



The Geography of Gifted Education: Exploring School and Neighborhood Predictors of Access to Gifted & Talented Programs in New York City

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Black and Hispanic students participate in gifted education at lower rates than their share of general education public school enrollment would suggest, including within New York City's Gifted and Talented (G&T) admissions process. Debates over this disparity focus on how students are identified rather than where programs exist. This paper examines a related supply-side question by asking where G&T programs are located. Drawing on a neighborhood dataset that identifies specific NYC neighborhoods and a 14-year school-year panel (2010-2024) linked to census features, we examine school and neighborhood predictors of G&T program presence. Combining machine learning with cross-classified multilevel models, we find that G&T program access is structured more strongly between neighborhoods than between NYC community school districts. Neighborhood homeownership independently predicts program presence after accounting for poverty, education, and school demographics, whereas school racial composition does not. NYC's 2022-2024 policy expansion marked a shift from earlier reforms focused on screening and admissions toward an explicit expansion of program sites. We show that this expansion placed new G&T programs in higher-poverty, lower-homeownership neighborhoods serving larger shares of Black and Hispanic students, disrupting the historical geography of program access. We discuss implications for understanding gifted access as a neighborhood-level phenomenon in large urban districts and for policies aimed at reducing inequities in advanced educational opportunity.

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Abstract

Black and Hispanic students participate in gifted education at lower rates than their share of general education public school enrollment would suggest, including within New York City's Gifted and Talented (G&T) admissions process. Debates over this disparity focus on how students are identified rather than where programs exist. This paper examines a related supply-side question by asking where G&T programs are located. Drawing on a neighborhood dataset that identifies specific NYC neighborhoods and a 14-year school-year panel (2010-2024) linked to census features, we examine school and neighborhood predictors of G&T program presence. Combining machine learning with cross-classified multilevel models, we find that G&T program access is structured more strongly between neighborhoods than between NYC community school districts. Neighborhood homeownership independently predicts program presence after accounting for poverty, education, and school demographics, whereas school racial composition does not. NYC's 2022-2024 policy expansion marked a shift from earlier reforms focused on screening and admissions toward an explicit expansion of program sites. We show that this expansion placed new G&T programs in higher-poverty, lower-homeownership neighborhoods serving larger shares of Black and Hispanic students, disrupting the historical geography of program access. We discuss implications for understanding gifted access as a neighborhood-level phenomenon in large urban districts and for policies aimed at reducing inequities in advanced educational opportunity.

I. Introduction

Gifted education programs are designed to provide academic acceleration and enrichment for students identified as high-ability learners. Research suggests that advanced academic grouping can improve outcomes for participating high-achieving students (Card & Giuliano, 2016a). Yet Black, Hispanic, and low-income students remain substantially underrepresented in gifted programs nationwide (Card & Giuliano, 2016b; Grissom, Redding, & Bleiberg, 2019; Plucker, Burroughs, & Song, 2010). Multiple factors contribute to these disparities, including identification procedures that may reinforce existing inequalities, information barriers that privilege families with greater social capital, and geographic inequities in program availability (Grissom, Redding, & Bleiberg, 2019; Lu, Weinberg, & McCormick, 2020; Peters & Carter, 2022).

Our paper focuses on this geographic dimension in the context of New York City's Gifted and Talented (G&T) program. Rather than asking only which students are identified, we examine the types of schools and neighborhoods in which G&T programs are located. The availability of a program in a child's school represents what might be called the "first stage" of access. Before questions of identification or selection arise, a program must exist in the building. If it does not, families may never learn that such programs are available, and students cannot be considered for programs that are not there. This initial stage of access is where some of the most consequential sorting occurs (Sattin-Bajaj & Roda, 2020).

We examine the 2010 to 2024 period in New York City, which spans two distinct policy eras. From 2010 to 2020, G&T program locations remained largely stable, with entrenched patterns of concentration in certain schools and neighborhoods. After 2020, following critiques of inequitable access and the disruption of COVID-19, the city launched an initiative to expand

G&T presence in historically underserved schools. We analyze these periods separately. First, we characterize the “historical access structure” of 2010 to 2020, identifying school and neighborhood factors associated with program presence. We use machine learning techniques (Random Forest and Classification Trees) to screen a large set of census-level predictors and identify which variables matter most. We then use cross-classified multilevel logistic regression to decompose G&T inequality across schools, neighborhoods, and districts, isolating neighborhood-level predictors from both school composition and district membership. Finally, we descriptively assess whether expansion sites departed from the historical placement profile.

This study makes three contributions. First, we demonstrate that G&T program inequality operates more strongly at the neighborhood level than at the district level. Across both pooled and single-year specifications, variation in program placement is more strongly structured between neighborhoods than between districts. In the pooled cross-classified multilevel model, 63% of the variation in program placement occurs between neighborhoods, compared with 11% between districts. In the 2019-20 cross-section, the corresponding shares are 7.2% and 2.9%. This finding challenges the common approach of treating school districts as the relevant geographic unit for understanding G&T program presence. These results suggest that substantial inequality exists below the district level, with meaningful variation between neighborhoods governed by the same district structure. Among tract-level local-area characteristics, homeownership rates independently predict G&T presence after controlling for school demographics, district membership, and other tract-level factors including education levels and poverty rates.

Second, we assess whether NYC’s 2022 to 2024 G&T expansion altered the historical placement pattern. Schools that gained new G&T programs were located in higher-poverty and

lower-homeownership local contexts and served more racially diverse student populations than schools that historically hosted programs. Predicted probabilities from the historical model provide a consistent illustration of this shift: 91% of schools that gained new G&T programs had less than a 10% predicted probability of hosting a program under the old patterns. Taken together, these patterns are consistent with broader geographic availability in the expansion period.

Third, we contribute methodologically by demonstrating how machine learning and multilevel modeling answer complementary questions about educational inequality. Machine learning methods reveal overall predictive patterns and identify key thresholds at the citywide level. Multilevel regression formally separates variation across geographic levels and provides interpretable effect estimates. By analyzing neighborhood-level variation using Neighborhood Tabulation Areas (NTAs) rather than relying solely on district-level comparisons, we show that administrative boundaries can obscure the community-level factors that shape educational opportunity (Tate, 2008; Türk & Östh, 2019).

II. Background and Context

The Geography of Opportunity

Our study is grounded in the geography of opportunity framework, which holds that a child's location fundamentally shapes their access to educational resources and their long-term outcomes (Tate, 2008). This framework extends a long sociological tradition of neighborhood-effects research (Wilson, 1987; Sampson, 2012). Chetty and Hendren (2018) demonstrated that childhood exposure to higher-quality neighborhoods produces lasting effects on earnings and college attendance, with each additional year of exposure generating measurable improvements. Chetty and colleagues (2020) further showed that these neighborhood effects vary by race, with

Black children experiencing sharply different returns to neighborhood quality than White children raised in the same areas. Social capital, including the networks, norms, and trust that facilitate collective action within communities, also varies across neighborhoods and is independently associated with economic mobility (Chetty et al., 2022). Bergman and colleagues (2024) confirmed that these effects are not purely a product of family selection. They find that providing families with information and vouchers to move to higher-opportunity neighborhoods produced meaningful gains for their children.

Applied to education, this framework predicts that the resources available in a child's school are shaped not only by district-level policy but by the characteristics of the surrounding community. Green, Sánchez, and Germain (2017) showed that school quality ratings cluster geographically even within the same district, creating distinct zones of educational advantage and disadvantage. Türk and Östh (2019), using Swedish longitudinal data and multilevel regression, found that neighborhood characteristics predict long-term outcomes for children even after accounting for individual and family factors. Corcoran and Baker-Smith (2018) documented an extreme version of this pattern in New York City, finding that 50% of students admitted to specialized high schools originated from just 5% of middle schools. The concentration of access to elite educational pathways reflects systematic differences in school-level resources and preparation that vary sharply across neighborhoods.

We extend this framework to the specific question of where gifted education programs are located. G&T programs represent a concrete educational resource whose geographic distribution is not random but is closely associated with neighborhood characteristics. Because race, socioeconomic status, and geography are deeply intertwined in American cities

(Massey & Denton, 1993; Chetty et al., 2020; Mordechay & Ayscue, 2024), geographic disparities in program availability may translate into demographic disparities in access.

Research on Access to Gifted Programs

Research on gifted education disparities has addressed barriers at multiple stages of access. One body of work examines identification, meaning how students are recognized and selected for programs. Standardized testing, teacher nominations, and other selection procedures have each been shown to contain potential biases that disadvantage low-income students and students of color (Ford, Wright, & Trotman Scott, 2020; Hines et al., 2022; Peters, 2022). Grissom, Redding, and Bleiberg (2019) documented that socioeconomic gaps in receipt of gifted services persist even among students with comparable achievement. Dixson et al. (2025) argue that these patterns are a product of how gifted education is organized structurally, not simply through individual biases among teachers or test designers. Information asymmetries can also compound these identification barriers. Lu, Weinberg, and McCormick (2020) found that attending public pre-Kindergarten increased G&T test-taking rates, particularly among immigrant families and those receiving free lunch, suggesting that institutional connections serve as information pipelines that facilitate or hinder access.

Reform efforts targeting identification have shown promise. Universal screening, in which all students are evaluated regardless of family initiative, substantially increased identification rates among economically disadvantaged students in a Florida district without changing eligibility criteria (Card & Giuliano, 2016b). Local norms approaches, which benchmark student performance against peers in similar contexts rather than national standards, have also improved representation (Peters et al., 2019). Plucker, Wells, and Meyer (2022) advocate for comprehensive policy redesign that addresses both identification and access. Yeung

and Mun (2022) emphasize the importance of disaggregating racial and ethnic data to reveal variation that broad demographic categories can mask.

A second body of work examines the availability of programs themselves, meaning where they are located and which schools and communities have access. Yaluma and Tyner (2021) documented that gifted programs are significantly less common in high-poverty schools nationally. Peters and Carter (2022) identified school-level characteristics that predict access to gifted services. Our study contributes to this strand of research by examining neighborhood-level factors and the geographic structure of program availability within a single urban district, and by descriptively assessing whether a deliberate policy expansion can depart from entrenched placement patterns.

Most policy efforts to broaden gifted access have focused on identification rather than location. These reforms include universal screening (Card & Giuliano, 2016b), changes in testing instruments or norms (Carman et al., 2018), teacher rating scales designed to surface talent among low-income students (Peters & Gentry, 2010), and multiple-measure systems intended to expand the pool of academically advanced students from underserved groups (Tran et al., 2022). A separate, less-studied strategy is to expand the geographic footprint of gifted programs themselves. Rather than changing who can qualify for a fixed set of sites, this supply-side approach changes where programs are located and therefore which communities encounter them as a realistic option. New York City's 2022-2024 expansion provides a useful case for examining that strategy in practice.

NYC School Districts and Neighborhoods

New York City operates one of the largest public school systems in the United States, enrolling over one million students across more than 1,800 schools in 32 community school

districts spanning five boroughs. The system encompasses substantial demographic, economic, and geographic diversity. School and neighborhood characteristics vary dramatically even within short distances, making NYC a particularly informative setting for studying the geography of educational opportunity.

The city's 32 community school districts are administrative units, each governed by a superintendent and community school board, and their boundaries are political constructions with their own histories rather than reflections of how residents experience neighborhood space (Kafka & Matheny, 2021). A typical district contains roughly nine distinct neighborhoods, and within-district variation in residential composition, homeownership, income, and other community characteristics is considerable. Two neighborhoods governed by the same superintendent can differ sharply in the resources and programs available to their schools. District-level comparisons can therefore mask much of the local variation that shapes educational opportunity. Throughout this paper, we accordingly treat the neighborhood, rather than the district, as the more informative geographic unit for understanding where G&T programs are located. We describe how we operationalize neighborhoods in the Data and Methods section.

NYC Gifted and Talented

NYC's G&T program has been a subject of public debate for decades. Formalized gifted education in the city dates to the 1970s, and questions of who benefits and who is excluded have accompanied the program throughout its history. In 2008, the city centralized G&T admissions around a standardized testing process using the OLSAT and NNAT assessments. Students scoring at or above the 90th percentile could apply to district-level programs, and those at the 97th percentile or above were eligible for citywide programs.

The centralized admissions process did not, however, produce an even distribution of programs. G&T classrooms were concentrated in certain districts and neighborhoods while largely absent from others. Some Manhattan districts maintained dozens of G&T classrooms, while districts in the South Bronx operated only a handful. The admissions process gave priority to students applying within their home district, which meant that a student's neighborhood effectively determined both whether a program was available nearby and their realistic chances of obtaining a seat. Geographic disparities in program availability thus reinforced the socioeconomic and racial disparities in G&T participation that the centralized process was intended to address.

The COVID-19 pandemic disrupted the admissions process entirely. Testing was suspended during the 2020 to 2021 school year. For the 2021 to 2022 school year, pre-K teachers could nominate students based on classroom observations rather than standardized test performance. The following year, the city implemented what it described as universal screening, making all students eligible for consideration regardless of whether their families had applied.

The Expansion Period

This section draws on our collaboration with the New York City Department of Education enrollment team during the 2022–2024 G&T expansion and is included to provide implementation context for the policy changes analyzed below. The pandemic-era disruption coincided with another policy change. In late 2021, the outgoing de Blasio administration announced plans to phase out the G&T program and replace it with a new one. After taking office in January 2022, Mayor Eric Adams instead adopted an expansion approach, emphasizing increased geographic availability rather than program elimination. The new administration would specifically target G&T program expansion to districts that had never offered the program

before. The new citywide commitment was to establish at least one kindergarten-entry and one grade 3-entry program in every district. In some districts, implementation went beyond that minimum, producing multiple new sites in fall 2022.

This shift reframed the issue less as one of student deficits and more as one of site availability. Prior to the expansion, one common explanation for neighborhoods without G&T programs was that too few students there met the earlier eligibility standard. Once the admissions process changed, that explanation became less persuasive, creating space for a different approach to site placement. More broadly, the expansion reframed the long-standing “chicken or egg” question of G&T placement: should programs be located only where large numbers of already-identified students exist, or can the placement of a program itself generate demand and participation? In practice, new sites were placed first in previously underserved areas, with the expectation that demand would develop around them.

To achieve this expansion goal, central NYC Public Schools teams worked directly with superintendents to identify where these programs should be located in the districts they oversee. In principle, the process was meant to account for instructional fit, principal willingness, and local context, but practical capacity constraints were often decisive. A school might have appeared to be a strong fit based on community perception, leadership quality, and instructional approach, yet still lack the space needed to sustain a program at scale. In general, superintendents preferred willing principals, but in practice the feasible set of sites was often narrower than the ideal set. As a result, some placements occurred in schools whose leadership was skeptical of the program on equity or instructional grounds.

A related challenge in G&T program planning is that some programs may be the only viable option in a given neighborhood but may still struggle to fill their seats at levels that make them

financially sustainable. Because these programs represent the only local option across broad geographic areas, proposals to close or consolidate them can generate substantial political resistance, particularly in communities with few alternatives. As a result, some low-enrollment programs may persist even when they are operationally difficult to sustain.

Maintaining these programs with very small enrollment rates can also be operationally difficult for schools. A class with just a handful of students is, as mentioned earlier, financially unworkable. At the same time, if the school programs these students into a general education class, G&T instruction becomes a differentiated approach within a general education setting rather than a distinct class. As families become aware of this dynamic, either having their child enrolled in a class that is very small or accepting that the G&T instruction will not take place in a distinct classroom for the G&T students, the program's reputation and desirability may diminish.

As G&T programs have expanded to areas that previously had few or none, the pressure put on individual programs seems to have lessened in the sense that district superintendents and principals have successfully phased out programs without much pushback from the community since there are now typically multiple programs in each district. This may not have been possible in prior years because of the limited nature of the program. Today, the system can mean many different things to many different people. With the mix of program models (district and citywide), entry points (kindergarten and grade 3), and variety of approaches toward implementation, it is very difficult to say with any degree of certainty what is truly consistent across all these programs.

III. Data & Methods

Research Questions

We address two main research questions:

RQ1: What school demographic and neighborhood characteristics are associated with the presence of G&T programs during the historical period (2010-2020), and at what level (school, neighborhood, district) does the most variation in G&T access occur?

RQ2: Did the 2022-2024 expansion reach schools and neighborhoods with different characteristics than those that historically hosted G&T programs?

Data Sources

We constructed a school-year panel dataset covering all New York City public schools from 2010-11 through 2023-24 (14 academic years). Student-level administrative records were obtained from the NYC Department of Education, providing enrollment, demographic characteristics, and gifted identification status for each student. These records were aggregated to the school-year level, yielding approximately 1,600 schools observed annually. Schools in Districts 75 and 79 (special education and alternative programs) were excluded.

Local-area characteristics were drawn from American Community Survey 5-year estimates obtained through the Census Bureau API using the *tidycensus* R package. We downloaded census-tract data for the five New York City counties for ACS vintages 2015 through 2022. Schools were linked spatially to the census tract containing the school building, and each school-year was assigned the ACS values for that tract and the appropriate ACS vintage. School years 2010-11 through 2014-15 were matched to the 2015 ACS vintage, and 2023-24 was matched to the 2022 vintage. These tract-level measures represent the immediate local context surrounding each school.

Measures

Outcome. We defined program presence as a binary indicator of whether a school had a G&T program in a given year, measured as enrolling 10 or more G&T-identified students. We chose

this threshold to distinguish schools with established programs from those with only a small number of individually identified gifted students. For 2023-24, we identified program presence using admissions records because the student-level G&T identification measure used in prior years was no longer available in a directly comparable form following the admissions-policy change. We used these records to identify program sites, but interpreted year-to-year changes in student counts cautiously because the underlying data source differed from earlier years.

School-level predictors. We included eight school-level demographic measures: total enrollment, percent Black, percent Hispanic, percent White, percent Asian, percent eligible for free or reduced-price lunch (our poverty measure), percent English Language Learners (ELL), and percent Students with Disabilities (SWD). For schools with G&T programs, school-level demographics were computed excluding G&T-identified students (i.e., using the general education population only).

Tract-level local-area predictors. We included 27 ACS measures for the census tract containing each school, covering income, employment, housing tenure and costs, housing structure, education, family structure, nativity, and residential stability. These measures vary over time through the matched ACS vintage and are interpreted as characteristics of the school's immediate local context.

Analytical Approach

Our analysis proceeded in three stages. In Stage 1, we used machine learning methods to characterize the historical access structure governing G&T program placement citywide. In Stage 2, we used cross-classified multilevel logistic regression to compare clustering at the NTA and district levels and to estimate associations between tract-level ACS characteristics and G&T program presence after accounting for school composition and geographic clustering. In Stage 3,

we descriptively compared the schools that gained G&T programs during 2022-2024 with schools that hosted programs in both the historical and expansion periods.

Districts vs. Neighborhoods

A key feature of our analytical framework is the distinction between school districts and neighborhoods. New York City's 32 school districts are administrative boundaries, each governed by a superintendent and community school board. A single district typically contains multiple neighborhoods, captured by Neighborhood Tabulation Areas (NTAs). On average, each district contains approximately 9 NTAs and there is considerable within-district variation in residential composition, homeownership, income, and other community characteristics between NTAs.

ACS covariates were measured at the census-tract level, the most granular geography available from the American Community Survey. Because many tracts contained only one or two schools, they were too small to serve as the grouping level for random intercepts. We therefore retained each school's own tract-level ACS values but used Neighborhood Tabulation Areas (NTAs) as the broader neighborhood grouping in the multilevel models. NTAs aggregate tracts into recognizable neighborhood areas, allowing Stage 1 to model citywide patterns using tract measures and Stage 2 to compare clustering at the NTA and district levels.

Stage 1: Machine Learning for Variable Selection

We used Random Forest and CART to identify citywide predictors of G&T program placement during the historical period (2010-11 through 2019-20), using a pooled complete-case panel of approximately 13,000 school-years and 35 predictors (8 school-level, 27 tract-level ACS measures). Stage 1 describes the citywide predictive structure and informs which local-area predictors enter the multilevel models in Stage 2.

We first fit a 500-tree classifier with class weights upweighting G&T schools by a factor of 10 to address class imbalance (More & Rana, 2017). Variable importance was measured by mean decrease in accuracy, with larger values indicating a greater contribution to out-of-bag prediction.

We then fit a recursive partitioning model with equal class priors and pruned the initial tree using the 1-SE rule (Breiman et al., 1984) to favor parsimony. CART provides interpretable splitting rules and variable-importance scores based on total reduction in the splitting criterion. We compared variable importance rankings across RF and CART and identified predictors that ranked highly in both. We also examined pairwise correlations among the tract-level ACS predictors and flagged pairs with absolute correlations above 0.7 before selecting local-area variables for Stage 2.

Stage 2: Cross-Classified Multilevel Logistic Regression

To decompose G&T inequality across levels and test whether tract-level local-area characteristics predict G&T presence net of school composition and district membership, we estimated cross-classified multilevel logistic regression models (Raudenbush & Bryk, 2002; Bates et al., 2015). Schools are cross-classified by NTA and district (rather than nested), because NTA boundaries do not align with district boundaries (some NTAs span multiple districts).

Our model does not include a school-level random intercept. G&T program status is highly stable within schools across years, leaving insufficient within-school variation to support a third variance component. We tested this in preliminary models that included a school random intercept and the estimated variance collapsed to zero (singular fit).

Model specification.

The general specification is:

$$\text{logit}\left[Pr\left(Y_{ijk}=1\right)\right]=\beta_0+X_{ijk}\beta+Z_j\gamma+u_j+v_k$$

In this specification, the outcome indicates whether school i in neighborhood j and district k hosted a G&T program in year t . School-level and tract-level predictors entered as fixed effects, and the neighborhood and district terms captured unobserved variation at each geographic level.

The neighborhood and district random intercepts are assumed to be normally distributed with mean zero.

All continuous predictors were standardized prior to estimation. The model does not include a school-level random intercept because G&T program status is highly stable within schools across years.

Model Sequence

We estimated four nested specifications in Stage 2.

Model 0 (M0): Empty model

$$\text{logit}\left[Pr\left(Y_{ijk}=1\right)\right]=\beta_0+u_j+v_k$$

Model 1 (M1): School-level predictors

$$\text{logit}\left[Pr\left(Y_{ijk}=1\right)\right]=\beta_0+X_{ijk}\beta+u_j+v_k$$

Model 2 (M2): Adds the focal tract-level predictor

$$\text{logit}\left[Pr\left(Y_{ijk}=1\right)\right]=\beta_0+X_{ijk}\beta+\gamma_1H_j+u_j+v_k$$

Model 3 (M3): Adds additional tract-level controls

$$\text{logit}\left[Pr\left(Y_{ijk}=1\right)\right]=\beta_0+X_{ijk}\beta+\gamma_1H_j+\gamma_2G_j+\gamma_3P_j+\gamma_4F_j+u_j+v_k$$

In this sequence, H_j denotes percent owner-occupied housing, G_j denotes percent of neighborhood residents with a graduate degree, P_j denotes neighborhood poverty rate, and F_j denotes percent foreign-born.

Variance decomposition. We quantify the relative contribution of neighborhoods and districts to G&T program placement using latent-variable intraclass correlation coefficients (ICCs) for the cross-classified logistic models (Snijders & Bosker, 2012):

$$\rho_N = \frac{\sigma_u^2}{\sigma_u^2 + \sigma_v^2 + \pi^2/3}, \rho_D = \frac{\sigma_v^2}{\sigma_u^2 + \sigma_v^2 + \pi^2/3}$$

Here, ρ_N denotes the share of total latent variance attributable to neighborhoods and ρ_D denotes the share attributable to districts. When $\rho_N > \rho_D$, variation in G&T program presence is more strongly structured across neighborhoods within districts than across districts themselves.

Robustness. Our primary multilevel models pool school-year observations from 2010-11 through 2019-20 to describe the historical placement pattern. Because the same schools appear in multiple years and the model does not include a school random intercept, the NTA and district random effects do not account for all within-school dependence. The pooled ICCs should therefore be interpreted as latent variance shares for the pooled school-year specification rather than as design-invariant quantities. We assess robustness in five ways. First, we estimate the model on the 2019-20 cross-section, which removes repeated school observations. Second, we estimate the homeownership model separately in each historical year. Third, we use the City-Defined Neighborhood Dataset rather than NTAs. Fourth, we vary the G&T threshold from the main 10-student definition to 5 and 15 students. Fifth, we restrict the sample to schools serving plausible elementary entry grades based on the NYC school location file. We focus on whether the direction and substantive ordering of results persist across these checks, rather than expecting identical ICC magnitudes across specifications.

Stage 3: Descriptive Assessment of Expansion Placement

To describe whether the 2022-2024 expansion reached a different set of schools, we classified schools into four trajectory groups based on G&T status during the historical period

(2010-2020) and the expansion period (2022-2024). The COVID suspension years, 2020-21 and 2021-22, were excluded. Our primary comparison is between Historical and Expansion G&T schools, which hosted programs in both periods, and Gained G&T schools, which first hosted programs during 2022-24. We also identify Lost G&T and Never G&T schools. Table A4 reports the trajectory counts, and Table A6 compares observed 2019-20 school and local-area characteristics across the groups.

As a supplementary descriptive exercise, we applied Model 1 to 2019-20 school characteristics and compared the distribution of conditional fitted probabilities across trajectory groups. These fitted values include the estimated NTA and district random intercepts and therefore summarize how closely each school resembled the historical placement pattern represented by the model. They are not out-of-sample forecasts, and they are not used to estimate a causal policy effect. The primary evidence for Stage 3 is the observed comparison of trajectory groups in Tables A4 and A6.

IV. Results

Descriptive Patterns

Table 1 presents the number and percentage of schools with G&T programs by year and borough from 2010 to 2024. In 2010-11, 115 schools citywide (6.8%) hosted G&T programs. This number declined gradually over the historical period, reaching 96 schools (5.7%) by 2019-20. The decline was concentrated in Brooklyn, which fell from 49 G&T schools (9.3%) to 30 (5.8%) over this period. The Bronx consistently had the fewest G&T schools, with no more than 10 in any year and rates ranging from 1.4% to 2.6%. Queens and Staten Island maintained relatively stable counts throughout the decade. Table 2 complements these trends by comparing

2019-20 G&T and non-G&T school characteristics within each borough, showing that G&T schools were typically larger and socioeconomically more advantaged than non-G&T schools.

Figure 1 displays these trends visually across boroughs. Panel A shows the percentage of schools with G&T programs, Panel B shows the number of schools with G&T programs, and Panel C shows total G&T students. Two features of the trend are notable. First, the COVID-19 suspension period (2020-21 and 2021-22) produced a visible dip in G&T counts across all boroughs. Second, beginning in 2022-23, a sharp increase is evident: the citywide total rose to 124 schools (7.3%), the highest point in the study period. This increase was driven by gains in the Bronx, Brooklyn, and Queens.

Figure 2 shows neighborhood-level change between 2019-20 and 2022-23. Gains are concentrated in parts of the Bronx, central Brooklyn, and Queens that had little or no prior G&T presence, while losses are fewer and more spatially limited. The map makes clear that the post-2022 expansion did not simply deepen the existing footprint in historically advantaged areas; it also extended programs into a broader set of neighborhoods.

Figure 2 also underscores that the expansion was not spatially uniform. In the South Bronx and in more peripheral parts of Queens and Brooklyn, including the Rockaways, new programs often appeared in neighborhoods that previously had little or no G&T presence, effectively filling gaps in the historical footprint. By contrast, lower Manhattan and Staten Island changed much less. In Staten Island, this relative stability is consistent with a borough structure in which the more affluent South Shore already had an established G&T presence but limited room for further expansion, while less affluent North Shore neighborhoods had more physical capacity but historically weaker program presence. The result is a borough where the post-2022 period largely preserved an existing uneven distribution rather than creating a new one.

These descriptive patterns establish that G&T programs are not distributed randomly across schools or neighborhoods. They are concentrated in schools with specific demographic profiles and in neighborhoods with specific socioeconomic characteristics. The analytical stages that follow examine which of these factors predict G&T presence and at what geographic level the inequality operates.

Stage 1: Classification Trees

Table A5 reports variable importance rankings from both models. Three variables appear in the top 10 of both methods: total enrollment (ranked 1st in both), percent White (8th in RF, 3rd in CART), and percent of households earning \$200,000 or more (4th in both). School enrollment is the dominant predictor, accounting for 20.2% of the total reduction in the CART splitting criterion and producing the largest mean decrease in accuracy in the Random Forest.

The CART tree reveals threshold effects. Schools with enrollment below approximately 500 have very low predicted probabilities of hosting a G&T program. Among larger schools, subsequent splits involve percent White, tract-level income, and percent married-couple families. Tract-level variables appear at multiple points in the tree alongside school-level variables, which indicates that local context adds predictive information beyond school composition alone.

The key finding from Stage 1 is that school composition dominates citywide prediction, but tract-level local-area characteristics (income, family structure, professional occupation, homeownership) contribute independently. These results characterize the broader predictive structure of G&T placement and help situate the local-area dimensions we carry into the multilevel models. Homeownership ranks 16th in both methods, which is consistent with our use of it as a theoretically motivated focal predictor rather than as the single strongest citywide

screening variable. Its contribution becomes clearer in Stage 2, which conditions on district and neighborhood structure.

Stage 2: Multilevel Models

Table 3 presents the variance decomposition from the cross-classified multilevel models. The empty model (M0) attributes 63% of the total variation in G&T program placement to differences between Neighborhood Tabulation Areas (NTAs), 11% to differences between districts, and the remaining 27% to residual within-neighborhood variation. Because the pooled model does not include a school random effect, these shares should be interpreted as latent variance shares for the pooled school-year specification rather than as design-invariant quantities. The more conservative 2019-20 cross-section yields smaller magnitudes but the same ordering, with neighborhood clustering still exceeding district clustering (7.2% vs. 2.9%).

Table 4 reports the fixed-effect estimates from the model sequence. In M1, which includes only school-level demographics, enrollment is positively associated with G&T presence (OR = 1.17, $p < .001$) and percent students with disabilities is also positively associated (OR = 1.23, $p < .001$). None of the four racial composition variables reach statistical significance once NTA and district random intercepts are included. School-level poverty is also nonsignificant (OR = 0.94, $p = .30$).

M2 adds a single tract-level predictor: percent owner-occupied housing. Homeownership is positively and significantly associated with G&T presence (OR = 1.31, $p < .001$). M3 adds three additional tract-level predictors (percent with a graduate degree, percent in poverty, and percent foreign-born), and homeownership remains significant (OR = 1.25, $p = .005$), indicating that its association with G&T presence is not reducible to local educational attainment or income. Tract poverty is negatively associated with G&T presence (OR = 0.62, $p < .001$).

Percent foreign-born is positively associated ($OR = 1.69, p < .001$), although we interpret this association descriptively and return to it in the Limitations. Percent with a graduate degree is not significant ($OR = 1.11, p = .26$). The AIC decreases from 5,832 in M1 to 5,815 in M2 to 5,740 in M3 (Table A3), indicating improved fit with each additional specification.

These findings are robust to reasonable alternative coding choices. In supplementary analyses reported in Appendix Table A10, varying the threshold used to classify a school as offering G&T from 5 to 15 students yields very similar fully adjusted M3 estimates for tract-level homeownership in the pooled models. Restricting the historical sample to schools serving plausible elementary entry grades also yields substantively similar estimates.

Appendix Table A7 illustrates these patterns with concrete within-district examples. Within District 2 (Manhattan), Upper East Side-Carnegie Hill had G&T programs in 66.7% of schools and 57.5% owner-occupied housing, while Chinatown had G&T programs in 6.2% of schools and 9.4% owner-occupied housing. In District 13, Prospect Heights had G&T programs in 100% of schools, compared with 0% in Bedford. In District 20, Bath Beach had G&T programs in 50% of schools and 47.1% owner-occupied housing, while Sunset Park East and Sunset Park West had no G&T programs and 22.8% owner-occupied housing. These examples illustrate that substantial neighborhood variation in G&T access exists within the same district. Figure 3 provides a complementary visual illustration from District 13, highlighting how nearby neighborhoods can differ markedly in local context and G&T access within the same district.

As a first robustness check, we re-estimated the Stage 2 models on a single 2019-20 cross-section, eliminating repeated school observations. In that single-year specification, the neighborhood ICC still exceeded the district ICC (7.2% vs. 2.9%). Homeownership remained positive in both M2 and M3 ($OR = 1.35, p = .010$; $OR = 1.24, p = .145$), although the fully

adjusted single-year estimate was less precise. We also estimated the homeownership model (M2) separately for each of the 10 historical cross-sections from 2010-11 through 2019-20 (Table A8). The coefficient is positive in all 10 years and statistically significant at the .05 level in 8 of 10, with odds ratios ranging from 1.18 to 1.40. These results suggest that the pooled panel sharpens precision but does not create the basic neighborhood pattern.

We also re-estimated the Stage 2 models using the City-Defined Neighborhood Dataset (CDND) rather than NTAs. CDND is substantially coarser in our sample (59 polygons versus 187 NTAs), but the broad variance decomposition result holds. Neighborhood-level clustering is larger than district-level clustering in the empty model under both definitions, and school racial composition remains non-significant in the full model under both specifications. The homeownership coefficient remains positive but becomes imprecise under CDND, which suggests that the strongest neighborhood sorting signal may operate at a finer geography than the coarser city-defined polygons capture. Appendix Table A10 likewise shows that the fully adjusted M3 homeownership estimate is robust to redefining G&T program presence using 5- and 15-student cutoffs and to restricting the sample to schools serving plausible elementary entry grades. Across all six specifications, the coefficient remains positive and statistically significant.

Stage 3: Descriptive Assessment of Expansion Placement

Table A4 reports the group counts. Of the 1,804 schools observed across both periods, 87 (4.8%) had G&T programs during both the historical and expansion periods (Historical and Expansion G&T). Forty-three schools (2.4%) gained G&T programs during 2022-24 that they did not have historically (Gained G&T). Sixty-two schools (3.4%) lost their G&T programs (Lost G&T), and 1,612 schools (89.4%) never had G&T programs in any year (Never G&T).

Table A6 provides the primary observed comparison across trajectory groups. Schools gaining G&T programs differed substantially from continuing G&T sites: they were located in lower-homeownership local contexts (24.4% vs. 44.6%) and served substantially higher-poverty student populations (84.8% vs. 58.2%). Lost G&T schools were more intermediate, remaining closer to continuing G&T sites than to gained sites on homeownership, income, and school poverty. Figure A1 provides a complementary illustration using conditional fitted probabilities from the historical model. In that descriptive exercise, Historical and Expansion G&T schools had a mean predicted probability of 0.27, whereas Gained G&T schools had a mean of 0.05 and 91% fell below 10%.

V. Discussion

This study examined the geographic distribution of Gifted and Talented programs across New York City public schools from 2010 to 2024. We discuss three groups of findings.

Neighborhood-Level Inequality in G&T Access

First, G&T program presence is more strongly clustered by neighborhood than by district. In the pooled school-year empty model, the NTA ICC is 62.8% and the district ICC is 10.6%. In the 2019-20 cross-section, the absolute ICCs are smaller, but the same ordering remains: 7.2% for NTAs and 2.9% for districts. The difference in magnitude indicates that the exact variance shares are sensitive to the pooled panel structure and should not be treated as universal quantities. The consistent conclusion is that district boundaries conceal substantial within-district geographic differentiation in program presence. The within-district examples in Appendix Table A7 illustrate this pattern directly.

Among tract-level local-area characteristics, homeownership independently predicts G&T presence across all model specifications and in year-by-year robustness checks. This association is not reducible to tract poverty or education levels. It captures something additional about the communities in which G&T programs are located. Several mechanisms may explain this. Homeowners may have longer time horizons in their communities and stronger incentives to invest in local school quality, including participation in parent organizations and school governance (Chetty et al., 2022; Mordechay & Ayscue, 2024). Residential stability may also facilitate the sustained advocacy needed to establish and preserve specialized programs. Once G&T programs exist in stable neighborhoods, homeownership families may mobilize to protect them from policy changes, a dynamic consistent with opportunity hoarding (Tilly, 1998; Sattin-Bajaj & Roda, 2020).

Community and School Characteristics Associated with G&T Placement

School-level racial composition does not predict G&T presence once neighborhood and district differences are accounted for. None of the four racial composition variables reach statistical significance in the multilevel models. This does not mean that race is unrelated to gifted education access more broadly. The descriptive data show large racial disparities, in that G&T schools have far higher White and Asian student shares and far lower Black and Hispanic shares than non-G&T schools. However, once neighborhood and district are held constant, a school's racial composition does not predict whether it hosts a G&T program. These results speak to program presence, not to disparities in identification, application, admission, or enrollment within neighborhoods. Expanding G&T programs into neighborhoods that currently lack them may therefore address one part of the broader access problem, while leaving identification, application, admission, and enrollment barriers unresolved.

Among the tract-level covariates in M3, poverty is negatively associated with G&T presence ($OR = 0.62$, $p < .001$), reinforcing that program placement is tied to local economic conditions beyond what school-level poverty captures. Graduate degree attainment is not significant ($OR = 1.11$, $p = .26$), while homeownership remains significant in the same model. This pattern suggests that G&T program placement is more closely tied to residential stability and civic infrastructure than to nearby residents' formal education levels. Family-structure variables, which ranked highly in Stage 1, were not included in the multilevel models because they were highly collinear with homeownership ($r = 0.70$). We focus on homeownership because it is the most interpretable and policy-legible indicator within this broader residential-stability cluster.

At the school level, the positive association between percent students with disabilities and G&T presence ($OR = 1.21$ to 1.23) likely reflects organizational capacity rather than a direct relationship between special education and gifted programming. The raw correlation between SWD share and G&T status is negative ($r = -0.14$) and the positive coefficient emerges only after controlling for enrollment, poverty, and other characteristics, indicating a suppression effect. Schools with higher SWD rates for their size and poverty level tend to be comprehensive, full-service institutions that host multiple specialized programs.

The 2022-2024 Expansion

Third, the 2022-2024 G&T expansion reached schools that lay well outside the historical placement profile. Schools that gained new G&T programs were located in lower-homeownership, higher-poverty local contexts (25% vs. 45% homeownership and 23% vs. 13% poverty) and served student populations with combined Black and Hispanic shares of 79% compared to 44% for Historical and Expansion G&T schools. The predicted-probability exercise

is consistent with this observed pattern: Gained G&T schools had a mean predicted probability of 0.05 under the historical model, compared to 0.27 for Historical and Expansion G&T schools, and 91% had predicted probabilities below 10%. Taken together, these patterns indicate that the expansion reached neighborhoods with substantially different demographic and socioeconomic profiles than those that historically hosted G&T programs. At the same time, the schools that lost G&T programs look more intermediate than the gained schools: in the appendix descriptives they remain much closer to the Historical and Expansion G&T profile than to the new Gained group on tract homeownership, tract income, and school poverty.

Nonetheless, the finding is important because it suggests that the expansion reached schools outside the historical placement profile. At the same time, the current analysis does not identify the mechanism behind either the historical concentration of programs or the new site-selection decisions. Questions about long-term sustainability and about who ultimately fills the new seats therefore remain open.

A related implication is that NYC's expansion occurred without a corresponding citywide instructional foundation for what gifted education should look like across sites. Many of the city's existing programs were created locally before NYC Public Schools centralized G&T admissions and eligibility, and they entered the current system with different histories, goals, and program models. As a result, the city expanded the geographic footprint of G&T more quickly than it established a coherent instructional vision across programs. For other large urban school systems considering similar expansion, the broader lesson may be to treat gifted education as a service to be designed and delivered coherently, rather than simply as a program location to be added.

Limitations

Our analysis examines where G&T programs are located, not who enrolls in them. Because NYC's district-level admissions process allows families to apply to programs outside their immediate neighborhood, the demographic composition of a G&T classroom may differ substantially from the school or neighborhood in which it is located. This disconnect underscores that physical availability is a necessary but not sufficient condition for equitable participation. Future research should examine whether supply-side expansions translate into enrollment gains for the communities in which new programs are placed, or whether existing patterns of information access and test preparation continue to shape who fills the seats.

Additionally, the foreign-born coefficient should be interpreted descriptively. We do not have tract-level subgroup measures that would allow us to identify which communities, if any, are driving that association. Future work with more detailed and complete ethnic subgroup data could investigate potential mechanisms more directly.

VI. Conclusion

This study demonstrates that the geography of G&T programs in New York City is patterned primarily at the neighborhood level. The majority of variation in G&T program presence occurs between neighborhoods within community school districts, not between community districts themselves. Homeownership independently predicts program presence after accounting for school composition, district membership, and other tract-level local-area factors, while school-level racial composition does not predict G&T presence within neighborhoods. This finding suggests that sociologists and education researchers studying educational opportunity should look beyond district boundaries, which are administrative conveniences that can obscure the community-level factors shaping which schools receive advanced programming.

For policy specifically, these findings show that gifted access is not only an admissions problem but also a location problem. Many reforms in large urban districts have focused largely on how students are identified and admitted, including universal screening, changes to eligibility rules, and revisions to application procedures. NYC's 2022-2024 expansion made a different kind of intervention by explicitly adding new G&T program sites. Our results show that those new sites were placed in schools and neighborhoods that differed sharply from the historical geography of G&T access, reaching higher-poverty, lower-homeownership neighborhoods serving larger shares of Black and Hispanic students. Whether these new programs ultimately fill seats with students from those neighborhoods, improve outcomes for those students, or represent a lasting structural change rather than a temporary policy departure remains to be seen. This study establishes that G&T program placement had a historical neighborhood structure, and that the 2022-2024 expansion began to disrupt that structure by changing where programs were located.

References

- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48.
<https://doi.org/10.18637/jss.v067.i01>
- Bergman, P., Chetty, R., DeLuca, S., Hendren, N., Katz, L. F., & Palmer, C. (2024). Creating moves to opportunity: Experimental evidence on barriers to neighborhood choice. *The American Economic Review*, 114(5), 1281-1337. <https://doi.org/10.1257/aer.20200407>
- Breiman, L., Friedman, J. H., Olshen, R. A., & Stone, C. J. (1984). *Classification and regression trees*. Wadsworth.
- Card, D., & Giuliano, L. (2016a). Can tracking raise the test scores of high-ability minority students? *American Economic Review*, 106(10), 2783-2816.
- Card, D., & Giuliano, L. (2016b). Universal screening increases the representation of low-income and minority students in gifted education. *Proceedings of the National Academy of Sciences*, 113(48), 13678-13683.
- Carman, C. A., Walther, C. A. P., & Bartsch, R. A. (2018). Using the cognitive abilities test (CogAT) 7 nonverbal battery to identify the Gifted/Talented: An investigation of demographic effects and norming plans. *The Gifted Child Quarterly*, 62(2), 193-209.
<https://doi.org/10.1177/0016986217752097>
- Chetty, R., & Hendren, N. (2018). The impacts of neighborhoods on intergenerational mobility I: Childhood exposure effects. *The Quarterly Journal of Economics*, 133(3), 1107-1162.
<https://doi.org/10.1093/qje/qjy007>

- Chetty, R., Hendren, N., Jones, M. R., & Porter, S. R. (2020). Race and economic opportunity in the United States: An intergenerational perspective. *The Quarterly Journal of Economics*, 135(2), 711-783. <https://doi.org/10.1093/qje/qjz042>
- Chetty, R., Jackson, M. O., Kuchler, T., Stroebe, J., Hendren, N., Fluegge, R. B., Gong, S., Gonzalez, F., Grondin, A., Jacob, M., Johnston, D., Koenen, M., Laguna-Muggenburg, E., Mudekereza, F., Rutter, T., Thor, N., Townsend, W., Zhang, R., Bailey, M., . . . Wernerfelt, N. (2022). Social capital I: Measurement and associations with economic mobility. *Nature (London)*, 608(7921), 108-121. <https://doi.org/10.1038/s41586-022-04996-4>
- Corcoran, S. P., & Baker-Smith, E. C. (2018). Pathways to an elite education: Application, admission, and matriculation to New York City's specialized high schools. *Education Finance and Policy*, 13(2), 256-279.
- Dixon, D. D., Peters, S. J., Plucker, J. A., & Callahan, C. M. (2025). The (conference) room where it happens: Explaining disproportional representation in gifted and talented education. *AERA Open*, 11. <https://doi.org/10.1177/23328584251369849>
- Ford, D. Y., Wright, B. L., & Trotman Scott, M. (2020). A matter of equity: Desegregating and integrating gifted and talented education for under-represented students of color. *Multicultural Perspectives (Mahwah, N.J.)*, 22(1), 28-36. <https://doi.org/10.1080/15210960.2020.1728275>
- Green, T. L., Sánchez, J., & Germain, E. (2017). Communities and school ratings: Examining geography of opportunity in an urban school district located in a resource-rich city. *The Urban Review*, 49(5), 777-804. <https://doi.org/10.1007/s11256-017-0421-1>

- Grissom, J. A., Redding, C., & Bleiberg, J. F. (2019). Money over merit? Socioeconomic gaps in receipt of gifted services. *Harvard Educational Review*, 89(3), 337-369.
<https://doi.org/10.17763/1943-5045-89.3.337>
- Hines, E. M., Fletcher, E. C., Ford, D. Y., Moore, J. L., & Middleton, T. J. (2022). A tale of two pandemics: Interrogating discrimination against black students in gifted education and other programs for advanced learners. *The Journal of Negro Education*, 91(3), 408-415.
- Kafka, J., & Matheny, C. (2021). Boundary matters: Uncovering the hidden history of New York City's school subdistrict lines. *AERA Open*, 7. <https://doi.org/10.1177/23328584211038939>
- Lu, Y., Weinberg, S. L., & McCormick, M. (2020). Test-taking for gifted and talented kindergarten: Underscoring the importance of outreach. *The Gifted Child Quarterly*, 64(4), 259-274. <https://doi.org/10.1177/0016986220941587>
- Massey, D. S., & Denton, N. A. (1993). *American apartheid: Segregation and the making of the underclass*. Harvard University Press.
- Mordechay, K., & Ayscue, J. B. (2024). Diversifying neighborhoods, diversifying schools? The relationship between neighborhood racial change and school segregation in New York City. *Education and Urban Society*, 56(1), 3-32.
<https://doi.org/10.1177/00131245221110555>
- More, A. S., & Rana, D. P. (2017, October). Review of random forest classification techniques to resolve data imbalance. In *2017 1st International conference on intelligent systems and information management (ICISIM)* (pp. 72-78). IEEE.

- Peters, S. J. (2022). The challenges of achieving equity within public school gifted and talented programs. *Gifted Child Quarterly*, 66(2), 82–94.
<https://doi.org/10.1177/00169862211002535>
- Peters, S. J., & Carter, J. S. (2022). Predictors of access to gifted education: What makes for a successful school? *Exceptional Children*, 88(4), 341–358.
<https://doi.org/10.1177/00144029221081092>
- Peters, S. J., & Gentry, M. (2010). Multigroup construct validity evidence of the HOPE scale: Instrumentation to identify low-income elementary students for gifted programs. *Gifted Child Quarterly*, 54(4), 298–313. <https://doi.org/10.1177/0016986210378332>
- Peters, S. J., Gentry, M., Whiting, G. W., & McBee, M. T. (2019). Who gets served in gifted education? Demographic representation and a call for action. *Gifted Child Quarterly*, 63(4), 273–287.
- Plucker, J. A., Wells, A., & Meyer, M. S. (2022). Identification policy: Addressing equity and excellence for advanced learners. *Gifted Child Today Magazine*, 45(4), 201-211.
<https://doi.org/10.1177/10762175221110942>
- Plucker, J. A., Burroughs, N., & Song, R. (2010). Mind the (Other) Gap! The Growing Excellence Gap in K-12 Education. *Center for Evaluation and Education Policy, Indiana University*.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Sage.
- Sampson, R. J. (2012). Great American city: Chicago and the enduring neighborhood effect. University of Chicago Press.

- Sattin-Bajaj, C., & Roda, A. (2020). Opportunity hoarding in school choice contexts: The role of policy design in promoting middle-class parents' exclusionary behaviors. *Educational Policy (Los Altos, Calif.)*, 34(7), 992-1035. <https://doi.org/10.1177/0895904818802106>
- Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling* (2nd ed.). Sage.
- Tate, W. F. (2008). "Geography of Opportunity": Poverty, place, and educational outcomes. *Educational Researcher*, 37(7), 397-411. <https://doi.org/10.3102/0013189X08326409>
- Tilly, C. (1998). *Durable inequality*. University of California Press.
- Tran, B. T. N., Wai, J., McKenzie, S., Mills, J., & Seaton, D. (2022). Expanding gifted identification to capture academically advanced, low-income, or other disadvantaged students: The case of Arkansas. *Journal for the Education of the Gifted*, 45(1), 64-83. <https://doi.org/10.1177/01623532211063936>
- Türk, U., & Östh, J. (2019). How much does geography contribute? Measuring inequality of opportunities using a bespoke neighbourhood approach. *Journal of Geographical Systems*, 21(2), 295-318. <https://doi.org/10.1007/s10109-019-00297-z>
- Wilson, W. J. (1987). *The truly disadvantaged: The inner city, the underclass, and public policy*. University of Chicago Press.
- Yaluma, C. B., & Tyner, A. (2021). Are U.S. schools closing the "Gifted gap"? Analyzing elementary and middle schools' gifted participation and representation trends (2012-2016). *Journal of Advanced Academics*, 32(1), 28-53. <https://doi.org/10.1177/1932202X20937633>
- Yeung, G., & Mun, R. U. (2022). A renewed call for disaggregation of racial and ethnic data: Advancing scientific rigor and equity in gifted and talented education research. *Journal*

for the Education of the Gifted, 45(4), 319-351.

<https://doi.org/10.1177/01623532221123795>

Tables and Figures

Table 1.*Schools with G&T Programs by Year and Borough, 2010-2024*

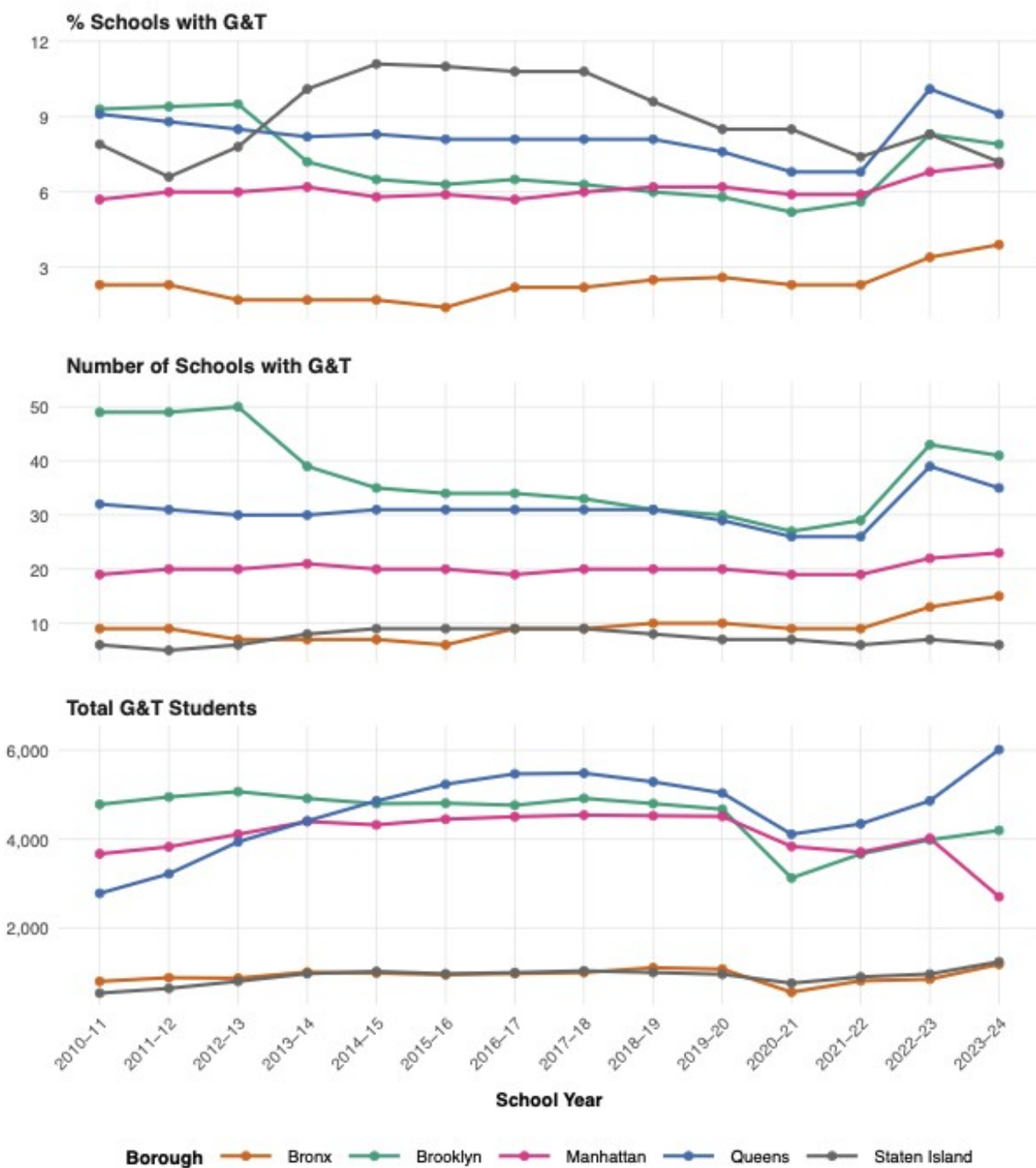
Year	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
2010-11	9 (2.3%)	49 (9.3%)	19 (5.7%)	32 (9.1%)	6 (7.9%)	115 (6.8%)
2011-12	9 (2.3%)	49 (9.4%)	20 (6%)	31 (8.8%)	5 (6.6%)	114 (6.8%)
2012-13	7 (1.7%)	50 (9.5%)	20 (6%)	30 (8.5%)	6 (7.8%)	113 (6.6%)
2013-14	7 (1.7%)	39 (7.2%)	21 (6.2%)	30 (8.2%)	8 (10.1%)	105 (6%)
2014-15	7 (1.7%)	35 (6.5%)	20 (5.8%)	31 (8.3%)	9 (11.1%)	102 (5.8%)
2015-16	6 (1.4%)	34 (6.3%)	20 (5.9%)	31 (8.1%)	9 (11%)	100 (5.7%)
2016-17	9 (2.2%)	34 (6.5%)	19 (5.7%)	31 (8.1%)	9 (10.8%)	102 (5.9%)
2017-18	9 (2.2%)	33 (6.3%)	20 (6%)	31 (8.1%)	9 (10.8%)	102 (5.9%)
2018-19	10 (2.5%)	31 (6%)	20 (6.2%)	31 (8.1%)	8 (9.6%)	100 (5.8%)
2019-20	10 (2.6%)	30 (5.8%)	20 (6.2%)	29 (7.6%)	7 (8.5%)	96 (5.7%)
2020-21	9 (2.3%)	27 (5.2%)	19 (5.9%)	26 (6.8%)	7 (8.5%)	88 (5.2%)
2021-22	9 (2.3%)	29 (5.6%)	19 (5.9%)	26 (6.8%)	6 (7.4%)	89 (5.3%)
2022-23	13 (3.4%)	43 (8.3%)	22 (6.8%)	39 (10.1%)	7 (8.3%)	124 (7.3%)
2023-24	15 (3.9%)	41 (7.9%)	23 (7.1%)	35 (9.1%)	6 (7.2%)	120 (7.1%)

Note. Schools are classified as having a G&T program if they enrolled 10 or more G&T-identified students. 2023-24 uses admissions data rather than student-level G&T identification due to the introduction of universal screening. Districts 75 and 79 are excluded.

Table 2.
G&T vs Non-G&T School Characteristics by Borough, 2019-20

<u>Metric</u>	<u>Group</u>	<u>Bronx</u>	<u>SMD</u>	<u>Brooklyn</u>	<u>SMD</u>	<u>Manhattan</u>	<u>SMD</u>	<u>Queens</u>	<u>SMD</u>	<u>Staten Island</u>	<u>SMD</u>	<u>Citywide</u>	<u>SMD</u>
N (schools)	G&T Schools	10		30		20		29		7		96	
	Non-G&T Schools	378		484		304		353		75		1595	
Mean G&T Students	G&T Schools	108	—	156	—	226	—	174	—	137	—	169	—
% School in G&T	G&T Schools	15.8	—	21.8	—	37.4	—	21	—	17.4	—	23.8	—
Enrollment	G&T Schools	748.4	0.51	796.9	0.35	610.9	0.36	882.7	0.11	828	-0.03	781.3	0.03
	Non-G&T Schools	549.9		590.3		479.7		810		850.5		688.6	
% Black	G&T Schools	28.9	0.19	25	-0.54	17.6	-0.28	8.8	-0.52	3.8	-0.85	17.4	-0.46
	Non-G&T Schools	26.2		41.5		22.4		22.1		15.4		28.7	
% Hispanic	G&T Schools	60.2	-0.24	25.9	-0.23	38.2	-0.41	32.8	-0.18	22.7	-0.62	33.8	-0.39
	Non-G&T Schools	64		31		48.5		37		32.2		43.5	
% White	G&T Schools	6	0.34	28.5	0.82	19	0.15	20.2	0.57	58.8	0.83	23.9	0.64
	Non-G&T Schools	3.8		13.7		16.1		11.9		38.8		12.6	
% Asian	G&T Schools	3.5	-0.08	18.6	0.49	21.6	0.8	34.3	0.46	12.3	0.22	21.9	0.59
	Non-G&T Schools	4		10.8		9.4		24.9		10.4		12	
% Poverty	G&T Schools	81.1	-0.69	69.3	-0.51	60.7	-0.35	62.6	-0.58	49.7	-0.65	65.3	-0.59
	Non-G&T Schools	88.2		78.6		69.9		72.1		63.6		77.1	
% ELL	G&T Schools	12.3	-0.4	14.7	0.14	10.9	-0.07	14.9	0.02	5.4	-0.37	13.1	-0.08
	Non-G&T Schools	18.6		12.8		11.9		14.6		8		14.2	
% SWD	G&T Schools	20.8	-0.31	20.8	-0.23	23.9	-0.07	16.6	-0.23	24.9	-0.34	20.5	-0.23
	Non-G&T Schools	25.9		24.6		25.1		20.4		31.4		24.4	
Tract: % Grad Degree	G&T Schools	10.5	1.27	15.8	0.35	28.7	0.3	13.2	0.34	13.6	0.43	17	0.39
	Non-G&T Schools	5.3		12.7		24.7		11.3		12.4		12.9	
Tract: % Owner-Occupied	G&T Schools	29.1	0.96	34.4	0.66	24.2	0.44	48.6	0.2	76.3	0.77	39.1	0.55
	Non-G&T Schools	15.5		26.3		18.9		44.7		65.1		28.1	
Tract: % Poverty	G&T Schools	25.1	-0.79	20	-0.41	18.4	-0.13	12.9	-0.29	8.3	-0.85	17.2	-0.5
	Non-G&T Schools	33.8		23.8		19.8		14.6		14.7		23	
Tract: % Single Mom w/ Kids	G&T Schools	15	-0.75	7.2	-0.53	5.4	-0.14	5	-0.48	4.7	-0.74	6.8	-0.56
	Non-G&T Schools	18.9		10.1		6.1		6.8		7.7		10.6	
Tract: % Foreign Born	G&T Schools	31.1	-0.45	36	0.07	28.1	-0.23	46.2	0.04	17.7	-0.88	35.6	-0.02
	Non-G&T Schools	34.5		35.2		30.5		45.7		23		35.8	
Tract: Median HH Income	G&T Schools	46687	0.99	58702	0.29	79651	0.21	64725	0.27	84582	0.89	65521	0.43
	Non-G&T Schools	33340		52269		71673		61115		71285		54284	

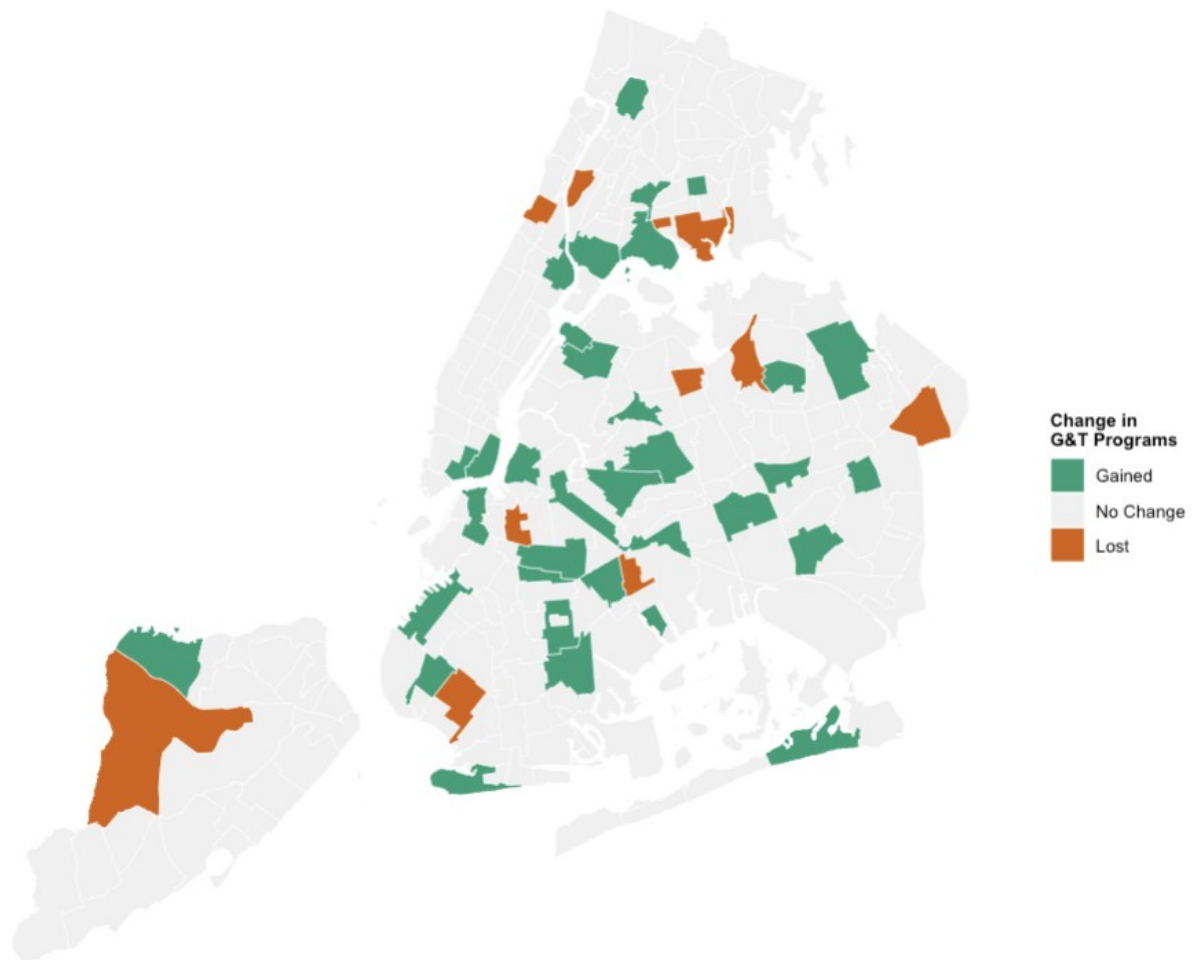
Note. Means for schools with and without G&T programs in 2019-20, shown separately by borough. SMD = standardized mean difference (positive values indicate G&T schools are higher). Schools classified as G&T if they enrolled 10 or more G&T-identified students.

Figure 1.*Trends in G&T Program Distribution across NYC Boroughs, 2010-2024*

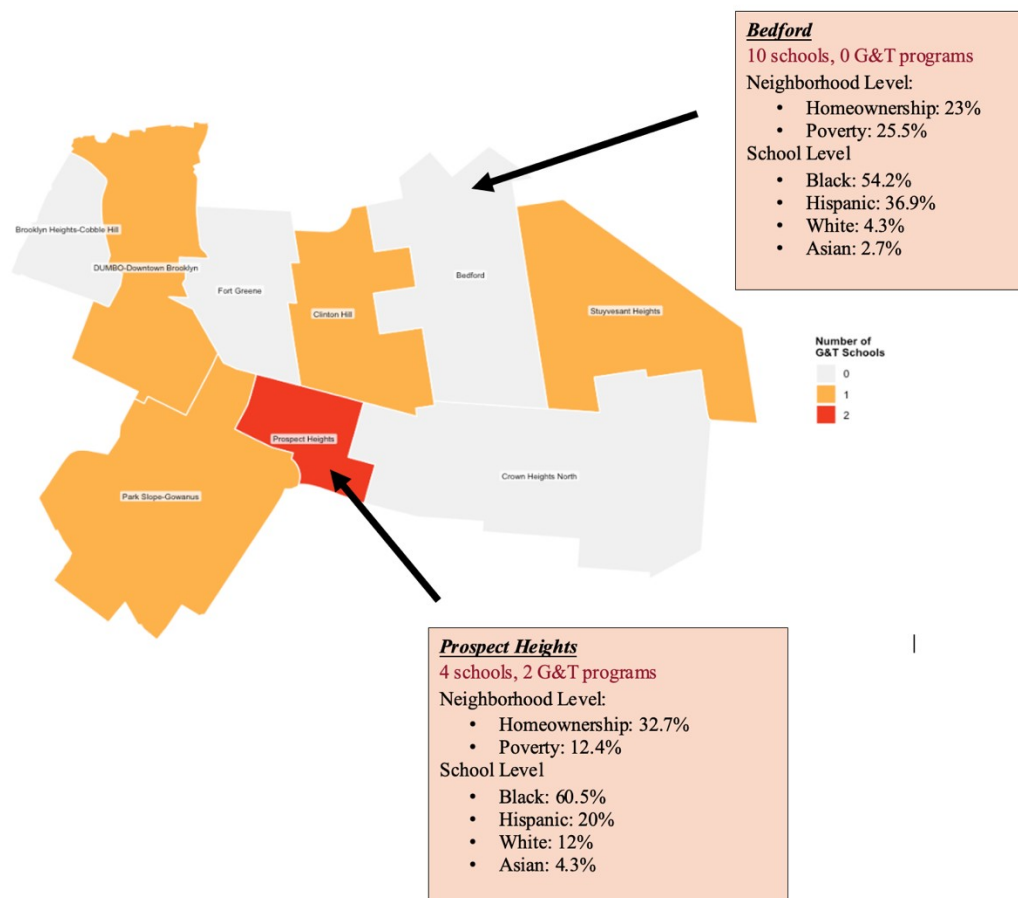
Note. Panel A shows the percentage of schools with G&T programs. Panel B shows the number of schools with G&T programs. Panel C shows total G&T students. For 2023–24, Panel C relies on admissions records rather than the student-level G&T identification field used in prior years and should therefore be interpreted cautiously relative to earlier totals.

Figure 2.

Change in G&T Programs by Neighborhood: 2019-20 to 2022-23



Note. Neighborhoods defined by Neighborhood Tabulation Areas (NTAs). "Gained" neighborhoods contain at least one school that added a G&T program between 2019-20 and 2022-23. "Lost" neighborhoods contain at least one school that dropped a G&T program; "No Change" neighborhoods retained the same G&T status. Neighborhoods with no G&T activity in either year are shown in light gray. Schools are classified as having a G&T program if they enrolled 10 or more G&T-identified students.

Figure 3.*Illustrative Within-District Contrast in District 13 (Brooklyn), 2019-20*

Note. Neighborhoods are Neighborhood Tabulation Areas within District 13 (Brooklyn). Shading indicates the number of schools with G&T programs in each neighborhood in 2019-20. Bedford had no G&T programs, while Prospect Heights had two, illustrating within-district variation that district-level summaries can obscure.

Table 3.*Variance Decomposition across Districts and NTAs in Pooled School-Year Models*

Model	σ^2 District	σ^2 NTA	Residual variance	ICC District	ICC NTA	Residual share	AIC
M0: Empty	1.305	7.768	3.29	0.106	0.628	0.266	5985
M1: + School demographics	1.192	7.563	3.29	0.099	0.628	0.273	5832.4
M2: + School + Homeownership	1.164	7.197	3.29	0.1	0.618	0.282	5815.4
M3: + School + Curated Tract Controls	1.35	8.153	3.29	0.106	0.637	0.257	5740.3

Note. Cross-classified multilevel logistic regression with random intercepts for Neighborhood Tabulation Area (NTA) and school district. ICC = intraclass correlation coefficient, representing the proportion of total variance attributable to each level. Residual variance refers to the fixed logistic residual; residual share reports its proportion of total variance and should not be interpreted as a school-level random effect. M0 = empty model (random intercepts only); M1 = school demographics; M2 = M1 + tract-level percent owner-occupied housing; M3 = M2 + tract-level percent with graduate degree, percent in poverty, and percent foreign-born. All predictors standardized prior to estimation. Historical period: 2010-11 through 2019-20

Table 4.*Multilevel Logistic Regression: Predictors of G&T Program Presence, 2010-2020*

Model	Variable	Estimate	SE	z_value	p_value	OR
M1: School only	(Intercept)	-4.4883	0.3545	-12.66	< .001	0.011
	Total Students	0.1608	0.036	4.47	< .001	1.174
	Percent Poverty	-0.0662	0.0638	-1.04	0.2992	0.936
	Percent Black	-0.5183	0.4645	-1.12	0.2645	0.596
	Percent Hispanic	-0.1328	0.4343	-0.31	0.7599	0.876
	Percent Asian	0.4335	0.3036	1.43	0.1534	1.543
	Percent White	0.0884	0.3383	0.26	0.7937	1.092
	Percent ELL	-0.1129	0.0643	-1.76	0.0792	0.893
	Percent SWD	0.2061	0.0489	4.22	< .001	1.229
M3: + Curated Tract Controls	(Intercept)	-4.7464	0.3746	-12.67	< .001	0.009
	Total Students	0.1303	0.0367	3.55	0.0004	1.139
	Percent Poverty (School)	-0.0906	0.0647	-1.4	0.1616	0.913
	Percent Black	-0.3537	0.4684	-0.76	0.4501	0.702
	Percent Hispanic	-0.0319	0.438	-0.07	0.9419	0.969
	Percent Asian	0.4618	0.306	1.51	0.1313	1.587
	Percent White	0.13	0.3408	0.38	0.7028	1.139
	Percent ELL	-0.1263	0.0666	-1.9	0.0578	0.881
	Percent SWD	0.1896	0.0493	3.84	0.0001	1.209
	Percent Owner Occupied	0.225	0.0801	2.81	0.005	1.252
	Percent Grad Degree	0.1016	0.0893	1.14	0.255	1.107
	Percent Poverty (Tract)	-0.4836	0.094	-5.15	< .001	0.617
	Percent Foreign Born	0.5259	0.0814	6.46	< .001	1.692

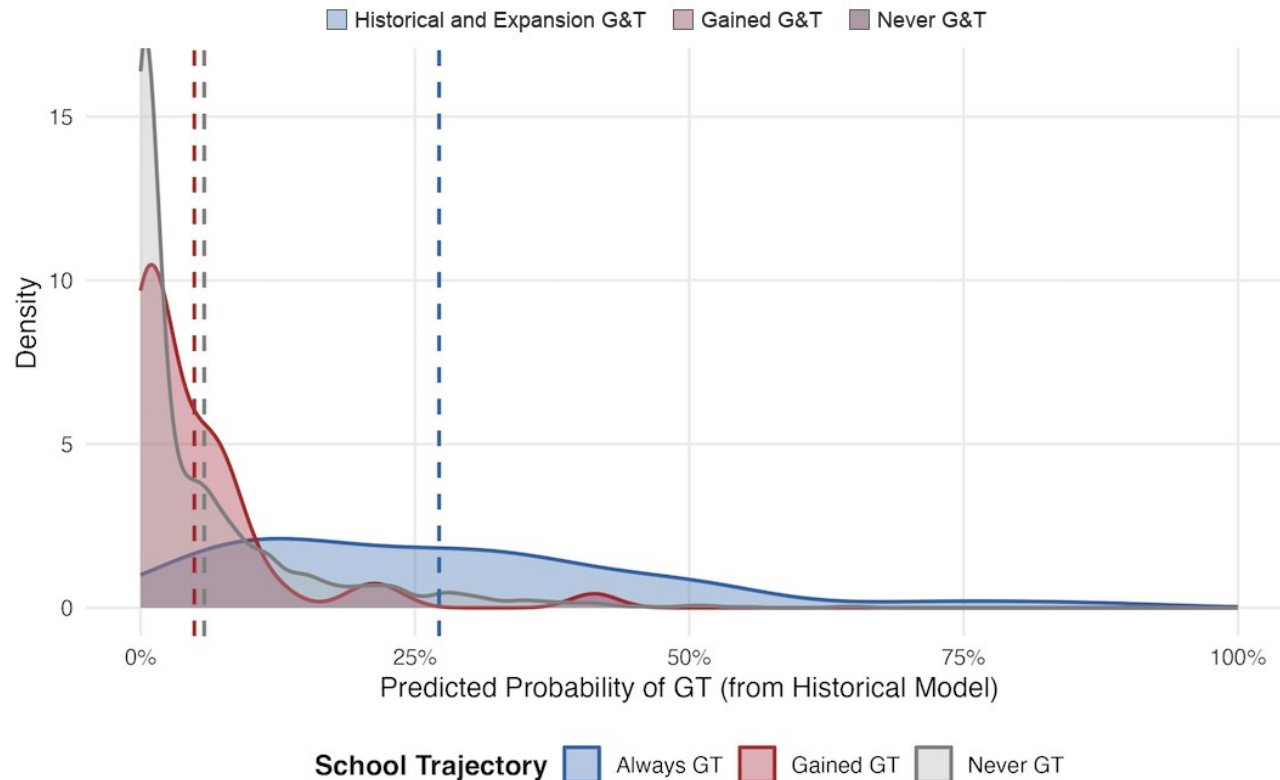
Note. Odds ratios from cross-classified multilevel logistic regression with random intercepts for NTA and district. School-level demographics computed excluding G&T-identified students (general education population) to prevent mechanical contamination. All predictors standardized; odds ratios reflect a one standard deviation change. M1 includes school demographics only. M2 (removed for space) adds tract-level percent owner-occupied housing. M3 adds tract-level percent with graduate degree, percent in poverty, and percent foreign-born. * $p < .05$, ** $p < .01$, *** $p < .001$.

Supplementary Appendix

The full supplementary materials are available on request.

Figure A1.

Predicted Probability of G&T Program Presence under the Historical Model, by School Trajectory



Note. Predicted probabilities generated from Model 1 (school demographics with NTA and district random intercepts) applied to 2019-20 school characteristics. “Historical and Expansion G&T” schools had G&T programs during both the historical (2010-20) and expansion (2022-24) periods. “Gained G&T” schools received new G&T programs during 2022-24. “Never G&T” schools never had G&T programs in any year. Dashed vertical lines indicate group means. 91% of Gained G&T schools had predicted probabilities below 10%.

Table A7.*Within-District Neighborhood Variation in G&T Access, 2019-20*

District	Neighborhood	N Schools	N G&T	% G&T	% Owner- Occupied	% Student Poverty	% Grad Degree	Median HH Income
District 2								
	Upper East Side-Carnegie Hill	3	2	66.7	57.5	18.7	53.1	171312
	Gramercy	14	0	0	41.4	61.6	41.4	127218
	West Village	5	0	0	38	49.1	44.5	145847
	Turtle Bay-East Midtown	3	0	0	36.3	29.2	44	161944
	SoHo/TriBeCa	5	1	20	34.5	40.7	34	163631
	Chelsea/Flatiron	20	2	10	33.1	57.6	35.6	122672
	Lenox Hill-Roosevelt Island	12	1	8.3	29	35.8	35.5	123425
	Yorkville	5	0	0	25.7	33.9	42.2	113630
	Murray Hill-Kips Bay	4	0	0	23.6	77.6	35.2	119667
	Battery Park City-Lower Manhattan	12	0	0	21.9	48.8	41.5	192965
	Clinton	14	1	7.1	16.5	70.8	29.5	87363
	Midtown-Midtown South	3	0	0	12.7	77.1	21.7	62800
	Chinatown	16	1	6.2	9.4	77.8	10	42567
	Lower East Side	1	0	0	4.1	96.3	4.9	16600
District 13								
	Brooklyn Heights-Cobble Hill	1	0	0	50.9	10.6	42.2	96250
	Prospect Heights	1	1	100	32.3	39.2	36	123274
	Park Slope-Gowanus	3	1	33.3	31.8	50.9	35.5	131668
	DUMBO/Downtown Brooklyn	10	0	0	31.4	80.2	33.5	124069
	Clinton Hill	8	1	12.5	31	77	21.3	81761
	Bedford	6	0	0	25.9	90.4	17.8	64678
	Fort Greene	8	0	0	22.3	73.7	26.3	97796
	Stuyvesant Heights	1	0	0	22.1	95.5	10.9	50290
	Crown Heights North	2	0	0	6.4	90.4	17.3	66252

District	Neighborhood	N Schools	N G&T	% G&T	% Owner- Occupied	% Student Poverty	% Grad Degree	Median HH Income
District 20								
	Dyker Heights	5	0	0	55.9	75.3	11.7	81756
	Bath Beach	4	2	50	47.1	76.1	9.5	70362
	Bensonhurst West	7	2	28.6	45.1	74.6	8.6	56271
	Bensonhurst East	2	1	50	41.2	38	21.2	60708
	Bay Ridge	8	2	25	41	69.1	19.7	86188
	Kensington-Ocean Parkway	2	0	0	40.5	85.4	23.2	56726
	Borough Park	9	1	11.1	39	86.4	6.7	50386
	Sunset Park West	3	0	0	22.8	93.2	8.1	36147
	Sunset Park East	3	0	0	22.8	91.9	4.2	50050

Note. Districts 2 (Manhattan), 13 (Brooklyn), and 20 (Brooklyn) selected to illustrate within-district variation in local homeownership and G&T program access. Each row represents a Neighborhood Tabulation Area (NTA). % G&T = percentage of schools in the NTA with a G&T program. % Owner-Occupied and other local-area characteristics summarize tract-level ACS values for schools in the NTA. % Student Poverty is the mean across schools within the NTA. Within-district correlations between homeownership and % G&T are $r = 0.62$ (District 2), $r = 0.18$ (District 13), and $r = 0.36$ (District 20). Neighborhood names shortened for readability.