



Geographic and Community Influences on College Savings: Evidence from the Universe of Pennsylvania 529 Account Holders

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Abstract

Families' college savings behaviors are important determinants of students' postsecondary enrollment and degree attainment. While prior work has examined how economic and sociological aspects of families shape savings behaviors, no study has examined how geographic or community-level factors relate to families' college savings. Drawing from prior work on the role of place in shaping economic and educational outcomes, our study leverages administrative records on the universe of Pennsylvania 529 account holders and beneficiaries in Pennsylvania (N=197,889) paired with a variety of community-level indicators to descriptively interrogate which geographic features or community influences relate to families' selection of a college savings plan, their first and mean contributions, and the frequency of savings. Our results suggest there are key community factors that help shape college savings, including socioeconomic status, income inequality, and nonprofit community resources. While these features have been linked to other economic and educational outcomes, our work is the first to document their association with families' college savings and not only provides policymakers and future researchers with important information on targeting college-going and college-saving resources but also on the salience of place in shaping yet another educational outcome.

Keywords: 529 plans; college savings; communities; descriptive analysis; income inequality; Pennsylvania; socioeconomic status; sociology of education

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Disclosures

Robert Nathenson discloses prior work on behalf of the Pennsylvania Treasury.

Introduction

While completing some education beyond high school was once simply a gateway to the American middle class, earning a college degree is now central to upward social mobility in the modern economy (Chetty et al., 2020). Individuals with a postsecondary credential, on average, earn more, live longer, and yield a host of positive externalities for society (Ma et al., 2019). Despite these benefits, access to college in the United States remains unequal along many dimensions, where students' opportunities and outcomes are sharply divided along racial, socioeconomic, and geographic lines. These unequal opportunities and unequal outcomes are due in part to rising college prices and declining affordability, which disproportionately impact students from groups traditionally underrepresented in higher education (Page & Scott-Clayton, 2016). The average price of tuition and fees at public, four-year colleges has risen dramatically over the last two decades alone, up nearly 101% in constant dollars (College Board, 2020). Yet, over the same period, median household income rose just over 9.6% (Federal Reserve Bank of St. Louis, 2020).

Students and families have few options to pay escalating prices, typically relying on some combination of savings, grants (or "scholarships"), and loans. To date, however, federal and state aid programs have not kept pace with rising costs, and, while loans are a viable mechanism to increase access, evidence on their costs and benefits for important student groups—like students of color and those enrolled at community colleges—remains mixed (Long & Riley, 2007; Singell & Stone, 2007). Under the remaining mechanism (savings), a broad body of literature has considered family savings for traditional-age students' college costs and its impact on enrollment and attainment (Cheatham & Elliott, 2013; Conley, 2001; Hamilton, 2013). This breadth of work has focused predominantly on economic and sociological aspects of the family, including how

race, gender, parental education, and income shape college savings behaviors (Hillman et al., 2015; Quadlin & Conwell, 2020; Song & Elliott, 2012). Yet despite the salience of place and local communities in shaping students' educational and economic trajectories (Chetty & Hendren, 2018), no study to our knowledge has examined how geographic or community-level factors relate to college savings behaviors.

A growing body of evidence has linked many geographic and community features to students' educational opportunities and outcomes (Chetty, Hendren, & Katz, 2016; Chetty, Hendren, Kline, et al., 2014; Chetty, Hendren, Lin, et al., 2016). In this light, we might similarly expect household college savings behaviors to be influenced by both community features (e.g., composition of the neighborhood, other households' educational attainment, or income) and community resources (e.g., institutions and infrastructure). Prior work has not only found that local institutions and organizations are instrumental in the development of individual social capital, but also that features of communities themselves (like average educational attainment or racial composition within communities) are significantly related to financial literacy and the availability of financial resources (Faber, 2019; Lachance, 2014). Thus, both the presence of community resources and the presence of college-educated or college-saving individuals, for example, may aid the transmission of the importance of saving and of college savings options. This reality may ultimately influence whether (and how) households develop "college-bound identities" and save for college (Elliott et al., 2011).

In this study, we leverage administrative records on the universe of Pennsylvania 529 (PA529) account holders and beneficiaries in Pennsylvania paired with a variety of community-level indicators to begin descriptively interrogating which community features and resources are related to savings behaviors. These data allow us to observe a host of college savings outcomes

(savings overall, plan selection, contributions, savings occurrences), as well as many demographic, economic, and social features of communities at the zip-code level. In all, our study seeks to extend existing works on college savings and the role of place in shaping students' educational opportunities and outcomes by examining how these geographic and community factors are related to college savings behaviors. In addition to filling this existing gap in knowledge, this focus provides us with the ability to generate information for policymakers on potential avenues to increase savings behaviors and to identify areas or communities within which savings-support resources could be targeted.

Literature Review

The college savings behaviors of students and families are important determinants of subsequent postsecondary enrollment and degree attainment. Indeed, college savings can influence whether and where students enroll in college and influence ultimate college completion (Charles et al., 2007; Elliott & Beverly, 2011). Cheatham and Elliott (2013) found that the importance of saving for college on subsequent enrollment extends to students with documented disabilities, and O'Connor et al. (2010) found that there is a sharp enrollment penalty for students whose families have *not* saved for college—and that this penalty is higher for Hispanic students than their White counterparts. While many studies find this correlational link between savings and college enrollment, more recent evidence documents large causal impacts of savings on enrollment (Song & Petracchi, 2020). Mechanically, these savings behaviors may not only provide financial resources to pay costs associated with college attendance but may also impact students' educational aspirations, a concept which has driven the widespread use of College Savings Accounts (CSAs) at the state and local levels (Conley, 2001; Elliott & Beverly, 2011; Song & Elliott, 2012). A large body of work has documented the salience of these college

aspirations on K-12 academic achievement and subsequent college enrollment (Nelson, 1972; Somers et al., 2002), and other works have documented how educational aspirations are impacted by students' environments, including individual, familial, peer, school, and community characteristics (Antonio, 2004; Ceja, 2004; Kiyama, 2010; Stewart et al., 2007). Under these contexts, both Elliott et al. (2011) and Zhan and Sherraden (2003) found a strong link between students' college expectations and savings. In all, college savings remains an important determinant of educational aspiration, enrollment, and attainment—and the notion of *place* may play an important role in college savings.

Prior work has focused on how economic and sociological aspects of the family influence college savings behaviors. Hillman et al. (2015) found substantial variation in (1) the level of financial support parents expected to be able to provide their children, (2) whether the family had a college savings account, and (3) the timing of college savings and preparation activities along dimensions of race, gender, parental education, and income. This analysis was extended by Quadlin and Conwell (2020) to examine the interrelatedness of academic achievement, race, and gender in parental college savings. The authors found that families of Black boys and girls saved less for college overall than their White counterparts but also that high-achieving Black girls were particularly disadvantaged in this process. The average savings for high-achieving Black girls was not only substantially less than those of high-achieving students in other racial groups but was equivalent to savings levels for Black girls of the weakest academic credentials. Song and Elliott (2012) similarly found that Hispanic families' expectations for their child's academic achievement mediated the relationship between their savings behaviors and students' ultimate college enrollment, and Hossler and Vesper (1993) found parents' own knowledge of college costs to be strongly related to savings behaviors. Additional works have found that race and

family size not only impact college savings but also the mechanisms by which families save for college (Steelman & Powell, 1989). Despite these works, no study to our knowledge has examined how geographic or community-level factors relate to college savings behaviors.

The Role of Place

Where students live and the features of their local communities have salient impacts in shaping their educational and economic trajectories, and a growing body of evidence has linked many geographic and community features to students' educational opportunities and outcomes. Chetty and Hendren (2018a, 2018b) show that the zip code and county in which a child grows up strongly determines their chances for upward social mobility and that students who moved to “better” (low poverty) neighborhoods had better long-run economic outcomes. This connection was also examined in the *Moving to Opportunity* experiment by Chetty, Hendren, and Katz (2016), where families were randomly provided assistance to move to better neighborhoods. The authors found that, for those who did, their children earned nearly \$302,000 more across their lifetime. Chetty, Hendren, Kline, et al. (2014) found that much of this variation in outcomes by place could be attributed to differences in residential segregation, income inequality, K-12 school quality, social capital, and family stability across neighborhoods. When examining disparities by gender and income in employment, earnings, and college attendance, Chetty, Hendren, Lin, et al. (2016) additionally found that income, the prevalence of racial minority and single-parent families, and proxies for neighborhood disadvantage were also strongly related to students' short- and long-run outcomes. In this light, we might similarly expect household college savings behaviors to be influenced by where families live. These influences could include both community features (e.g., composition of the neighborhood, other households' educational

attainment or income, and disadvantage) and community resources (e.g., institutions, infrastructure, and social capital).

Prior work has found local institutions and organizations to be instrumental in the development of individual social capital, as well as features of the communities themselves (educational attainment or racial composition) to be significantly related to the availability of financial resources and to important outcomes (like financial literacy). Faber (2019) found that the availability of financial resources varied widely by neighborhoods' racial composition and income, and Lachance (2014) found that the average education level within a zip code was the strongest predictor of residents' financial literacy. Lachance (2014) attributed this finding to the impact of individuals' advantaged or disadvantaged social networks and found that this zip-code-level determinant extended to various other savings and credit measures. Beyond these peer effects, Roman and Moore (2004) documented the role of local organizations in facilitating the development of individual social capital and in the support of neighborhood outcomes, observing that the number of community-based, social service, religious, and pro-social organizations was positively related to individuals' satisfaction, neighborhood engagement, trust and reciprocity, social control, and social cohesion. Thus, we might expect the presence of community resources (schools, social capital, or nonprofit organizations)—alongside community features (the presence of college-educated or college-saving individuals)—to additionally influence college savings behaviors by facilitating social networks, transmitting college-going or college-saving information, or providing structural resources to support these activities.

Pennsylvania's 529 College and Career Savings Program

Our study leverages data on the universe of PA529 account holders and beneficiaries in Pennsylvania to examine how community features and resources relate to savings behaviors.

This state-run program is one of the largest college-savings programs in the nation, with more than 330,000 unique PA 529 accounts and more than \$9 billion in total assets (Pennsylvania Treasury Department, 2026). This has been fueled in part by Pennsylvania's investment of \$100 for every baby born or adopted in the state since 2019 through the Keystone Scholars Program, which, during the pilot phase, doubled the likelihood a family opened a PA 529 account within the first year of a child's life (Nathenson & Pennsylvania Treasury Department, 2022). There is no income limit or restriction on who can contribute to a savings plan, and the minimum contribution is now only \$1. Contributions may be deducted from state income tax, and there is no fee or tax penalty on qualified withdrawals—which can be used to pay in-state or out-of-state higher-education costs. Contributions can also be used for some expenses in recognized credential and registered apprenticeship programs, and up to \$20,000 a year may be used for elementary or secondary school tuition (Pennsylvania Treasury Department, 2026). Funds may be invested in two ways: the Guaranteed Savings Plan (GSP) or the Investment Plan (IP). The GSP is a lower-risk plan indexed to tuition growth, where funds are determined by the Pennsylvania Treasury, whereas the IP is a portfolio-driven plan where plan owners can select from a variety of Vanguard investment vehicles. Under both plans, contributions grow free of federal and state income tax.

Data and Measures

The primary source of data for this project are administrative records from the Pennsylvania Treasury Department on the state's 529 college savings program. These records cover the universe of account holders and beneficiaries from Q1 2006 through Q4 2018 and include information on owner and beneficiary age, savings plan and investment type, contributions, withdrawals, and automatic investment selections, as well as zip codes for both

parties (beneficiary and owner) and a host of other data. The data used for this study were fully deidentified with respect to names, full addresses, and social security numbers. We focus specifically on four primary outcomes of interest: the plan selection (GSP or IP), the size of the first contribution, the mean contribution over all activity, and the average annual number of contributions (aggregated to a quarterly basis; up to four per year). These outcomes allow us to observe households' engagement with the 529 program and the size, frequency, and length of college savings contributions. We also observe and include several account-level variables that may be related to these savings outcomes, including the account owner age (at the year of account opening), the beneficiary age (at the year of opening), the delivery preference for account-related correspondence (email or letter), and whether or not the account has active automatic contributions. After isolating owners and beneficiaries who reside in the state, complete records with zip-code information on both parties cover 197,889 accounts.¹

To understand how community features and resources relate to these college savings behaviors, we merge this dataset with a variety of zip-code-level geographic and community factors and sociological indices from other sources, including information on socioeconomic status (SES), concentrated affluence and disadvantage, income inequality, K-12 schools, and community resource organizations. This dataset allows us to observe the universe of college savers and their behaviors alongside a host of geographic and community factors (features and resources) of interest, including:

Socioeconomic status. From the U.S. Census Bureau's American Community Survey (5-year estimates), we derive a zip-code-level measure of socioeconomic status following prior

¹ A PA 529 account may be held by a resident of another state or invested for a beneficiary in another state. Given our focus on geographic and community-level factors (and spatial proximity among households), we focus on those who reside in the state and have valid zip codes.

work by Cowen et al. (2012) and Jang and Reardon (2019). This standardized composite measure captures median household income, median housing prices and rent levels, the unemployment rate, poverty levels, and educational attainment.

Concentrated affluence and disadvantage. Also from the American Community Survey, we derive two zip code-level measures of communities' economic contexts. Guided by Massey (1996), we observe a standardized level of concentrated affluence, which combines the percentage of families with incomes of \$75,000 or higher, the proportion of adults with a college degree, and the proportion of adults working in managerial or professional roles. Conversely, we also observe communities' levels of concentrated disadvantage, a composite measure of the proportion of families below the poverty line, the proportion on public assistance, the proportion of households headed by single women, and the unemployment rate (Wodtke et al., 2011).

Income inequality. With the knowledge that economic segregation and income inequality can also impact educational outcomes (Chetty, Hendren, Kline, et al., 2014), we collect the most recent zip code-level Gini Index from the American Community Survey (Reardon, 2011). Gini is a measure of income inequality within each region, and the standardized measure ranges from 0 (perfect equality) to 1 (perfect inequality).

K-12 schools. From the U.S. Department of Education's Common Core of Data, we collect the number of public and private schools in each zip code to consider school prevalence as an indicator of additional sources of community resources and to proxy for the likelihood of college and college-savings related activities (e.g., college fairs) for an additional feature.

Community resources. Finally, as a direct measure of nominal community resources and institutions that could facilitate educational and economic opportunity (Roman & Moore, 2004),

we collect the number of 501(c)(3) non-profit organizations operating in each zip code from the Urban Institute's National Center for Charitable Statistics Data Archive.

Descriptive statistics covering the outcomes and predictors of interest among our analytic sample are presented in Table 1. Roughly half (47%) of the sample selected the (lower risk) GSP plan and made an initial contribution of \$2,905. The average number of contributions to an account per year was 2.41 (quarterly, out of 4) from 2006 through 2018 at an average contribution amount of \$325. These descriptives also point to large differences in college savings behaviors and access to community resources among the sample, including wide variation in the size of the first and mean contributions, the number of annual contributions, and access to K-12 schools and nonprofit organizations.² Given statewide coverage, there is also wide variation in the measures of community SES, concentrated affluence and disadvantage, and income inequality across our sample.

Methods

Given the exploratory nature of this study, we employ correlational and regression analyses to descriptively examine how these geographic and community factors are related to college savings outcomes. After examining how each predictor relates to our outcomes of interest, we ask how, after controlling for account-level details, each community feature and resource (individually and collectively) predicts (1) selection of a savings plan, (2) the size of the first contribution, (3) the average contribution amount, and (4) the annual number of contributions. In the regression framework, we model these relationships using an ordinary least-squares (OLS) solution represented by

² Recall, there are virtually no limitations on contributions, who can open an account, or who can be a beneficiary. Among the 197,889 records, 350 accounts received initial contributions over \$100,000. Accounts can be opened for oneself or for others and can also be used to pay education-related expenses (e.g., loans). Accounts are also tax-free and inheritable.

$$\text{Savings}_{izc} = \alpha_0 + \beta \text{Account}'_{izc} + \lambda \text{Features}'_{izc} + \theta \text{Resources}'_{izc} + \phi_t + \pi_c + \varepsilon_{izc},$$

which suggests a college savings behavior for household i in zip code z and county c is a function of household or account information (owner and beneficiary age, account preferences), the community *features* of interest (SES, concentrated affluence, concentrated disadvantage, income inequality), and the community *resources* of interest (K-12 schools, nonprofit organizations). We also control for across-region, time-variant factors with year-of-account-open fixed effects (ϕ_t) and for region-specific, time-invariant characteristics with county fixed effects (π_c). We log financial outcomes (first and mean contribution) given highly skewed distributions and use a linear probability specification when predicting savings plan selection (GSP versus IP). Further, given that prior work has established that outcomes for individuals within communities—and particularly those in education—are impacted by those of their neighbors or peers (Burdick-Will, 2018), we estimate heteroscedastic-robust standard errors clustered at the county level. These models allow us to explore if, and to what extent, each geographic and community factor is associated with a college savings behavior.

Results

Correlations among our outcomes and predictors of interest are presented in Table 2. While our outcomes are similar in nature, they appear to capture distinctive savings behaviors. The strongest correlation among them is between the first and mean contributions, but only at a level of 0.47. Furthermore, while our predictors and indices share many common features, they too capture distinct measures of community features and resources. The only correlations above 0.50 are between SES and concentrated disadvantage (-.74) and between nonprofit organization counts and the number of K-12 schools (0.66). In all, these suggest our data are equipped to

provide us with useful insights into how various college savings behaviors vary with many distinct neighborhood features and resources.

Regarding our outcomes of interest, the strongest correlates to GSP plan selection were socioeconomic status (-.15) and beneficiary age (.10), suggesting households in higher-SES zip codes were more likely to choose the Investment Plan (IP) option, and that accounts for older children (nearer college-age) were more likely to be invested in the less-risky GSP plan. For first contribution size, the strongest correlates were owner age (.14), beneficiary age (.12), automatic investments (-.16), and SES (.12). These suggest that accounts held by older individuals, for older children, and in higher-SES neighborhoods had higher average initial contributions, but that accounts where owners chose to make automatic (recurring) contributions, the initial investment was less. The strongest correlates to mean contribution amount were SES (.21), concentrated disadvantage (-.12), and income inequality (.13), suggesting that average investment amounts increased as neighborhood SES and income inequality increased—but decreased in areas with higher concentrated disadvantage. The strongest correlate to the frequency of contributions was a mechanical association with automatic investments (.66), but also with account owner age (-.18) and email notification delivery (.13). These suggest older account owners make fewer annual contributions but that those who receive emailed account statements or updates made more annual contributions.

Results from OLS regressions are presented in Table 3 for the four primary college savings outcomes of interest.³ Across the four full models, three factors emerged as significant

³ See the Appendix for (1) reduced models relying only upon account information and fixed effects, (2) models with each individual predictor or index added to those controls in a stepwise fashion, and (3) fully saturated models with all predictors and all controls.

and consistent predictors of our college savings behaviors of interest: SES, income inequality, and nonprofit community resources.

Socioeconomic status. Community-level SES is a statistically significant predictor of plan selection, first and mean contribution amounts, and contribution frequency. Our models suggest that, even after controlling for other factors, when neighborhood SES increased by 1 standardized point, the likelihood a household within that neighborhood chose the GSP (over the investment-driven IP) plan decreased by approximately 7.1 percentage points. Similarly, as SES increased, the first and mean contribution grew by approximately 42.8% and 45.9%, respectively. From the mean, this difference equates to a roughly \$1,240 higher first contribution and a roughly \$150 higher mean contribution. Zip-code-level SES was also associated with a significant reduction in the average number of annual contributions, but this figure was nominally minimal (-0.06 on a contribution range of 0-4).⁴ In all, these results suggest individuals in higher SES neighborhoods were more likely to choose the investment-driven IP plan, which might accrue higher annual interest and yield higher overall savings balances for students, and to make larger first and mean contributions.

Income inequality. Like SES, the Gini Index remained a statistically significant predictor for all four outcomes of interest. As the level of income inequality increased in a zip code, household selection of the GSP plan was predicted to fall by approximately 2.9 percentage points for every step along the Gini Index. Similarly, as income inequality increased incrementally, first and mean contributions were predicted to grow by 14.4% and 14.2%, respectively. These equate to roughly \$420 higher initial contribution and an increase in the mean contribution of over \$45.

⁴ This finding may reflect true contribution differences or may be driven by us being “overpowered” to detect any small differences as statistically significant given our large sample size ($N=197,889$). In either case, the finding is not materially meaningful.

Also, like SES, each additional step up along the Gini Index (toward higher income inequality) was associated with 0.03 fewer annual contributions. These results cumulatively suggest that families within neighborhoods with greater income inequality preferred the investment-driven IP plan and made larger first and mean contributions. This is likely driven by the savings behaviors of those at the upper end of the income distributions within each of these zip codes.⁵

Community resources. The number of 501(c)(3) organizations operating in each zip code, a measure of community resources and support, was associated with significant, albeit small changes in families' savings behaviors. While we find no meaningful relationship between nonprofit organizations and the average annual number of contributions, we find that each additional organization was associated with a reduction in the likelihood of GSP selection by a small 0.01%. Our models also suggest that every additional community organization was associated with an 0.03%-0.05% increase in families' first and average contributions. While this growth is small, a one-standard-deviation increase in the number of nonprofit organizations ($\sigma = 83.5$) would be associated with a predicted increase in the first contribution of over \$120 and the average of nearly \$10.⁶ These results suggest that the number of community resources may be associated with contribution amounts but that the type of community resource may matter. That is, while we observe these relationships between 501(c)(3)s and household savings, we do not detect any relationship between K-12 schools and our outcomes.

Discussion

⁵ That is, income is bounded by \$0 but can increase infinitely in the positive direction. Therefore, at a point, a measure of income inequality can only increase by those on the upper end of the income distribution continuing upward. Thus, as income inequality increases, we expect savings changes to be driven by those high-earning households (as evidenced here).

⁶ For example, regarding first contribution: $(0.05 \times 83.5) = 4.175$ and $\$2,905 \times (4.175/100) = \121 .

The college savings behaviors of students and families are important determinants of subsequent postsecondary enrollment and degree attainment, and, while prior work has examined how economic and sociological aspects of families shape savings behaviors, no study to our knowledge has examined how geographic or community-level factors relate to families' college savings. Drawing from prior work on the role of place in shaping students' educational opportunities and outcomes, we extend existing literature on college savings by examining how various community features and community resources relate to college savings. Our study leverages administrative records on the universe of PA529 account holders and beneficiaries in Pennsylvania paired with a variety of community-level indicators to descriptively interrogate which geographic features or community influences relate to families' college savings behaviors. Our results suggest there are key community factors that help shape college savings, including socioeconomic status, income inequality, and community resources.

We find two key features of communities—socioeconomic status and income inequality—to be significantly predictive of college savings plan selection, first and average contributions, and contribution frequency. As neighborhood socioeconomic status and income inequality increased, families in Pennsylvania made larger initial and average contributions and increasingly preferred the investment-driven plan (IP) rather than the guaranteed savings plan (GSP). While these findings are the first to link these community features to college savings, they reinforce and extend the prior work of Chetty, Hendren, Kline, et al. (2014) and Chetty, Hendren, Lin, et al. (2016), which found income, educational attainment, and unemployment (factors within our SES scale), as well as income inequality, to be significantly predictive of students' long-run employment, earnings, and college attendance outcomes. While SES may be an unsurprising correlate to college savings, our work underscores the impact of access to

physical and social capital (or lack thereof) for students in their educational aspiration and college-going process. These results suggest that students and families in lower-SES neighborhoods may be additionally disadvantaged in the college-savings process. Furthermore, while prior work has documented reduced economic mobility and earnings among children growing up in racially and economically segregated areas (Chetty & Hendren, 2018; Chetty, Hendren, & Katz, 2016), our findings suggest that income inequality may also have stark implications for families' college savings.

In addition to key community features, our results suggest that the presence of key community resources, 501(c)(3) nonprofit organizations, also strongly relate to college savings behaviors. Like the work of Chetty, Hendren, Kline, et al. (2014) and Roman and Moore (2004), which identified access to community resources as key determinants of individual social capital and economic opportunity, our results suggest that community-based organizations may also influence savings through, among other mechanisms, social networks and the transmission of college-going or college-saving information. Our findings suggest that each additional nonprofit organization within an account holder's zip code was associated with increased first and mean contributions. Prior work by Lachance (2014) found that community organizations impact individuals' advantaged or disadvantaged social networks, suggesting these organizations could not only mechanically support college-savings behaviors by facilitating connections (among college-saving and non-saving families) or by transmitting college-going or college-saving information but also by providing structural resources to support these activities. Our disparate findings between null K-12 school relationships and positive nonprofit organization relationships may suggest that the type of community resource may matter in the college-savings arena—and may be additionally reflective of other differences across communities (the concentration of K-

12 schools or nonprofit operations within urban areas). In all, we find that, in addition to the composition of local communities, access to these resources to support and facilitate the college-savings process also matter for families.

While we worked diligently to provide a careful, first descriptive analysis of geographic and community influences on college savings behaviors, our study is not without notable limitations or opportunities for improvement. Given our administrative records, our largest blind spot is on the extensive savings margin in our inability to observe families who do *not* save for college or families who may save for college in different ways. Yet even with this limitation, our large sample size and rich set of individual and community covariates still allow us to make meaningful observations about how features of and resources within communities relate to investment decisions, contribution levels, and savings frequency of college-savers. Just as prior work has examined how educational aspirations or college savings relate to postsecondary enrollment and attainment, future work in this area should examine how these regional factors relate to college enrollment and college choice. Understanding how these geographic and community influences relate to college savings and subsequent enrollment will help us better understand how these community features and resources ultimately relate to students' educational outcomes.

In addition to filling a gap in extant knowledge, our study also has important implications for public policy. Our findings that students within lower-SES and economically segregated communities, and those with reduced access to nonprofit community resources, are likely to have lower levels of savings to support their postsecondary pursuits should provide policymakers or state college-savings program administrators with useful information for identifying communities for increased outreach or 529-plan participation incentives.

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Table 1. Descriptive Statistics

Variable	N	Mean	St. Dev.	Min	25 th Pctl.	75 th Pctl.	Max
Plan Selection (GSP)	197,889	0.47	0.50	0	0	1	1
First Contribution (\$)	197,889	2,904.99	9,301.18	0	100	1,525	446,374
Mean Contribution (\$)	197,889	325.35	537.15	0.02	37.20	357.69	12,576.92
Mean Annual N Contributions	197,889	2.41	1.33	0.08	1.00	3.70	4.00
Account Owner Age (at open)	197,889	42.78	11.29	0	35	47	119
Beneficiary Age (at open)	197,889	5.98	6.39	0	1	9	108
Delivery Preference (email)	197,889	0.90	0.30	0	1	1	1
Automatic Contributions (yes)	197,889	0.44	0.50	0	0	1	1
Socioeconomic Status	197,889	3.42	0.79	0.09	2.81	4.02	7.23
Concentrated Disadvantage	197,889	-0.28	0.49	-1.23	-0.60	-0.12	4.87
Concentrated Affluence	197,889	0.32	1.05	-2.24	-0.37	0.91	4.31
Gini Coefficient	197,889	0.43	0.04	0.004	0.41	0.46	0.79
N K-12 Schools	197,889	8.04	5.15	0	4	12	27
Community Resources	197,889	109.85	83.47	1	50	153	1,786

Sources: American Community Survey (U.S. Census), Common Core of Data (U.S. ED), PA Department of Treasury, and Urban Institute.

Notes: Figures rounded. For extreme values: Among the 197,889 records, 350 accounts received initial contributions over \$100,000; An additional 184 accounts appeared to have errors in the recorded age of either the account owner or beneficiary. Recall, there are virtually no limitations on contributions, who can open an account, or who can be a beneficiary. Accounts can be opened for oneself or for others and can also be used to pay education-related expenses (e.g., loans). Accounts are also tax-free and inheritable.

Table 2. Correlation Matrix

	GSP	First Cont.	Mean Cont.	Annual N Cont.	Owner Age	Benef. Age	Email Delivery	Auto. Invest	SES	Disadv.	Affluence	Gini	K-12 Schools	Com. Resources
GSP	1													
First Cont.	-0.029	1												
Mean Cont.	-0.043	0.474	1											
Annual N Cont.	0.107	-0.224	0.012	1										
Owner Age	-0.012	0.137	0.089	-0.181	1									
Benef. Age	0.102	0.123	0.111	-0.127	0.214	1								
Email Delivery	-0.007	-0.013	0.034	0.131	-0.077	-0.014	1							
Auto. Invest	0.003	-0.163	-0.093	0.660	-0.162	-0.138	0.082	1						
SES	-0.146	0.121	0.208	-0.050	0.044	0.009	0.060	-0.011	1					
Disadvantage	0.074	-0.059	-0.115	0.007	-0.015	0.006	-0.054	-0.004	-0.742	1				
Affluence	-0.050	0.047	0.077	-0.023	0.025	0.007	0.013	-0.008	0.313	-0.097	1			
Gini	-0.096	0.094	0.130	-0.068	0.060	0.013	0.005	-0.036	0.123	0.257	0.149	1		
K-12 Schools	-0.050	0.028	0.040	-0.016	0.014	0.002	0.024	0.001	0.122	0.056	0.034	0.261	1	
Com. Resources	-0.071	0.066	0.086	-0.043	0.050	0.005	0.022	-0.022	0.188	0.024	0.053	0.413	0.658	1

Sources: American Community Survey (U.S. Census), Common Core of Data (U.S. ED), PA Department of Treasury, and Urban Institute.

Notes: N = 197,889; Figures rounded.

Table 3. Geographic and Community Predictors of College Savings Behaviors, by Outcome of Interest

	Plan Selection (GSP)	First Contribution (log\$)	Mean Contribution (log\$)	Mean Annual N. Contributions
Plan Type (GSP)	-	-0.560***	-0.432***	0.261***
	-	(0.028)	(0.023)	(0.016)
Owner Age	-0.001**	0.025***	0.015***	-0.007***
	(0.0003)	(0.001)	(0.001)	(0.0003)
Beneficiary Age	0.007***	0.014***	0.016***	-0.007***
	(0.0003)	(0.002)	(0.002)	(0.001)
Delivery (email)	0.010 ⁺	0.110***	0.605***	0.381***
	(0.006)	(0.017)	(0.021)	(0.013)
Auto Investment (yes)	0.023***	-0.753***	0.301***	1.796***
	(0.004)	(0.021)	(0.018)	(0.014)
SES	-0.071***	0.428***	0.459***	-0.056***
	(0.008)	(0.023)	(0.022)	(0.009)
Conc. Disadvantage	0.003	0.011	0.020	-0.026
	(0.010)	(0.035)	(0.028)	(0.016)
Conc. Affluence	0.001	0.009	0.006	0.003
	(0.003)	(0.008)	(0.009)	(0.002)
Gini	-0.029***	0.144***	0.142***	-0.026***
	(0.004)	(0.014)	(0.015)	(0.005)
K-12 Schools	0.0003	-0.003	-0.002	0.002 ⁺
	(0.001)	(0.002)	(0.002)	(0.001)
Community Resources	-0.0001⁺	0.0005***	0.0003***	-0.0001⁺
	(0.00003)	(0.0001)	(0.0001)	(0.0001)
Type × Auto. Invest.	-	0.188***	0.170***	-0.149***
	-	(0.023)	(0.023)	(0.014)
Constant	0.999***	3.580***	2.706***	1.891***
	(0.016)	(0.064)	(0.057)	(0.034)
Year Open FE	Y	Y	Y	Y
County FE	Y	Y	Y	Y
Observations	197,889	197,889	197,889	197,889
Adjusted R ²	0.140	0.145	0.132	0.476

Sources: American Community Survey (U.S. Census), Common Core of Data (U.S. ED), PA Department of Treasury, and Urban Institute.

Notes: ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. Table reports coefficients and heteroscedastic robust standard errors clustered at county level (in parentheses). Figures rounded. SES, Gini, and Community Resources bolded for ease of identification by readers.

APPENDIX

Table A1. Plan Selection (GSP)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Owner Age	-0.001*** (0.0003)	-0.001*** (0.0003)	-0.001*** (0.0003)	-0.001*** (0.0003)	-0.001*** (0.0003)	-0.001*** (0.0002)	-0.001*** (0.0002)	-0.001** (0.0003)
Beneficiary Age	0.007*** (0.0003)	0.007*** (0.0003)						
Delivery (email)	0.002 (0.006)	0.009 (0.006)	0.006 (0.006)	0.002 (0.006)	0.003 (0.006)	0.002 (0.006)	0.003 (0.006)	0.010+ (0.006)
Auto Investment (yes)	0.026*** (0.004)	0.025*** (0.004)	0.026*** (0.004)	0.026*** (0.004)	0.024*** (0.004)	0.026*** (0.004)	0.025*** (0.003)	0.023*** (0.004)
SES		-0.078*** (0.004)						-0.071*** (0.008)
Conc. Disadvantage			0.066*** (0.010)					0.003 (0.010)
Conc. Affluence				-0.006+ (0.004)				0.001 (0.003)
Gini					-0.035*** (0.003)			-0.029*** (0.004)
K-12 Schools						-0.001 (0.001)		0.0003 (0.001)
Community Resources							-0.0002*** (0.00004)	-0.0001* (0.00003)
Constant	0.835*** (0.013)	1.045*** (0.014)	0.845*** (0.013)	0.836*** (0.013)	0.795*** (0.013)	0.843*** (0.014)	0.868*** (0.014)	0.999*** (0.016)
Year Open FE	Y	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	197,889	197,889	197,889	197,889	197,889	197,889	197,889	197,889
Adjusted R ²	0.129	0.137	0.132	0.129	0.133	0.129	0.131	0.140

Sources: American Community Survey (U.S. Census), Common Core of Data (U.S. ED), PA Department of Treasury, and Urban Institute.

Notes: + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. Table reports coefficients and heteroscedastic robust standard errors clustered at county level (in parentheses). Figures rounded. Model predicts GSP plan type selection using a linear probability specification.

Table A2. First Contribution (log \$)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Plan Type (GSP)	-0.634*** (0.035)	-0.579*** (0.031)	-0.614*** (0.032)	-0.633*** (0.036)	-0.608*** (0.032)	-0.634*** (0.035)	-0.625*** (0.033)	-0.560*** (0.028)
Owner Age	0.027*** (0.001)	0.026*** (0.001)	0.027*** (0.001)	0.027*** (0.001)	0.026*** (0.001)	0.027*** (0.001)	0.026*** (0.001)	0.025*** (0.001)
Beneficiary Age	0.014*** (0.002)	0.014*** (0.002)	0.014*** (0.002)	0.014*** (0.002)	0.014*** (0.003)	0.014*** (0.002)	0.014*** (0.002)	0.014*** (0.002)
Delivery (email)	0.156*** (0.020)	0.112*** (0.017)	0.131*** (0.017)	0.155*** (0.020)	0.151*** (0.019)	0.155*** (0.021)	0.150*** (0.019)	0.110*** (0.017)
Auto Investment (yes)	-0.770*** (0.023)	-0.762*** (0.021)	-0.770*** (0.023)	-0.770*** (0.023)	-0.759*** (0.021)	-0.770*** (0.023)	-0.767*** (0.022)	-0.753*** (0.021)
SES		0.456*** (0.032)						0.428*** (0.023)
Conc. Disadvantage			-0.385*** (0.055)					0.011 (0.035)
Conc. Affluence				0.053* (0.022)				0.009 (0.008)
Gini					0.186*** (0.020)			0.144*** (0.014)
K-12 Schools						0.004 (0.004)		-0.003 (0.002)
Community Resources							0.001*** (0.0002)	0.0005*** (0.0001)
Type × Auto. Invest.	0.193*** (0.024)	0.191*** (0.024)	0.192*** (0.023)	0.194*** (0.024)	0.190*** (0.024)	0.193*** (0.024)	0.193*** (0.024)	0.188*** (0.023)
Constant	4.666*** (0.053)	3.399*** (0.056)	4.589*** (0.053)	4.654*** (0.053)	4.858*** (0.053)	4.633*** (0.054)	4.473*** (0.054)	3.580*** (0.064)
Year Open FE	Y	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	197,889	197,889	197,889	197,889	197,889	197,889	197,889	197,889
Adjusted R ²	0.122	0.140	0.129	0.123	0.130	0.122	0.125	0.145

Sources: American Community Survey (U.S. Census), Common Core of Data (U.S. ED), PA Department of Treasury, and Urban Institute.

Notes: ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. Table reports coefficients and heteroscedastic robust standard errors clustered at county level (in parentheses). Figures rounded.

Table A3. Mean Contribution (log \$)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Plan Type (GSP)	-0.508*** (0.031)	-0.451*** (0.024)	-0.486*** (0.027)	-0.507*** (0.032)	-0.483*** (0.028)	-0.507*** (0.031)	-0.500*** (0.030)	-0.432*** (0.023)
Owner Age	0.016*** (0.001)	0.015*** (0.001)						
Beneficiary Age	0.017*** (0.003)	0.016*** (0.002)	0.017*** (0.002)	0.017*** (0.003)	0.016*** (0.003)	0.017*** (0.003)	0.017*** (0.002)	0.016*** (0.002)
Delivery (email)	0.653*** (0.025)	0.607*** (0.021)	0.627*** (0.021)	0.652*** (0.024)	0.648*** (0.024)	0.652*** (0.025)	0.648*** (0.024)	0.605*** (0.021)
Auto Investment (yes)	0.284*** (0.019)	0.292*** (0.018)	0.284*** (0.020)	0.284*** (0.020)	0.295*** (0.018)	0.284*** (0.019)	0.287*** (0.019)	0.301*** (0.018)
SES		0.478*** (0.033)						0.459*** (0.022)
Conc. Disadvantage			-0.409*** (0.056)					0.020 (0.028)
Conc. Affluence				0.051* (0.022)				0.006 (0.009)
Gini					0.181*** (0.022)			0.142*** (0.015)
K-12 Schools						0.003 (0.004)		-0.002 (0.002)
Community Resources							0.001*** (0.0002)	0.0003*** (0.0001)
Type × Auto. Invest.	0.174*** (0.022)	0.172*** (0.022)	0.174*** (0.022)	0.175*** (0.022)	0.171*** (0.023)	0.175*** (0.022)	0.175*** (0.022)	0.170*** (0.023)
Constant	3.861*** (0.048)	2.534*** (0.050)	3.779*** (0.047)	3.849*** (0.048)	4.048*** (0.048)	3.839*** (0.048)	3.684*** (0.048)	2.706*** (0.057)
Year Open FE	Y	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	197,889	197,889	197,889	197,889	197,889	197,889	197,889	197,889
Adjusted R ²	0.187	0.210	0.196	0.188	0.196	0.187	0.190	0.216

Sources: American Community Survey (U.S. Census), Common Core of Data (U.S. ED), PA Department of Treasury, and Urban Institute.

Notes: ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. Table reports coefficients and heteroscedastic robust standard errors clustered at county level (in parentheses). Figures rounded.

Table A4. Mean Annual Number of Contributions (N)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Plan Type (GSP)	0.271*** (0.016)	0.265*** (0.017)	0.269*** (0.016)	0.271*** (0.016)	0.266*** (0.017)	0.271*** (0.016)	0.269*** (0.016)	0.261*** (0.016)
Owner Age	-0.007*** (0.0003)	-0.007*** (0.0003)						
Beneficiary Age	-0.007*** (0.001)	-0.007*** (0.001)						
Delivery (email)	0.377*** (0.013)	0.381*** (0.013)	0.378*** (0.013)	0.377*** (0.013)	0.378*** (0.013)	0.377*** (0.013)	0.378*** (0.013)	0.381*** (0.013)
Auto Investment (yes)	1.799*** (0.015)	1.798*** (0.015)	1.799*** (0.015)	1.799*** (0.015)	1.797*** (0.014)	1.799*** (0.015)	1.798*** (0.015)	1.796*** (0.014)
SES		-0.048*** (0.006)						-0.056*** (0.009)
Conc. Disadvantage			0.024* (0.010)					-0.026 (0.016)
Conc. Affluence				-0.004 (0.004)				0.003 (0.002)
Gini					-0.033*** (0.005)			-0.026*** (0.005)
K-12 Schools						-0.0003 (0.001)		0.002+ (0.001)
Community Resources							-0.0002*** (0.00003)	-0.0001+ (0.0001)
Type × Auto. Invest.	-0.150*** (0.014)	-0.150*** (0.014)	-0.150*** (0.014)	-0.150*** (0.014)	-0.149*** (0.014)	-0.150*** (0.014)	-0.150*** (0.014)	-0.149*** (0.014)
Constant	1.770*** (0.028)	1.902*** (0.030)	1.775*** (0.028)	1.771*** (0.028)	1.736*** (0.028)	1.773*** (0.028)	1.797*** (0.028)	1.891*** (0.034)
Year Open FE	Y	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	197,889	197,889	197,889	197,889	197,889	197,889	197,889	197,889
Adjusted R ²	0.475	0.476	0.476	0.475	0.476	0.475	0.476	0.476

Sources: American Community Survey (U.S. Census), Common Core of Data (U.S. ED), PA Department of Treasury, and Urban Institute.

Notes: + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. Table reports coefficients and heteroscedastic robust standard errors clustered at county level (in parentheses). Figures rounded.