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Reducing Student Loan Debt through Parents' College Savings

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Reducing Student Loan Debt through Parents' College Savings

One policy rationale for promoting Child Development Accounts (CDAs) is that they may help reduce college debt, but no research provides evidence of this. Research does suggest that high-dollar student loans (\$10,000 or more) can reduce the probability that lower income students in particular persist in and graduate from college. In this study, we find evidence to suggest that parents' college savings may reduce the probability that students accrue high-dollar student loan debt across all income levels with the exception of high-income students. Based on this and evidence from separate research on small-dollar children's savings accounts, we suggest that it is important for policies and programs to clearly state their goals. For example, if the goal is to improve expectations for attending and graduating from college or to increase educational attainment, small-dollar children's savings accounts might make a difference. However, if the goal is to reduce college debt, programs must help children accumulate enough savings to reduce reliance on college loans.

Keywords: *Child Development Accounts (CDAs), saving, college enrollment, student loans, college debt*

Introduction

The College Board (2012a), which produces an annual report tracking college costs, estimates the total cost of college attendance and room and board at an in-state, public four-year college for the 2012–13 school year is \$8,655, an increase of 4.8% from the prior school year. Total cost of a private four-year college also rose by 4.2% in 2012–13 to \$29,056 (College Board, 2012a). Researchers find that increasing college costs have a negative impact on college enrollment decisions (Heller, 1997; Leslie & Brinkman, 1988; McPherson & Schapiro, 1998). McPherson and Schapiro (1998) estimate that a \$150 net cost increase (in 1993–1994 dollars) results in a 1.6 percentage-point reduction in enrollment among low-income students. Further compounding the problem is the decline in wages (in inflation-adjusted dollars) for bottom income groups (College Board, 2012a). According to the College Board (2012a), family income declined in 2011 by 5% for the poorest 20% of families.

Shifting the Burden of Paying for College from Society to Students

In addition to rising college costs and stagnant or decreasing family wages, changing federal and state policies are pressuring students to rely more on borrowing. Since the late 1970s, the federal government increasingly has attempted to promote equal access through adoption of policies that make college loans accessible to more students (Heller, 2008). Most recently, the Health Care and Education Reconciliation Act (2010) routed all federal loans through the Direct Loan program, making it easier for students and families to borrow directly from the U.S. Department of Education.

Another important change in financial aid policy is the shift from need-based aid to merit-based aid (Woo & Choy, 2011). *Need-based aid* is determined solely by assets and income (i.e., financial need) of prospective students and their families. Factors such as test scores have no bearing on the aid decision. *Merit-based aid*—most commonly scholarships—often is awarded based on test scores. Students with little financial need have the same entitlement to merit-based aid as students with high

levels of financial need. Woo and Choy (2011) find that the proportion of undergraduates receiving merit-based aid rose from 6% in 1995–1996 to 14% in 2007–2008. Further, research suggests that merit-based aid is awarded disproportionately to students from higher income families (Woo & Choy, 2011) and has done little to improve college enrollment rates among low-income and minority students (Marin, 2002).

Another change is the role that society plays—largely through providing scholarship and grants—in financing college. Elliott and Friedline (2012) find that students might carry a larger proportion of the college cost burden than society through student loans, savings, job earnings, or federal work study programs. They also find that the college cost burden might vary by race, income level (which is the focus of this paper), and length of college program. Regarding four-year college enrollment, Elliott and Friedline find that the college cost burden is lowest among the lowest income group but highest among the middle-income group. Moreover, they find evidence to suggest that parents' college savings may help lower the burden on students.

Growing amounts of student debt

Americans see student loans as investments that support long-term achievement (Cunningham & Santiago, 2008), but this borrowing has real costs for students in the amount of debt with which they leave college. During the 2011–2012 school year, 37% of all undergraduate financial aid received (\$70.8 billion) came from federal loans (College Board, 2012b). The next highest sources were federal Pell grants (19%) and institutional grants (18%). The percentage of undergraduate students who obtained federal loans increased from 23% in 2001–2002 to 35% in 2011–2012. In 2010–2011, nearly 57% of public four-year college students graduated with debt (The College Board, 2012b). On average, students who attended public four-year colleges borrowed \$23,800. Total borrowing for college hit \$113.4 billion for the 2011–2012 school year, up 24% from 2007 (College Board, 2012b).

Too much debt may have undesired affects

As a policy mechanism, student loans are designed to ensure that more students have access to college by providing additional funds at the time of enrollment. However, research suggests that after a certain level, student loans might not produce the desired effect of increased enrollment and graduation rates (Dwyer, McCloud, & Hodson, 2012; Heller, 2008). If this is true, simply continuing to increase the amount of loans available to students might not produce the desired effects, and other complementary financial aid policies might be necessary.

Heller (2008) concludes after a literature review that very little evidence suggests loans improve outcomes. Similarly, Cofer and Somers (2001) suggest that larger amounts are counterproductive and fail to meet the goal of making college accessible to more students while smaller loan amounts might have positive effects. Dwyer, McCloud, and Hodson (2012) find that debt below \$10,000 has a positive relationship with college completion, while debt above \$10,000 has a negative relationship with college completion for the bottom 75% of the income distribution in their study. Other researchers find evidence that loan debt may have a more negative impact on college persistence during the first year than in subsequent years (Dowd & Coury, 2006; Kim, 2007).

Further, prior research suggests that student loans may be a more effective strategy for middle- and high-income students because of low-income students' aversion to borrowing (Campaigne &

Hossler, 1998; Paulsen & St. John, 2002). Similar findings exist with regard to race. Perna (2000) finds that student loans have a negative effect on enrollment in four-year college for Black students, and she attributes this in part to an aversion to borrowing.

Interestingly, evidence suggests that loans plus grants might be a more effective strategy than loans by themselves. For example, Hu and St. John (2001) examine different types of financial aid and find that when combined with grants, loans have a more positive effect on persistence than loans only among different racial groups. This led Heller (2008) to conclude, “If grant aid were proportionally higher, then loans might provide more of a positive impact on college participation” (p. 49). However, with the shift toward merit-based aid for determining eligibility for grants and scholarships, some researchers suggest that grants increasingly benefit middle- and upper income students (Woo & Choy, 2011).

The growing belief among policymakers is that the individual—who benefits most from attending college—should bear more personal responsibility. Thus, there might be very little political will to continue to increase the number of scholarships and grants available to students. Given this, there may be need for an innovation in financial aid that not only aligns with the notion of individual responsibility but also augments student loans. Asset accumulation strategies, such as Child Development Accounts (CDAs), might be just such an innovation within the financial aid system.

CDAs might serve as a policy vehicle for allocating intellectual and material resources to low- and moderate-income children. Unlike basic savings accounts, CDAs leverage investments by individuals, families, and sometimes third parties (e.g., initial deposits, incentives, matches). CDAs align with the ideals of personal responsibility because they require students and their families to help pay for college by saving.

Saving and the Potential for Augmenting the Capacity of Student Loans

In May of 2012, the Department of Education (DOE) announced a college savings account research demonstration project that will test CDAs as part of the Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) initiative. The demonstration will test the effectiveness of pairing new federally supported college savings accounts with GEAR UP activities against the effectiveness of standard GEAR UP activities that do not include college savings accounts. They initially will allocate \$8.7 million already appropriated to support the demonstration.¹

Researchers who study CDAs suggest that they have both direct effects (e.g., reducing the price of college by providing students with money to pay for college) and indirect effects (e.g., improving engagement in school prior to college by making college appear within reach) (Elliott, Choi, Destin, & Kim, 2011; Elliott & Nam, in press). Researchers also find that saving is associated with college enrollment (Elliott & Beverly, 2011a), college persistence (Elliott & Beverly, 2011b), and college graduation (Elliott, in press). Evidence suggests that savings might be more beneficial than grants because they help students accumulate assets that remain well after leaving college (Elliott, Rifenburg, Webley, Friedline, & Nam, 2012; Friedline & Elliott, in press).

While some evidence suggests that assets—such as net worth and savings accounts—do have positive relationships with college enrollment and graduation (see Elliott, Destin, & Friedline, 2011),

¹ For more information, go to http://newamerica.net/events/2012/financing_college_success.

there is little information about whether CDAs can help reduce student debt. In this study, we focus on the role of parents' savings for their children's college education and its potential to reduce the amount of debt students are forced to assume in order to attend college. We focus on savings accounts because they most closely resemble CDAs, which can be thought of as savings accounts for children. Because CDAs allow not only children but also parents and others to save in the accounts, Loke and Sherraden (2009) suggest that they might have a "...multiplier effect by engaging the larger family in the asset-accumulation process" (p. 119).

Research Question

In this study, we ask whether parents' savings for their children's college education are associated with reduced college debt. Research suggests that the decision to borrow for college is a complex process (e.g., Dowd & Coury, 2006; Kinzie et al., 2004). Students are provided with many alternative financial aid packages from different schools, but research databases provide very little information about the financing alternatives from which the student had to choose. As a result, developing highly explanatory models (i.e., models that explain a lot of the difference in why one child chooses to borrow for college and a similarly situated child does not) can be difficult. Moreover, we find no research outside of descriptive studies that predict how much debt students accumulate while in college or whether having parents with college savings is predictive of the amount of debt incurred.

Research on financial aid has focused largely on students' aversion to taking out loans, loans' predictability of college attainment, and predictors of loan default. Research on CDAs has focused primarily on educational attainment and children's expectations for attending college, but one of the policy arguments for adopting CDAs is that they can help reduce college debt. Given this, it seems important to undertake a study to test whether an association exists between assets—in this case, parents' college savings—and college debt while controlling for factors believed to play a role in whether students borrow to pay for college.

Methods

Dataset

This study uses longitudinal data from the Educational Longitudinal Survey of 2002 (ELS:2002) made available to the public by the National Center for Education Statistics (NCES). The survey began in 2002 when students were in 10th grade, and follow-up waves took place in 2004 and 2006. Its purpose was to follow students as they progressed through high school and transitioned to postsecondary education or the labor market and is an ideal dataset to test whether early experiences or resources predicted later outcomes.

The ELS:2002 aimed to present a holistic picture of student achievement by gathering information from multiple sources. Students, their parents, teachers, librarians, and principals provided information regarding students' average grades, math achievement, and educational expectations and school resources and curriculum, teacher experience, student and parent work/employment, and students' post-high school enrollment in college. Dependent variables in this study are from the 2006 wave and independent variables are from the 2002 and 2004 waves.

Study Sample

The final sample of this study is restricted to students who were in the 2002 10th grade cohort, and the 2006 ELS samples (i.e., those who answered the follow-up questionnaires), graduated high school, and attended a four-year college. American Indian (0.8%) and biracial students (4.5%) were eliminated from the analysis due to small sample sizes. We also restricted the sample to students who started college between July and December 2004 and students who had finished or were still in college in 2006 at the time of the last ELS interview. After these restrictions were applied, the full sample included 4,963 students. Four subsamples also were drawn from the full sample based on household income level: 860 low-income (\$35,000 or below) students, 1,235 moderate-income (\$35,001–\$75,000) students, 629 middle-income (\$75,001–\$100,000) students, and 951 high-income (\$100,001 or higher) students.

Student Variables

All control variables—with exception of dependent status, student's income, and expected student loan debt in the future, which were measured in 2006—were measured in the 2002 or 2004 waves of the ELS. The outcome variable—amount of student loan debt—was measured in 2006.

Student's income

This is a categorical variable indicating total 2005 job earnings: 1 = less than \$1,000, 2 = \$1,000–\$2,999, 3 = \$3,000–\$5,999, 4 = \$6,000–\$9,999, 5 = \$10,000–\$14,999, 6 = \$15,000–\$19,999, 7 = \$20,000 or more. This was collapsed into a five-level variable to more equally distribute the sample across the different categories: 0 = less than \$1,000, 1 = \$1,000–\$2,999, 2 = \$3,000–\$5,999, 3 = \$6,000–\$9,999, 4 = \$10,000 or more.

Student race/ethnicity

The variable representing race included seven categories in the ELS:2002. American Indian or Alaska Native and more than one race were not included in this analysis due to small sample sizes, and Hispanic and Latino were combined. Four categories were included in the final analysis: White = 0, Black = 1, Latino/Hispanic = 2, and Asian = 3.

Gender

Student's gender is a dichotomous variable: 1 = male, 0 = female.

Student GPA

Students' grade point average (GPA) is a categorical variable that averages grades for all coursework in 9th through 12th grades. There are seven categories: 0 = 0.00–1.00, 1 = 1.01–1.50, 2 = 1.51–2.00, 3 = 2.01–2.50, 4 = 2.51–3.00, 5 = 3.01–3.50, and 6 = 3.51–4.00. We collapsed categories 0–2 into one due to small frequencies (36, 156, and 782, respectively).

College costs

Students were asked how important low costs (e.g., of tuition, books, room and board) were for choosing a school. Responses were dichotomized: 1 = very important, 0 = not very important.

Financial aid

Students were asked how important the availability of financial aid was for choosing a school. Responses were dichotomized: 1 = very important, 0 = not very important.

Amount student expects to borrow

Students were asked the amount they expected in undergraduate student loans in the future. The amount expected to borrow is a categorical variable: 1 = \$0–1,999, 2 = \$2,000–3,999, 3 = \$4,000–5,999, 4 = \$6,000–7,999, 5 = \$8,000–9,999, 6 = \$10,000–14,999, 7 = \$15,000–19,999, 8 = \$20,000 or more. In this study, expected student loan amount was collapsed into a three-level variable: 0 = \$0–\$9,999, 1 = \$10,000–\$19,999, 2 = \$20,000 or more.

Parent/household variables

Household income

In the ELS:2002, household income included 13 distinct levels. For this study, the levels of household income were combined into four levels: 0 = low-income (\$0–\$20,000), 1 = moderate-income (\$20,001–\$50,000), 2 = middle-income (\$50,001–\$100,000), and 3 = high-income (\$100,001 or higher). The levels were chosen, in part, to keep relatively equal cases in each category while maintaining important distinctions between income groups.

Parent education level

Parent education level is equivalent to whichever parent's is higher and includes eight distinct levels. The eight levels were collapsed into three for the final analysis: 0 = high school diploma or less, 1 = some college, 2 = four-year college degree or higher.

Number of siblings

Number of siblings was a continuous variable that ranged from 0–7. We collapsed families with 4–7 siblings into the same category because of small frequencies with a new range of 0–4.

Secondary school variables

College counseling

This is a dichotomous variable that indicates whether the student had gone to the counselor for college entrance information: 1 = yes, 0 = no.

Percentage of students who attended a four-year college

Percentage of 2003 graduates from high school that went to a four-year college (i.e., this is the percentage from a child's high school when the child was in 11th grade): 1 = none, 2 = 1%–10%, 3 = 11%–24%, 4 = 25%–49%, 5 = 50%–74%, 6 = 75%–100%. Categories 1–4 were collapsed into one category to help balance the sample and because we felt 50% or more would represent a high level of students attending four-year colleges.

University variables

Dependent status

This is a dichotomous variable that indicates whether students lived with their parents in 2006: 1 = yes, 0 = no.

College selectivity

The following categories made up the college selectivity variable: 1 = public, four-year or above; 2 = private, not-for-profit, four-year; 3 = private, for-profit, four-year; 4 = public, two-year; 5 = private, not-for-profit, two-year; 6 = private, for-profit, two-year; 7 = public, less than two-year; 8 = private, not-for-profit, less than two-year; 9 = private, for-profit, less than two-year. Due to sample restrictions, only categories that applied to four-year college attendance (1, 2, and 3) were applicable. Categories 2 and 3 were collapsed to make a dichotomous variable: 0 = public, four-year; 1 = private, four-year).

Applied for financial aid

Students were asked if they applied for financial aid, which resulted in a dichotomous variable: 1 = yes, 0 = no.

Savings or earnings, grants, or parents' college loans

Students were asked if they paid for postsecondary education with savings or earnings, grants, or parents' college loans. All three variables were dichotomous: 1 = yes, 0 = no.

Out of state

This is a dichotomous variable that indicates whether the student attended college in the state where they lived: 1 = yes, 0 = no.

Variable of interest

Parents' college savings accounts

The variable of interest came from a survey question that asked parents whether they were financially preparing to pay for their children to attend college by starting a savings account: 1 = yes, 0 = no.

Outcome Variable

Amount borrowed

The outcome variable of amount borrowed was drawn from the 2006 wave and was a categorical variable: 1 = \$0–\$1,999, 2 = \$2,000–\$3,999, 3 = \$4,000–\$5,999, 4 = \$6,000–\$7,999, 5 = \$8,000–\$9,999, 6 = \$10,000–\$14,999, 7 = \$15,000–\$19,999, 8 = \$20,000 or more.² In this study, we created a three-level variable: (0 = did not borrow, 1 = \$0–\$9,999, 2 = \$10,000 or more. The “did not

² Dr. Isaiah Lee O’Rear at the National Center for Education Statistics informed us that students who indicated they used student loans were permitted to respond that they received \$0. It is unclear what a \$0 loan represents.

borrow” category included students who skipped the amount borrowed question.³ These categories were chosen based on research that suggests loan debt of \$10,000 or more has a negative effect on college attainment (Dwyer et al., 2012).

Analysis Plan

We used two steps—with no problems of multicollinearity—to produce and analyze results for predictors of student college loan debt. The first step was to conduct propensity score analyses for parents with a savings account for their child’s college education (i.e., treated cases) and parents without a savings account for their child’s college education (i.e., non-treated cases). We used two propensity score analyses (i.e., pair matching and propensity score weighting) to cross-validate the results from the two models that adjust selection bias given the observed covariates.

The second step was to create four subgroups (low-income, moderate-income, middle-income, and high-income) using the family income variable and estimating multinomial logistic regressions for each subgroup. Logistic regressions are estimated, and propensity score matching is not used for the subgroups because of sample size. Matching further reduces sample size and power. Data analysis steps were conducted using STATA (version 12).

Propensity score analyses

Propensity score analysis balances the treatment group (i.e., those with savings accounts) on covariates to get more accurate estimates of the effects of treatment. This method involves matching and weighting cases to create new samples and performing covariate balance checks (D’Agostino, 1998). Following the estimation of the propensity scores, we used two methods of propensity score analysis, including nearest neighbor with caliper match and propensity score weighting. Matching typically reduces the sample size due to the inability to match all treated and non-treated observations (Guo & Fraser, 2010; Rosenbaum, 2002; Rosenbaum & Rubin, 1985), which could result in a loss of a statistical power of the treatment effect on outcome estimation. Propensity score weighting was used as a non-sample-reducing correction to selection bias.

Propensity score estimation

Logistic regressions were done to estimate propensity scores (i.e., the predicted probability of parents having a savings account for their child’s college education in 2002). Prior to estimating the propensity scores, we conducted a series of logistic regressions to determine the covariates affecting selection bias. The results of these tests (Table 1) reveal significant differences among most covariates. Table 2 provides unadjusted descriptive statistics.

³ Dr. Isaiah Lee O’Rear also informed us that legitimate skips could be treated as having responded “did not borrow” based on how our sample is restricted.

Reducing Student Loan Debt through Parents' College Savings

Table 1. Full Sample Covariate Balance Checks

Student variables	Before matching (N = 3675)		After matching (N = 2661)		ATT weighting (N = 3675)	
	β	SE	β	SE	β	SE
Income \$0–\$999 (reference)						
Income \$1,000–\$2,999	-.032	.112	.029	.140	-.117	.100
Income \$3,000–\$5,999	-.043	.117	.020	.138	-.041	.104
Income \$6,000–\$9,999	-.279*	.132	.131	.159	-.004	.123
Income \$10,000 or higher	-.473**	.150	.025	.183	.032	.141
White (reference)						
Black	-.212	.132	.012	.156	-.005	.124
Latino/Hispanic	-.597*	.147	.028	.179	-.076	.146
Asian	.036	.132	-.044	.159	-.048	.131
Male	-.167	.810	-.023	.097	.028	.072
GPA 2.00 or lower (reference)						
GPA 2.01–2.50	-.162	.233	-.022	.277	-.409	.212
GPA 2.51–3.00	-.120	.194	-.063	.224	-.238	.174
GPA 3.01–3.50	.038	.188	.072	.217	-.282	.168
GPA 3.51–4.00	.132	.184	-.055	.215	-.213	.164
Low college costs very important	-.330***	.090	.086	.107	.059	.081
Financial aid very important	-.622***	.085	.034	.094	.110	.072
Expected to borrow \$0–\$9,999 (reference)						
Expected to borrow \$10,000–\$19,999	-.549***	.114	.097	.141	.074	.104
Expected to borrow \$20,000 or more	-.412***	.107	-.077	.124	-.012	.098
Parent/Household variables						
Low-income (\$35,000 or below) (reference)						
Moderate-income (\$35,001–\$75,000)	.382***	.099	-.055	.122	-.097	.082
Middle-income (\$75,001–\$100,000)	.926***	.124	.026	.143	-.021	.104
High-income (\$100,001 or higher)	1.334***	.117	-.244	.139	-.168	.095
Head of household had high school education or less (reference)						
Head of household had some college	.603***	.150	.109	.185	-.057	.130
Head of household had two-year college degree	.487**	.174	.254	.212	.075	.156
Head of household had four-year college degree or higher	1.201***	.126	.113	.153	-.084	.110
0 or 1 sibling (reference)						
2 siblings	.292*	.113	.040	.136	-.148	.102
3 siblings	.051	.120	.065	.148	-.069	.110
4 or more siblings	-.226	.138	-.011	.165	-.046	.122
Secondary school variables						
Received college counseling while in high school	.026	.077	-.059	.089	-.016	.075
Percentage of students from high school who attended four-year college	.284**	.084	-.008	.094	-.135	.077
College/University variables						
Lived with parents (independent status)	-.494***	.095	.065	.119	.005	.088
Attended private four-year college	.146	.079	-.076	.095	-.104	.075
Applied for financial aid	-.611***	.107	.119	.117	.184*	.090
Paid for college with savings or earnings	-.125	.079	-.003	.093	.014	.072
Paid for college with grants	-.440***	.082	.100	.098	.042	.073
Paid for college with parent loans	-.118	.085	-.061	.102	-.061	.080
Out-of-state student	.401	.085	-.096	.100	-.106	.083

Note. β = regression coefficients; SE = standard error.

*p < .05; **p < .01; ***p < .001.

Reducing Student Loan Debt through Parents' College Savings

Table 2. Unadjusted descriptive statistics

Categorical variables	Full (N = 3675)		Low (n = 860)		Moderate (n = 1,235)		Middle (n = 629)		High (n = 951)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Student variables										
Income \$0–\$999	804	22	229	27	224	18	111	18	240	25
Income \$1,000–\$2,999	1,044	28	219	25	340	28	185	29	300	32
Income \$3,000–\$5,999	1,027	28	215	25	379	31	183	29	250	26
Income \$6,000–\$9,999	474	13	109	17	177	14	86	14	102	11
Income \$10,000 or higher	326	09	88	10	115	9	64	10	59	06
White (reference)	2,641	72	465	54	897	73	505	80	774	81
Black	341	09	146	17	106	09	44	07	45	05
Latino/Hispanic	296	08	109	13	101	8	37	06	49	05
Asian	397	11	140	16	131	11	43	07	83	09
Male	2,075	56	516	60	703	57	332	53	524	55
GPA 2.00 or lower	254	07	68	08	75	06	42	07	69	07
GPA 2.01–2.50	241	07	76	09	71	06	42	07	52	05
GPA 2.51–3.00	630	17	156	18	212	17	111	18	151	16
GPA 3.01–3.50	1,140	31	253	29	377	31	210	33	300	32
GPA 3.51–4.00	1,410	38	307	36	500	40	224	36	379	40
Low college costs very important	909	25	307	36	365	30	131	21	106	11
Financial aid very important	1,844	50	568	66	754	61	288	46	234	25
Expected to borrow \$0–\$9,999	2,257	69	573	67	751	61	413	66	790	83
Expected to borrow \$10,000–\$19,999	549	15	162	19	234	19	87	14	66	07
Expected to borrow \$20,000 or more	599	16	125	15	250	20	129	21	95	10
Parent/Household variables										
Low-income (\$35,000 or below) (reference)	860	23	—	—	—	—	—	—	—	—
Moderate-income (\$35,001–\$75,000)	1,235	34	—	—	—	—	—	—	—	—
Middle-income (\$75,001–\$100,000)	629	17	—	—	—	—	—	—	—	—
High-income (\$100,001 or higher)	951	26	—	—	—	—	—	—	—	—
Head of household had high school education or less (reference)	423	12	214	25	154	12	37	06	18	02
Head of household had some college	640	17	187	22	285	23	106	17	62	07
Head of household had two-year college degree	290	08	82	20	139	11	40	06	29	03
Head of household had four-year college degree or higher	2,322	63	377	44	657	53	446	71	842	89
0 or 1 sibling (reference)	563	15	166	19	190	15	91	14	116	12
2 siblings	1,445	39	314	37	486	40	263	42	382	40
3 siblings	1,045	28	214	25	332	27	183	29	316	33
4 or more siblings	622	17	166	19	227	18	92	15	137	14
Secondary school variables										
Received college counseling while in high school	1,768	48	442	51	579	47	296	47	451	52
Percentage of students from high school who attended four-year college	2,230	63	457	53	692	56	483	70	733	77
College/University variables										
Lived with parents (independent status)	768	21	254	30	287	23	121	19	106	11
Attended private four-year college	1,302	35	283	33	404	33	214	34	401	42
Applied for financial aid	2,938	80	762	89	1,099	89	517	82	560	59
Paid for college with savings or earnings	1,550	42	371	43	594	48	285	45	300	32
Paid for college with grants	2,403	65	680	79	899	73	379	60	445	47
Paid for college with parent loans	845	23	161	19	319	26	186	26	179	19
Out-of-state student	1,051	29	187	22	285	23	176	28	403	42
Variable of interest										
Parent had college savings account for child	1,834	50	298	35	544	44	359	57	633	67

Note. Data from the Education Longitudinal Study (ELS). Outcome variables: Did not borrow, Borrowed \$0 - \$9,999, Borrowed \$10,000 or more.

Nearest neighbor with caliper match

After estimating propensity scores, we performed nearest neighbor matching with caliper (Cochran & Rubin, 1973). Parents with savings accounts (i.e., treated) and without savings accounts (i.e., non-treated) were ordered randomly. Then a treated parent was selected and matched with a non-treated parent using the closest propensity score within the region of caliper (Guo & Fraser, 2010). The caliper size was equal to 0.25 times the standard deviation of the obtained propensity score. The matched pair was not used in matching other pairs (i.e., matching without replacement).

Propensity scores ranged from 0.096 to 0.85. Among treated parents, less than 1% of the sample had propensity scores below 0.1, and none had propensity scores above 0.8. Among non-treated parents, less than 1% of the sample had propensity scores below 0.1, and approximately 2% had propensity scores above 0.8. We imposed a common support region by trimming at 5% and removing treated parents whose propensity scores were lower than the minimum and non-treated parents whose scores were higher than the maximum propensity scores for non-treated parents.

Average treatment-effect-for-the-treated (ATT) weight

We used estimated propensity scores calculate the average treatment-effect-for-the-treated (ATT) sampling weight (i.e., the effect when considering only parents in the treated group) for each imputed dataset. We estimate the ATT weight as 1 for a treated parent and $p/(1-p)$ for a non-treated parent where p equals the propensity score.

Covariate balance checks

We conducted balance checks to determine the ability of the propensity score analyses to balance relevant covariates. Given the potential selection bias evident among the covariates, balance checks were necessary to determine whether propensity score analyses adjusted for observed bias (Barth, Guo, & McCrae, 2008; D'Agostino, 1998; Guo, Barth, & Gibbons, 2006; Guo & Fraser, 2010). We performed all balance checks using weighted simple logistic regression (Guo & Fraser, 2010). Results are reported using regression coefficients and robust standard errors.

Multinomial logistic regression

Following the steps taken to balance the data, we used multinomial logistic regressions to predict student college loan debt in 2006. Results of the logistic regressions are presented in Tables 3–13. Findings at significance levels of $p < .05$ are noted in the tables.

Full Sample Results

To conserve space, only results from the ATT-weighted model are reported in this section with not borrowing as the reference group. However, findings for the unadjusted and nearest neighbor matching models are included in Tables 3 and 4 for the reference group \$0–\$9,999. These results are included only in the Tables and are not reported.

Results from covariate balance checks

Results from the balance checks are presented in Table 1. In the unadjusted sample, most covariates showed significant group differences between parents with college savings accounts (i.e., treated) and parents without college savings accounts (i.e., nontreated). Group differences were no longer

significant after we conducted the nearest neighbor with caliper match and the ATT weight, which suggests that both methods were successful in reducing bias among observed covariates.

Descriptive results

We will discuss highlights here, but Table 2 provides descriptive statistics for the full sample and the low-, moderate-, middle-, and high-income subsamples. A higher percentage of low-income students (10%) than high-income students (6%) earn \$10,000 or more. Black students make up a larger proportion of low-income students (17%) than they do any other income group. A higher percentage of low-income students (36%) than moderate-income (30%), middle-income (21%), or high-income (11%) students perceive that costs are very important when choosing a college. Similarly, low-income students (66%) are more likely than moderate-income (61%), middle-income (46%), and high-income (25%) students to report that financial aid is very important for choosing a college when compared. High-income students (83%) are the most likely to expect to borrow \$0–\$9,999, while moderate-income (20%) and middle-income (21%) students are the most likely to report expecting to borrow \$20,000 or more.

The two highest income groups (71% of middle-income and 89% of high-income) are the most likely to have parents with four-year college degrees or higher. In addition, a higher percentage of high-income students (77%) attend high schools that are above the mean average regarding the percentage of students who go on to attend four-year colleges. With respect to university characteristics, high-income students (11%) are the least likely to report living at home with their parents, while low-income students (30%) are the most likely. High-income students also are more likely (42%) to attend private four-year colleges than low-income (33%), moderate-income (33%), and middle-income (34%) students. High-income students (32%) are the least likely to report paying for college with their own savings or earnings. Low-income students (79%) are the most likely to report paying for college with grants when contrasted with moderate-income (73%), middle-income (60%), and high-income (47%) students.

Regarding parents' college savings accounts, a higher percentage of high-income students' (67%) parents have a college savings account compared to low-income (50%), moderate-income (35%), and middle-income (57%) students. With respect to the outcome variable, high-income students (76%) are the least likely to have borrowed at all and the least likely (9%) to have borrowed \$10,000 or more. In contrast, moderate-income (28%) and middle-income (24%) students are the most likely to have borrowed \$10,000 or more. Among low-income students, 35% borrowed \$0–\$9,999, and about 20% borrowed \$10,000 or more.

Multinomial logistic results for small-dollar student loans (\$0–\$9,999) relative to not borrowing, full sample

Tables 3–5 show results from multinomial logistic regression predicting the amount of student loan debt. ATT results are reported in Table 5. Positive significant predictors of amount of student loan debt include student's income, race, gender, GPA, having reported financial aid as very important, amount expected to borrow, number of siblings, having applied for financial aid, having paid for college with savings or earnings, having paid for college with grants, and having paid for college with parents' loans. Positive predictors *increase* the probability that a student will take out a small-dollar student loan.

Reducing Student Loan Debt through Parents' College Savings

Table 3. Multinomial logistic predicting amount of student loan debt, unadjusted, full model ($N = 3,675$)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	<i>SE</i>	O.R.	β	<i>SE</i>	O.R.	β	<i>SE</i>	O.R.
<i>Pseudo R</i> ² = .34									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	0.316	0.164	—	0.119	0.247	—	-0.198	0.232	—
Income \$3,000–\$5,999	0.394 *	0.171	1.484	0.587 *	0.254	1.799	0.193	0.226	—
Income \$6,000–\$9,999	0.304	0.200	—	0.458	0.276	—	0.154	0.262	—
Income \$10,000 or higher	0.389	0.231	—	0.219	0.353	—	-0.169	0.325	—
White (reference)									
Black	0.352	0.193	—	-0.370	0.242	—	-0.721 **	0.230	.486
Latino/Hispanic	0.254	0.208	—	-0.409	0.313	—	-0.664 *	0.277	.515
Asian	-0.251	0.205	—	-0.268	0.250	—	-0.017	0.249	—
Male	0.215	0.111	—	0.472 **	0.169	1.603	0.257	0.142	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	0.394	0.346	—	0.853	0.494	—	0.459	0.408	—
GPA 2.51–3.00	0.699 *	0.285	2.011	1.152 **	0.375	3.164	0.453	0.330	—
GPA 3.01–3.50	0.400	0.263	—	0.240	0.366	—	-0.160	0.318	—
GPA 3.51–4.00	0.042	0.259	—	-0.363	0.357	—	-0.406	0.318	—
Low college costs very important	-0.206	0.150	—	-0.274	0.192	—	-0.068	0.165	—
Financial aid very important	0.507 *	0.138	1.660	0.704 ***	0.182	2.021	0.197	0.181	—
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	1.696 *	0.186	5.450	3.553 ***	0.219	34.930	1.858 ***	0.164	6.409
Expected to borrow \$20,000 or more	-0.149	0.232	—	3.552 ***	0.207	34.879	3.701 ***	0.218	40.475
Parent/Household variables									
Low-income (\$35,000 or below) (reference)									
Moderate-income (\$35,001–\$75,000)	0.168	0.141	—	0.430 *	0.191	1.537	0.262	0.182	—
Middle-income (\$75,001–\$100,000)	-0.140	0.201	—	0.221	0.267	—	0.361	0.231	—
High-income (\$100,001 or higher)	-0.595 **	0.198	.552	-0.730 **	0.280	.482	-0.135	0.270	—
Head of household had high school education or less (reference)									
Head of household had some college	-0.300	0.218	—	-0.044	0.268	—	0.256	0.247	—
Head of household had two-year college degree	0.310	0.262	—	0.531	0.351	—	0.221	0.331	—
Head of household had four-year college degree or higher	-0.438 *	0.192	.645	-0.726 **	0.257	.484	-0.288	0.249	—
0 or 1 sibling (reference)									
2 siblings	0.435 *	0.179	1.545	0.468	0.242	—	0.033	0.219	—
3 siblings	0.220	0.182	—	0.304	0.238	—	0.084	0.229	—
4 or more siblings	0.567 **	0.198	1.762	0.933 ***	0.265	2.542	0.366	0.244	—
Secondary school variables									
Received college counseling while in high school	0.087	0.115	—	-0.162	0.151	—	-0.249	0.149	—
Percentage of students from high school who attended four-year college	0.090	0.126	—	0.028	0.159	—	-0.063	0.149	—
College/University variables									
Lived with parents (independent status)	-0.470 **	0.153	.625	-1.110 ***	0.217	.330	-0.639 **	0.200	.528
Attended private four-year college	0.249 *	0.123	1.282	0.743 ***	0.178	2.101	0.494 **	0.163	1.638
Applied for financial aid	1.931 ***	0.221	6.893	1.967 ***	0.355	7.148	0.036	0.394	—
Paid for college with savings or earnings	0.540 ***	0.117	1.716	0.255	0.170	—	-0.285	0.155	—
Paid for college with grants	0.130	0.150	—	0.186	0.210	—	0.056	0.201	—
Paid for college with parent loans	0.975 ***	0.135	2.650	1.188 ***	0.175	3.280	0.213	0.168	—
Out-of-state student	0.040	0.144	—	0.240	0.192	—	0.200	0.193	—
Variable of interest									
Parent had college savings account for child	-0.275 *	0.116	.759	-0.633 ***	0.160	.531	-0.358 *	0.146	.699

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; *SE* = standard error; OR = odds ratio.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Reducing Student Loan Debt through Parents' College Savings

Table 4. Multinomial logistic predicting amount of student loan debt, nearest neighbor matching, full sample (N = 2,661)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .34									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	0.150	0.184	—	-0.059	0.286	—	-0.209	0.280	—
Income \$3,000–\$5,999	0.417*	0.194	1.518	0.554*	0.281	1.740	0.137	0.258	—
Income \$6,000–\$9,999	0.141	0.224	—	0.235	0.298	—	0.095	0.311	—
Income \$10,000 or higher	0.197	0.255	—	-0.328	0.417	—	-0.525	0.402	—
White (reference)									
Black	0.548*	0.237	1.730	-0.165	0.300	—	-0.713**	0.274	.490
Latino/Hispanic	0.347	0.262	—	-0.342	0.409	—	-0.689	0.353	—
Asian	-0.265	0.222	—	-0.236	0.283	—	0.028	0.277	—
Male	0.208	0.128	—	0.403*	0.199	1.496	0.195	0.175	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	0.558	0.401	—	1.284*	0.556	3.611	0.726	0.475	—
GPA 2.51–3.00	0.717*	0.314	2.048	1.194**	0.455	3.299	0.476	0.383	—
GPA 3.01–3.50	0.544	0.295	—	0.544	0.438	—	0.000	0.353	—
GPA 3.51–4.00	0.099	0.292	—	-0.067	0.429	—	-0.166	0.366	—
Low college costs very important	-0.338	0.180	—	-0.292	0.225	—	0.046	0.200	—
Financial aid very important	0.483**	0.153	1.620	0.742***	0.205	2.099	0.259	0.205	—
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	1.718***	0.226	5.573	3.763***	0.269	43.065	2.045***	0.205	7.727
Expected to borrow \$20,000 or more	0.002	0.261	—	3.724***	0.252	41.413	3.722***	0.264	41.343
Parent/Household variables									
Low-income (\$35,000 or below) (reference)									
Moderate-income (\$35,001–\$75,000)	0.149	0.165	—	0.463*	0.233	1.589	0.314	0.219	—
Middle-income (\$75,001–\$100,000)	-0.202	0.233	—	0.205	0.315	—	0.407	0.277	—
High-income (\$100,001 or higher)	-0.553*	0.225	.575	-0.810*	0.336	.445	-0.257	0.324	—
Head of household had high school education or less (reference)									
Head of household had some college	-0.638*	0.275	.528	-0.487	0.348	—	0.152	0.319	—
Head of household had two-year college degree	-0.300	0.298	—	0.031	0.423	—	0.330	0.376	—
Head of household had four-year college degree or higher	-0.830***	0.237	.436	-1.325***	0.332	.266	-0.495	0.323	—
0 or 1 sibling (reference)									
2 siblings	0.325	0.199	—	0.282	0.282	—	-0.043	0.252	—
3 siblings	0.211	0.203	—	0.291	0.291	—	0.080	0.272	—
4 or more siblings	0.636**	0.233	1.888	0.984**	0.318	2.676	0.349	0.295	—
Secondary school variables									
Received college counseling while in high school	0.030	0.134	—	-0.154	0.184	—	-0.184	0.182	—
Percentage of students from high school who attended four-year college	0.012	0.145	—	-0.073	0.189	—	-0.085	0.175	—
College/University variables									
Lived with parents (independent status)	-0.293	0.174	—	-0.824**	0.267	.439	-0.531*	0.249	.588
Attended private four-year college	0.132	0.141	—	0.637**	0.205	1.890	0.504	0.192	—
Applied for financial aid	1.888***	0.243	6.607	2.297***	0.409	9.944	0.409	0.445	—
Paid for college with savings or earnings	0.576***	0.131	1.779	0.207	0.185	—	-0.369*	0.178	.691
Paid for college with grants	0.129	0.168	—	0.057	0.251	—	-0.072	0.233	—
Paid for college with parent loans	1.023***	0.152	2.781	1.143***	0.202	3.135	0.120	0.193	—
Out-of-state student	0.064	0.167	—	0.504*	0.226	1.656	0.440*	0.224	1.553
Variable of interest									
Parent had college savings account for child	-0.320 *	0.135	.726	-0.778***	0.178	.460	-0.457**	0.161	.633

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio.

*p < .05; **p < .01; ***p < .001.

Reducing Student Loan Debt through Parents' College Savings

Table 5. Multinomial logistic predicting amount of student loan debt, ATT weighted, full sample (N = 3,675)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .36									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	0.223	0.145	—	-0.117	0.210	—	-0.341	0.202	—
Income \$3,000–\$5,999	0.350*	0.152	1.418	0.407	0.224	—	0.057	0.204	—
Income \$6,000–\$9,999	0.215	0.185	—	0.283	0.242	—	0.068	0.240	—
Income \$10,000 or higher	0.344	0.217	—	0.243	0.326	—	-0.101	0.293	—
White (reference)									
Black	0.486*	0.191	1.626	-0.095	0.223	—	-0.582**	0.207	.559
Latino/Hispanic	0.049	0.203	—	-0.328	0.350	—	-0.378	0.297	—
Asian	-0.269	0.162	—	-0.493*	0.231	.611	-0.224	0.239	—
Male	0.234*	0.106	1.264	0.408**	0.142	1.504	0.174	0.128	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	0.619*	0.297	1.857	1.108**	0.375	3.028	0.489	0.336	—
GPA 2.51–3.00	0.789**	0.250	2.202	0.948**	0.334	2.580	0.158	0.293	—
GPA 3.01–3.50	0.400	0.230	—	0.278	0.313	—	-0.122	0.271	—
GPA 3.51–4.00	0.116	0.223	—	-0.187	0.298	—	-0.303	0.269	—
Low college costs very important	-0.063	0.138	—	-0.165	0.168	—	-0.103	0.143	—
Financial aid very important	0.337**	0.113	1.401	0.697***	0.160	2.008	0.360*	0.155	1.433
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	1.894***	0.168	6.646	3.696***	0.200	40.305	1.803***	0.158	6.065
Expected to borrow \$20,000 or more	0.074	0.197	—	3.593***	0.195	36.336	3.519***	0.206	33.759
Parent/Household variables									
Low-income (\$35,000 or below) (reference)									
Moderate-income (\$35,001–\$75,000)	0.196	0.126	—	0.522**	0.179	1.685	0.326	0.173	—
Middle-income (\$75,001–\$100,000)	-0.153	0.168	—	0.208	0.228	—	0.360	0.203	—
High-income (\$100,001 or higher)	-0.553**	0.161	0.575	-0.631*	0.249	.532	-0.078	0.245	—
Head of household had high school education or less (reference)									
Head of household had some college	-0.270	0.209	—	-0.336	0.247	—	-0.066	0.215	—
Head of household had two-year college degree	0.120	0.241	—	0.422	0.320	—	0.302	0.279	—
Head of household had four-year college degree or higher	-0.408*	0.189	0.664	-0.805**	0.242	0.447	-0.397	0.211	—
0 or 1 sibling (reference)									
2 siblings	0.406**	0.153	1.501	0.539**	0.203	1.715	0.133	0.194	—
3 siblings	0.325*	0.165	1.384	0.413*	0.204	1.511	0.088	0.199	—
4 or more siblings	0.626**	0.181	1.869	1.042***	0.226	2.836	0.417	0.214	—
Secondary school variables									
Received college counseling while in high school	-0.046	0.103	—	-0.182	0.140	—	-0.135	0.137	—
Percentage of students from high school who attended four-year college	-0.068	0.109	—	0.050	0.146	—	0.118	0.136	—
College/University variables									
Lived with parents (independent status)	-0.184	0.130	—	-0.755***	0.208	0.470	-0.571**	0.195	0.565
Attended private four-year college	0.174	0.107	—	0.677***	0.151	1.969	0.503	0.147	—
Applied for financial aid	2.118***	0.203	8.313	2.116***	0.366	8.295	-0.002	0.397	—
Paid for college with savings or earnings	0.522***	0.108	1.686	0.209	0.142	—	-0.313*	0.137	0.731
Paid for college with grants	0.259*	0.129	1.296	0.258	0.200	—	-0.001	0.190	—
Paid for college with parent loans	1.008***	0.134	2.741	1.134***	0.164	3.109	0.126	0.143	—
Out-of-state student	-0.079	0.131	—	0.357*	0.163	1.430	0.437**	0.152	1.548
Variable of interest									
Parent had college savings account for child	-0.176	0.101	—	-0.528***	0.136	.590	-0.352**	0.127	.704

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATT = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 6. Sensitivity analyses for unobserved heterogeneity

Γ	Q_mh+	Q_mh-	p_mh+	p_mh-
1.000	0.827	0.827	0.204	0.204081
1.100	0.199	1.940	0.421	0.026187
1.200	1.214	2.957	0.112	0.001551
1.300	2.149	3.895	0.016	0.000049
1.400	3.016	4.766	0.001	9.40E-07
1.5	3.82401	5.57816	0.000066	1.20E-08
1.6	4.58171	6.34069	2.30E-06	1.10E-10
1.7	5.29518	7.05937	5.90E-08	8.40E-13
1.8	5.96964	7.73935	1.20E-09	5.00E-15
1.9	6.60943	8.38493	1.90E-11	0
2	7.21821	8.99971	2.60E-13	0

Note. Γ = gamma. Q-MH+ = Mantel-Haenszel (1959) statistic for overestimation of treatment effect.

Students with their own incomes of \$3,000–\$5,999 are about 42% more likely than students with incomes of \$0–\$999 to have borrowed when all other factors are constant (*O.R.* = 1.418; $p < .05$). Black students are 63% more likely than White students to take out small-dollar loans (*O.R.* = 1.626; $p < .05$). When contrasted with females, males are about 26% more likely to have borrowed (*O.R.* = 1.264; $p < .05$). Contrasted with students with GPAs of 2.00 or lower, those with GPAs between 2.01 and 2.50 are nearly twice as likely to have borrowed (*O.R.* = 1.857; $p < .05$), and students with GPAs of 2.51–3.00 are more than twice as likely to have borrowed (*O.R.* = 2.202; $p < .01$). Being a student who perceives that the availability of financial aid as very important is associated with being approximately 40% more likely to have borrowed than being a student who does not perceive that the availability of financial aid is very important (*O.R.* = 1.401; $p < .01$). Expecting to borrow \$10,000–\$19,999 rather than \$0–\$9,999 in the future is associated with students being more than seven times more likely to have borrowed (*O.R.* = 6.646; $p < .001$).

The only household variable that increases the likelihood of borrowing is the number of siblings the student has. Contrasted with students who have one or no siblings, those who have two siblings are about 50% more likely to have borrowed (*O.R.* = 1.501; $p < .01$), those who have three siblings about 38% more likely to have borrowed (*O.R.* = 1.384; $p < .05$), and those who have four siblings or more are nearly twice as likely to have borrowed (*O.R.* = 1.869; $p < .01$).

Students who applied for financial aid versus students who did not are eight times more likely to have borrowed (*O.R.* = 8.313; $p < .001$). Students who paid for college with their own savings or earnings are 69% more likely to have borrowed than students who did not pay for college with their own savings or earnings (*O.R.* = 1.686; $p < .001$). Students who paid for college with grants are 30% more likely to have borrowed than students who did not pay for college with grants (*O.R.* = 1.296; $p < .05$). Students who paid for college with parents' loans are about three times more likely to have borrowed than students with parents who did not pay for college with parents' loans (*O.R.* = 2.741; $p < .001$).

We also find two household variables that are negative significant predictors of the amount of student loan debt: living in a high-income household and having parents with four-year degrees or higher. Negative predictors *decrease* the chance that a student borrows between \$0 and \$9,999.

Household income works as a protective factor against borrowing. Contrasted with low-income students, high-income students are about 42% less likely to have borrowed ($O.R. = 0.575$; $p < .01$). Contrasted with students whose parents have a high school education or less, students with parents who have four years of college or more are about 34% less likely to have borrowed ($O.R. = 0.664$; $p < .05$).

Multinomial logistic results for high-dollar student loans (\$10,000 or higher) relative to not borrowing, full sample

We find that positive significant predictors of high-dollar loans include gender, GPA, having reported financial aid as very important, amount expected to borrow, income, number of siblings, attendance at a private four-year college, having applied for financial aid, having paid for college with parents' loans, and having attending college out of state (see Table 5).

Contrasted with females, males are about 50% more likely to have borrowed ($O.R. = 1.504$; $p < .001$). Contrasted with students who have GPAs of 2.00 or lower, those with GPAs between 2.01 and 2.50 are about three times more likely to have borrowed ($O.R. = 3.028$; $p < .01$), and those with GPAs between 2.51 and 3.00 are more than two and half times more likely to have borrowed ($O.R. = 2.580$; $p < .01$). Students who perceive the availability of financial aid as very important are more than twice as likely to have borrowed than students who did not perceive the availability of financial aid is very important ($O.R. = 2.008$; $p < .01$). Contrasted with students who expected to borrow \$0–\$9,999, those who expected to borrow \$10,000–\$19,999 are more than 40 times more likely to have borrowed ($O.R. = 40.305$; $p < .001$), and those who expected to borrow \$20,000 or more are more than 36 times more likely to have borrowed ($O.R. = 36.337$; $p < .001$). Surprisingly, contrasted with low-income students, moderate-income students are about 69% more likely to have borrowed ($O.R. = 1.685$; $p < .01$).

The only household variable that increases the likelihood of borrowing \$10,000 or more is the number of siblings the student has. Contrasted with students who have one or no siblings, those who have two siblings are about 72% more likely to have borrowed ($O.R. = 1.715$; $p < .01$), those who have three siblings are about 51% more likely to have borrowed ($O.R. = 1.511$; $p < .05$), and those who have four siblings or more are nearly three times more likely to have borrowed ($O.R. = 2.836$; $p < .01$).

Contrasted with students who attended public four-year colleges, those who attended private four-year colleges are twice as likely to have borrowed ($O.R. = 1.969$; $p < .001$). Students who applied for financial aid are about eight times more likely to have borrowed than students who did not apply for financial aid ($O.R. = 8.295$; $p < .001$). Students who paid for college with parents' loans are about three times more likely to have borrowed than students who did not pay for college with parents' loans ($O.R. = 3.109$; $p < .001$). Out-of-state students are about 43% more likely to have borrowed than in-state students ($O.R. = 1.430$; $p < .05$).

We also find that race, income, parent's level of education, having lived with parents, and parents' college savings accounts are negative significant predictors of amount of student loan debt. Contrasted with White students, Asian students are 39% less likely to have borrowed ($O.R. = 0.611$; $p < .05$). Contrasted with students in low-income households, those in high-income households are 47% less likely to have borrowed ($O.R. = 0.532$; $p < .05$). Contrasted with students whose parents had a high school education or less, students whose parents had some college are about 55% less

likely to have borrowed ($O.R. = 0.447; p < .001$). Contrasted with students who lived on their own, those who lived with parents are 53% less likely to borrow ($O.R. = 0.470; p < .001$).

Regarding our variable of interest—whether or not parents had college savings accounts—students whose parents had college savings accounts are 41% less likely to have borrowed than students whose parents did not have college savings accounts ($O.R. = 0.590; p < .001$).

Results by Income Level

Multinomial logistic results for small-dollar student loans (\$0–\$9,999) relative to not borrowing, low-income (\$35,000 or below) sample

Results from multinomial logistic regression predicting amount of student loan debt are reported in Tables 7 and 8. We find that positive significant predictors include race, gender, having reported financial aid as very important, amount expected to borrow, having applied for financial aid, having paid for college with savings or earnings, and having paid for college with parents' loans.

Contrasted with White students, Black students are more than three times more likely to have borrowed than not ($O.R. = 3.223; p < .01$). Contrasted with females, males are about 65% more likely to have borrowed ($O.R. = 1.654; p < .05$). Students who perceived the availability of financial aid as very important are more than twice as likely to have borrowed than students who did not perceive that availability of financial aid is very important ($O.R. = 2.390; p < .01$). Contrasted with students who expected to borrow \$0–\$9,999, those who expected to borrow \$10,000–\$19,999 are more than six times more likely to have borrowed ($O.R. = 5.955; p < .001$), and those who expected to borrow \$20,000 or more are more than three times more likely to have borrowed ($O.R. = 3.072; p < .05$).

Several college or university factors increase students' likelihood of borrowing. Students who applied for financial aid are about ten times more likely to have borrowed than students who did not apply for financial aid ($O.R. = 9.860; p < .001$). Students who paid for college with their own savings or earnings are 77% more likely to have borrowed than students who did not pay for college with their own savings or earnings ($O.R. = 1.772; p < .05$). Students who paid for college with parents' loans are about three times more likely to have borrowed than students who did not pay for college with parents' loans ($O.R. = 2.953; p < .01$).

We also find the only negative significant predictor of amount of student loan debt is having lived in a household with parents who have some college. Contrasted with students whose parents had a high school education or less, those whose parents had some college are about 53% less likely to have borrowed ($O.R. = 0.468; p < .05$).

Multinomial logistic results for high-dollar student loans (\$10,000 or higher) relative to not borrowing, low-income (\$35,000 or below) sample

We find that positive significant predictors of amount of student loan debt include gender, GPA, having reported financial aid as very important, amount expected to borrow, having attended a private four-year college, having applied for financial aid, having paid for college with parents' loans, and having attended college out of state (see Table 7).

Reducing Student Loan Debt through Parents' College Savings

Table 7. Multinomial logistic regression predicting amount of student loan debt, unadjusted, low-income (\$35,000 or below) sample (N = 860)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .34									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	-0.021	0.320	—	0.437	0.429	—	0.458	0.377	—
Income \$3,000–\$5,999	-0.037	0.309	—	0.133	0.465	—	0.170	0.380	—
Income \$6,000–\$9,999	-0.024	0.418	—	0.543	0.488	—	0.568	0.416	—
Income \$10,000 or higher	-0.045	0.419	—	0.891	0.556	—	0.937	0.523	—
White (reference)									
Black	0.537	0.340	—	-0.031	0.421	—	-0.568	0.365	—
Latino/Hispanic	0.185	0.378	—	-0.627	0.540	—	-0.813	0.484	—
Asian	-0.483	0.320	—	-0.469	0.470	—	0.014	0.514	—
Male	0.355	0.206	—	1.144 **	0.358	3.139	0.789 *	0.343	2.202
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	-0.244	0.545	—	-0.519	0.741	—	-0.275	0.627	—
GPA 2.51–3.00	0.538	0.520	—	0.175	0.585	—	-0.364	0.502	—
GPA 3.01–3.50	0.002	0.453	—	-0.914	0.547	—	-0.916	0.497	—
GPA 3.51–4.00	-0.226	0.458	—	-1.176 *	0.504	.309	-0.950 *	0.473	.387
Low college costs very important	0.114	0.283	—	-0.337	0.397	—	-0.451	0.332	—
Financial aid very important	0.710 *	0.301	2.034	1.059 *	0.415	2.885	0.349	0.394	—
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	1.749 ***	0.319	5.747	3.916 ***	0.438	50.205	2.167 ***	0.369	8.736
Expected to borrow \$20,000 or more	0.085	0.470	—	3.782 ***	0.471	43.905	3.697 ***	0.466	40.310
Parent/Household variables									
Head of household had high school education or less (reference)									
Head of household had some college	-0.412	0.354	—	0.347	0.459	—	0.759	0.391	—
Head of household had two-year college degree	0.325	0.426	—	0.564	0.540	—	0.239	0.493	—
Head of household had four-year college degree or higher	-0.269	0.306	—	-0.102	0.444	—	0.167	0.408	—
0 or 1 sibling (reference)									
2 siblings	0.638	0.314	—	0.485	0.469	—	-0.152	0.438	—
3 siblings	0.195	0.341	—	0.173	0.461	—	-0.022	0.441	—
4 or more siblings	0.621	0.368	—	0.986	0.527	—	0.365	0.459	—
Secondary school variables									
Received college counseling while in high school	-0.098	0.236	—	-0.488	0.327	—	-0.390	0.304	—
Percentage of students from high school who attended four-year college	-0.047	0.233	—	-0.297	0.331	—	-0.250	0.302	—
College/University variables									
Lived with parents (independent status)	-0.609 *	0.273	.544	-1.474 ***	0.364	.229	-0.865 *	0.345	.421
Attended private four-year college	0.041	0.264	—	0.763 *	0.362	2.144	0.722 *	0.315	2.058
Applied for financial aid	2.192 ***	0.473	8.956	3.338 ***	0.655	28.165	1.146	0.747	—
Paid for college with savings or earnings	0.592 *	0.231	1.808	0.354	0.331	—	-0.238	0.293	—
Paid for college with grants	0.388	0.352	—	-0.510	0.422	—	-0.898 *	0.426	.407
Paid for college with parent loans	0.923 **	0.311	2.518	1.685 ***	0.411	5.392	0.762 *	0.354	2.142
Out-of-state student	0.249	0.318	—	0.130	0.435	—	-0.119	0.402	—
Variable of interest									
Parent had college savings account for child	-0.203	0.235	—	-1.076 **	0.343	.341	-0.873 **	0.328	.428

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATI = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

*p < .05; **p < .01; ***p < .001.

Reducing Student Loan Debt through Parents' College Savings

Table 8. Multinomial logistic regression predicting amount of student loan debt, ATT weighted, low-income (\$35,000 or below) sample (N = 860)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .38									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	-0.152	0.284	—	-0.109	0.419	—	0.043	0.383	—
Income \$3,000–\$5,999	-0.201	0.285	—	-0.265	0.440	—	-0.064	0.380	—
Income \$6,000–\$9,999	0.133	0.405	—	0.749	0.604	—	0.616	0.561	—
Income \$10,000 or higher	-0.235	0.436	—	0.116	0.555	—	0.351	0.521	—
White (reference)									
Black	1.170 **	0.337	3.223	0.731	0.454	—	-0.439	0.412	—
Latino/Hispanic	0.189	0.384	—	-0.165	0.679	—	-0.354	0.619	—
Asian	-0.473	0.312	—	-0.703	0.478	—	-0.230	0.462	—
Male	0.503 *	0.206	1.654	0.798 *	0.350	2.220	0.294	0.319	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	0.047	0.552	—	-0.945	0.696	—	-0.992	0.599	—
GPA 2.51–3.00	0.288	0.482	—	-0.430	0.626	—	-0.718	0.556	—
GPA 3.01–3.50	-0.243	0.423	—	-1.387 *	0.556	.250	-1.144 *	0.492	.319
GPA 3.51–4.00	-0.338	0.435	—	-1.402 *	0.569	.246	-1.063	0.503	—
Low college costs very important	0.066	0.258	—	-0.206	0.427	—	-0.272	0.369	—
Financial aid very important	0.871 **	0.281	2.390	1.016 *	0.448	2.763	0.145	0.391	—
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	1.784 ***	0.327	5.955	4.045 ***	0.441	57.115	2.261 ***	0.366	9.590
Expected to borrow \$20,000 or more	1.122 *	0.506	3.072	4.526 ***	0.536	92.370	3.403 ***	0.454	30.067
Parent/Household variables									
Head of household had high school education or less (reference)									
Head of household had some college	-0.759 *	0.373	.468	-0.103	0.454	—	0.656	0.385	—
Head of household had two-year college degree	-0.037	0.401	—	0.725	0.581	—	0.762	0.541	—
Head of household had four-year college degree or higher	-0.138	0.296	—	0.031	0.427	—	0.169	0.384	—
0 or 1 sibling (reference)									
2 siblings	0.500	0.305	—	0.260	0.467	—	-0.239	0.439	—
3 siblings	0.372	0.357	—	0.186	0.454	—	-0.186	0.422	—
4 or more siblings	0.677	0.353	—	0.630	0.500	—	-0.048	0.447	—
Secondary school variables									
Received college counseling while in high school	-0.222	0.220	—	-0.583	0.323	—	-0.361	0.288	—
Percentage of students from high school who attended four-year college	-0.198	0.206	—	-0.462	0.333	—	-0.264	0.307	—
College/University variables									
Lived with parents (independent status)	-0.344	0.280	—	-1.119 *	0.444	.327	-0.775 *	0.391	.461
Attended private four-year college	0.027	0.254	—	0.796 *	0.373	2.216	0.768 *	0.310	2.156
Applied for financial aid	2.288 ***	0.474	9.860	3.028 *	0.896	20.662	0.740	0.941	—
Paid for college with savings or earnings	0.572 *	0.226	1.772	0.085	0.345	—	-0.487	0.320	—
Paid for college with grants	0.619	0.316	—	0.226	0.501	—	-0.393	0.464	—
Paid for college with parent loans	1.083 **	0.329	2.953	1.765 ***	0.409	5.842	0.682 *	0.314	1.978
Out-of-state student	0.003	0.294	—	0.429 *	0.396	1.535	0.425	0.354	—
Variable of interest									
Parent had college savings account for child	-0.249	0.208	—	-0.728	0.318	—	-0.479	0.288	—

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATT = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

*p < .05; **p < .01; ***p < .001.

Contrasted with females, males are about twice as likely to have borrowed ($O.R. = 2.220; p < .05$). Students who perceived the availability of financial aid as very important are more than twice as likely to have borrowed than students who did not perceive the availability of financial aid is very important ($O.R. = 2.763; p < .05$). Contrasted with students who expected to borrow \$0–\$9,999, those who expected to borrow \$10,000–\$19,999 are about 57 times more likely to have borrowed ($O.R. = 57.115; p < .001$), and those who expected to borrow \$20,000 or more are more than 92 times more likely to have borrowed ($O.R. = 92.370; p < .001$).

Contrasted with students who attended public four-year colleges, students who attended private four-year colleges are about twice as likely to have borrowed ($O.R. = 2.216; p < .05$). Students who applied for financial aid are about 21 times more likely to have borrowed than students who did not apply for financial aid ($O.R. = 20.662; p < .05$). Students who paid for college with parents' loans are about six times more likely to have borrowed than students who did not pay for college with parents' loans ($O.R. = 5.842; p < .001$). Contrasted with in-state students, out-of-state students are about 54% more likely to have borrowed ($O.R. = 1.535; p < .05$).

We also find that GPA and having lived with parents are negative significant predictors of amount of student loan debt. Contrasted with students with GPAs of 2.00 or lower, those with GPAs between 3.01 and 3.50 are about 75% less likely to have borrowed ($O.R. = .250; p < .05$), and those with GPAs between 3.51 and 4.00 are approximately 75% less likely to have borrowed ($O.R. = 0.246; p < .05$). Students who lived with parents are 67% less likely to have borrowed than students who did not live with parents ($O.R. = 0.327; p < .05$).

Multinomial logistic results for small-dollar student loan (\$0–\$9,999) relative to not borrowing, moderate-income (\$35,001–\$75,000) sample

Results from multinomial logistic regression predicting amount of student loan debt are reported in Tables 9 and 10. We find that positive significant predictors include student income, race, GPA, having applied for financial aid, having paid for college with savings or earnings, and having paid for college with parents' loans.

Contrasted with students who had incomes between \$0 and \$999, those who had incomes between \$1,000 and \$2,999 are about twice as likely to have borrowed ($O.R. = 2.021; p < .01$), those who had incomes between \$3,000 and \$5,999 are about twice as likely to have borrowed ($O.R. = 1.822; p < .05$), and those who had incomes between \$6,000 and \$9,999 are about twice as likely to have borrowed ($O.R. = 2.138; p < .05$). Contrasted with White students, Black students are about two and half times more likely to have borrowed ($O.R. = 2.427; p < .01$). Contrasted with students with GPAs of 2.00 or lower, those with GPAs between 2.51 and 3.00 are about twice as likely to have borrowed ($O.R. = 2.201; p < .05$), and those with GPAs between 3.01 and 3.50 are more than twice as likely to have borrowed ($O.R. = 2.064; p < .05$). Contrasted with students who expected to borrow \$0–\$9,999, those who expected to borrow \$10,000–\$19,999 are about 5.75 times more likely to have borrowed ($O.R. = 5.761; p < .001$).

Reducing Student Loan Debt through Parents' College Savings

Table 9. Multinomial logistic regression predicting amount of student loan debt, unadjusted, moderate-income (\$35,001–\$75,000) sample (N = 1235)

	0 vs. 1			0 vs. 2			1 vs. 2			
	β	SE	O.R.	B	SE	O.R.	B	SE	O.R.	
<i>Pseudo R</i> ² = .34										
Student variables										
Income \$0–\$999 (reference)										
Income \$1,000–\$2,999	0.722	0.278	—	0.137	0.442	—	-0.585	0.407	—	
Income \$3,000–\$5,999	0.819 **	0.307	2.269	0.878	0.450	—	0.059	0.407	—	
Income \$6,000–\$9,999	0.946 **	0.340	2.575	0.839	0.466	—	-0.107	0.458	—	
Income \$10,000 or higher	0.990 *	0.417	2.691	0.033	0.656	—	-0.957	0.586	—	
White (reference)										
Black	0.501	0.329	—	-0.515	0.471	—	-1.016 *	0.438	.362	
Latino/Hispanic	0.391	0.351	—	-0.171	0.525	—	-0.561	0.453	—	
Asian	-0.110	0.333	—	-0.243	0.399	—	-0.133	0.372	—	
Male	-0.224	0.203	—	-0.058	0.273	—	0.166	0.223	—	
GPA 2.00 or lower (reference)										
GPA 2.01–2.50	-0.392	0.582	—	1.309	0.857	—	1.701 *	0.813	5.477	
GPA 2.51–3.00	0.824	0.460	—	2.188 **	0.694	8.915	1.364 *	0.598	3.912	
GPA 3.01–3.50	0.601	0.433	—	1.126	0.657	—	0.525	0.568	—	
GPA 3.51–4.00	0.179	0.416	—	0.197	0.651	—	0.018	0.573	—	
Low college costs very important	-0.348	0.223	—	-0.225	0.245	—	0.123	0.242	—	
Financial aid very important	0.307	0.215	—	0.477	0.282	—	0.170	0.294	—	
Expected to borrow \$0–\$9,999 (reference)										
Expected to borrow \$10,000–\$19,999	1.616 ***	0.283	5.032	3.696 ***	0.349	40.290	2.080 ***	0.277	8.006	
Expected to borrow \$20,000 or more	-0.354	0.402	—	3.731 ***	0.364	41.715	4.085 ***	0.327	59.414	
Parent/Household variables										
Head of household had high school education or less (reference)										
Head of household had some college	-0.238	0.317	—	-0.211	0.405	—	0.027	0.372	—	
Head of household had two-year college degree	0.489	0.401	—	0.690	0.536	—	0.201	0.447	—	
Head of household had four-year college degree or higher	-0.543	0.285	—	-1.070 **	0.376	.343	-0.527	0.349	—	
0 or 1 sibling (reference)										
2 siblings	0.301	0.259	—	0.310	0.375	—	0.009	0.339	—	
3 siblings	0.120	0.283	—	0.079	0.360	—	-0.041	0.352	—	
4 or more siblings	0.229	0.284	—	0.324	0.416	—	0.096	0.395	—	
Secondary school variables										
Received college counseling while in high school	0.196	0.187	—	-0.127	0.258	—	-0.323	0.244	—	
Percentage of students from high school who attended four-year college	0.015	0.205	—	-0.054	0.244	—	-0.069	0.235	—	
College/University variables										
Lived with parents (independent status)	-0.742 **	0.237	.476	-1.069 **	0.344	.343	-0.327	0.309	—	
Attended private four-year college	0.422 *	0.207	1.525	1.149 ***	0.264	3.156	0.727 **	0.244	2.069	
Applied for financial aid	1.641 ***	0.364	5.159	2.310 ***	0.550	10.078	0.670	0.572	—	
Paid for college with savings or earnings	0.417 *	0.208	1.517	0.123	0.277	—	-0.294	0.243	—	
Paid for college with grants	-0.153	0.252	—	0.009	0.318	—	0.162	0.299	—	
Paid for college with parent loans	1.283 ***	0.238	3.607	1.271 ***	0.300	3.566	-0.011	0.260	—	
Out-of-state student	0.043	0.248	—	0.516	0.339	—	0.473	0.300	—	
Variable of interest										
Parent had college savings account for child	-0.449 *	0.185	.638	-0.881 **	0.256	.414	-0.432	0.234	—	

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATT = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

*p < .05; **p < .01; ***p < .001.

Reducing Student Loan Debt through Parents' College Savings

Table 10. Multinomial logistic regression predicting amount of student loan debt, ATT weighted, moderate-income (\$35,001–\$75,000) sample (N = 1,235)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .34									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	0.704 **	0.246	2.021	0.272	0.349	—	-0.432	0.328	—
Income \$3,000–\$5,999	0.600 *	0.265	1.822	0.773 *	0.357	2.166	0.173	0.332	—
Income \$6,000–\$9,999	0.760 *	0.304	2.138	1.070 **	0.398	2.914	0.310	0.393	—
Income \$10,000 or higher	0.593	0.368	—	0.571	0.550	—	-0.022	0.489	—
White (reference)									
Black	0.887 **	0.304	2.427	0.209	0.389	—	-0.678 *	0.341	.508
Latino/Hispanic	0.256	0.330	—	-0.296	0.481	—	-0.552	0.402	—
Asian	-0.063	0.271	—	-0.304	0.409	—	-0.240	0.396	—
Male	-0.127	0.165	—	0.069	0.217	—	0.197	0.193	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	-0.368	0.489	—	1.157	0.762	—	1.525 *	0.761	4.596
GPA 2.51–3.00	0.789 *	0.395	2.201	2.376 ***	0.648	10.766	1.588 **	0.583	4.892
GPA 3.01–3.50	0.725 *	0.360	2.064	1.489 *	0.598	4.432	0.764	0.539	—
GPA 3.51–4.00	0.232	0.344	—	0.687	0.592	—	0.455	0.539	—
Low college costs very important	-0.304	0.193	—	-0.172	0.242	—	0.131	0.214	—
Financial aid very important	0.347	0.183	—	0.759 **	0.247	2.137	0.412	0.247	—
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	1.751 ***	0.279	5.761	3.798 ***	0.328	44.633	2.047 ***	0.237	7.748
Expected to borrow \$20,000 or more	-0.035	0.320	—	3.880 ***	0.301	48.429	3.915 ***	0.295	50.150
Parent/Household variables									
Head of household had high school education or less (reference)									
Head of household had some college	-0.221	0.300	—	-0.406	0.380	—	-0.185	0.327	—
Head of household had two-year college degree	0.187	0.371	—	0.348	0.485	—	0.161	0.421	—
Head of household had four-year college degree or higher	-0.521	0.276	—	-1.032 **	0.354	.356	-0.512	0.323	—
0 or 1 sibling (reference)									
2 siblings	0.364	0.225	—	0.681 *	0.307	1.975	0.317	0.288	—
3 siblings	0.329	0.247	—	0.560	0.308	—	0.231	0.296	—
4 or more siblings	0.295	0.273	—	1.104 **	0.365	3.016	0.809 *	0.341	2.246
Secondary school variables									
Received college counseling while in high school	0.141	0.164	—	-0.120	0.223	—	-0.261	0.200	—
Percentage of students from high school who attended four-year college	-0.012	0.173	—	0.070	0.226	—	0.082	0.210	—
College/University variables									
Lived with parents (independent status)	-0.304	0.203	—	-0.696 *	0.322	.498	-0.392	0.295	—
Attended private four-year college	0.313	0.182	—	1.081 ***	0.248	2.948	0.768 **	0.233	2.155
Applied for financial aid	1.667 ***	0.305	5.296	2.051 ***	0.516	7.779	0.384	0.542	—
Paid for college with savings or earnings	0.600 **	0.173	1.821	0.331	0.222	—	-0.269	0.209	—
Paid for college with grants	0.035	0.217	—	0.156	0.294	—	0.121	0.273	—
Paid for college with parent loans	1.347 ***	0.216	3.845	1.370 ***	0.276	3.934	0.023	0.225	—
Out-of-state student	-0.009	0.209	—	0.384	0.283	—	0.393	0.251	—
Variable of interest									
Parent had college savings account for child	-0.323 *	0.159	.724	-0.710 **	0.227	.498	-0.387	0.201	—

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATT = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

*p < .05; **p < .01; ***p < .001.

Students who applied for financial aid are about five times more likely to have borrowed than students who did not apply for financial aid ($O.R. = 5.296; p < .001$). Students who paid for college with their own savings or earnings are nearly twice as likely to have borrowed than students who did not pay for college with their own savings or earnings ($O.R. = 1.821; p < .01$). Students who paid for college with parents' loans are almost four times more likely to have borrowed than students who did not pay for college with parents' loans ($O.R. = 3.845; p < .01$).

The variable of interest—whether or not parents had college savings accounts—is the only factor that we find reduces the amount of student debt for the moderate-income group. Students whose parents had a college savings account are 28% less likely to have borrowed than student whose parents did not have a college savings account ($O.R. = 0.724; p < .05$).

Multinomial logistic results for high-dollar student loans (\$10,000 or higher) relative to not borrowing, moderate-income (\$35,001–\$75,000) sample

We find that positive significant predictors of amount of student loan debt include students' income, GPA, having reported financial aid as very important, amount expected to borrow, having applied for financial aid, number of siblings, having lived with parents, having attended a private four-year college, and having paid for college with parents' loans (see Table 9).

Contrasted with students who had incomes between \$0 and \$999, those who had incomes between \$3,000 and \$5,999 are about twice as likely to have borrowed with all other factors constant ($O.R.=2.166; p<.05$), and those who had incomes between \$6,000 and \$9,999 are about three times more likely to have borrowed ($O.R. = 2.914; p < .01$). Contrasted with students with GPAs of 2.00 and lower, those with GPAs between 2.51 and 3.00 are about 10.75 times more likely to have borrowed ($O.R. = 10.766; p < .001$), and those with GPAs between 3.01 and 3.51 are more than 4.5 times more likely to borrow ($O.R. = 4.432; p < .05$). Students who perceived the availability of financial aid as very important are almost twice as likely to have borrowed than students who did not perceive the availability of financial aid is very important ($O.R. = 2.137; p < .05$). Contrasted with students who expected to borrow \$0–\$9,999, those who expected to borrow \$10,000–\$19,999 are more than 45 times more likely to have borrowed ($O.R. = 44.633; p < .001$), and those who expected to borrow \$20,000 or more are more than 48 times more likely to have borrowed ($O.R. = 48.633; p < .001$).

The only household variable that is a positive predictor of borrowing is the number of siblings a student has. Contrasted with students who have one or no siblings, those with two siblings are about twice as likely to have borrowed ($O.R. = 1.975; p < .05$), those with four or more siblings are nearly three times more likely to borrow ($O.R. = 3.016; p < .01$).

Contrasted with students who attended public four-year colleges, students who attended private four-year colleges are about twice as likely to have borrowed ($O.R. = 2.216; p < .05$). Students who applied for financial aid are about eight times more likely to have borrowed than students who did not apply for financial aid ($O.R. = 7.779; p < .001$). Students who paid for college with parents' loans are about four times more likely to have borrowed than students who did not pay for college with parents' loans ($O.R. = 2.948; p < .001$).

We also find that negative significant predictors of amount of student loan debt include parents' level of education, students' dependent status, and parents' college savings. Contrasted with students

whose parents had a high school education or less, students whose parents had four-year degrees or higher are about 64% less likely to have borrowed ($O.R. = 0.356; p < .05$). Students who lived with parents are nearly 50% less likely to have borrowed than students who did not live with parents ($O.R. = 0.498; p < .05$).

Students whose parents had college savings accounts are about 50% less likely to have borrowed than students whose parents did not have college savings accounts ($O.R. = 0.498; p < .01$).

Multinomial logistic results for small-dollar student loans (\$0–\$9,999) relative to did not borrow, middle-income (\$75,001–\$100,000) sample

Results from multinomial logistic regression predicting amount of student loan debt are reported in Tables 11 and 12. We find that positive significant predictors of amount of student loan debt include amount expected to borrow, having applied for financial aid, and having paid for college with grants.

Only one student factor increases the likelihood that a middle-income student borrows. Contrasted with students who expect to borrow \$0–\$9,999, those who expect to borrow \$10,000–\$19,999 are more than ten times more likely to have borrowed ($O.R. = 10.036; p < .001$).

There are several college or university factors that increase that the likelihood students will borrow. Students who applied for financial aid are about 15 times more likely to have borrowed than students who did not apply for financial aid ($O.R. = 15.142; p < .001$). Moreover, students who paid for college with grants are approximately twice as likely to have borrowed than students who did not pay for college with grants ($O.R. = 1.943; p < .05$).

We also find two negative significant predictors of amount of student loan debt: students' income and college counseling. Contrasted with students who had incomes between \$0 and \$999, those who had incomes between \$1,000 and \$2,999 relative to incomes are about 57% less likely to have borrowed ($O.R. = 0.429; p < .05$). Further, students who spoke to a high school counselor about college information are about 42% less likely to have borrowed than students who did not speak to a high school counselor about college information ($O.R. = 0.576; p < .05$).

Multinomial logistic results for high-dollar student loans (\$10,000 or higher) relative to not borrowing, middle-income (\$75,001–\$100,000) sample

We find that several predictor increase the amount of student loan debt: GPA, having reported financial aid as very important, amount expected to borrow, number of siblings, having applied for financial aid, having paid for college with savings or earnings, and having paid for college with parents' loans (see Table 11).

Contrasted with students with GPAs of 2.00 or lower, those with GPAs between 2.01 and 2.50 are more than ten times more likely to have borrowed ($O.R. = 10.331; p < .05$). Students who perceived the availability of financial aid as very important are about three times as likely to have borrowed than students who did not perceive the availability of financial aid is very important ($O.R. = 2.843; p < .01$). Contrasted with students who expected to borrow \$0–\$9,999, those who expected to borrow \$10,000–\$19,999 are nearly 54 times more likely to have borrowed ($O.R. = 53.814; p < .001$), and those who expected to borrow \$20,000 or more are nearly 97 times more likely to have borrowed ($O.R. = 96.724; p < .001$).

Reducing Student Loan Debt through Parents' College Savings

Table 11. Multinomial logistic regression predicting amount of student loan debt, unadjusted, middle-income (\$75,001–\$100,000) sample (N = 629)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .35									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	0.067	0.411	—	0.312	0.548	—	0.246	0.612	—
Income \$3,000–\$5,999	-0.136	0.444	—	0.245	0.566	—	0.381	0.598	—
Income \$6,000–\$9,999	0.013	0.495	—	-1.199	0.666	—	-1.211	0.727	—
Income \$10,000 or higher	-0.259	0.575	—	-0.426	0.638	—	-0.167	0.670	—
White (reference)									
Black	-0.443	0.496	—	-0.962	0.622	—	-0.519	0.653	—
Latino/Hispanic	0.431	0.686	—	-0.459	0.954	—	-0.890	0.933	—
Asian	-0.137	0.442	—	-0.114	0.696	—	0.023	0.747	—
Male	0.509	0.288	—	0.836	0.392	—	0.328	0.360	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	1.447	0.814	—	0.909	1.350	—	-0.537	1.128	—
GPA 2.51–3.00	0.465	0.692	—	0.701	0.774	—	0.236	0.681	—
GPA 3.01–3.50	0.279	0.665	—	-0.190	0.720	—	-0.469	0.556	—
GPA 3.51–4.00	-0.590	0.675	—	-0.836	0.723	—	-0.246	0.636	—
Low college costs very important	-0.403	0.399	—	-0.224	0.520	—	0.179	0.453	—
Financial aid very important	0.484	0.290	—	1.060 *	0.423	2.885	0.576	0.394	—
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	1.725 ***	0.473	5.615	3.278 ***	0.563	26.534	1.553 ***	0.435	4.725
Expected to borrow \$20,000 or more	-0.589	0.487	—	3.667 ***	0.474	39.140	4.256 ***	0.589	70.525
Parent/Household variables									
Head of household had high school education or less (reference)									
Head of household had some college	-0.665	0.646	—	-0.844	0.985	—	-0.180	0.918	—
Head of household had two-year college degree	-0.380	0.761	—	-0.410	1.078	—	-0.030	1.087	—
Head of household had four-year college degree or higher	-1.282 *	0.590	.278	-1.567	0.918	—	-0.285	0.837	—
0 or 1 sibling (reference)									
2 siblings	0.364	0.465	—	1.140	0.720	—	0.775	0.714	—
3 siblings	0.228	0.486	—	1.342	0.721	—	1.114	0.746	—
4 or more siblings	0.316	0.550	—	2.343 **	0.749	10.416	2.028 *	0.794	7.599
Secondary school variables									
Received college counseling while in high school	-0.329	0.292	—	-0.075	0.385	—	0.254	0.363	—
Percentage of students from high school who attended four-year college	0.449	0.296	—	0.420	0.405	—	-0.030	0.393	—
College/University variables									
Lived with parents (independent status)	-0.284	0.375	—	-1.771 **	0.527	.170	-1.486 **	0.567	.226
Attended private four-year college	-0.132	0.349	—	0.435	0.415	—	0.567	0.403	—
Applied for financial aid	2.517 ***	0.527	12.392	1.267	0.699	—	-1.250	0.844	—
Paid for college with savings or earnings	0.477	0.304	—	0.386	0.421	—	-0.091	0.399	—
Paid for college with grants	0.647	0.334	—	0.609	0.459	—	-0.039	0.451	—
Paid for college with parent loans	0.640	0.335	—	0.945 *	0.438	2.572	0.304	0.409	—
Out-of-state student	0.294	0.362	—	-0.392	0.420	—	-0.686	0.438	—
Variable of interest									
Parent had college savings account for child	0.101	0.296	—	-0.315	0.370	—	-0.416	0.359	—

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATI = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Reducing Student Loan Debt through Parents' College Savings

Table 12. Multinomial logistic regression predicting amount of student loan debt, ATT weighted, middle-income (\$75,001–\$100,000) sample (N = 629)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .38									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	-0.847 *	0.388	.429	-0.567	0.530	—	0.280	0.586	—
Income \$3,000–\$5,999	-0.640	0.406	—	-0.178	0.550	—	0.462	0.598	—
Income \$6,000–\$9,999	-0.712	0.482	—	-1.825 **	0.664	.161	-1.113	0.723	—
Income \$10,000 or higher	-0.495	0.525	—	-1.442	0.871	—	-0.947	0.894	—
White (reference)									
Black	-0.224	0.511	—	-1.123	0.708	—	-0.899	0.745	—
Latino/Hispanic	-0.057	0.534	—	-0.135	0.809	—	-0.079	0.786	—
Asian	0.141	0.491	—	-1.335	0.687	—	-1.476 *	0.663	.229
Male	0.185	0.265	—	0.492	0.383	—	0.308	0.357	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	1.265	0.798	—	2.335 *	1.021	10.331	1.070	0.956	—
GPA 2.51–3.00	0.809	0.667	—	0.671	0.758	—	-0.138	0.673	—
GPA 3.01–3.50	0.337	0.639	—	0.211	0.587	—	-0.126	0.530	—
GPA 3.51–4.00	-0.338	0.630	—	-0.328	0.606	—	0.010	0.581	—
Low college costs very important	0.164	0.377	—	0.383	0.465	—	0.219	0.424	—
Financial aid very important	0.152	0.301	—	1.045 **	0.383	2.843	0.893 *	0.372	2.442
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	2.306 ***	0.483	10.036	3.986 ***	0.535	53.814	1.679 ***	0.371	5.362
Expected to borrow \$20,000 or more	0.404	0.490	—	4.572 ***	0.411	96.724	4.168 ***	0.510	64.568
Parent/Household variables									
Head of household had high school education or less (reference)									
Head of household had some college	0.763	0.703	—	-0.468	0.881	—	-1.231	0.845	—
Head of household had two-year college degree	1.096	0.807	—	0.701	1.038	—	-0.395	1.021	—
Head of household had four-year college degree or higher	0.079	0.656	—	-0.766	0.834	—	-0.845	0.830	—
0 or 1 sibling (reference)									
2 siblings	0.478	0.412	—	0.771	0.549	—	0.293	0.523	—
3 siblings	0.220	0.470	—	1.141 *	0.536	3.130	0.921	0.535	—
4 or more siblings	0.339	0.496	—	1.485 *	0.627	4.414	1.146	0.659	—
Secondary school variables									
Received college counseling while in high school	-0.551 *	0.279	.576	-0.264	0.350	—	0.287	0.326	—
Percentage of students from high school who attended four-year college	0.125	0.311	—	0.188	0.383	—	0.063	0.361	—
College/University variables									
Lived with parents (independent status)	-0.363	0.341	—	-1.344 *	0.543	.261	-0.981	0.585	—
Attended private four-year college	-0.361	0.326	—	0.245	0.398	—	0.606	0.394	—
Applied for financial aid	2.717 ***	0.474	15.142	1.759 *	0.824	5.808	-0.958	0.950	—
Paid for college with savings or earnings	0.377	0.274	—	-0.066	0.363	—	-0.443	0.388	—
Paid for college with grants	0.664 *	0.323	1.943	0.614	0.428	—	-0.050	0.413	—
Paid for college with parent loans	0.298	0.325	—	0.790 *	0.368	2.204	0.492	0.358	—
Out-of-state student	0.025	0.348	—	-0.387	0.414	—	-0.411	0.416	—
Variable of interest									
Parent had college savings account for child	-0.056	0.241	—	-0.699 *	0.345	.497	-0.643	0.330	—

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATT = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Contrasted with students who have one or no siblings, those who have three siblings are about three times more likely to have borrowed ($O.R. = 3.130; p < .05$), and those who have four siblings or more are more than four times more likely to have borrowed ($O.R. = 4.414; p < .01$).

Students who applied for financial aid are about six times more likely to have borrowed than students who did not apply for financial aid ($O.R. = 5.808; p < .05$). Students who paid for college with parents' loans are about twice as likely to have borrowed than students who did not pay for college with parents' loans ($O.R. = 2.204; p < .05$).

Factors that reduce the amount of student loan debt incurred include students' income, dependent status, and parents' college savings. Contrasted with students who had incomes between \$0 and \$999, those with incomes between \$6,000 and \$9,999 are about 84% less likely to have borrowed ($O.R. = 0.161; p < .01$). Students who lived with their parents are about 74% less likely to have borrowed than students who did not live with their parents ($O.R. = 0.261; p < .05$).

The variable of interest—whether or not parents had college savings accounts—affected students' likelihood of borrowing \$10,000 or more. Students whose parents had college savings accounts are 50% less likely to have borrowed than students whose parents did not have college savings accounts ($O.R. = 0.497; p < .05$).

Multinomial logistic results for small-dollar student loans (\$0–\$9,999) relative to not borrowing, high-income (\$100,001 or higher) sample

Multinomial logistic regression results predicting amount of student loan debt are reported in Tables 13 and 14. We find that positive significant predictors include students' income, GPA, amount expected to borrow, number of siblings, having applied for financial aid, and having paid for college with parents' loans.

Contrasted with students who had incomes between \$0 and \$999, those who had incomes between \$3,000 and \$5,999 are about three times more likely to have borrowed ($O.R. = 3.195; p < .01$), and those who had incomes of \$10,000 or higher are about three times more likely to have borrowed ($O.R. = 3.136; p < .05$). Contrasted with students with GPAs of 2.00 or lower, those with GPAs between 2.51 and 3.00 are more than four times more likely to have borrowed ($O.R. = 4.314; p < .05$). Contrasted with students who expected to borrow \$0–\$9,999, those who expected to borrow \$10,000–\$19,999 are more than 9.5 times more likely to have borrowed ($O.R. = 9.660; p < .001$).

Contrasting students who have one or no siblings, those with two siblings are about four times more likely to have borrowed ($O.R. = 3.826; p < .05$), those who have three siblings are about 3.5 times more likely to have borrowed ($O.R. = 3.595; p < .05$), and those who have four or more siblings are nearly ten times more likely to have borrowed ($O.R. = 9.740; p < .01$). Students who applied for financial aid are about 11 times more likely to have borrowed between \$0 and \$9,999 in student loans than students who did not apply for financial aid ($O.R. = 10.784; p < .001$). Students who paid for college with parents' loans are more than 3.5 times more likely to have borrowed between \$0 and \$9,999 in student loans than students who did not pay for college with parents' loans ($O.R. = 3.619; p < .001$).

Reducing Student Loan Debt through Parents' College Savings

Table 13. Multinomial logistic regression predicting amount of student loan debt, unadjusted, high-income (\$100,000 or higher) sample (N = 951)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .42									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	0.842 *	0.422	2.321	-0.298	0.670	—	-1.140	0.641	—
Income \$3,000–\$5,999	1.318 **	0.419	3.736	0.774	0.674	—	-0.544	0.681	—
Income \$6,000–\$9,999	0.317	0.544	—	0.644	0.745	—	0.327	0.796	—
Income \$10,000 or higher	1.363 *	0.569	3.909	0.351	0.974	—	-1.012	0.973	—
White (reference)									
Black	0.371	0.583	—	-1.320	0.898	—	-1.691*	0.839	.184
Latino/Hispanic	0.216	0.535	—	-0.522	0.812	—	-0.738	0.762	—
Asian	-0.167	0.580	—	-0.195	0.633	—	-0.028	0.676	—
Male	0.521	0.305	—	0.344	0.429	—	-0.177	0.392	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	2.592 **	0.915	13.362	1.740	0.953	—	-0.852	1.069	—
GPA 2.51–3.00	1.666 *	0.806	5.289	0.993	0.782	—	-0.673	0.935	—
GPA 3.01–3.50	0.986	0.773	—	0.367	0.792	—	-0.619	0.939	—
GPA 3.51–4.00	1.171	0.751	—	0.291	0.764	—	-0.881	0.927	—
Low college costs very important	-0.029	0.439	—	0.155	0.616	—	0.184	0.643	—
Financial aid very important	0.713 *	0.315	2.040	0.731	0.432	—	0.018	0.447	—
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	2.172 ***	0.567	8.772	3.959 ***	0.660	52.412	1.788**	0.522	5.975
Expected to borrow \$20,000 or more	0.386	0.499	—	4.121 ***	0.487	61.601	3.735***	0.552	41.891
Parent/Household variables									
Head of household had high school education or less (reference)									
Head of household had some college	-1.767	1.318	—	-0.334	1.519	—	1.433	1.543	—
Head of household had two-year college degree	-0.644	1.365	—	1.283	1.254	—	1.927	1.690	—
Head of household had four-year college degree or higher	-0.198	1.060	—	-0.333	1.102	—	-0.135	1.401	—
0 or 1 sibling (reference)									
2 siblings	0.819	0.586	—	0.506	0.786	—	-0.313	0.779	—
3 siblings	0.543	0.589	—	0.006	0.705	—	-0.537	0.733	—
4 or more siblings	1.967 **	0.598	7.153	2.068 **	0.758	7.909	0.100	0.738	—
Secondary school variables									
Received college counseling while in high school	0.470	0.283	—	0.208	0.387	—	-0.263	0.418	—
Percentage of students from high school who attended four-year college	-0.002	0.336	—	-0.561	0.443	—	-0.559	0.480	—
College/University variables									
Lived with parents (independent status)	0.621	0.384	—	0.064	0.678	—	-0.557	0.692	—
Attended private four-year college	0.834 **	0.265	1.860	0.414	0.451	—	-0.420	0.418	—
Applied for financial aid	2.630 ***	0.484	2.303	1.884 **	0.622	1.513	-0.746	0.761	—
Paid for college with savings or earnings	0.726 *	0.285	13.870	0.240	0.451	—	-0.486	0.446	—
Paid for college with grants	0.095	0.307	—	0.276	0.498	—	0.181	0.527	—
Paid for college with parent loans	1.239 ***	0.313	3.452	1.327 **	0.463	3.769	0.088	0.490	—
Out-of-state student	-0.286	0.286	—	0.453	0.439	—	0.739	0.453	—
Variable of interest									
Parent had college savings account for child	-0.486	0.327	----	-0.452	0.369	—	0.034	0.400	—

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATI = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Reducing Student Loan Debt through Parents' College Savings

Table 14. Multinomial logistic regression predicting amount of student loan debt, ATT weighted, high-income (\$100,000 or higher) sample (N = 951)

	0 vs. 1			0 vs. 2			1 vs. 2		
	β	SE	O.R.	β	SE	O.R.	β	SE	O.R.
<i>Pseudo R</i> ² = .42									
Student variables									
Income \$0–\$999 (reference)									
Income \$1,000–\$2,999	0.420	0.432	—	-0.072	0.561	—	-0.492	0.576	—
Income \$3,000–\$5,999	1.162 **	0.445	3.195	0.804	0.589	—	-0.357	0.618	—
Income \$6,000–\$9,999	0.255	0.538	—	0.300	0.621	—	0.045	0.716	—
Income \$10,000 or higher	1.143 *	0.552	3.136	0.795	0.985	—	-0.348	0.983	—
White (reference)									
Black	0.244	0.861	—	-0.743	0.841	—	-0.987	0.749	—
Latino/Hispanic	-0.129	0.501	—	-0.686	0.849	—	-0.557	0.913	—
Asian	-1.056 *	0.445	.348	-0.250	0.554	—	0.805	0.673	—
Male	0.500	0.289	—	0.772 *	0.358	2.164	0.272	0.367	—
GPA 2.00 or lower (reference)									
GPA 2.01–2.50	1.258	0.790	—	2.371 *	0.915	10.703	1.112	0.928	—
GPA 2.51–3.00	1.462 *	0.688	4.314	0.963	0.917	—	-0.498	0.910	—
GPA 3.01–3.50	0.296	0.624	—	0.450	0.872	—	0.154	0.895	—
GPA 3.51–4.00	0.706	0.622	—	0.056	0.837	—	-0.650	0.843	—
Low college costs very important	0.766	0.544	—	-0.141	0.680	—	-0.908	0.608	—
Financial aid very important	-0.060	0.351	—	0.731	0.392	—	0.791	0.406	—
Expected to borrow \$0–\$9,999 (reference)									
Expected to borrow \$10,000–\$19,999	2.268 ***	0.568	9.660	3.716 ***	0.625	41.090	1.448 **	0.483	4.254
Expected to borrow \$20,000 or more	-0.142	0.444	—	3.491 ***	0.446	32.830	3.633 ***	0.554	37.842
Parent/Household variables									
Head of household had high school education or less (reference)									
Head of household had some college	-1.089	1.237	—	0.060	1.334	—	1.149	1.393	—
Head of household had two-year college degree	-0.824	1.358	—	1.312	1.372	—	2.136	1.506	—
Head of household had four-year college degree or higher	-0.696	1.084	—	-0.728	1.224	—	-0.032	1.234	—
0 or 1 sibling (reference)									
2 siblings	1.342 *	0.600	3.826	-0.021	0.465	—	-1.363 *	0.657	.256
3 siblings	1.280 *	0.626	3.595	-0.680	0.495	—	-1.959 **	0.698	.141
4 or more siblings	2.276 ***	0.631	9.740	0.832	0.501	—	-1.444 *	0.662	.236
Secondary school variables									
Received college counseling while in high school	0.058	0.276	—	-0.077	0.366	—	-0.135	0.400	—
Percentage of students from high school who attended four-year college	-0.284	0.368	—	-0.277	0.438	—	0.007	0.484	—
College/University variables									
Lived with parents (independent status)	0.601	0.368	—	-0.095	0.631	—	-0.697	0.683	—
Attended private four-year college	0.424	0.253	—	0.265	0.442	—	-0.160	0.444	—
Applied for financial aid	2.378 ***	0.485	10.784	3.367 ***	0.726	28.991	0.989	0.822	—
Paid for college with savings or earnings	0.391	0.283	—	0.306	0.382	—	-0.084	0.417	—
Paid for college with grants	0.284	0.296	—	0.183	0.458	—	-0.101	0.468	—
Paid for college with parent loans	1.286 ***	0.291	3.619	1.116 *	0.437	3.053	-0.170	0.436	—
Out-of-state student	-0.387	0.283	—	0.952 *	0.406	2.590	1.339 **	0.406	.812
Variable of interest									
Parent had college savings account for child	-0.305	0.246	—	-0.513	0.366	—	-0.208	0.385	—

Note. Data from the Education Longitudinal Study (ELS). β = regression coefficients; SE = standard error; OR = odds ratio; ATT = the average treatment effect for the treated using the weight of 1 for a treated case and $p/(1-p)$ for a non-treated case.

* $p < .05$; ** $p < .01$; *** $p < .001$.

We find that race is a negative significant predictor of amount of student loan debt. In particular, contrasted with White students, Asian students are about 65% less likely to have borrowed ($O.R. = 0.348; p < .05$).

Multinomial logistic results for high-dollar student loans (\$10,000 or higher) relative to not borrowing, high-income (\$100,000 or higher) sample

We find no negative significant predictors of high-income students borrowing \$10,000 or higher, but we find that positive significant predictors of amount of student loan debt include gender, GPA, amount expected to borrow, having applied for financial aid, having paid for college with parents' loans, and having been an out-of-state student.

Contrasted with females, males are more than twice as likely to have borrowed ($O.R. = 2.164; p < .05$). Contrasted with students with GPAs of 2.00 or lower, those with GPAs between 2.01 and 2.50 are about 10.75 times more likely to have borrowed ($O.R. = 10.703; p < .05$). Contrasted with students who expected to borrow \$0–\$9,999, those who expected to borrow \$10,000–\$19,999 are about 41 times more likely to have borrowed ($O.R. = 41.090; p < .001$), those who expected to borrow \$20,000 or more are more than 33 times more likely to have borrowed ($O.R. = 32.830; p < .001$).

Students who applied for financial aid are about 11 times more likely to have borrowed than students who did not apply for financial aid ($O.R. = 10.784; p < .001$). Students who paid for college with parents' loans are about three times more likely to have borrowed than students who did not pay for college with parents' loans ($O.R. = 3.053; p < .05$). Out-of-state students are about 2.5 times more likely to have borrowed \$10,000 or more in student loans than in-state students ($O.R. = 2.590; p < .05$).

Summary

Table 14 provides a quick summary of all statistically significant predictors for all ATT weighted models estimated in this study. Interestingly, student income appears to increase the likelihood that moderate-income students take out small- and high-dollar student loans. Being Black also seems to increase the likelihood that, in particular, students from the two lower income groups take out small-dollar loans but not high-dollar loans. Gender seems to matter most noticeably for males in the low-income sample who have higher odds of taking out student loans than low-income females. Encouragingly, having higher GPAs reduces the likelihood that low-income students will have to take out high-dollar loans, while earning average GPAs increases the likelihood that middle- and high-income students take out high-dollar loans. Findings across all models suggest that expecting to take out student loans of \$10,000–\$19,999 increases the likelihood that students will take out loans—regardless of the type—contrasted with not taking out loans.

Having two or more siblings increases the likelihood that moderate- and middle-income students will take out high-dollar loans. Not surprisingly, applying for financial aid affects whether or not students will take out student loans. Also, attending a private four-year college and being either a low- or moderate-income student increases the likelihood that students take out high-dollar loans. Having parents who take out loans increases the likelihood that students in all subsamples will take out high-dollar loans.

Finally, with respect to our variable of interest—whether or not parents had college savings accounts—results suggest that parents' college savings help reduce the likelihood that students will take out high-dollar loans in all subsamples except high-income students.

Discussion

Our primary research question is whether parents' savings for their children's college education is associated with reduced amounts of college debt. Multinomial logistic results from this study indicate that parents who open savings accounts to help pay for their children's college education may reduce the likelihood that their children will take out high-dollar student loans. These loans are of particular interest because they may be the most damaging to persistence and graduation from college (Dwyer, McCloud, & Hodson, 2011; Dwyer et al., 2012; Paulsen & St. John, 2002).

Like Elliott and Freidline (2012), we find that students are more likely to report paying for their four-year college attendance with family contributions when their parents open college savings accounts. Equally important, consistent results from the nearest neighbor matching and propensity score weighting models suggest that the effect of parents' college savings on high-dollar amount is robust (i.e., the results are insensitive to selection bias given the covariates in the models).

We find that a number of factors increase the likelihood that a student will take out a high-dollar loan. The amount of money children expect to borrow in the future is a very strong predictor of whether students take out loans in actuality. Students who expected to borrow \$10,000 or more were far more likely to have taken out high-dollar amounts. Some research suggests that students may gain a boost in self-esteem and a sense of mastery from taking out student loans, which may encourage them to take out additional loans. However, this sense of mastery begins to fade over time (Dwyer et al., 2011). Additional research suggests that students are more likely to drop out of college once loans become too high (\$10,000 or more), which might occur because students who take on high-dollar loans early in their college careers do not have realistic expectations about what they can afford to pay back (Dwyer et al., 2011; Dwyer et al., 2012). As more reasonable expectations are formed, they become more averse to taking out additional loans necessary to finish and graduate. However, more research is necessary to understand this potential relationship.

More research also is needed with respect to gender, particularly among low-income students. In this study, we find that males are more likely than females to take out student loans, which is contrary to findings by Dwyer et al. (2012) who find females are more likely to have higher debt amounts. However, they examine cumulative debt through graduation, while examine debt at the beginning of students' college careers. A reason for doing so is to verify whether early debt is more predictive of persistence than debt that occurs after the first year of college (Dowd & Coury, 2006; Kim, 2007).

Limitations

A limitation of this study is the use of propensity score weighting, which may increase random error in estimates due to endogeneity and specification of the propensity score estimation equation (Freedman & Berk, 2008). In some cases, propensity score weighting has been found to exaggerate endogeneity (Freedman & Berk, 2008). More specifically, parents' college savings may be endogenous if assignment into treatment groups correlates with unobserved covariates that impact college enrollment and graduation. Endogeneity may be introduced by unknowingly omitting relevant or important covariates. In this study, concerns regarding endogeneity can be mitigated

somewhat because we used two propensity score analyses (i.e., pair matching and propensity score weighting) to cross-validate the results from the two models that adjust for selection bias given the observed covariates.

Implications

The main implication of this study is that parents' college savings may reduce the amount of college debt that students are forced to bear to attain a college degree. These findings hold across all income levels with the exception of high-income students. However, finding ways to reduce college debt burdens among low- and moderate-income students may be more important than finding ways to reduce debt among higher income students. Debt may have a more negative affect on whether those students persist in college than their higher income counterparts (Paulsen & St. John, 2002).

While debt that exceeds \$10,000 is associated with students being less likely to graduate from college regardless of gender, males are more likely than females to drop out of college at lower levels of debt (Dwyer et al., 2012). As a result, high-dollar loans may be especially damaging to male students, and it is magnified by the growing trend of males enrolling and graduating from college at lower rates than females (Buchmann & DiPrete, 2006).

Finally, our findings suggest that grants are doing very little to reduce the need for student loans, which may be because they make up a shrinking proportion of the overall financial aid a student can receive. For example, the proportion of federal grants to federal loans in 1976 was about even (Archibald, 2002), but the ratio had shifted to 27% grants and 70% loans by 1985 and 17% grants and 82% loans by 1998 (Archibald, 2002; see also Heller & Rogers, 2006). This may suggest a need to increase the amount of grant aid available or that other strategies are needed that align better with the American ideal of personal responsibility like savings.

Conclusion

A policy argument for adopting CDAs has long been that they can help reduce the amount of college debt students leave school with, but no research confirms this. In this study, we find evidence to suggest that parents' college savings can be part of a strategy to help reduce college debt amounts. However—even if small-dollar savings accounts for college improve enrollment and graduation rates (Elliott, in press)—CDAs must be adequately funded to be effective in reducing debt.

Some research suggests that debt over \$10,000 can have adverse effects on students' persistence in college (Dwyer et al., 2011; Dwyer et al., 2012), but students graduate with about \$24,000 in debt on average (College Board, 2012b). We acknowledge that this is a very crude and speculative estimate, but the basic idea of parents' college savings accounts may provide a starting point for programs that have reducing college debt as their goal. How can we expect students and their parents to save at least \$14,000 for college, particularly if they are low-income? We suggest that an important key is starting savings as early as birth. In addition to starting early, CDA programs can provide students with initial deposits, savings matches, incentives, and the opportunity for third parties to make deposits in these accounts.

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