Sibling Spillovers of Georgia's HOPE Scholarship*

Bogyung Kim†

March 12, 2026

Abstract

Does college financial aid benefit nonrecipients' college enrollment? This paper examines the potential spillover effects of Georgia's HOPE Scholarship on younger siblings' postsecondary outcomes. Using student-level administrative records from public school districts linked to the National Student Clearinghouse and a fuzzy regression discontinuity design, I estimate spillover effects of older siblings' eligibility for Georgia's HOPE Scholarship on younger siblings' college outcomes. Eligibility raises older siblings' scholarship receipt and spills over to increase younger siblings' college enrollment at the margin. The spillover effects are concentrated among low-income families and are stronger for siblings with an age gap of under four years. Spillovers are larger for Black students and students with disabilities, potentially mitigating enrollment gaps with groups that have historically higher enrollment rates. Overall, the findings show that merit-based financial aid generates positive within-family spillovers, implying that conventional program evaluations may underestimate the program's total impact.

Keywords: Merit-based Scholarship, Sibling Spillovers, College Enrollment

JEL Codes: I23, I26, J08

*I am grateful to Jonathan Smith for his insightful guidance throughout this project. I also thank Seth Gershenson, Benjamin Marx, Tim Sass, and Daniel Kreisman for their valuable feedback and discussions, and Annick Simo for her assistance with data preparation. The views in this paper are my own and do not necessarily reflect those of the anonymous public school districts or the Georgia Policy Labs. The author has no research support, financial relationships, or other potential conflicts of interest to disclose in relation to this work. All remaining errors are my own.

†Department of Economics, Andrew Young School of Policy Studies, Georgia State University. Email: bkim74@gsu.edu

1 Introduction

The cost of earning a bachelor's degree in the United States has increased substantially faster than median household income over the past two decades. Between 2000 and 2022, average tuition and fees at public four-year colleges rose by 84 percent, while real median household income increased by only 15.7 percent.[1] This widening affordability gap has transformed financial aid from a supplementary resource into a fundamental necessity for higher education. In 2022, approximately 87 percent of college students received some form of financial assistance.[2]

Georgia's HOPE Scholarship, the nation's first state-sponsored merit-aid program (Doyle, 2006) initiated in 1993, plays a major role in supporting college affordability in Georgia. HOPE provides nearly full tuition coverage at in-state public institutions and offers fixed awards for eligible private colleges. Its generosity and broad institutional coverage make Georgia one of the largest providers of state grant aid per undergraduate enrollee; in the 2019–20 academic year, Georgia ranked at the top nationwide in state grant dollars per student.[3] By substantially lowering the net price of in-state attendance, HOPE directly shapes students' postsecondary options and incentives. Existing research has largely focused on how Georgia's financial aid affects recipients' enrollment (Dynarski, 2000, 2004; Cornwell et al., 2006a), persistence and completion (Henry et al., 2004), and post-college outcomes (Sjoquist and Winters, 2013). However, researchers have examined far less whether financial aid shapes the college enrollment decisions of non-recipients.

In this paper, I examine whether an older sibling's receipt of Georgia's HOPE Scholarship affects a younger sibling's college enrollment. Focusing on sibling spillovers of financial aid is important for two reasons. First, siblings are likely to exert stronger and more direct influences on one another than school peers. Family-based interactions often play a larger role than neighborhood or school environments (Duncan et al., 2001), and prior research shows that older siblings' academic performance affects younger siblings' test scores and educational outcomes (Nicoletti and Rabe, 2019; Oliveira et al., 2022; Karbownik and Özek, 2023). Second, college financial aid represents a family-level shock that can relax parental budget constraints and influence borrowing and educational loans (Bhargava et al., 2025), making the study of sibling spillovers relevant for understanding distributional effects. If merit-based scholarships primarily benefit students from more advantaged backgrounds, any spillover effects on siblings may likewise accrue disproportionately to higher-income households, potentially exacerbating inequality in college access.

I use student-level administrative data from one large public school district in Metro Atlanta, covering high school graduating cohorts from 2012 through 2023. I identify siblings by matching students who co-reside at the same address and share a last name among all stu-

[1] Source: NCES , 2022–23, U.S. Census Bureau (2026).
[2] National Center for Education Statistics, 2023.
[3] National Association of State Student Grant & Aid Programs Annual Survey, 2020.

dents who were ever enrolled between the 2010–11 and 2023–24 school years. Using detailed high school enrollment and course-taking records, I determine students' eligibility for the HOPE Scholarship. I then link these records to National Student Clearinghouse data on postsecondary enrollment to construct measures of on-time college enrollment. The outcomes of interest include on-time enrollment and institution type, including four-year, full-time, in-state, and public colleges.

Identification relies on the HOPE Scholarship's GPA eligibility cutoff. I use a fuzzy regression discontinuity design, with older siblings qualifying based on a sharp 3.0 cutoff in weighted high school GPA calculated from core academic courses. In the first stage, I regress older siblings' scholarship receipt on their GPA eligibility. In the second stage, I compare younger siblings whose older siblings are just above the cutoff with those whose older siblings just missed the threshold, using the first-stage estimates as instruments. Because younger siblings differ only in older siblings' scholarship eligibility induced by the cutoff, this design provides plausibly exogenous variation to identify the causal effect of an older sibling's HOPE receipt on younger siblings' college enrollment. The GPA-induced eligibility cutoff for older siblings also helps avoid reflection problems that arise in the estimation of peer effects.

I find that the HOPE Scholarship increases recipients' college enrollment and generates spillover effects on younger siblings. In the first stage, HOPE-eligible students are 63.1 percentage points more likely to receive the scholarship. Recipients' enrollment rises by 2.4 percentage points, while younger siblings' enrollment increases by 4.7 percentage points, corresponding to 5 percent and 9 percent increases over the control mean. Effects are especially pronounced for in-state and public colleges. For Georgia colleges, enrollment rises by 6.2 percentage points for recipients and 7.0 percentage points for siblings, while for public colleges the increases are 3.5 and 5.8 percentage points, respectively. These patterns align with the scholarship's eligibility rules, which apply only to in-state institutions and are more generous for public colleges. The scholarship increases recipients' four-year college enrollment by 2.9 percentage points, but sibling effects on four-year enrollment are not distinguishable from zero.

Heterogeneity analysis suggests evidence for two potential channels of sibling spillovers: indirect effects through parents and direct effects through sibling interactions. First, scholarship eligibility may alter parental resource allocation by reducing college costs. The empirical results show that positive spillovers are concentrated among students of lower socioeconomic status, proxied by eligibility for free or reduced-price meals (FRPM). In FRPM-eligible families, younger siblings are 15.9 percentage points more likely to enroll in college, which may also be influenced by improved first-year college outcomes for older siblings following scholarship receipt. In contrast, I do not observe significant effects among students who were never eligible for FRPM. The presence of spillovers only among lower–socioeconomic status families suggests that

reducing college costs for one child may ease household budget constraints and facilitate greater investment in another child's postsecondary education.

Sibling interactions also appear to contribute to spillovers to some degree. Siblings with age gaps of less than four years exhibit positive and statistically significant spillover effects. Among these siblings, younger siblings are 7.5 percentage points more likely to enroll in Georgia colleges and 6.6 percentage points more likely to enroll in public colleges. In contrast, although the estimated effects for siblings with age gaps greater than four years are larger in magnitude, the estimates are not statistically distinguishable from zero, suggesting that siblings closer in age are more likely to share information about college applications and scholarship eligibility.

This study contributes to the literature on the HOPE Scholarship and sibling spillovers in two main ways. First, this paper provides some of the initial evidence of positive financial aid spillovers on nonrecipients' college enrollment. Prior studies of the HOPE Scholarship focus on direct recipients' outcomes, including college enrollment (Dynarski, 2000, 2002a; Cornwell et al., 2006a) and persistence and completion (Henry et al., 2004). Using Current Population Survey data and comparisons with other Southern states, Dynarski (2002a) finds that HOPE increased college enrollment among Georgia youth by 7.9 percentage points, or 4–6 percentage points per $1,000 of aid (Dynarski, 2000, 2002a). These effects were concentrated among middle- and high-income students, widening racial gaps in enrollment (Dynarski, 2000). Cornwell et al. (2006a) finds similar effects, with HOPE increasing freshman enrollment by 5.9 percent, particularly at four-year colleges. Despite this evidence, little is known about how HOPE affects nonrecipients indirectly exposed to the program. I examine spillover effects on recipients' younger siblings' college enrollment.

Second, this paper contributes to the growing literature on sibling spillovers by focusing on the role of financial aid. Most studies of sibling spillovers in postsecondary education are by Altmejd et al. (2021) and Goodman et al. (2019). Exploiting quasi-random variation in older siblings' target college choices generated by admission cutoffs, these studies show that enrollment of an older sibling in a target college increases younger siblings' enrollment in four-year institutions, attendance at the same college, and enrollment in higher-quality colleges. Altmejd et al. (2021) notes that the positive effects are concentrated among students with lower predicted four-year college enrollment rates. Regarding the main mechanism, Goodman et al. (2019) shows that sibling spillovers operate primarily through information transmission about college experiences. Building on this literature, my contribution is to study sibling spillovers generated by a financial aid program. Using variation in older siblings' HOPE Scholarship eligibility, I show how reducing the cost of college for one child affects younger siblings' college enrollment and institution choice.

Overall, this paper documents positive externalities of a scholarship program by examin-

ing younger siblings' college enrollment outcomes. By influencing younger siblings' enrollment decisions, the program generates spillovers that are not captured in standard evaluations focused solely on treated students. As a result, conventional estimates of the HOPE Scholarship's impact on college enrollment may understate the aid's total effect.

2 Background

2.1 HOPE Scholarship in Georgia

The Helping Outstanding Pupils Educationally (HOPE) Scholarship is one of the most expansive state-funded merit-based financial aid programs in the United States and covers the largest share of state-funded college enrollees in Georgia.[4] Established in 1993 and funded by Georgia state lottery revenues, HOPE provides tuition subsidies to Georgia residents who meet academic and residency requirements and enroll in eligible in-state postsecondary institutions. Since HOPE's inception, the program has awarded more than $15 billion to over 2.1 million students through the 2023–24 academic year.[5]

The generosity of the HOPE Scholarship varies by institution type, with the most comprehensive coverage provided to students attending four-year public institutions. In Fiscal Year 2025, HOPE covered more than 95 percent of tuition at eligible four-year public colleges within the University System of Georgia (USG).[6] Students enrolled in public technical colleges under the Technical College System of Georgia (TCSG) and those attending approved private institutions receive fixed partial awards. The HOPE Scholarship does not provide funding for enrollment at out-of-state institutions.

For example, in the Fall 2025 semester, an eligible student enrolling in 15 credit hours at the University of Georgia, a four-year public research university in Georgia, could receive up to $5,017 in HOPE funding, fully covering tuition. HOPE is a first-dollar scholarship, meaning that HOPE covers the tuition first prior to the application of other grants or scholarships. Because HOPE does not cover mandatory fees, students remain responsible for approximately $729 unless the other forms of aid might offset the fees, such as federal Pell Grants. By contrast, students attending private institutions receive a flat award of $2,985, which covers less than 10 percent of tuition at private universities such as Emory University, where tuition totals $33,540. Students enrolled in technical colleges are eligible for awards of up to $1,605.[7]

[4] National Association of State Student Grant & Aid Programs, 2021–2022.

[5] Georgia Student Finance Commission, 2024.

[6] The full list of HOPE coverage rates across USG institutions in FY 2026 is available at: https://gsfc.georgia.gov/document/document/fy-2026-hope-factor-rate-chart/download

[7] For award amounts and the list of eligible institutions, see: https://gsfc.georgia.gov/document/document/fy-2026-award-amounts-0/download

Academic and residency requirements set by the Georgia Student Finance Commission (GSFC) determines the initial eligibility for the HOPE Scholarship at the time of college enrollment. Academic eligibility is based on the High School HOPE GPA, a GSFC-calculated weighted average using grades in core academic subjects: English, mathematics, science, social studies, and foreign languages. To qualify, students must graduate with a HOPE GPA of at least 3.0. This measure is distinct from the cumulative high school GPA and is not subject to rounding. In addition, students graduating after May 2015 must complete a minimum of four rigor course credits in advanced academic coursework.[8] Student can check their HOPE GPA information at the beginning of tenth grade through the GAfutures online platform, after official transcript data transmitted electronically from high schools to GSFC each summer.

To satisfy residency requirements, students must reside in Georgia for at least twelve consecutive months prior to college enrollment and must graduate from an eligible Georgia high school. Applicants need to submit either the Free Application for Federal Student Aid (FAFSA) or the Georgia Student Finance Application (GSFAPP) through GSFC. Importantly, the HOPE Scholarship has no income requirement, making the program a purely merit-based form of financial aid.

Eligibility for continued receipt of the HOPE Scholarship during college is contingent on academic performance. Recipients must maintain a cumulative college GPA of at least 3.0 at every 30, 60, and 90 attempted credit hours of checkpoints. Students who lose eligibility due to academic performance may regain the scholarship at a later checkpoint upon meeting the GPA requirement again (Ribar and Rubenstein, 2021).

2.2 Previous Studies

Early evaluations of HOPE established its primary success in expanding access.[9] Using a difference-in-differences design, Dynarski (2000) found that the program increased college attendance in Georgia by 7 percentage points, roughly 4 percentage points for every $1,000 in aid. Using institution-level data, Cornwell et al. (2006a) show that HOPE increased total college enrollment in Georgia by 5.9 percentage points. However, the distributional aspect is mixed. Because the program is purely merit-based, benefits are concentrated on middle- and high-income youth,

[8]Eligible rigor courses include AP (Advanced Placement), IB (International Baccalaureate), and dual enrollment courses as well as the designated advanced courses in core subjects. Four credits typically correspond to eight semester-long classes. 97.9% of graduates from cohort 2012 to 2023 are eligible for rigor requirement. The full list for rigor courses as of school year 2024-25 is available at: https://www.gafutures.org/media/apofcfmn/rigor-list-september-2025.pdf

[9]Beyond the postsecondary outcomes of HOPE, studies have examined including automobile consumption in Georgia (Cornwell and Mustard, 2007), local home price changes (Campbell and Smith, 2009), institutional price changes (Long, 2004), improvement in high school graduation (Henry and Rubenstein, 2002), and decline in state funding in K-12 education (Chakrabarti et al., 2018).

which can widen the enrollment gap (Dynarski, 2000) as well as the gap between Black and White students (Dynarski, 2002b, 2004). On the other hand, HOPE might be beneficial for low-income students if it works with the Pell Grant (Singell Jr et al., 2004), and can boost four-year college enrollment among Black students (Cornwell et al., 2006a).

Beyond the decision to attend college, HOPE also shifts college choices. Cornwell et al. (2006a) further show that HOPE increased total enrollment in in-state institutions. Black students experienced relatively larger gains in both two- and four-year enrollment, particularly at Historically Black Colleges and Universities (HBCUs). The program also increased enrollment in private four-year institutions, with larger percentage gains than in public four-year colleges. Focusing on selectivity and interstate migration, Chakrabarti and Roy (2013) show that HOPE shifted Georgia freshmen toward more selective institutions, especially within the state.

Evidence on initial HOPE's effects on persistence remains relatively limited, and on the completion is mixed. Using cross-cohort comparisons and control states, Dynarski (2008) find that HOPE increased college completion by 3 percentage points, with larger gains among women. In contrast, Sjoquist and Winters (2012) find no significant improvement in completion rates, leading many students to lose eligibility during college. Using administrative data from the University System of Georgia between 1995 and 1999, Henry et al. (2004) compared HOPE recipients and non-recipients and show that the positive effects of HOPE on persistence and graduation are substantially diminished when students lose the scholarship, highlighting the importance of retaining the grant.

Finally, several studies examine how students respond behaviorally to HOPE's GPA retention threshold. Because maintaining a 3.0 college GPA is required to retain the scholarship, students may adjust their major choices and course-taking behavior. Studying Georgia Tech freshmen in the program's early years, Dee and Jackson (1999) descriptively documented that 56 percent of students lost the scholarship after their first year, with particularly high losses among STEM majors. Sjoquist and Winters (2015) similarly show that students may avoid more rigorous STEM fields to reduce the risk of losing eligibility. In contrast, Zhang (2011) find that HOPE increased STEM degree attainment, especially among women, relative to pre-HOPE cohorts in control states. Additional evidence from Cornwell et al. (2006b) suggests that students reduced math and science course-taking while maintaining slightly higher GPAs, while Cornwell et al. (2005) document strategic behaviors such as course withdrawals, reduced credit loads near the retention cutoff, and increased summer enrollment. Collectively, this literature demonstrates that students actively respond to the program's incentives and constraints once enrolled in college.

3 Data

I use student-level administrative records from a large public school district in the Metro Atlanta area. The data cover high school graduating cohorts from 2012 through 2023 and include 69,566 unique students who were enrolled in their senior year in the district. I link these secondary school records to postsecondary enrollment data from the National Student Clearinghouse (NSC).

3.1 High School Enrollment Data

The secondary data from the school district provide course-taking and transcript records, enrollment histories, and demographic characteristics. Academic records include specific courses taken, letter and numeric grades for each course, final high school HOPE GPA, and graduation status. The dataset also contains a HOPE eligibility indicator identifying whether a student qualifies for the scholarship, along with reasons for ineligibility among non-eligible students.

I determine students' residency eligibility for HOPE using high school enrollment histories by limiting the sample to students who resided in Georgia for at least 12 consecutive months prior to enrolling in college. Among high school seniors enrolled in 12th grade, approximately 98% satisfy the residency criterion. The dataset also provides demographic characteristics, including sex, race/ethnicity, English Learner status, disability status, and ever-eligibility for Free or Reduced-Price Meals (FRPM), which I use as a proxy for socioeconomic disadvantage.[10]

3.2 Matching Siblings

I match students based on having the same last name and residing at the same address in a given year among all students enrolled between 2011 and 2024 to construct the sibling identifiers. I follow a similar approach to that used in the existing literature.[11] After matching on name and address, I calculate birth-month gaps using birth year and month information to identify twins and to measure age differences between siblings.

I exclude students with incomplete or ambiguous address information to avoid false positives in the matching process. Some students living in apartment complexes have missing unit numbers, which prevents verification of co-residence at the household level. Because sibling

[10] Students in households receiving SNAP or TANF are automatically eligible for free or reduced-price meals, and households with income below 185% of the federal poverty level qualify. Additional information on FRPM eligibility criteria in Georgia is available at: https://gadoe.org/snp/free-reduced-policy/

[11] Recent studies of sibling spillovers using administrative education data use this approach, including Florida school district data (Heissel, 2017; Karbownik and Özek, 2023), Philadelphia public schools (Gottfried and McGene, 2013), English administrative school records (Nicoletti and Rabe, 2019, 2013), and College Board data (Goodman et al., 2015; Gurantz et al., 2020; Goodman et al., 2019).

matches require students to reside in the same housing unit over multiple years, I exclude observations with unidentifiable unit information. I first distinguish addresses as apartment complexes or single-family residences and retain only students with complete address information. Approximately 18.4% of student-year-level observations live in apartment complexes, and about 0.23% of records contain missing or incomplete address components.

I also restrict the sibling sample to students whose last names and residential addresses match exactly. I exclude students who share an address but have different last names, such as cousins, step-siblings (Hunter et al., 1998; Gottfried and McGene, 2013), or refugee students, from the main analysis sample. In robustness checks, I relax this restriction to include co-residing students with different last names. Although this approach may generate false negatives by excluding some true sibling pairs, it minimizes the risk of including non-siblings in the main analysis. While the matched sibling sample may differ from the unmatched sample along certain dimensions (e.g., refugee status or housing type), these differences do not threaten the internal validity of the research design or the unbiased estimation of treatment effects.

3.3 National Student Clearinghouse

I link students to National Student Clearinghouse (NSC) postsecondary enrollment data using unique student identifiers.[12] The NSC covers approximately 93% of U.S. postsecondary institutions as of 2012 (Dynarski et al., 2015), including institutions located outside Georgia. The NSC provides detailed information on enrolled institutions, enrollment intensity, specific enrollment dates, majors among degree-attaining students, and degree attainment status and timing.[13]

The outcomes of interest include indicators for whether a student enrolls on time in any postsecondary institution within 16 months of high school graduation[14], whether the student enrolls in a Georgia institution, and whether the student enrolls in a four-year, full-time, or public institution. Because some students enroll in or transfer across multiple institutions over time, I focus on the first institution in which they enroll after graduating from high school.

The data do not contain information on actual HOPE receipt or FAFSA completion, so I construct an indicator for scholarship receipt based on whether students are eligible for the scholarship and enroll in in-state, eligible postsecondary institutions. However, this potential measurement error is likely smaller than one might expect. Between 2013 and 2019, 95.25 percent of HOPE-eligible students, as calculated by their HOPE GPA, actually received the scholarship among University System of Georgia college enrollees, and nearly no ineligible students received

[12]Georgia Policy Labs obtained identifiable data from participating school districts and generated de-identified student identifiers. I use only the de-identified dataset for all analyses and data linkage.

[13]Details on data coverage and variable construction are provided in Appendix A.

[14]This definition follows the Georgia Office of Student Achievement's calculation of college enrollment rates for Georgia high school graduates.

it.[15] Nevertheless, some eligible students who enroll in eligible institutions may not receive the scholarship if they fail to complete the FAFSA or the Georgia Student Finance Application.

I supplement the NSC data with institution-level information from the Integrated Postsecondary Education Data System (IPEDS), maintained by the National Center for Education Statistics, to examine college choice by institutional selectivity and tuition. To analyze whether students enroll in more selective institutions, I use data on the average combined SAT Math and Evidence-Based Reading scores of admitted students. Following Bueno et al. (2024), I classify institutions into four selectivity tiers based on average SAT scores, ranging from 900 or higher to 1200 or higher, using data from the 2015 academic year.[16]

To examine whether students enroll in higher-cost institutions, I use information on in-state and out-of-state tuition and fees from IPEDS. I construct annual tuition measures using institutional tuition distributions, defining indicators for institutions at or above the 25th, 50th, and 75th percentiles. Because tuition data are measured annually, institutions may fall into different bands if tuition changes over time. These quantiles are calculated separately for the full set of institutions and for Georgia institutions only.

3.4 Summary Statistics

I restrict the sample in my analysis to high school seniors who graduate, which allows me to examine college enrollment decisions following high school completion. For the analysis of college enrollment outcomes, both siblings must be high school seniors. For example, sibling pairs are excluded if the younger sibling is still too young to enroll in college or drops out of high school. Second, I restrict the sibling sample to first- and second-born children within a household. I focus on the oldest and second-oldest siblings because identifying spillover effects for later-born children is challenging when multiple older siblings may simultaneously influence outcomes. To maximize statistical power, I include households with up to three children. Since 97.6% of sibling pairs come from households with two or three children, I cap the sample at a maximum of three siblings. Finally, I include twins and triplets in the main analysis sample. Although birth order is difficult to distinguish and their college enrollment timing typically coincides, spillovers may still arise through parental resource reallocation among siblings.

Of the 34,659 matched siblings, 1,696 are twins or triplets. The older sibling sample is restricted to students who satisfy all other eligibility requirements so that eligibility at the cutoff is determined solely by the HOPE GPA threshold. The younger sibling sample does not need to

[15] See Song and Rubenstein (2024), Table 7, for details.

[16] Nationally representative SAT percentiles are as follows: a score of 900 corresponds to the 29th percentile, 1000 to the 48th percentile, 1100 to the 69th percentile, and 1200 to the 81st percentile (College Board, https://research.collegeboard.org/reports/sat-suite/understanding-scores/sat).

be eligible for the scholarship, since the outcome of interest is not restricted to HOPE receipt. Hence, I keep younger siblings who are not eligible for HOPE.

Table 1 presents summary statistics for the study sample by baseline characteristics and college enrollment outcomes. The first column reports statistics for the full sample of students from the 2012–2023 graduating cohorts. The second column reports statistics for the full matched sibling sample, and the third column presents the older sibling regression discontinuity sample within the optimal bandwidth of 0.3 around the cutoff.

Among all graduates, 39 percent of students are Black, 45 percent were ever eligible for FRPM, and the mean HOPE GPA is 3.06. Compared with statewide averages in Georgia[17] , the racial composition of the sample is similar. The statewide shares of Black and White students are 36 percent and 35 percent, respectively, as of the 2023–24 school year. The proportions of English Learners and students with disabilities are also comparable to statewide averages (12 percent and 13.3 percent, respectively), though the share of FRPM-eligible students in the sample is lower than the statewide average of 64 percent.

Seventy-seven percent of students enroll in college after graduating from high school, which is higher than Georgia's overall rate of 64.4% (Governor's Office of Student Achievement, 2024–25). Fifty-three percent of students enroll in in-state colleges, and 67 percent enroll in four-year colleges. Most students enroll in institutions with average SAT scores between 900 and 1100, and 26 percent enroll in top-selective colleges, where the average SAT score is above 1200.

The sibling sample in Column 2 of Table 1 is more likely to be Asian or White and less likely to be Black. Thirty-five percent are ever eligible for free or reduced-price meals and have a slightly higher mean HOPE GPA of 3.15. The mean number of siblings is 2.17. The sibling sample is also more likely to enroll in college (82 percent) and slightly more likely to enroll in in-state colleges (56 percent). The older siblings within the analysis sample of the optimal bandwidth have similar demographic characteristics to the sibling sample and are slightly more likely to enroll in college.

4 Empirical Strategy

This paper uses a regression discontinuity design with GPA as running variable to addresses the question on whether a older sibling's HOPE eligibility generates spillover effects on the college enrollment of younger siblings. Estimating the effects of the HOPE Scholarship is challenging because scholarship-eligible students are systematically different from ineligible students. For example, high-achieving students are more likely to be eligible for the scholarship and are also more

[17] Student and school demographic data for Georgia are obtained from the Governor's Office of Student Achievement: https://gosa.georgia.gov/report-card-dashboards-data/report-card/contents-report-card/student-and-school-demographics.

likely to enroll in college, potentially reflecting differences in parental investments, aspirations, and motivation. To address this concern, I compare older siblings who narrowly miss the GPA threshold with those who narrowly meet it, as these students are comparable except for HOPE GPA eligibility.

Moreover, identifying causal sibling spillover effects of financial aid presents additional concerns relative to estimating students' own effects. Siblings share observed and unobserved characteristics that influence academic achievement and postsecondary enrollment, including family resources, parental preferences, neighborhood environments, and inherent cognitive skills (Black and Devereux, 2011). Moreover, siblings interact closely with one another sometimes closer than their peers in school (Duncan et al., 2001), and older siblings may influence younger siblings' educational achievement (Karbownik and Özek, 2023), college choice (Aguirre and Matta, 2021; Altmejd et al., 2021), and field of study in higher education (Avdeev et al., 2024). The interactions among siblings raise concerns discussed in the peer effects literature including reflection problems (Manski, 1993, 2000), whereby the outcomes of one sibling may simultaneously influence and be influenced by the outcomes of the other.

I implement a fuzzy RD design within a two-stage least squares framework to estimate local average treatment effects (Hahn et al., 2001; Lee and Lemieux, 2010). Comparing the postsecondary outcomes of their younger siblings therefore isolates the causal spillover effects of the HOPE Scholarship. This design also addresses reflection concerns. Variation in treatment arises solely from the older sibling's marginal eligibility at the GPA cutoff, which is determined prior to and cannot be influenced by the younger sibling's college enrollment decisions. I begin by estimating a first-stage regression that regresses the scholarship receipt on the older sibling's HOPE eligibility with following equation.

$$HOPE^{o}_{itf} = \alpha_0 + \alpha_1 Above^{o}_{itf} + \alpha_2 D^{o}_{itf} + \alpha_3 Above^{o}_{itf} \times D^{o}_{itf} + \Gamma X^{o}_{itf} + \gamma_{st} + \epsilon_{itf}, \qquad (1)$$

where $HOPE^{o}_{itf}$ is an indicator for whether the older sibling o in family f and graduating cohort t receives the HOPE Scholarship. $Above^{o}_{itf}$ equals one if the older sibling's HOPE GPA is at or above the 3.0 cutoff, and D^{o}_{itf} measures the distance of the GPA from the threshold. The interaction term $Above^{o}_{itf} \times D^{o}_{itf}$ allows for different linear trends on either side of the cutoff. X^{o}_{itf} includes the older sibling's demographic characteristics, such as gender, race/ethnicity, free or reduced-price meal eligibility, English learner status, and disability status. The specification includes high school by graduating cohort fixed effects, γ_{st}. Standard errors are clustered at the family level (Altmejd et al., 2021), which is the treatment level. The RD bandwidth is 0.3 by optimal calculation. I then estimate reduced-form RD specifications that relate the older sibling's

HOPE eligibility to the younger sibling's college enrollment outcomes.

$$Y^y_{itf} = \beta_0 + \beta_1 Above^o_{itf} + \beta_2 D^o_{itf} + \beta_3 Above^o_{itf} \times D^o_{itf} + \Omega X^y_{itf} + \gamma_{st} + \epsilon_{itf}, \tag{2}$$

where Y^y_{itf} denotes the younger sibling's postsecondary enrollment outcome. The coefficient α_1 captures the reduced-form effect of the older sibling's HOPE eligibility on the younger sibling's college-going behavior. The model controls for younger sibling characteristics, denoted by X^y_{itf}. Finally, I implement a two-stage least squares estimator using predicted scholarship receipt for the older sibling from Equation 1.

$$Y^y_{itf} = \delta_0 + \beta_1 \widehat{HOPE}^o_{itf} + \delta_2 D^o_{itf} + \delta_3 Above^o_{itf} \times D^o_{itf} + \Lambda X^y_{itf} + \gamma_{st} + \nu_{itf}, \tag{3}$$

where $\widehat{HOPE}^o_{itf}$ is the probability of the older sibling's scholarship receipt from the first-stage regression. The coefficient δ_1 identifies the local average spillover effect of an older sibling's HOPE Scholarship receipt on the younger sibling's college enrollment outcomes.

4.1 Validity Checks for RD Design

The RD design relies on the assumption that students on either side of the cutoff are comparable and do not differ systematically except for their treatment assignment, which is scholarship eligibility. I examine the balance of the covariates to test the student characteristics are smooth around the cutoff, including sex, race/ethnicity, eligibility for free or reduced-price meals, English learner status, and disability status. I do not find evidence of statistically significant discontinuities in observable student characteristics in the full sample or in subsamples defined by free or reduced-price meal eligibility. Appendix Table C1 reports formal balance tests, and Appendix Figure B1 presents graphical evidence for demographic characteristics around the threshold.

Another key assumption of the RD design is the continuity of the running variable at the cutoff. Visual inspection of the data, however, reveals notable heaping at whole- and half-point GPA values. Panel A of Figure B2 in the Appendix plots the distribution of HOPE GPA and shows pronounced bunching at 2.5, 3.0, 3.5, and 4.0. This heaping pattern is similarly observed in both the FRPM-eligible and non-FRPM-eligible subsamples (Appendix Figure B2 Panel C and Panel D). While such heaping could raise concerns about manipulation, it may also reflect the mechanical construction of the HOPE GPA. The HOPE GPA is calculated by converting numeric course grades into discrete letter grades (A, B, C, D, and F) on a four-point scale and applying a 0.5 weight to Advanced Placement, International Baccalaureate, and Dual Enrollment courses.

Because the GPA is computed as an average of these discrete values, mechanical clustering at .0, .25, and .5 increments may arise even in the absence of intentional behavior. Similar patterns have been documented in prior studies using both high school GPA (Bettinger et al., 2019; Bhargava et al., 2025) and college GPA (Barreca et al., 2016; Ost et al., 2018; Schudde and Scott-Clayton, 2016; Scott-Clayton and Schudde, 2020).

To assess whether the observed heaping can be explained by mechanical features of GPA construction, Appendix Figure B2 Panel B presents a simulated GPA distribution generated from randomly assigned course grades, by following Ost et al. (2018). The simulated distribution exhibits similar heaping patterns at the whole numbers, including at the scholarship cutoff. If the heaping is driven primarily by the mechanical construction of GPA, the running variable should appear smooth once exact mass points are removed. By following Scott-Clayton and Schudde (2020), I examine the density of the running variable after excluding observations exactly at the cutoff. Appendix Figure B3 reports density tests using the full sample (Panel A), which suggest bunching at the threshold, and a restricted sample that excludes students with a HOPE GPA exactly equal to 3.0 (Panel B) (McCrary, 2008). After excluding exact cutoff values, the density appears smooth around the threshold, with no statistically significant discontinuity (p-value = 0.514).

Nevertheless, the presence of heaping at the eligibility threshold warrants careful examination. To further address concerns related to heaping, I implement a "donut" RD design that excludes students with a HOPE GPA exactly equal to 3.0 (Barreca et al., 2016; Schudde and Scott-Clayton, 2016; Ost et al., 2018). I also estimate specifications that incorporate "trends-in-heaps," controlling the indicators for heaped GPA values and their interactions with a quadratic function of distance from the cutoff by following Zimmerman (2014); Barreca et al. (2016). In the robustness section, I present the results for alternative specifications and additional analyses aimed at assessing whether the observed lumpiness is consistent with mechanical features of GPA construction or with potential manipulation.

Related to the continuity assumption, students should not be able to precisely manipulate their HOPE GPA around the cutoff. Several institutional features of the HOPE Scholarship suggest that such precise manipulation may be limited. First, the Georgia Student Finance Commission (GSFC) calculates final HOPE GPAs after high schools submit official transcripts, and students observe their finalized HOPE GPA through the GAfutures platform after June 30 following graduation.[18] This centralized calculation process may reduce the scope for discretionary adjustments at the school level. Second, because HOPE GPA reflects cumulative academic performance across four years of coursework, marginal changes in individual courses are unlikely to generate large discrete changes in overall GPA. This feature may further limit students' ability to strategically

[18] Additional information about GAfutures is available at https://www.gafutures.org/.

sort around the cutoff. In the robustness section, I examine potential behavioral responses in course-taking patterns using high school transcript data. Specifically, I test whether students near the cutoff appear more or less likely to enroll in advanced or rigorous courses that could inflate their weighted HOPE GPA.

5 Results

Older sibling's HOPE Scholarship eligibility has the positive spillovers to the younger sibling's college enrollment and influences the types of institutions chosen. Table 2 presents the main results of the scholarship's eligibility on spillover effects on recipients' younger siblings, Table 3 reports results for college choice by selectivity. In each table, Panel A reports results for the full sample, Panel B for students ever eligible for free or reduced-price meals (FRPM), and Panel C for students never eligible for FRPM. Each column represents a separate regression with student characteristics as covariates and high school-by-cohort fixed effects, and clustered in family-level.

5.1 First Stage

I begin with the first-stage estimates presented in Column (1) of Table 2. Eligibility increases the older sibling's probability of receiving the scholarship by 71.4 percentage points in the full sample (Panel A). Figure 1 shows visually how the first stage works for the variation. If older siblings are above the cutoff of 3.0, they are eligible for the scholarship and available to receive the scholarship. Below 3.0, none of students are eligible for the scholarship, cannot get the HOPE. The first-stage estimates are smaller than overall college enrollment rates because scholarship receipt is conditional on enrollment in eligible Georgia institutions. Eligible high school seniors with GPA at or above the cutoff who do not enroll in college or who enroll outside Georgia do not receive the scholarship.

FRPM-eligible students have a slightly larger first-stage effect than non-FRPM students: 73.8 percent of FRPM-eligible students receive the scholarship (Panel B), compared with 70.6 percent of non-FRPM students (Panel C). This likely reflects that low-income older siblings are impacted by their own eligibility on college choice toward in-state so that higher take-ups for the scholarship, than the high-income students.

The reported first-stage estimates may somewhat overstate the true effects, as the scholarship receipt variable is constructed using both HOPE eligibility and enrollment in eligible Georgia institutions. While this potential measurement error in the first stage could potentially be minimal, it still warrants consideration. Therefore, I interpret the main regression results primarily through the reduced-form estimates.

5.2 Sibling Spillovers of HOPE on College Enrollment

The HOPE Scholarship generates positive spillover effects on recipients' younger siblings' college enrollment. Table 2 reports the main results of this paper. Columns (2) through (6) of Panel A present the corresponding spillover effects on younger siblings for the full sample. Within each panel, the first row shows reduced-form estimates from Equation 2, and the second row reports IV estimates from Equation 3.

Eligibility for the older sibling's HOPE Scholarship increases the younger sibling's on-time college enrollment by 4.7 percentage points (6 percent) in the reduced-form estimates (Table 2, Column 2), which can be interpreted as a lower bound of the scholarship's effect. The positive enrollment effect is larger for in-state and public college enrollment. Younger siblings whose older siblings are marginally eligible for the scholarship are 7 percentage points (12.7 percent) more likely to enroll in Georgia institutions and 5.8 percentage points (7.4 percent) more likely to enroll in public colleges.

Panel A of Figure 2 visually illustrates younger siblings' enrollment outcomes across older siblings' HOPE GPA bins. The horizontal axis shows the older sibling's HOPE GPA, and the vertical axis shows the younger sibling's college enrollment outcomes. The discontinuity at the GPA cutoff of 3.0 provides causal evidence of sibling spillovers from the HOPE Scholarship. The graph shows a clear jump at the cutoff for overall enrollment and for in-state enrollment in Panel B. The stronger impacts on in-state and public college enrollment reflect the structure of the HOPE Scholarship, which is available only for in-state institutions and provides the largest subsidy for public colleges.

Older siblings' aid eligibility also increases the likelihood that younger siblings enroll full-time in college by 6.8 percentage points (9.8 percent), as shown in Column 4 of Table 2. The increase in full-time enrollment may reflect both the overall rise in college enrollment and a shift from part-time to full-time enrollment. One possible explanation is that when older siblings receive the scholarship, household financial constraints related to college costs are reduced, allowing younger siblings to work fewer hours while enrolled. Consistent with this mechanism, approximately 75 percent of part-time college students work while enrolled, compared with 43 percent of full-time students.[19] If older siblings receive the scholarship and household financial pressure related to college expenses declines, younger siblings may be better able to focus on their studies and enroll full-time rather than part-time.

Another possible explanation relates to information about the structure of the HOPE Scholarship. Because the scholarship amount is larger for full-time enrollment (especially for students taking 15 credits), older siblings who receive the scholarship may transmit information about

[19] Source: National Center for Education Statistics (2022).

its benefits and incentives. As a result, younger siblings may be more likely to choose full-time enrollment in order to maximize the amount of financial aid received. Older siblings' HOPE eligibility is associated with a positive estimate for younger siblings' enrollment in four-year colleges, but the magnitude is smaller than that for overall on-time enrollment and the estimate is not statistically significant.

Notably, the spillover effects vary substantially by family socioeconomic background, with positive impacts concentrated among students from lower-SES families. I divide students based on whether they were ever eligible for free or reduced-price meals (FRPM), which serves as a proxy for lower household income. Figure 2 reports heterogeneous effects by FRPM status for college enrollment outcomes and effects by college selectivity. Panel B of Figure 2 presents results for FRPM-eligible siblings only, while Panel C shows results for non-FRPM-eligible siblings.

FRPM-eligible younger siblings are 16 percentage points (25 percent) more likely to enroll in college if their older siblings are marginally eligible for the scholarship. In contrast, there is no meaningful effect among non-FRPM-eligible siblings; the estimates are small in magnitude and not statistically significant. Panel C of Figure 2 visually demonstrates that the effects are concentrated among low-income students. Non-FRPM younger siblings have relatively high enrollment rates regardless of their older sibling's scholarship eligibility. In contrast, low-income younger siblings exhibit a large jump in enrollment at the older sibling's HOPE GPA cutoff of 3.0.

Older siblings' eligibility also increases younger siblings' enrollment in in-state colleges by 17.1 percentage points (38 percent). In Panel D of Figure 2, when older siblings are marginally below the cutoff, low-income younger siblings have lower in-state college enrollment rates than higher-income siblings. However, when older siblings are marginally above the cutoff, the enrollment rate differences between low- and high-income siblings become minimal. These results suggest that the HOPE Scholarship increases college enrollment among younger siblings and helps mitigate enrollment gaps across income groups. The remaining RD figures for full-time, four-year, and public college enrollment are presented in Appendix Figure A4.

Turning to college choice by selectivity, the older sibling's HOPE eligibility does not lead to higher enrollment in more selective colleges for younger siblings overall, but younger siblings from low-income families are more likely to enroll in moderately selective institutions. Table 3, Panel B, Column 2 shows that younger siblings from low-income households are 12.2 percentage points (27.5 percent) more likely to enroll in colleges with an average SAT above 900. Low-income younger siblings also exhibit positive estimates for enrollment in colleges with average SAT scores above 1000 and 1100, with increases of 10 and 9.6 percentage points, respectively (Columns 3 and 4). Figure 3 visually supports the positive enrollment among low-income household on colleges average over 1000+ and 1100+ in Panel D and E. Overall, younger siblings from low-income backgrounds are not only more likely to enroll in college, but they also tend to enroll

in more selective institutions. In contrast, younger siblings from higher-income families show negative effects on enrollment in moderately selective colleges, although these estimates are less precisely estimated. Especially, higher-income siblings are 9.1 percentage points less likely to enroll in the most selective colleges. One potential explanation is that students may trade off college quality and cost in response to available merit aid (Goodman, 2008; Cohodes and Goodman, 2014). Moreover, Georgia has relatively few institutions in the most selective category (including the University of Georgia and Georgia Tech as public institutions, and Emory University as a private institution in the SAT 1200+ tier), which may further constrain choices. The RD figure for college enrollment in SAT 900+ institutions are presented in Appendix Figure A5.

5.3 Robustness Check and Placebo Test

I conduct a series of additional analyses to assess the robustness of the main findings under alternative specifications. First, to address potential concerns related to GPA heaping at the cutoff, I re-estimate the regressions excluding observations at the exact cutoff (GPA 3.0) using a donut RD design, following (Barreca et al., 2011, 2016). Relative to the main estimates, the donut RD produce point estimates that are similar or slightly smaller in magnitude while remaining at the similar level of statistical significance. Table 4 reports the donut RD results for the full sample across all college enrollment outcomes.

I also report specifications excluding student demographic covariates and estimates using a triangular kernel, which gives more weight to observations near the cutoff. Both the specification without demographic controls and the triangular kernel approach yield estimates that are similar to the main findings in the magnitude of the effects for the full sample. These estimates are presented in the first and third rows of Table 4.

Next, I examine the sensitivity of the results to alternative bandwidth choices. Specifically, I re-estimate the models using both narrower and wider bandwidths relative to the optimal bandwidth of 0.3, for both local linear and quadratic specifications. The results for college enrollment and persistence shown in Figure B7 indicate that the magnitude of the estimates and their confidence intervals are broadly similar across bandwidth choices relative to the optimal specification.

For the placebo test, I assess whether the observed discontinuities are specific to the true scholarship cutoff rather than reflecting arbitrary thresholds in the GPA distribution. To do so, I conduct a random cutoff exercise by estimating the model at 0.05 GPA increments between 2.6 and 3.4, while holding the bandwidth constant across specifications. The largest and statistically significant discontinuities appear at the true cutoff, whereas estimates at placebo cutoffs are generally smaller and statistically insignificant (Appendix Figure B8). While this exercise cannot fully rule out all alternative explanations, the pattern of results is consistent with the interpretation that the main findings are driven by the policy-relevant threshold.

Finally, related to concerns about potential GPA manipulation, I examine whether students near the eligibility cutoff adjust their course-taking behavior in ways that could mechanically inflate their HOPE GPA.[20] Specifically, I regress the number of courses taken in AP, IB, Dual Enrollment, and other courses included in the rigor requirements on marginal eligibility status for students in 10th, 11th, and 12th grades. Although only a fraction of 10th graders take rigor courses and students are more likely to take them in 12th grade, I do not find statistically significant differences in course-taking patterns among main RD sample in any grade and across the grades. While this evidence cannot definitively rule out strategic behavior, the absence of detectable changes in course selection may suggest limited systematic adjustment in response to the HOPE GPA threshold. The corresponding estimates are reported in Appendix Table C2.

5.4 Heterogeneity

The positive spillover effects observed among FRPM-eligible households suggest that the HOPE Scholarship may help mitigate college enrollment gaps for demographic groups that have historically exhibited lower college-going rates. Heterogeneity analyses by race and other demographic characteristics are consistent with this interpretation. As shown in Panel A of Figure 4, Black students and younger siblings with disabilities are significantly more likely to enroll in college when their older siblings are eligible for the HOPE Scholarship. Similar patterns emerge for in-state enrollment: Black, Hispanic, and younger siblings with disabilities are more likely to enroll in Georgia institutions when their older siblings receive the scholarship (Panel B). These findings suggest that students who historically have had lower baseline probabilities of college enrollment—particularly Black students and students with disabilities—may benefit not only directly from HOPE eligibility but also indirectly through within-household spillovers. Additional heterogeneous analyses are presented in Appendix Figure B6.

The larger spillover effects observed among low-SES families may be related to improvements in older siblings' college outcomes following scholarship receipt. Table 5 examines heterogeneity in college persistence by FRPM eligibility. Among FRPM-eligible students, HOPE recipients are 7.2 percentage points more likely to persist into the second semester of their freshman year and 4.5 percentage points more likely to persist into the second year. In contrast, no detectable effects on persistence are observed among students who were not FRPM-eligible. These results suggest that the scholarship improves early college outcomes for low-SES students, which may in turn amplify spillover effects on younger siblings. Estimates for longer-term persistence

[20] Ideally, one could use 10th- or 11th-grade intermediate HOPE GPA as the running variable and examine postsecondary outcomes to assess whether effects persist prior to the senior year. If positive effects remained, this would more directly suggest limited scope for last-minute GPA manipulation. However, when using intermediate GPA measures, the estimates for postsecondary outcomes are imprecise and noisy. Therefore, I instead examine course-taking behavior as a suggestive, though indirect, test of potential manipulation.

outcomes are less precise, reflecting the scholarship's retention policy, which requires students to maintain a minimum college GPA every 30 attempted credit hours.

To explore potential mechanisms underlying these spillover effects, I examine heterogeneity by sibling age gap. Specifically, I estimate spillover effects separately for sibling pairs with an age gap of four years or less and those with an age gap greater than four years. Smaller age gaps may facilitate communication, shared experiences, and information transmission between siblings (Zang et al., 2023), as older siblings can help younger siblings navigate scholarship applications and college preparation. In particular, when siblings are close in age, they may be of college-going age at similar times, increasing opportunities for interaction and shared decision-making. Conversely, larger age gaps may strengthen hierarchical relationships, through which older siblings transmit advice and prior experiences (Altonji et al., 2017). Panel A of Table 6 reports results for siblings with an age gap of four years or less, while Panel B presents results for siblings with larger age gaps. Overall, I find no clear differences in spillover effects by age gap. However, among siblings with smaller age gaps, spillover effects on enrollment in Georgia colleges and public colleges are positive and statistically significant. This pattern is consistent with closer-aged older siblings helping younger siblings identify and apply to HOPE-eligible institutions.

Next, I examine heterogeneity by sibling sex composition. By comparing spillover effects for same-sex and opposite-sex sibling pairs, I assess whether sibling interactions are stronger among same-sex siblings, which would suggest an important role for sibling interaction channels. The results do not show stronger spillovers for same-sex siblings in on-time college enrollment. Instead, the effects are larger for opposite-sex pairs. Among low-income families with opposite-sex siblings, younger siblings—both brothers and sisters—are 24.6 percentage points more likely to enroll in college. In contrast, for in-state college enrollment, same-sex siblings in low-income families experience stronger positive spillovers, increasing enrollment by 21.6 percentage points. However, given the relatively small sample size, these estimates should be interpreted with caution. Overall, sex composition does not provide clear evidence that stronger interactions among same-sex siblings drive the spillover effects in college enrollment. Figure 5 further shows that among opposite-sex pairs, the combination of an older sister and a younger brother generates a positive and statistically significant effect on the younger brother's college enrollment.

Finally, I replicate the spillover effects using eligibility for the Zell Miller Scholarship to assess whether the magnitude of sibling spillovers varies with the size of the financial aid. The Zell Miller Scholarship is the other statewide merit-based program in Georgia that targets higher-achieving students and differs from HOPE in both eligibility criteria and benefit structure. To qualify for Zell, students must earn a HOPE GPA of at least 3.7 and achieve a minimum SAT score of 1200 or ACT score of 26. While HOPE provides a flat per-credit-hour subsidy, the Zell

Miller Scholarship covers full tuition. As a result, the difference in aid between Zell and HOPE depends on the number of credit hours attempted. For example, at the University of Georgia, students taking 15 credit hours receive the same tuition support under both programs, whereas students taking 12 credit hours receive $4,013 under HOPE compared with $5,017 under Zell, equal to the full tuition amount of $5,017. Across enrollment intensities, the difference in aid between Zell and HOPE ranges from $0 to $2,676 per semester.[21]

If spillover effects operate primarily through household resource reallocation or financial relief, the relatively small differences in aid associated with Zell Miller eligibility would be expected to generate weaker spillover effects on younger siblings. Examining outcomes around the Zell Miller cutoff therefore provides a useful benchmark for interpreting the magnitude of the HOPE spillover estimates.

The first-stage results, which regress Zell receipt on the 3.7 GPA eligibility cutoff, indicate a weak first stage, with F-statistics below 10. Reduced-form estimates show that being just above the Zell cutoff for the older sibling does not increase younger siblings' overall college enrollment, but it increases enrollment in public colleges by 7.5 percentage points, although the estimate is statistically significant only at the 10 percent level. Overall, students appear to respond less strongly to the Zell Miller Scholarship than to HOPE in their college enrollment decisions, and Zell eligibility generates weaker spillover effects on younger siblings. Table C3 reports reduced-form estimates of Zell Miller Scholarship eligibility on students' own college enrollment outcomes in Panel A and spillover effects on younger siblings in Panel B.

6 Conclusion and Policy Implications

This paper investigates the effects of the Georgia HOPE Scholarship not only on recipient's younger siblings. Using administrative data from one large public school district and a regression discontinuity design around the GPA threshold, I find that merit-based financial aid can generate positive spillovers within families. The HOPE Scholarship generates particularly strong spillovers for lower-socioeconomic status households, Black students, and younger students with disabilities. Overall, the results indicate that the benefits of the HOPE Scholarship extend beyond individual recipients, shaping broader household educational outcomes.

The findings have important implications for policy design and evaluation. Traditional assessments of financial aid programs typically focus only on the outcomes of the students who directly receive support, potentially underestimating the total impact of such programs. By accounting for spillovers to siblings, the overall social returns to merit-based scholarships may be larger than conventional cost-benefit calculations suggest. The paper highlights the value of

[21]The full list of HOPE coverage rates across USG institutions in FY 2026 is available at: https://gsfc.georgia.gov/document/document/fy-2026-hope-factor-rate-chart/download.

considering family- and household-level effects when designing and evaluating state-funded financial aid programs, particularly in contexts where educational resources are constrained and siblings are likely to influence one another's postsecondary choices.

References

Aguirre, Josefa and Juan Matta, "Walking in your footsteps: Sibling spillovers in higher education choices," *Economics of Education Review*, 2021, *80*, 102062.

Altmejd, Adam, Andrés Barrios-Fernández, Marin Drlje, Joshua Goodman, Michael Hurwitz, Dejan Kovac, Christine Mulhern, Christopher Neilson, and Jonathan Smith, "O brother, where start thou? Sibling spillovers on college and major choice in four countries," *The Quarterly Journal of Economics*, 2021, *136* (3), 1831–1886.

Altonji, Joseph G, Sarah Cattan, and Iain Ware, "Identifying sibling influence on teenage substance use," *Journal of Human Resources*, 2017, *52* (1), 1–47.

Avdeev, Stanislav, Nadine Ketel, Hessel Oosterbeek, and Bas Van Der Klaauw, "Spillovers in fields of study: Siblings, cousins, and neighbors," *Journal of Public Economics*, 2024, *238*, 105193.

Barreca, Alan I, Jason M Lindo, and Glen R Waddell, "Heaping-induced bias in regression-discontinuity designs," *Economic inquiry*, 2016, *54* (1), 268–293.

__ **, Melanie Guldi, Jason M Lindo, and Glen R Waddell**, "Saving babies? Revisiting the effect of very low birth weight classification," *The quarterly journal of economics*, 2011, *126* (4), 2117–2123.

Bettinger, Eric, Oded Gurantz, Laura Kawano, Bruce Sacerdote, and Michael Stevens, "The long-run impacts of financial aid: Evidence from California's Cal Grant," *American Economic Journal: Economic Policy*, 2019, *11* (1), 64–94.

Bhargava, Palaash, Sandra E Black, Jeffrey T Denning, Robert W Fairlie, and Oded Gurantz, "A Family Affair: The Effects of College on Parent and Student Finances," Technical Report, National Bureau of Economic Research 2025.

Black, Sandra E and Paul J Devereux, "Recent developments in intergenerational mobility," *Handbook of labor economics*, 2011, *4*, 1487–1541.

Bueno, Carycruz, Lindsay Page, and Jonathan Smith, "Assessing Atlanta's placed-based college scholarship," *AERA Open*, 2024, *10*, 23328584241287459.

Campbell, Noel D and Frank Smith, "Merit-Based Scholarship"Over-Awards"and Home Prices," *Public Finance Review*, 2009, *37* (2), 198–216.

Chakrabarti, Rajashri and Joydeep Roy, "Merit aid, student mobility, and the role of college selectivity," *FRB of New York Staff Report*, 2013, (641).

__ **, Nicole Gorton, and Joydeep Roy**, "Getting ahead by spending more? Local community response to state merit aid programs," *Local Community Response to State Merit Aid Programs (October 2018). FRB of New York Staff Report*, 2018, (872).

Cohodes, Sarah R and Joshua S Goodman, "Merit aid, college quality, and college completion: Massachusetts' Adams scholarship as an in-kind subsidy," *American Economic Journal: Applied Economics*, 2014, *6* (4), 251–285.

Cornwell, Christopher and David B Mustard, "Merit-based college scholarships and car sales," *Education Finance and Policy*, 2007, *2* (2), 133–151.

__ , __ , **and Deepa J Sridhar**, "The enrollment effects of merit-based financial aid: Evidence from Georgia's HOPE program," *Journal of Labor Economics*, 2006, *24* (4), 761–786.

Cornwell, Christopher M, Kyung Hee Lee, and David B Mustard, "Student responses to merit scholarship retention rules," *Journal of Human Resources*, 2005, *40* (4), 895–917.

Cornwell, Christopher Mark, Kyung Hee Lee, and David B Mustard, "The effects of state-sponsored merit scholarships on course selection and major choice in college," Technical Report, IZA Discussion Papers 2006.

de Oliveira, Isabela Innocente Gomes et al., "Do school starting age generate externalities on siblings? Evidence using regression discontinuity design." PhD dissertation 2022.

Dee, Thomas S and Linda A Jackson, "Who loses HOPE? Attrition from Georgia's college scholarship program," *Southern Economic Journal*, 1999, *66* (2), 379–390.

Doyle, William R, "Adoption of merit-based student grant programs: An event history analysis," *Educational evaluation and policy analysis*, 2006, *28* (3), 259–285.

Duncan, Greg J, Johanne Boisjoly, and Kathleen Mullan Harris, "Sibling, peer, neighbor, and schoolmate correlations as indicators of the importance of context for adolescent development," *Demography*, 2001, *38*, 437–447.

Dynarski, Susan, "Hope for whom? Financial aid for the middle class and its impact on college attendance," *National tax journal*, 2000, *53* (3), 629–661.

__ , "The behavioral and distributional implications of aid for college," *American Economic Review*, 2002, *92* (2), 279–285.

__ , "The consequences of merit aid," 2002.

__ , "The new merit aid," in "College choices: The economics of where to go, when to go, and how to pay for it," University of Chicago Press, 2004, pp. 63–100.

__ , "Building the stock of college-educated labor," *Journal of human resources*, 2008, *43* (3), 576–610.

Dynarski, Susan M, Steven W Hemelt, and Joshua M Hyman, "The missing manual: Using National Student Clearinghouse data to track postsecondary outcomes," *Educational Evaluation and Policy Analysis*, 2015, *37* (1_suppl), 53S–79S.

Goodman, Joshua, "Who merits financial aid?: Massachusetts' Adams scholarship," *Journal of public Economics*, 2008, *92* (10-11), 2121–2131.

__ **, Michael Hurwitz, Christine Mulhern, and Jonathan Smith**, "O brother, where start thou? Sibling spillovers in college enrollment," Technical Report, National Bureau of Economic Research 2019.

__ , __ **, Jonathan Smith, and Julia Fox**, "The relationship between siblings' college choices: Evidence from one million SAT-taking families," *Economics of Education Review*, 2015, *48*, 75–85.

Gottfried, Michael A and Juliana McGene, "The spillover effects of having a sibling with special educational needs," *The Journal of Educational Research*, 2013, *106* (3), 197–215.

Gurantz, Oded, Michael Hurwitz, and Jonathan Smith, "Sibling effects on high school exam taking and performance," *Journal of Economic Behavior & Organization*, 2020, *178*, 534–549.

Hahn, Jinyong, Petra Todd, and Wilbert Van der Klaauw, "Identification and estimation of treatment effects with a regression-discontinuity design," *Econometrica*, 2001, *69* (1), 201–209.

Heissel, Jennifer A, "Teenage motherhood and sibling outcomes," *American economic review*, 2017, *107* (5), 633–637.

Henry, Gary T and Ross Rubenstein, "Paying for grades: Impact of merit-based financial aid on educational quality," *Journal of Policy Analysis and Management: The Journal of the Association for Public Policy Analysis and Management*, 2002, *21* (1), 93–109.

__ , __ , and Daniel T Bugler, "Is HOPE enough? Impacts of receiving and losing merit-based financial aid," *Educational Policy*, 2004, *18* (5), 686–709.

Hunter, Andrea G, Jane L Pearson, Nicholas S Ialongo, and Sheppard G Kellam, "Parenting alone to multiple caregivers: Child care and parenting arrangements in Black and White urban families," *Family Relations*, 1998, pp. 343–353.

Jr, Larry D Singell, Glen R Waddell, and Bradley R Curs, "Hope for the Pell? The impact of merit-aid on needy students," Technical Report, University of Oregon Economics Department 2004.

Karbownik, Krzysztof and Umut Özek, "Setting a Good Example?: Examining Sibling Spillovers in Educational Achievement Using a Regression Discontinuity Design," *Journal of Human Resources*, 2023, *58* (5), 1567–1607.

Lee, David S and Thomas Lemieux, "Regression discontinuity designs in economics," *Journal of economic literature*, 2010, *48* (2), 281–355.

Long, Bridget Terry, "How do financial aid policies affect colleges?: The institutional impact of the Georgia HOPE scholarship," *Journal of Human Resources*, 2004, *39* (4), 1045–1066.

Manski, Charles F, "Identification of endogenous social effects: The reflection problem," *The review of economic studies*, 1993, *60* (3), 531–542.

__ , "Economic analysis of social interactions," *Journal of economic perspectives*, 2000, *14* (3), 115–136.

McCrary, Justin, "Manipulation of the running variable in the regression discontinuity design: A density test," *Journal of econometrics*, 2008, *142* (2), 698–714.

Nicoletti, Cheti and Birgitta Rabe, "Inequality in pupils' test scores: How much do family, sibling type and neighbourhood matter?," *Economica*, 2013, *80* (318), 197–218.

__ **and** __ , "Sibling spillover effects in school achievement," *Journal of Applied Econometrics*, 2019, *34* (4), 482–501.

Ost, Ben, Weixiang Pan, and Douglas Webber, "The returns to college persistence for marginal students: Regression discontinuity evidence from university dismissal policies," *Journal of Labor Economics*, 2018, *36* (3), 779–805.

Ribar, DC and R Rubenstein, "Dynamics of merit-based scholarships in Georgia," *GPL Reports*, 2021, *8*.

Schudde, Lauren and Judith Scott-Clayton, "Pell grants as performance-based scholarships? An examination of satisfactory academic progress requirements in the nation's largest need-based aid program," *Research in Higher Education*, 2016, *57*, 943–967.

Scott-Clayton, Judith and Lauren Schudde, "The consequences of performance standards in need-based aid: Evidence from community colleges," *Journal of Human Resources*, 2020, *55* (4), 1105–1136.

Sjoquist, David L and John V Winters, "Building the stock of college-educated labor revisited," *Journal of Human Resources*, 2012, *47* (1), 270–285.

__ **and** __ , "The effects of HOPE on post-college retention in the Georgia workforce," *Regional Science and Urban Economics*, 2013, *43* (3), 479–490.

__ **and** __ , "The effect of Georgia's HOPE scholarship on college major: a focus on STEM," *IZA Journal of Labor Economics*, 2015, *4* (1), 15.

Song, Youngwan and Ross Rubenstein, "How Does Reducing Merit-Aid Generosity and Certainty Affect College Choices? Evidence from Georgia's HOPE Scholarship," *Research in Higher Education*, 2024, *65* (1), 1–41.

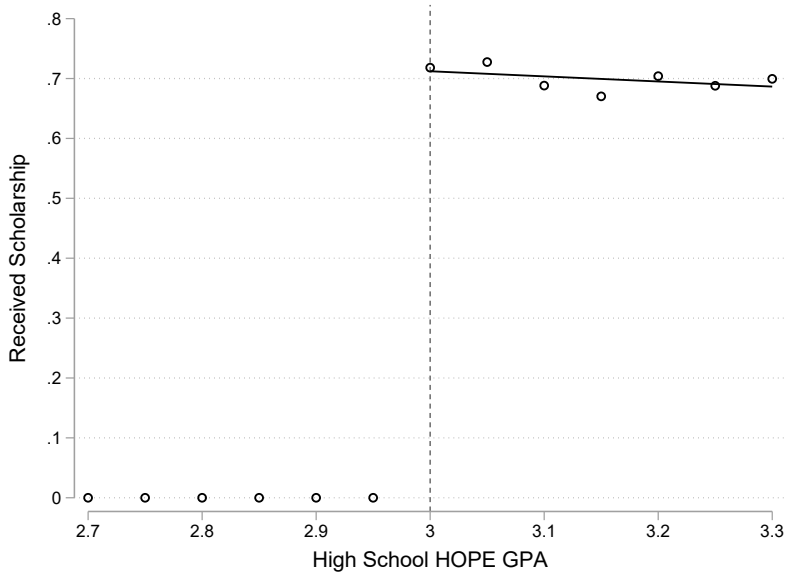
U.S. Census Bureau, "Real Median Household Income in the United States [MEHOINUSA672N]," FRED, Federal Reserve Bank of St. Louis 2026. Retrieved February 27, 2024 from https://fred.stlouisfed.org/series/MEHOINUSA672N.

Zang, Emma, Poh Lin Tan, and Philip J Cook, "Sibling spillovers: Having an academically successful older sibling may be more important for children in disadvantaged families," *American Journal of Sociology*, 2023, *128* (5), 1529–1571.

Zhang, Liang, "Does merit-based aid affect degree production in STEM fields? Evidence from Georgia and Florida," *The Journal of Higher Education*, 2011, *82* (4), 389–415.

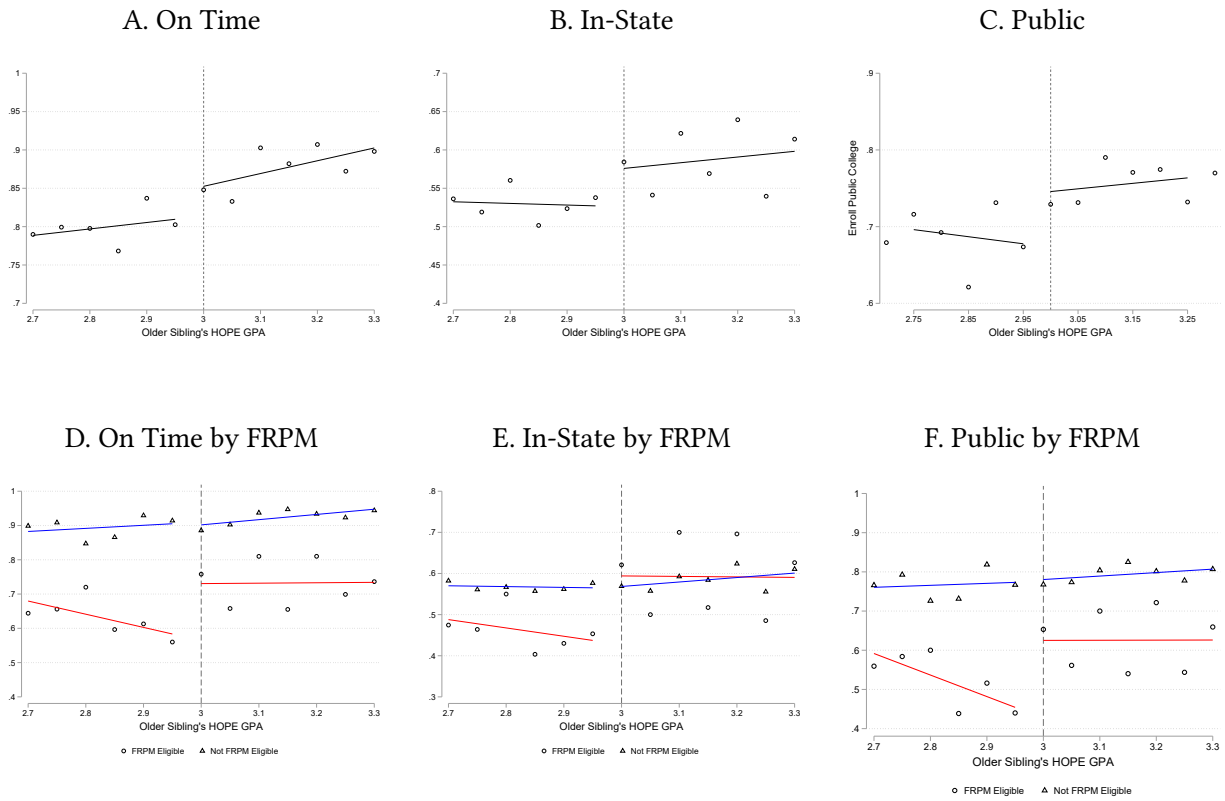
Zimmerman, Seth D, "The returns to college admission for academically marginal students," *Journal of Labor Economics*, 2014, *32* (4), 711–754.

Figure 1: Fraction of Older Sibling's HOPE Scholarships Received over HOPE GPA Bins



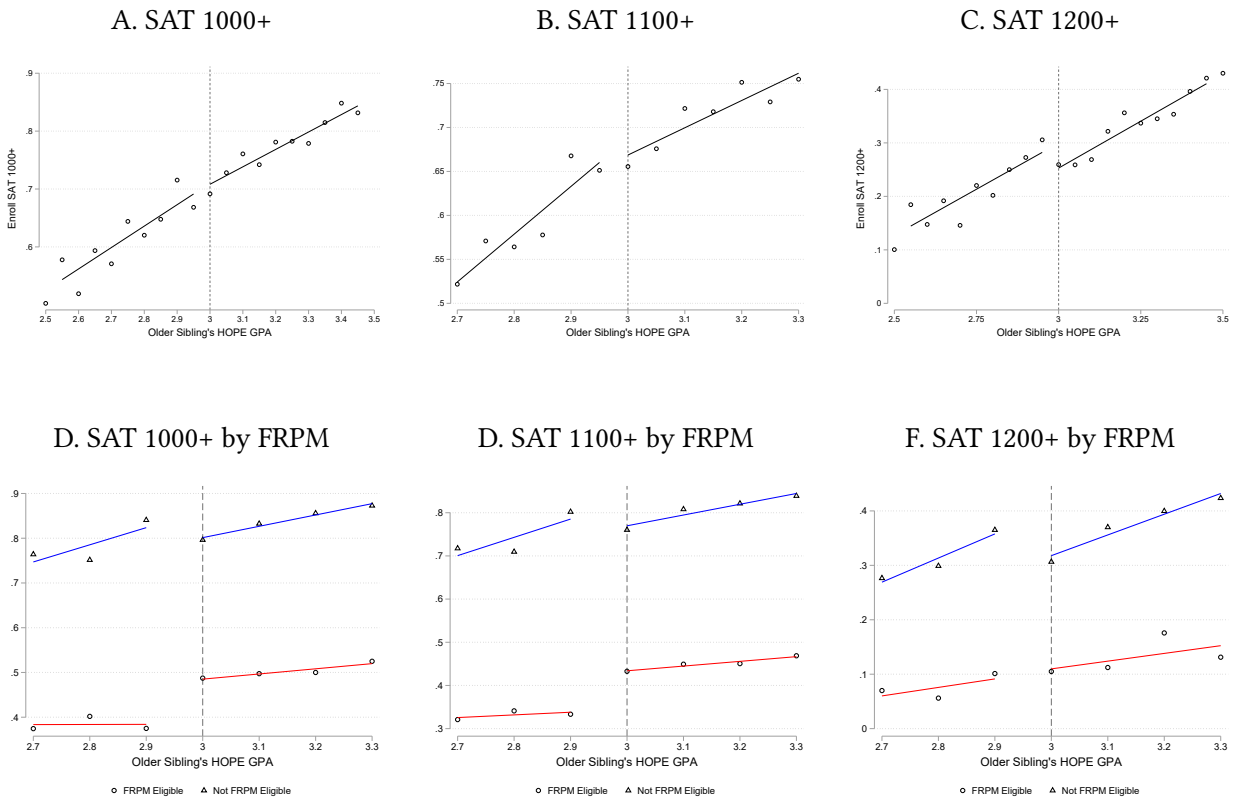
Note: The figure displays the fraction of students receiving the HOPE Scholarship across HOPE GPA bins. High school HOPE GPA data come from public school district records, and scholarship receipt is calculated based on enrollment in Georgia colleges and satisfaction of HOPE eligibility criteria. College enrollment data come from the National Student Clearinghouse.

Figure 2: HOPE Scholarship Impacts on Younger Siblings' College Enrollment



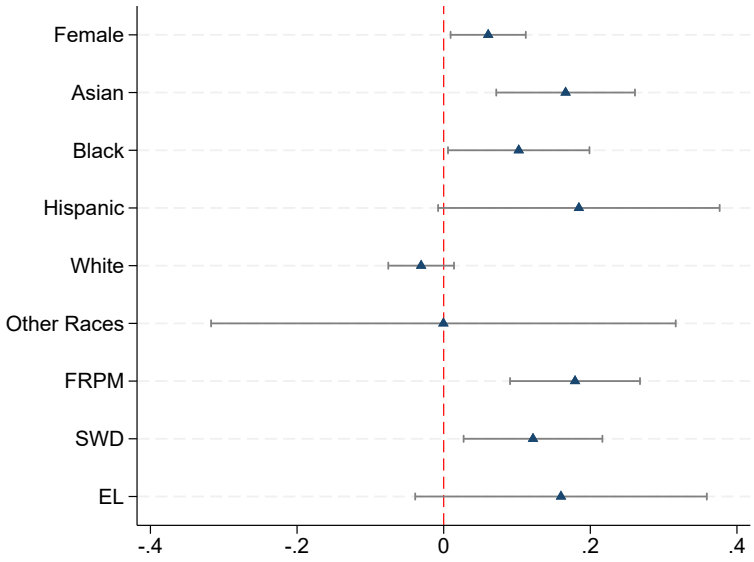
Note: Each panel displays regression discontinuity estimates of the effects of older siblings' HOPE Scholarship eligibility on younger siblings' college enrollment outcomes. Panel (a) shows on-time enrollment, and Panel (b) shows enrollment in Georgia institutions. The younger sibling sample consists of the two oldest siblings in households with two or three children, where the older sibling resided in Georgia for at least 12 months prior to graduation and met the academic rigor requirements. College enrollment data come from the National Student Clearinghouse.

Figure 3: HOPE Scholarship Impacts on Younger Siblings' College Choice by Selectivity

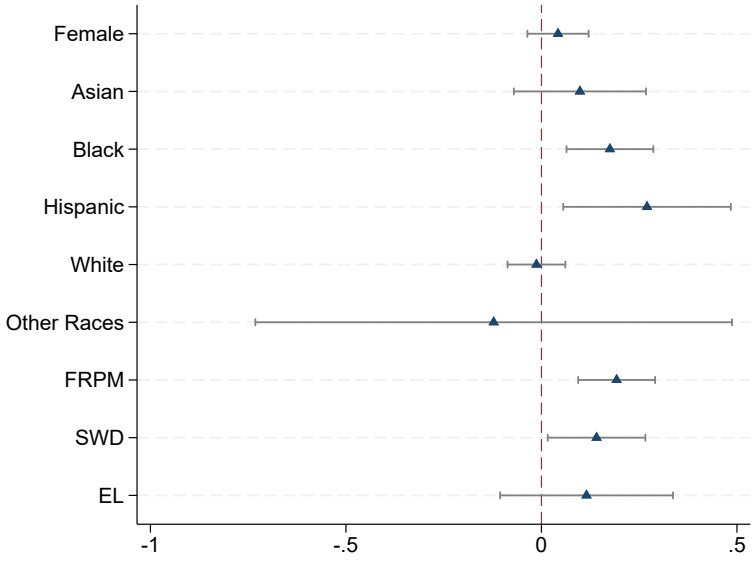


Note: Each panel displays regression discontinuity estimates of the effects of older siblings' HOPE Scholarship eligibility on younger siblings' college enrollment outcomes. Panel (a) shows on-time enrollment, and Panel (b) shows enrollment in Georgia institutions. The younger sibling sample consists of the two oldest siblings in households with two or three children, where the older sibling resided in Georgia for at least 12 months prior to graduation and met the academic rigor requirements. College enrollment data come from the National Student Clearinghouse.

Figure 4: HOPE Scholarship Impacts on Younger Siblings' College Enrollment by Demographics



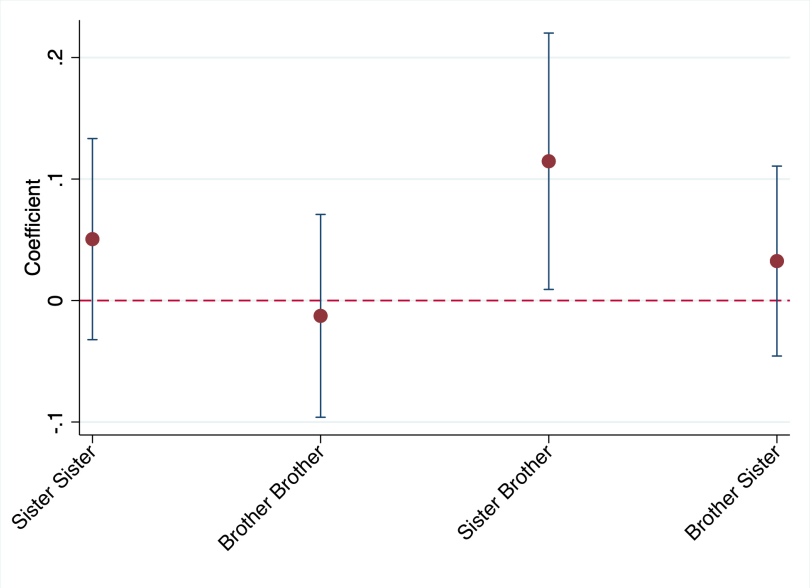
(a) On-Time Enrollment



(b) In-State Enrollment

Note: Each coefficient shown in the figure reports heterogeneous regression discontinuity estimates of college enrollment outcomes by younger siblings' demographic characteristics. The RD bandwidth is 0.3, selected using the optimal bandwidth procedure. The younger sibling sample consists of the two oldest siblings in households with two or three children, where the older sibling resided in Georgia for at least 12 months prior to graduation and met the academic rigor requirements. Standard errors are clustered at the sibling-identifier level, and all models include high school–by–cohort fixed effects. College enrollment data come from the National Student Clearinghouse.

Figure 5: HOPE Scholarship Impacts on Younger Siblings' College Enrollment by Sex Composition



Note: Each coefficient shown in the figure reports regression discontinuity estimates of college enrollment outcomes by siblings' sex composition. The RD bandwidth is 0.3, selected using the optimal bandwidth procedure. The younger sibling sample consists of the two oldest siblings in households with two or three children, where the older sibling resided in Georgia for at least 12 months prior to graduation and met the academic rigor requirements. Standard errors are clustered at the sibling-identifier level, and all models include high school–by–cohort fixed effects. College enrollment data come from the National Student Clearinghouse.

Table 1: Summary Statistics

	Full Sample		Oldest Two Siblings		Older Sibling RD Sample	
	Mean	SD	Mean	SD	Mean	SD
Baseline Characteristics						
Female	0.519	0.499	0.502	0.500	0.476	0.499
Asian	0.116	0.320	0.136	0.343	0.099	0.298
Black	0.389	0.487	0.279	0.448	0.253	0.435
Hispanic	0.108	0.310	0.100	0.300	0.093	0.291
White	0.378	0.485	0.473	0.499	0.545	0.498
Other Races	0.038	0.192	0.039	0.194	0.039	0.194
Ever Free/Reduced-Price Meal	0.450	0.497	0.347	0.476	0.296	0.456
English Learner	0.102	0.302	0.092	0.289	0.084	0.278
Student with Disability	0.149	0.356	0.162	0.368	0.139	0.352
High School HOPE GPA	3.057	0.597	3.155	0.570	3.026	0.171
Number of Siblings	1.678	0.797	2.177	0.382	2.180	0.384
College Enrollment						
Enroll On-Time College	0.771	0.420	0.819	0.384	0.883	0.295
Enroll In-State College	0.534	0.499	0.563	0.495	0.598	0.490
Enroll Four-Year College	0.676	0.468	0.742	0.437	0.825	0.379
Enroll Full-Time College	0.665	0.472	0.725	0.446	0.809	0.392
Enroll Public College	0.644	0.479	0.691	0.462	0.769	0.421
College Selectivity						
Enroll Avg SAT 900+ College	0.630	0.483	0.707	0.454	0.796	0.402
Enroll Avg SAT 1000+ College	0.586	0.493	0.676	0.467	0.764	0.424
Enroll Avg SAT 1100+ College	0.538	0.498	0.635	0.481	0.702	0.457
Enroll Avg SAT 1200+ College	0.260	0.439	0.328	0.469	0.216	0.411
N	68,239		25,258		3,848	

Note. College enrollment outcomes are from the National Student Clearinghouse (NSC). The full sample consists of 68,239 graduates from public high schools in Metro Atlanta spanning graduating cohorts from 2012 to 2023. “All Siblings" refers to students identified as having one or more siblings within the same school district. “Oldest Two Siblings" includes the two oldest children in sibling households with two or three children. “Older Sibling RD Sample" consists of older siblings from the oldest-two sibling sample whose high school HOPE GPA lies within a bandwidth of 0.3 around the 3.0 eligibility cutoff.

Table 2: Sibling Spillovers of HOPE Scholarship on College Enrollment

	First Stage	College Enrollment Outcomes				
	(1) HOPE	(2) On-Time	(3) GA College	(4) Full-Time	(5) Four-Year	(6) Public
Panel A. All Younger Siblings						
Older GPA $\geq$ 3.0 (RF)	0.714***	0.047**	0.070**	0.068***	0.030	0.058**
	(0.020)	(0.022)	(0.033)	(0.027)	(0.026)	(0.028)
	[467.47]					
Older HOPE (IV)		0.065**	0.096**	0.094**	0.038	0.079**
		(0.031)	(0.044)	(0.036)	(0.034)	(0.038)
Control Mean		0.788	0.551	0.689	0.734	0.788
N	3,848	3,848	3,848	3,793	3,848	3,848
Panel B. FRPM Eligible Siblings						
Older GPA $\geq$ 3.0 (RF)	0.738***	0.159***	0.171***	0.172***	0.167***	0.188***
	(0.033)	(0.052)	(0.057)	(0.054)	(0.053)	(0.056)
	[163.19]					
Older HOPE (IV)		0.208***	0.243***	0.200***	0.208***	0.251***
		(0.064)	(0.072)	(0.069)	(0.067)	(0.070)
Control Mean		0.632	0.448	0.505	0.527	0.518
N	1,145	1,145	1,145	1,130	1,145	1,145
Panel C. Non-FRPM Eligible Siblings						
Older GPA $\geq$ 3.0 (RF)	0.706***	-0.011	0.012	0.014	-0.038	-0.011
	(0.023)	(0.023)	(0.039)	(0.031)	(0.028)	(0.032)
	[337.50]					
Older HOPE (IV)		0.008	0.025	0.042	-0.029	0.016
		(0.035)	(0.054)	(0.044)	(0.040)	(0.045)
Control Mean		0.897	0.568	0.769	0.819	0.775
N	2,698	2,698	2,698	2,658	2,698	2,698

Note: This table reports the main regression discontinuity estimates of the impact of HOPE Scholarship eligibility on younger siblings' college enrollment by household income status. College enrollment outcomes are obtained from the National Student Clearinghouse (NSC). The RD bandwidth is 0.3 around the 3.0 GPA cutoff, based on the optimal bandwidth calculation. F-statistics for the first-stage equations are reported in brackets. Standard errors (in parentheses) are clustered at the sibling-identifier level. All models include demographic controls and school-by-cohort fixed effects. Each column represents a separate regression. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: Sibling Spillovers of HOPE Scholarship on College Choice by Selectivity

	First Stage	College Selectivity Outcomes			
	(1) HOPE	(2) SAT 900+	(3) SAT 1000+	(4) SAT 1100+	(5) SAT 1200+
Panel A. All Younger Siblings					
Older GPA $\geq$ 3.0 (RF)	0.714***	0.003	0.001	-0.001	-0.058**
	(0.020)	(0.026)	(0.025)	(0.027)	(0.026)
	[467.47]				
Older HOPE (IV)		0.001	-0.003	0.001	-0.083**
		(0.035)	(0.035)	(0.036)	(0.036)
Control Mean		0.671	0.642	0.595	0.230
N	3,848	3,848	3,848	3,848	3,848
Panel B. FRPM Eligible Siblings					
Older GPA $\geq$ 3.0 (RF)	0.738***	0.122**	0.100*	0.096*	-0.023
	(0.033)	(0.054)	(0.054)	(0.053)	(0.034)
	[163.19]				
Older HOPE (IV)		0.157**	0.129*	0.148**	-0.032
		(0.068)	(0.068)	(0.067)	(0.042)
Control Mean		0.443	0.385	0.331	0.076
N	1,145	1,145	1,145	1,145	1,145
Panel C. Non-FRPM Eligible Siblings					
Older GPA $\geq$ 3.0 (RF)	0.706***	-0.056*	-0.059*	-0.072**	-0.091**
	(0.023)	(0.029)	(0.029)	(0.031)	(0.036)
	[337.50]				
Older HOPE (IV)		-0.061	-0.069*	-0.082*	-0.137***
		(0.040)	(0.041)	(0.043)	(0.049)
Control Mean		0.802	0.791	0.751	0.323
N	2,698	2,698	2,698	2,698	2,698

Note: This table reports the main regression discontinuity estimates of the impact of HOPE Scholarship eligibility on younger siblings' college enrollment by household income status. College enrollment outcomes are obtained from the National Student Clearinghouse (NSC). The RD bandwidth is 0.3 around the 3.0 GPA cutoff, based on the optimal bandwidth calculation. F-statistics for the first-stage equations are reported in brackets. Standard errors (in parentheses) are clustered at the sibling-identifier level. All models include demographic controls and school-by-cohort fixed effects. Each column represents a separate regression. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Alternative Specifications for Robustness Test

	(1) On-Time	(2) GA College	(3) Full-Time	(4) Four-Year	(5) Public	(6) SAT 900+	(7) SAT 1000+	(8) SAT 1100+	(9) SAT 1200+
All Younger Siblings									
No Controls	0.042*	0.070**	0.063**	0.023	0.056*	-0.004	-0.014	-0.022	-0.077***
	(0.023)	(0.033)	(0.028)	(0.027)	(0.029)	(0.028)	(0.028)	(0.029)	(0.028)
Donut	0.041*	0.058*	0.057**	0.029	0.049**	-0.007	-0.019	-0.019	-0.075***
	(0.023)	(0.034)	(0.028)	(0.026)	(0.030)	(0.027)	(0.026)	(0.028)	(0.029)
Triangular	0.031	0.042	0.050*	0.025	0.033	-0.007	-0.016	-0.020	-0.077**
	(0.024)	(0.036)	(0.029)	(0.028)	(0.031)	(0.028)	(0.028)	(0.029)	(0.031)

Note: Panel A reports effects for older sibling's college enrollment, while Panel B reports spillover effects on younger siblings. All specifications use the optimal bandwidth of 0.3. Robustness checks include specifications with no additional controls, a triangular kernel, and a donut RD excluding observations exact at the cutoff (full sample for exact 3.0 is 704, and sibling sample size for exact 3.0 is 137). Standard errors (in parentheses) are clustered at the high school HOPE GPA level for Panel A, and sibling-identifier level for Panel B. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Impact of HOPE Scholarship on College Persistence and Completion by Family Income Status

	Persist 2nd Semester	Persist 2nd Year	Persist 3rd Year	Complete 4-Year College
Panel A: FRPM				
GPA $\geq$ 3.0	0.072***	0.045**	0.023	0.012
	(0.022)	(0.021)	(0.017)	(0.013)
Control Mean	0.338	0.206	0.103	0.115
R-squared	0.098	0.145	0.134	0.157
Obs.	8,993	8,993	8,993	8,993
Panel B: Non-FRPM				
GPA $\geq$ 3.0	0.009	-0.003	-0.007	0.021
	(0.014)	(0.018)	(0.016)	(0.013)
Control Mean	0.523	0.352	0.209	0.249
R-squared	0.040	0.153	0.146	0.245
Obs.	13,304	13,304	13,304	13,304

Note: This table reports reduced-form estimates of the impact of HOPE scholarship eligibility on ones' college persistence and completion, separately by free or reduced-price meal (FRPM) eligibility. College persistence and completion outcomes are obtained from the National Student Clearinghouse (NSC). The RD bandwidth is 0.25 around the 3.0 GPA cutoff, based on the optimal bandwidth calculation. Standard errors (in parentheses) are clustered at the high school HOPE GPA level. All models include demographic controls and school-by-cohort fixed effects. Each column represents a separate regression. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Sibling Spillovers of HOPE Scholarship by Age Gap

	(1) On-Time	(2) GA College	(3) Full-Time	(4) Four-Year	(5) Public	(6) SAT 900+	(7) SAT 1000+	(8) SAT 1100+	(9) SAT 1200+
Panel A: FRPM Eligible Siblings									
Age Gap ≤ 4	0.185***	0.199***	0.154***	0.194***	0.226***	0.116	0.160*	0.180***	0.014
	(0.066)	(0.073)	(0.071)	(0.068)	(0.071)	(0.071)	(0.070)	(0.067)	(0.043)
R-squared	0.302	0.229	0.280	0.321	0.258	0.308	0.329	0.315	0.214
N	825	825	825	825	825	825	825	825	825
Age Gap > 4	0.122	0.149	0.182	0.091	0.145	0.128	0.019	0.031	-0.074
	(0.127)	(0.150)	(0.149)	(0.139)	(0.153)	(0.138)	(0.143)	(0.143)	(0.082)
R-squared	0.516	0.428	0.455	0.469	0.348	0.470	0.451	0.437	0.374
N	230	230	230	230	230	230	230	230	230
Panel B: Non-FRPM Eligible Siblings									
Age Gap ≤ 4	-0.014	0.034	0.008	-0.042	0.013	-0.071**	-0.074**	-0.076**	-0.110***
	(0.026)	(0.045)	(0.036)	(0.033)	(0.036)	(0.034)	(0.034)	(0.036)	(0.042)
R-squared	0.087	0.078	0.104	0.113	0.086	0.126	0.139	0.148	0.116
N	2,148	2,148	2,148	2,148	2,148	2,148	2,148	2,148	2,148
Age Gap > 4	0.056	-0.048	0.078	0.024	0.017	0.019	0.004	0.000	-0.057
	(0.067)	(0.101)	(0.084)	(0.077)	(0.087)	(0.078)	(0.078)	(0.081)	(0.094)
R-squared	0.196	0.223	0.220	0.203	0.255	0.238	0.268	0.274	0.207
N	458	458	458	458	458	458	458	458	458

Note: College enrollment outcomes are obtained from the National Student Clearinghouse (NSC). The RD bandwidth is 0.3 around the 3.0 GPA cutoff, based on the optimal bandwidth calculation. F-statistics for the first-stage equations are reported in brackets. Standard errors (in parentheses) are clustered at the sibling-identifier level. All models include demographic controls and school-by-cohort fixed effects. Each column represents a separate regression. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: Sibling Spillovers of HOPE Scholarship by Sex Composition

	(1) On-Time	(2) GA College	(3) Full-Time	(4) Four-Year	(5) Public	(6) SAT 900+	(7) SAT 1000+	(8) SAT 1100+	(9) SAT 1200+
Panel A: FRPM Eligible Siblings									
Same Sex	0.086	0.216***	0.104	0.092	0.205***	0.052	0.005	-0.007	-0.082*
	(0.068)	(0.076)	(0.073)	(0.073)	(0.074)	(0.073)	(0.072)	(0.071)	(0.047)
R-squared	0.160	0.122	0.187	0.194	0.130	0.196	0.203	0.208	0.091
N	649	649	649	649	649	649	649	649	649
Opposite Sex	0.246***	0.131	0.224***	0.256***	0.227***	0.217***	0.219***	0.233***	0.017
	(0.076)	(0.084)	(0.076)	(0.075)	(0.082)	(0.079)	(0.078)	(0.077)	(0.046)
R-squared	0.261	0.148	0.266	0.247	0.173	0.226	0.232	0.222	0.147
N	575	575	563	575	575	575	575	575	575
Panel B: Non-FRPM Eligible Siblings									
Same Sex	-0.001	-0.014	0.021	-0.017	-0.043	-0.043	-0.040	-0.034	-0.052
	(0.031)	(0.053)	(0.041)	(0.038)	(0.043)	(0.039)	(0.040)	(0.042)	(0.049)
R-squared	0.057	0.039	0.069	0.070	0.043	0.071	0.078	0.102	0.072
N	1,453	1,453	1,437	1,453	1,453	1,453	1,453	1,453	1,453
Opposite Sex	-0.013	0.024	0.011	-0.053	0.028	-0.075*	-0.078*	-0.103**	-0.135**
	(0.034)	(0.056)	(0.045)	(0.042)	(0.048)	(0.042)	(0.043)	(0.045)	(0.052)
R-squared	0.064	0.054	0.088	0.100	0.051	0.118	0.143	0.149	0.101
N	1,389	1,389	1,360	1,389	1,389	1,389	1,389	1,389	1,389

Note: College enrollment outcomes are obtained from the National Student Clearinghouse (NSC). The RD bandwidth is 0.3 around the 3.0 GPA cutoff, based on the optimal bandwidth calculation. F-statistics for the first-stage equations are reported in brackets. Standard errors (in parentheses) are clustered at the sibling-identifier level. All models include demographic controls and school-by-cohort fixed effects. Each column represents a separate regression. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Disclaimer

The data used in this study are drawn from administrative records provided by public school districts in Metro Atlanta area. Access to these data was granted through data use agreements with the participating districts and the Georgia Policy Labs. The findings and conclusions presented in this paper are solely those of the author and do not represent the views of the school districts, the Georgia Policy Labs, or any affiliated institutions. All errors are my own.

This manuscript should not be cited or distributed without the author's permission, in accordance with the data usage agreement established with the school districts and the Georgia Policy Labs.

Appendices

A. Additional Details on Data Construction

A1. High School Administrative Records

This appendix provides more details on data and variable constructions. The main dataset used in this study comes from administrative records from an anonymous public school district located in Atlanta, Georgia, covering graduating cohorts from 2012 to 2023. Using school enrollment data (available from the 2003-04 through the 2023–24 school years), I define graduation status based on the exit date and withdrawal codes recorded during students' final year of high school (12th grade). Students who withdraw from the school system in 12th grade with the withdrawal reason coded as "High school graduation" and a non-missing withdrawal date are classified as high school graduates. Based on this definition, 89.56 percent of 12th-grade students are identified as graduating from high school.

Eligibility for the HOPE Scholarship requires students to have resided in Georgia for at least 12 consecutive months prior to college enrollment. I construct the residency eligibility indicator using entry codes and entry dates from the school enrollment data. Students who enter the school system during the 12th-grade school year after September 1 with entry reasons coded as "Entered from another state or U.S. territory," "Entered from another country," or "Entered from another state or country" are classified as not meeting the residency requirement for the scholarship. Information on rigor requirement eligibility, final HOPE GPA, and final HOPE eligibility status is obtained directly from administrative records provided by the school district.

Student demographic characteristics are defined using the first available record in the student-year panel dataset. Student-year panel data is available from the 2003-04 through the 2023–24 school years. Race and ethnicity are categorized into mutually exclusive five groups: Black, White, Hispanic, Asian, and Other (others are including American Indian, Pacific Islander, and students reporting multiple races). The free or reduced-price meal (FRPM) indicator identifies students who were eligible for the program in any observed school year. Disability status and English learner status are defined as indicators for students who were ever identified as participating in a special education program or classified as having limited English proficiency during the observation period.

A2. NSC Data Details

The National Student Clearinghouse reports enrollment coverage of approximately 93 percent nationwide and 94.8 percent in Georgia as of Fall 2011 (Dynarski et al., 2015). Coverage is particularly high for the types of institutions most relevant for this study: more than 99 percent for public four-year colleges and approximately 96 percent for public two-year colleges. Because the majority of students in this sample enroll in these institution types (91 percent in four-year institutions and 86.2 percent in public colleges) the likelihood of missing enrollment records is minimal. As a result, NSC coverage is unlikely to pose a significant concern for this analysis.

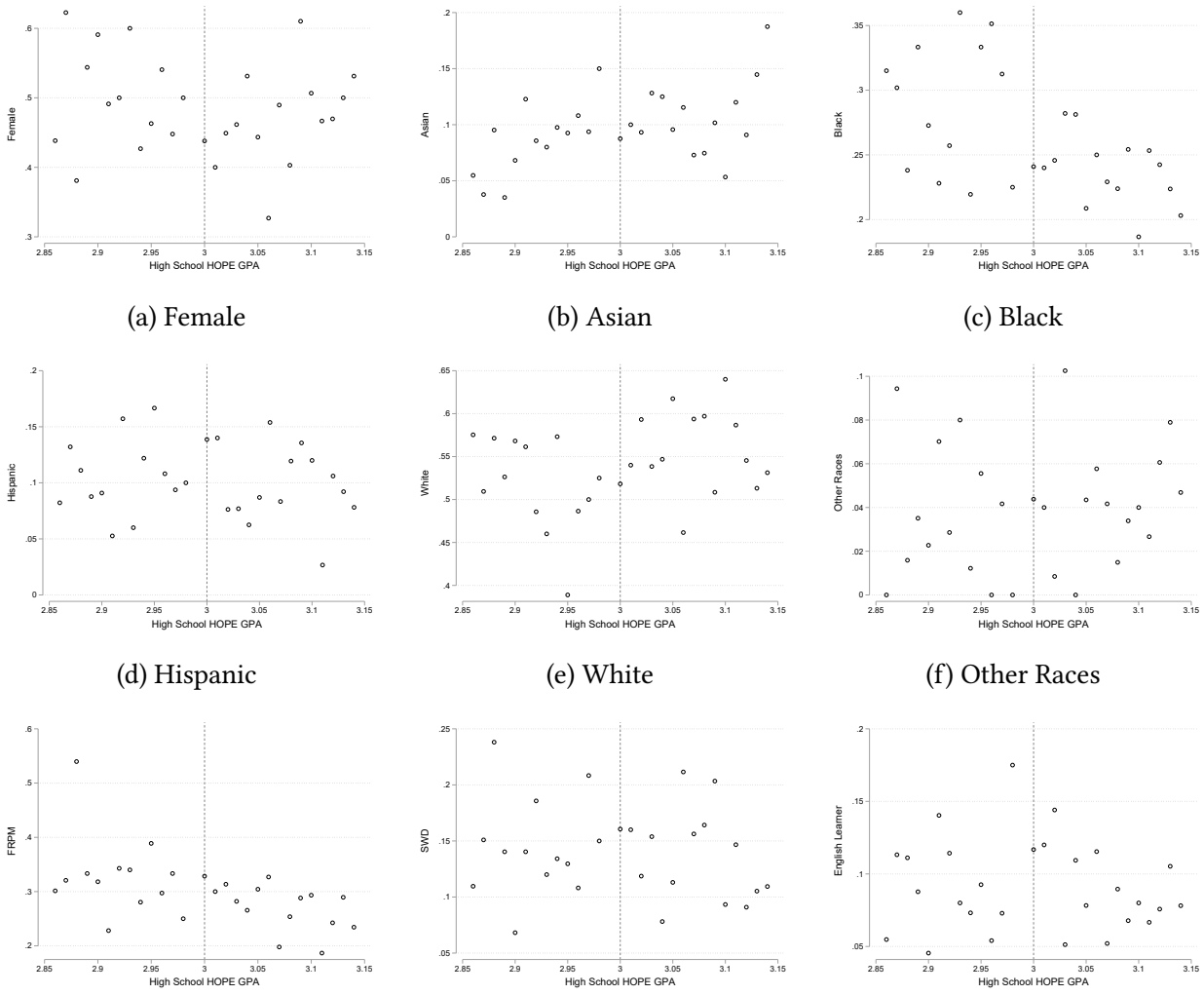
The NSC data include multiple records per student because enrollment information is reported at the term level, and additional records may appear when students transfer institutions or change enrollment intensity. To construct the analysis dataset, I collapse the NSC records to a student–institution level dataset. Institution characteristics are assigned based on the first record associated with each student–institution pair.

A3. Outcome Variable Construction

On-time college enrollment is defined for students matched to the NSC data who enroll in any postsecondary institution in the United States. Using the college start date and high school graduation date, I construct indicators for enrollment within specific time windows after high school graduation. Overall, 83.78 percent of students in the sample ever enroll in college after graduating from high school, 80.21 percent enroll within 16 months, and 77.82 percent enroll within 12 months. Indicators for enrollment in in-state, four-year, full-time, and public institutions, as well as enrollment by institutional selectivity, are defined based on the first institution attended after high school graduation, regardless of the timing of enrollment.

B. Supplementary Figures

Figure B1: Covariate Balance Check by Student Demographics



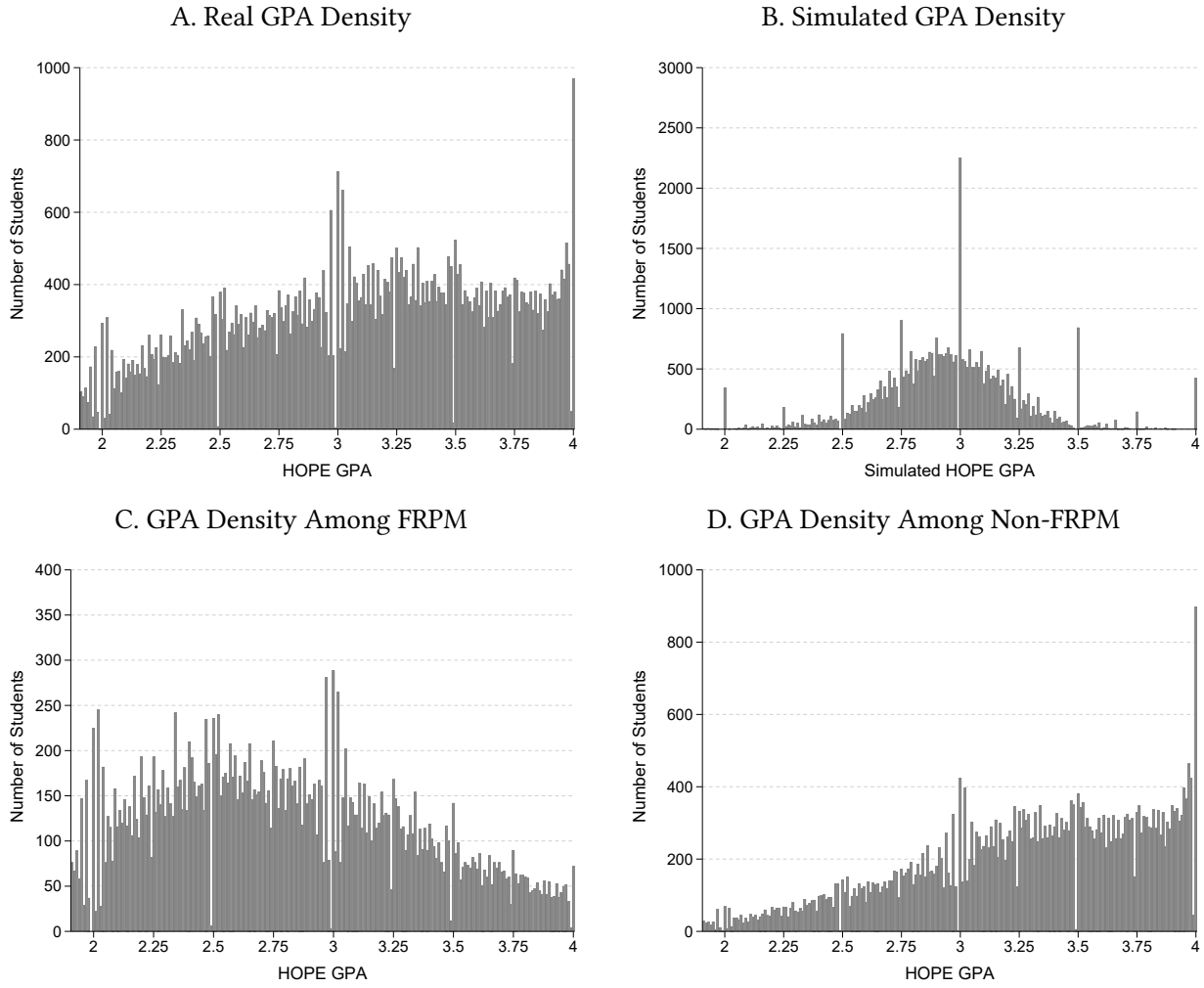
(a) Female (b) Asian (c) Black

(d) Hispanic (e) White (f) Other Races

(g) FRPM (h) SWD (i) EL

Note: Each figure shows the share of students in each demographic subgroup by HOPE GPA bins around the 3.0 eligibility cutoff, marked by a vertical dotted line. The sample includes older siblings who graduated from Metro Atlanta public school districts between 2012 and 2023 and were continuously enrolled in high school during the 12 months before graduation.

Figure B2: GPA Density Histograms

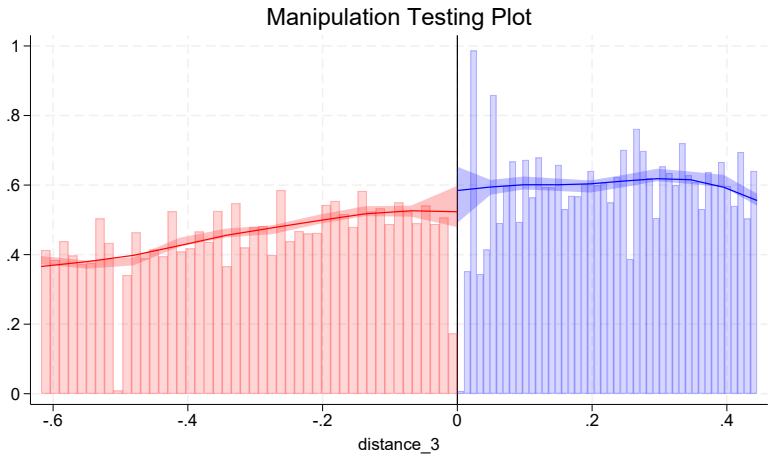


Note: The graphs display density histograms of students' high school HOPE GPA. The sample includes high school graduates from the 2012–2023 cohorts who resided in Georgia for at least 12 consecutive months prior to graduation and met the academic rigor requirements.

Figure B3: Running Variable Density Test



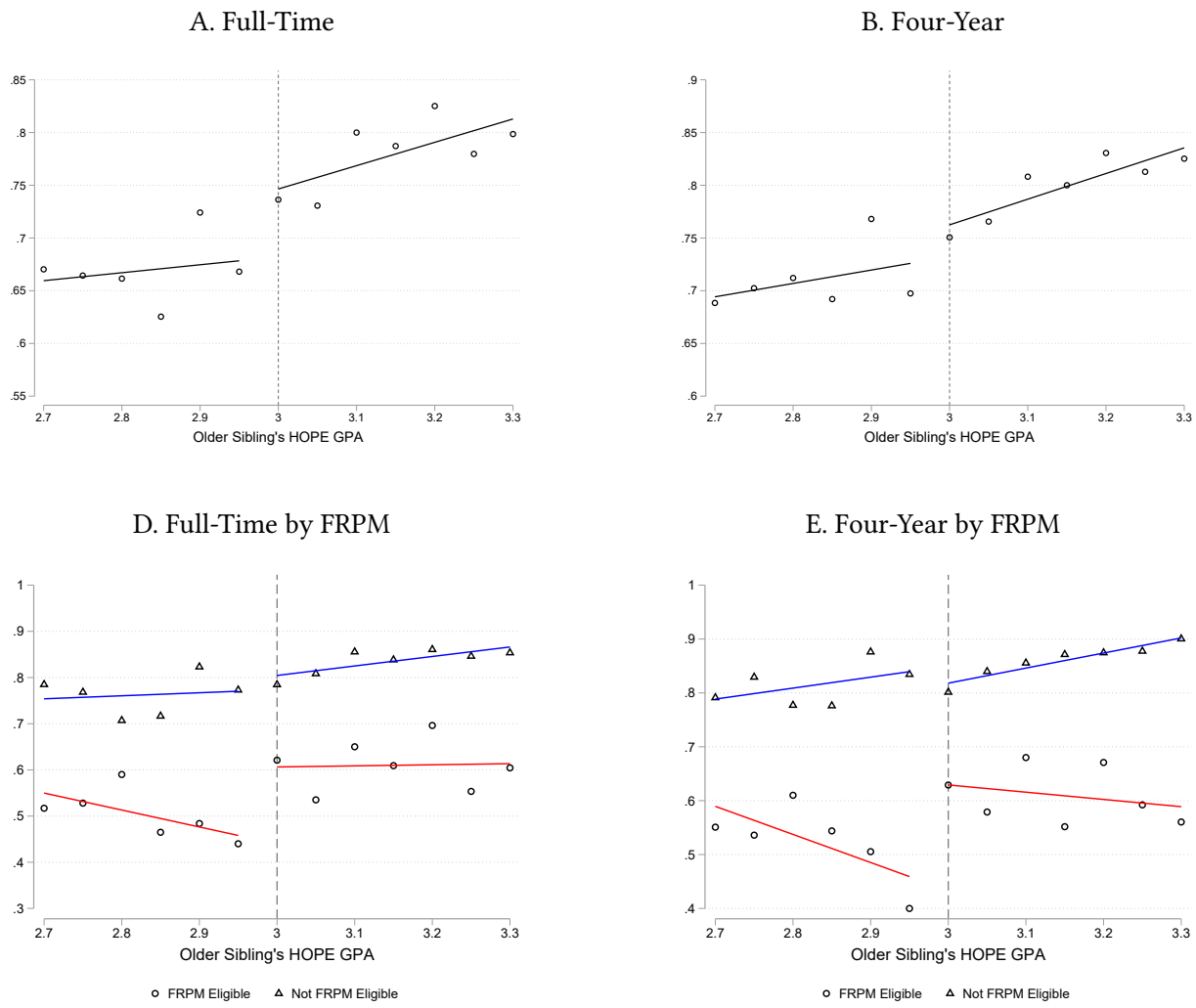
(a) With Cutoff



(b) Without Exact Cutoff Sample

Note: Each figure presents a density test around the cutoff of 3.0 following McCrary (2008). The sample includes students who graduated from public school districts in Metro Atlanta between 2011 and 2023 and who were continuously enrolled in high school for the 12 months preceding graduation. The solid black vertical line at 0 denotes the cutoff. Panel (a) displays the full density plot, where the 3.0 GPA cutoff is normalized to 0, and Panel (b) displays the density plot excluding observations with an exact 3.0 GPA. Panel (a) shows a statistically significant jump at the cutoff (p-value = 0.000), whereas Panel (b) shows no statistically significant discontinuity at the cutoff (p-value = 0.514).

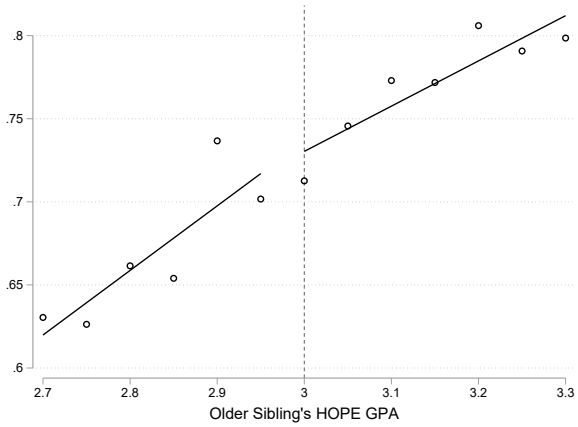
Figure A4: Scholarship Impacts on Younger Sibling's College Enrollment



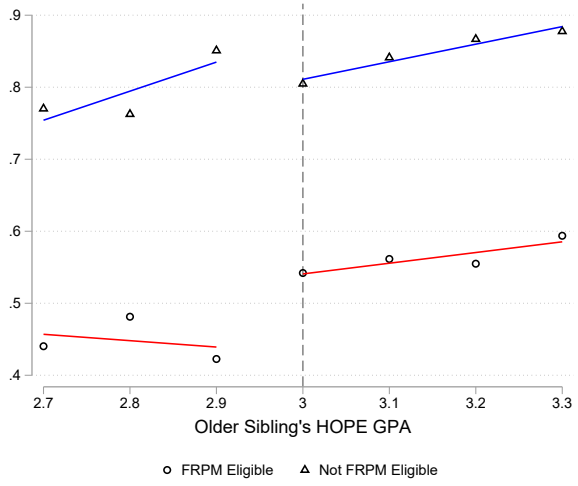
Note: Each panel displays regression discontinuity estimates of the effects of HOPE Scholarship eligibility on younger siblings' college enrollment outcomes. The younger sibling sample includes the oldest two siblings in two- or three-child households, whose older siblings resided in Georgia for at least 12 months prior to graduation and met academic rigor requirements. College enrollment data come from the National Student Clearinghouse.

Figure A5: Scholarship Impacts on Younger Sibling's College Choice by Selectivity

A. SAT 900+

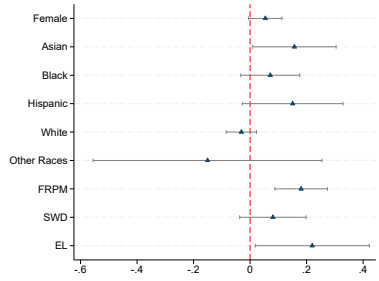


C. SAT 900+ by FRPM

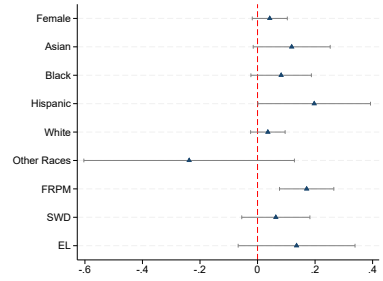


Note: Each panel displays regression discontinuity estimates of the effects of HOPE Scholarship eligibility on younger siblings' college enrollment outcomes. The younger sibling sample includes the oldest two siblings in two- or three-child households, whose older siblings resided in Georgia for at least 12 months prior to graduation and met academic rigor requirements. College enrollment data come from the National Student Clearinghouse.

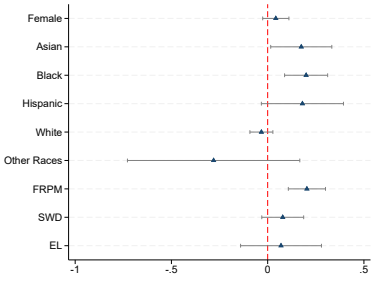
Figure B6: Scholarship Impacts on Younger Sibling's College Enrollment by Student Demographics



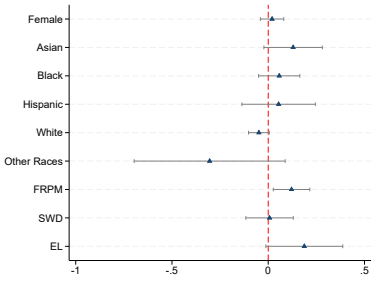
(a) Four-Year



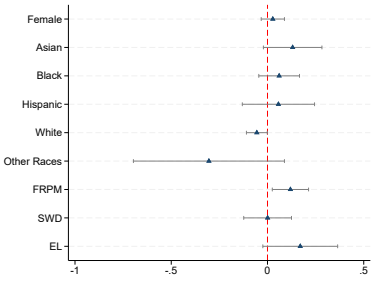
(b) Full-Time



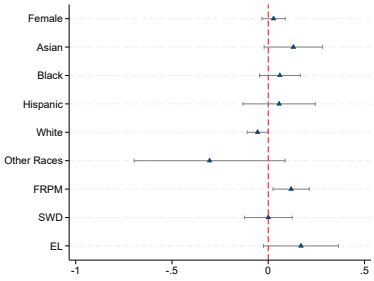
(c) Public



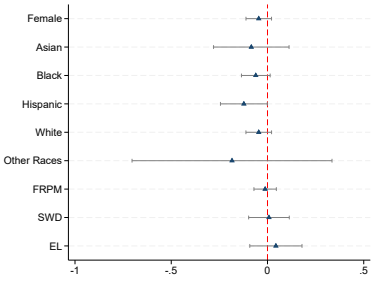
(d) SAT 900+



(e) SAT 1000+



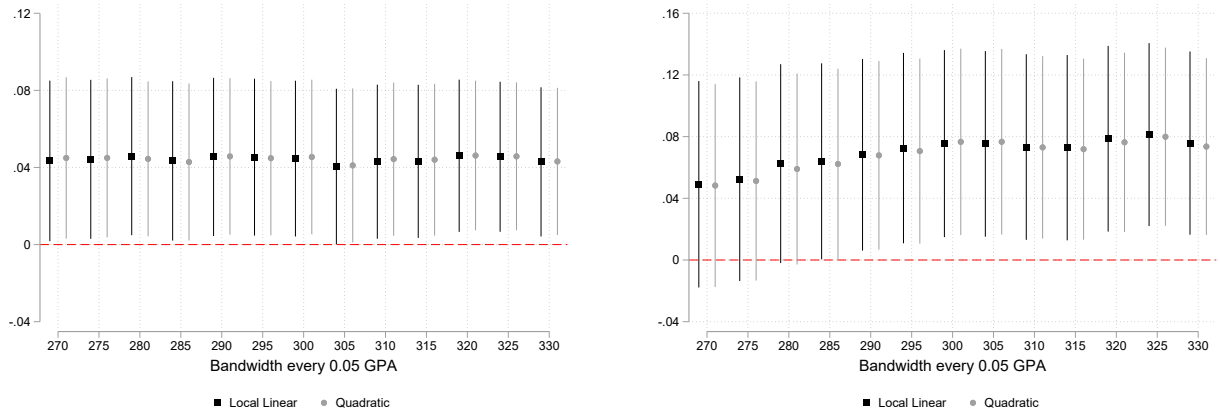
(f) SAT 1100+



(g) SAT 1200+

Note: Each coefficient shown in the figure reports heterogeneous regression discontinuity estimates of college enrollment outcomes by younger siblings' demographic characteristics. The RD bandwidth is 0.3, selected using the optimal bandwidth procedure. The younger sibling sample consists of the two oldest siblings in households with two or three children, where the older sibling resided in Georgia for at least 12 months prior to graduation and met academic rigor requirements. Standard errors are clustered at the sibling-identifier level, and all models include high school–by–cohort fixed effects. College enrollment data come from the National Student Clearinghouse.

Figure B7: Different Bandwidth for Younger Sibling's College Enrollment

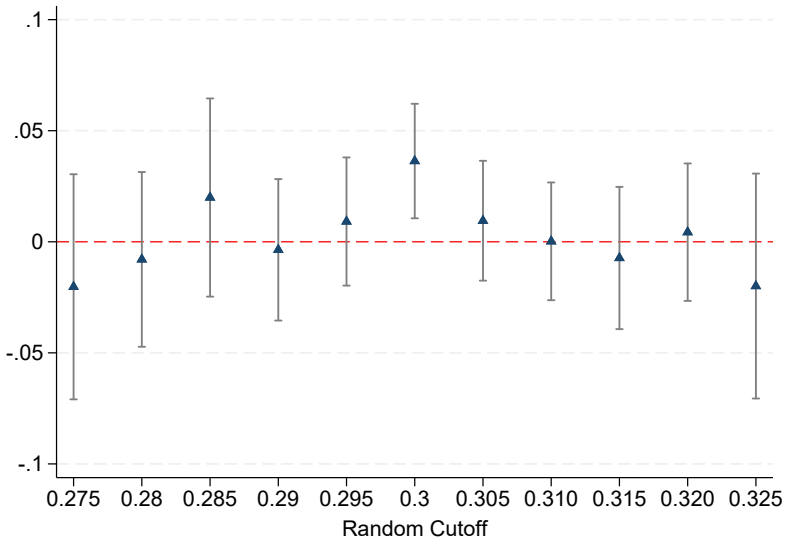


(a) On-Time Enrollment

(b) In-State Enrollment

Note: Each panel shows sensitivity checks using different RD bandwidths: Panel (a) displays on-time college enrollment, and Panel (b) shows in-state college enrollment for the younger sibling sample. Local linear and quadratic regressions are shown in each panel. The younger sibling sample includes the oldest two siblings in two- or three-child households, whose older siblings resided in Georgia for at least 12 months prior to graduation and met academic rigor requirements. College enrollment data come from the National Student Clearinghouse. All models control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Standard errors are clustered at the sibling-identifier level.

Figure B8: Falsification Test for Random Cutoff



Note: Each coefficient represents the estimated sibling spillover effect at a placebo cutoff. The younger sibling sample includes the oldest two siblings in two- or three-child households, whose older siblings resided in Georgia for at least 12 months prior to graduation and met academic rigor requirements. College enrollment data come from the National Student Clearinghouse. All models control for student demographics (sex, race/ethnicity, ever eligibility for free or reduced-price meals, English Learner status, and disability status) and include high school-by-cohort fixed effects. Standard errors are clustered at the sibling-identifier level.

C. Supplementary Tables

Table C1: Covariate Balance Check by Student Income Group

	(1) Female	(2) Asian	(3) Black	(4) Hispanic	(5) White	(6) Other Races	(7) FRPM Eligible	(8) Student With Disability	(9) English Learners
Panel A. All Younger Siblings									
GPA $\geq$ 3.0	-0.045	0.002	-0.019	0.016	0.006	0.001	0.003	-0.007	0.022
	(0.028)	(0.017)	(0.025)	(0.019)	(0.029)	(0.009)	(0.025)	(0.019)	(0.016)
N	3,848	3,848	3,848	3,848	3,848	3,848	3,848	3,848	3,848
R-Squared	0.004	0.004	0.025	0.006	0.018	0.000	0.032	0.002	0.008
Panel B. FRPM Eligible Siblings									
GPA $\geq$ 3.0	-0.054	0.048*	-0.021	0.009	-0.016	0.014		0.010	0.069
	(0.056)	(0.025)	(0.054)	(0.050)	(0.040)	(0.021)		(0.032)	(0.046)
N	1,145	1,145	1,145	1,145	1,145	1,145		1,145	1,145
R-Squared	0.005	0.007	0.012	0.005	0.003	0.002		0.000	0.007
Panel C. Non-FRPM Eligible Siblings									
GPA $\geq$ 3.0	-0.067*	-0.026	-0.026	-0.003	0.048	-0.000		-0.007	0.004
	(0.037)	(0.025)	(0.027)	(0.018)	(0.035)	(0.013)		(0.029)	(0.015)
N	2,698	2,698	2,698	2,698	2,698	2,698		2,698	2,698
R-Squared	0.006	0.002	0.002	0.003	0.001	0.000		0.003	0.000

Note: Panel A regresses demographic characteristics on an indicator for scholarship eligibility for the full student sample, while Panel B reports corresponding estimates for the FRPM eligible siblings, and C reports the Non-FRPM eligible siblings. The regression bandwidth is 0.3 in Panel B, based on the optimal bandwidth procedure. Standard errors (in parentheses) are clustered by high school HOPE GPA. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C2: High School Course Taking Behavior by HOPE Eligibility

	Rigor (1)	AP (2)	IB (3)	Dual (4)
During 10th Grade	0.001	-0.027	-0.001	-
	(0.103)	(0.031)	(0.001)	-
Y-Mean	3.49	0.32	0.00	0.00
Druing 11th Grade	-0.162	-0.071	-0.008	-0.012
	(0.115)	(0.072)	(0.015)	(0.012)
Y-Mean	5.50	1.30	0.06	0.02
During 12th Grade	-0.095	-0.042	-0.029	0.014
	(0.099)	(0.084)	(0.020)	(0.049)
Y-Mean	4.53	1.42	0.07	0.37
N	11,885	11,885	11,885	11,885

Note: This table reports the robustness check for showing the continuity of the course taking behavior among the older siblings. All models include demographic controls and school-by-cohort fixed effects. Each column represents a separate regression. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C3: Sibling Spillovers of Zell Miller Scholarship

	(1) On-Time	(2) GA College	(3) Full-Time	(4) Four-Year	(5) Public	(6) SAT 900+	(7) SAT 1000+	(8) SAT 1100+	(9) SAT 1200+
Older GPA $\geq$ 3.7	-0.013	0.041	0.020	-0.001	0.075*	-0.004	-0.012	-0.016	-0.045
	(0.025)	(0.050)	(0.029)	(0.034)	(0.039)	(0.032)	(0.032)	(0.034)	(0.051)
Control Mean	0.932	0.609	0.642	0.907	0.784	0.883	0.862	0.842	0.485
R-Squared	0.200	0.123	0.205	0.159	0.117	0.213	0.214	0.218	0.166
N	1,496	1,496	1,496	1,496	1,496	1,496	1,496	1,496	1,496

Note: The regression discontinuity bandwidth is 0.25, based on the optimal bandwidth calculation. Standard errors are reported in parentheses and are clustered at the sibling-pair level in Panel B. The first-stage estimate is 0.085 (p = 0.051), with an F-statistic of 4.42 and an R-squared of 0.118. All models include demographic controls (sex, race/ethnicity, FRPM eligibility, English Learner status, and disability status) and high school-by-cohort fixed effects. Each column corresponds to a separate regression. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.