equally from moving to the OV.

Urbanization. Third, we examine the impact of urbanization by ranking the origin school areas by population density (residents/km^2), using data from the 2001 census. *A priori,* the role of

[16] We chose it among other pollutants mainly due to data availability. Each school was assigned a pollution value based on the closest in-proximity station. We calculated the mean values of SO_2 based on yearly data from 1984-2004.

urbanization is ambiguous. On the one hand, moving from densely populated areas to the pleasant environment of the OV, with its superior infrastructure, may improve students' grades, but on the other hand, the move might have caused stress for their families, as the OV was far from their workplaces. Column (5) examines the differential effect for areas above the median, whereas column (6) uses the 75th percentile as the threshold for the interaction term. Secondary education students from more densely populated neighborhoods exhibit a similar increase in performance to those from less urbanized areas.

Proximity to OV. Lastly, we examine heterogeneity in the distance from the previous neighborhood to the OV. For students from nearby areas, the transition is less abrupt and perhaps smoother, as they are more likely to maintain friendships and adapt to the new environment, which is not very dissimilar to their old one. Most students, however, came from distant schools in Attica and were very unlikely to have been able to maintain any connection to their former environment and friends. For example. Barnhardt, *et al*. (2016) show that slum dwellers who, through a lottery, moved to improved housing on the outskirts of Ahmedabad, Gujarat, India, report increased isolation. These students may experience a harsher, more radical change, which could make adaptation to the new environment challenging, at least initially (although our estimates above suggest positive short-run effects). We use the distance from the previous school to the OV, in kilometres, as a proxy for the intensity of the move and assess whether students experiencing a smoother move achieve a larger performance boost than those from areas farther from the OV. As shown in columns (7)-(8), there are no significant differences in grades of OV students coming from more and less proximate areas of Attica.

TABLE 3: MECHANISMS OF NEIGHBORHOOD EFFECTS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Low Income		Pollution		Urbanization		Distance	
Dependent variable	Median	25^{th} prc.	Median	75^{th} prc.	Median	75^{th} prc.	Median	25^{th} prc.
Post × Treat	0.776***	0.728***	0.760***	0.761***	0.775***	0.711***	0.599**	0.521***
	(0.231)	(0.182)	(0.273)	(0.227)	(0.284)	(0.223)	(0.250)	(0.192)
Post × Treat × I	-0.328	-0.368	-0.250	-0.425	-0.245	-0.198	0.0722	0.314
	(0.354)	(0.578)	(0.343)	(0.350)	(0.349)	(0.345)	(0.360)	(0.436)
Mean of dependent variable (control group)	14.31	14.31	14.31	14.31	14.31	14.31	14.31	14.31
SD of dependent variable (control group)	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70
Observations	1,473	1,473	1,473	1,473	1,473	1,473	1,473	1,473
R-squared	0.066	0.061	0.059	0.060	0.059	0.059	0.059	0.061
Total number of students (treated and non treated)	597	597	597	597	597	597	597	597
Number of treated students	435	435	435	435	435	435	435	435
Student FE	YES	YES	YES	YES	YES	YES	YES	YES
Grade × Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of clusters	95	95	95	95	95	95	95	95

Notes: The table reports regression results for the overall average across different mechanisms. Columns (1) and (2) show results for low-income neighborhoods (below the median and below the 25^{th} percentile). Columns (3) and (4) show results for highly polluted neighborhoods (above the median and above the 75^{th} percentile). Columns (5) and (6) show results for highly urbanized neighborhoods (above the median and above the 75^{th} percentile). Columns (7) and (8) present results based on the distance of the previous neighborhood to the OV (below the median and below the 25^{th} percentile). Standard errors clustered at the initial school level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations based on school data. The data were hand-collected and are not publicly available.

5. Discussion

The allocation of families to the Athens Olympic Village provides a rare opportunity to study the effects of relocating households to a newly developed neighborhood through randomized assignment. We document two main findings. First, students who moved to the OV experienced a meaningful increase in academic performance, driven primarily by gains in language subjects. Second, these improvements are concentrated among students who were performing below the median prior to relocation, consistent with a "fresh start" effect. The gains are similar across gender and across origin neighborhoods.

These findings suggest that large-scale housing initiatives that relocate families to newly developed neighborhoods can generate short-run educational benefits, particularly for lower-achieving adolescents. While such programs are often justified on grounds of housing affordability and urban development, our results indicate that they may also reduce achievement gaps by disproportionately benefiting students who were previously struggling. Designing housing policy with attention to school environments and the transition experience may therefore enhance the educational returns of place-based interventions.

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An Olympic Opportunity

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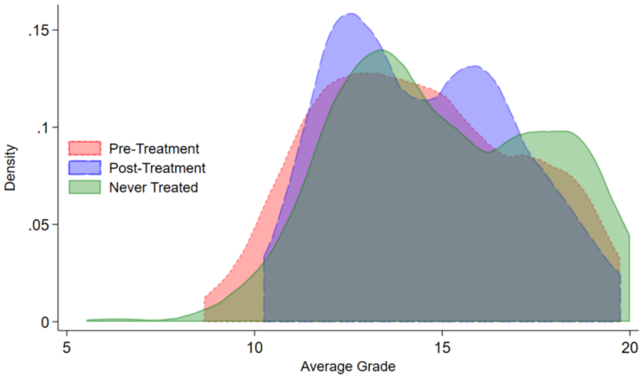
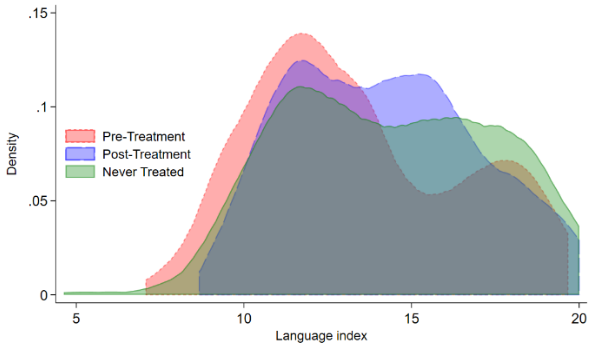
SUPPLEMENTAL APPENDIX

FIGURE A1: RAW GRADES DISTRIBUTION BY OV TREATMENT

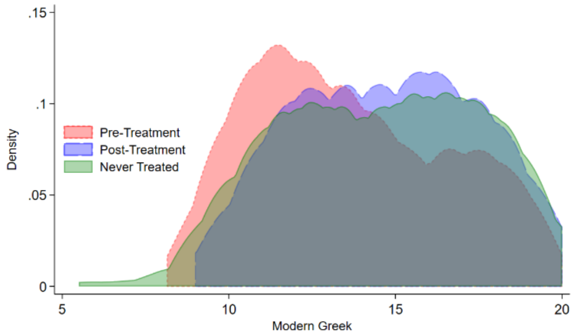
Panel A: Overall average grade



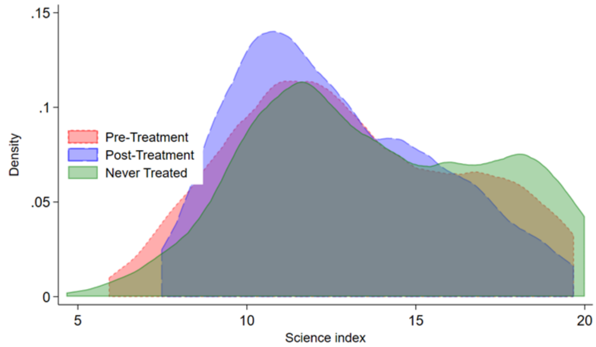
Panel B: Language index



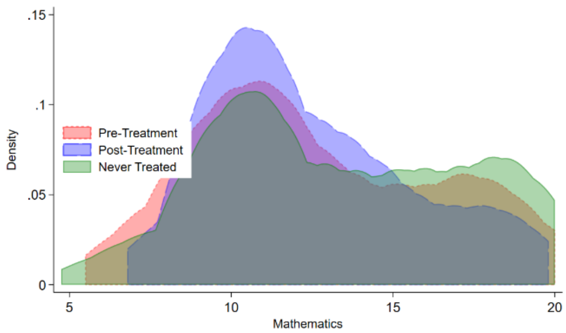
Panel C: Modern Greek



Panel D: Science index



Panel E: Mathematics



Notes: The figure shows the distribution of grades by treatment group. Control group is shown in green. Treated group is shown in pink (before treatment) and in purple (after treatment).
Source: Authors' calculations based on school data. The data were hand-collected and are not publicly available.

TABLE A1: SAMPLE SELECTION TESTS

	(1)	(2)	(3)
Panel A: Before treatment	Treated & Matched	Gymnasio	Lykeio
Dependent variable	Overall average	Overall average	Overall average
Treat	-0.901*	-0.668	-1.462
	-0.461	-0.465	-1.131
Observations	393	277	116
Number of treated students	124	79	45
Grade FE	YES	YES	YES
School × Year FE	YES	YES	YES
Number of clusters	93	58	35
	(1)	(2)	(3)
Panel B: After treatment	Treated & Only OV	Gymnasio	Lykeio
Dependent variable	Overall average	Overall average	Overall average
onlyOV	-0.454*	-0.548*	-0.222
	-0.273	-0.317	-0.395
Observations	859	557	302
Number of treated students	124	79	106
Grade FE	YES	YES	YES
School × Year FE	YES	YES	YES
Number of clusters	93	58	35

Notes: The table reports the results of sample selection tests. We use the following regression framework to test for sample selection: $Overall\ Average_{it} = b\ treat_i + yearFE + gradeFE + schoolFE + \varepsilon_{it}$, where $Overall\ Average_{it}$ is the end-year overall average grade of student i in year t, $treat_i$ is a binary indicator for students in the treatment group, while we include year, grade and school fixed effects. Standard errors are clustered at the initial school level. In panel A we compare the performance of students in the matched control and treatment group before the treated students switch to OV schools. Column (2) is restricted to students in *gymnasio*, and column (3) is restricted to students in *lykeio*. In panel B we compare the performance of treated students after moving to the OV between those for which we have past performance information and those that we do not.

Source: Authors' calculations based on school data. The data were hand-collected and are not publicly available.

TABLE A2: OLYMPIC VILLAGE'S IMPACT ON STUDENTS' PERFORMANCE

Dependent variable	(1) Overall average matched dataset without OnlyOV	(2) Overall average general dataset without OnlyOV	(3) Girls matched dataset without OnlyOV	(4) Boys matched dataset without OnlyOV	(5) Language Index matched dataset without OnlyOV	(6) Science Index matched dataset without OnlyOV	(7) Overall average matched dataset with OnlyOV	(8) Language Index matched dataset with OnlyOV	(9) Science Index matched dataset with OnlyOV
Post × Treat	0.646***	0.486***	0.538**	0.606***	1.251***	0.283	0.648***	1.250***	0.295
	(0.180)	(0.162)	(0.250)	(0.208)	(0.203)	(0.210)	(0.181)	(0.205)	(0.211)
Mean of dependent variable (control group)	14.985	15.020	14.766	13.790	14.317	13.748	14.310	13.819	12.698
SD of dependent variable (control group)	2.742	2.689	2.746	2.554	3.101	3.493	2.701	3.064	3.441
Observations	793	6,752	2,079	2,026	793	793	1,473	1,473	1,473
R-squared	0.053	0.013	0.029	0.085	0.116	0.038	0.058	0.087	0.084
Total number of students (treated and non treated)	286	2,425	753	748	286	286	597	597	597
Number of treated students	124	124	62	62	124	124	473	473	473
Student FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Grade × Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of clusters	93	93	75	77	93	93	95	95	95

Notes: Standard errors clustered at the initial school level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on school data. The data were hand-collected and are not publicly available.