Education

Primary school spending per pupil (2000 dollars)

8th grade math scores
The identification assumption underlying this exercise is that there is no systematic difference in nutrition between eligible and noneligible households with an elderly member. As I discuss later, this assumption may be problematic, and I present results for an alternative specification that relaxes it.

**Results**

The results from estimating equation 1 are presented in table 3. Columns 1–3 do not distinguish by gender of the eligible household member. For girls the coefficient is positive but insignificant without controlling for the presence of noneligible members over age 50 (column 1). When these controls are introduced, the coefficient more than doubles (0.35) and becomes significant (column 2).
## EFFECT OF SSA COLLEGE AID ON PROBABILITY OF ATTENDING COLLEGE

### Table 2—OLS, Effect of Eligibility for Student Benefits on Probability of Attending College by Age 23

<table>
<thead>
<tr>
<th></th>
<th>(1) Difference-in-differences</th>
<th>(2) Add covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deceased father × before</td>
<td>0.182</td>
<td>0.219 (0.102)</td>
</tr>
<tr>
<td>Deceased father</td>
<td>−0.123</td>
<td>Y</td>
</tr>
<tr>
<td>Before</td>
<td>0.026</td>
<td>Y</td>
</tr>
</tbody>
</table>

Source: Dynarski 2003
**EFFECT OF PROVIDING INFORMATION ABOUT RETURNS TO COLLEGE IN DOMINICAN REPUBLIC**

<table>
<thead>
<tr>
<th></th>
<th>$\Delta$ Implied Return (Self)</th>
<th>Returned Next Year</th>
<th>Completed Secondary</th>
<th>Years of Schooling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Treatment</td>
<td>366</td>
<td>366</td>
<td>.039</td>
<td>.041</td>
</tr>
<tr>
<td></td>
<td>(29)</td>
<td>(29)</td>
<td>(.025)</td>
<td>(.023)</td>
</tr>
<tr>
<td>Log (income per capita)</td>
<td>30.0</td>
<td></td>
<td>.075</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(48)</td>
<td></td>
<td>(.042)</td>
<td></td>
</tr>
<tr>
<td>School Performance</td>
<td>1.1</td>
<td></td>
<td>.011</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(13)</td>
<td></td>
<td>(.010)</td>
<td></td>
</tr>
<tr>
<td>Father’s education</td>
<td>-26</td>
<td></td>
<td>.082</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(33)</td>
<td></td>
<td>(.029)</td>
<td></td>
</tr>
<tr>
<td>Interviewed</td>
<td></td>
<td></td>
<td></td>
<td>.014</td>
</tr>
</tbody>
</table>

Source: Jensen 2010
Figure 1

Distribution of Family Income Among Families with a Child in the 12th Grade, 2008

Source: Hoxby, C. M., & Avery, C. 2012
## Table 1
**College Costs and Resources by Selectivity**

<table>
<thead>
<tr>
<th>Selectivity (Barron's)</th>
<th>Out-of-Pocket Cost for a Student at the 20th Percentile of Family Income (includes room and board)</th>
<th>Comprehensive Cost (includes room and board)</th>
<th>Instructional Expenditure per Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>most competitive</td>
<td>6,754</td>
<td>45,540</td>
<td>27,001</td>
</tr>
<tr>
<td>highly competitive plus</td>
<td>13,755</td>
<td>38,603</td>
<td>13,732</td>
</tr>
<tr>
<td>highly competitive</td>
<td>17,437</td>
<td>35,811</td>
<td>12,163</td>
</tr>
<tr>
<td>very competitive plus</td>
<td>15,977</td>
<td>31,591</td>
<td>9,605</td>
</tr>
<tr>
<td>very competitive</td>
<td>23,813</td>
<td>29,173</td>
<td>8,300</td>
</tr>
<tr>
<td>competitive plus</td>
<td>23,552</td>
<td>27,436</td>
<td>6,970</td>
</tr>
<tr>
<td>competitive</td>
<td>19,400</td>
<td>24,166</td>
<td>6,542</td>
</tr>
<tr>
<td>less competitive</td>
<td>26,335</td>
<td>21,262</td>
<td>5,359</td>
</tr>
<tr>
<td>some or no selection, 4-year</td>
<td>18,981</td>
<td>16,638</td>
<td>5,119</td>
</tr>
<tr>
<td>private 2-year</td>
<td>14,852</td>
<td>17,822</td>
<td>6,796</td>
</tr>
<tr>
<td>public 2-year</td>
<td>7,573</td>
<td>10,543</td>
<td>4,991</td>
</tr>
<tr>
<td>for-profit 2-year</td>
<td>18,486</td>
<td>21,456</td>
<td>3,257</td>
</tr>
</tbody>
</table>

Notes: The sources are colleges' net cost calculators for the out-of-pocket cost column and IPEDS for the remaining columns. The net cost data were gathered for the 2009-10 school year by the authors, for the institutions at the very competitive and more selective levels. For the institutions of lower selectivity, net cost estimates are based on the institution's published net cost calculator for the year closest to 2009-10--never later than 2011-12. Net costs are then reduced to approximate 2009-10 levels using the institution's own room and board and tuition net of aid numbers from IPEDS, for the relevant years.

Source: Hoxby, C. M., & Avery, C. 2012
Figure 7
Number of High Achievers per 17-year-old
darker = greater number of high achievers per 17-year-old

Source: Hoxby, C. M., & Avery, C. 2012

Figure 8
High Income Students' Portfolios of College Applications
(1 student = weight of 1)

Source: Hoxby, C. M., & Avery, C. 2012
Figure 10
Low Income Students' Portfolios of College Applications
(1 student = weight of 1)

Source: Hoxby, C. M., & Avery, C. 2012
11.5

The Role of the Government in Higher Education

Current Government Role

**Figure 11-4**

**Government Spending on Higher Education**

- Eighty-five percent of the roughly $199 billion the government spends annually on higher education is in the form of state and local funding for colleges and universities. The remainder is split among Pell Grants, tax breaks, and student loans.
The early period of gender parity in college enrollments from 1900 to 1930 (covering the birth cohorts of 1880 to 1910) was not the result of a situation where only an elite class sent children of both genders to college. Just 5 percent of the women enrolled in privately-controlled colleges in 1925 attended the elite “seven-sister” schools and only 22 percent were in any all-women’s college. Half of all American college students in 1925 were in publicly-controlled institutions of higher education, and 55 percent of women were. A substantial fraction of women during this period attended teacher-training colleges, and many of these schools had two-year programs. In 1925, for example, 30 percent of the female enrollments

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**Figure 1**

**College Graduation Rates (by 35 years) for Men and Women: Cohorts Born from 1876 to 1975**

*Sources: 1940 to 2000 Census of Population Integrated Public Use Micro-data Samples (IPUMS).*

*Notes: The figure plots separately by sex the fraction of each birth cohort who had completed at least four years of college by age 35 for the U.S. born. When the IPUMS data allows us to look directly at thirty-five-year-olds in a given year, we use that data. Since educational attainment data was first collected in the U.S. population censuses in 1940, we need to infer completed schooling at age 35 for cohorts born prior to 1905 based on their educational attainment at older ages. We also don’t observe all post-1905 birth cohorts at exactly age 35. We use a regression approach to adjust observed college graduation rates for age based on the typical proportional life-cycle evolution of educational attainment of a cohort. The age-adjustment regressions are run on birth-cohort year cells pooled across the 1940 to 2000 IPUMS with the log of the college graduation rate as the dependent variable and a full set of birth cohort dummies and a quartic in age as the covariates. The details of the age-adjustment method are the same as used by DeLong, Goldin, and Katz (2003, Figure 2–1). College graduates are those with 16 or more completed years of schooling for the 1940 to 1980 samples and those with a bachelor’s degree or higher in the 1990 to 2000 samples. The underlying sample includes all U.S. born residents aged 25 to 64 years.*
Figure 1: Income Eligibility Thresholds for the Different Levels of BCS Grant

Notes: The figure shows the income eligibility thresholds for the different levels of grants (denoted L0 to L6) awarded through the French Bourses sur critères sociaux program in 2009. The thresholds, which depend on the applicant’s family need assessment (FNA) score, apply to parental taxable income earned two years before the application (x-axis). The FNA score (y-axis) is capped at 17 and has a median value of 3. Income thresholds are expressed in 2011 euros.

Figure 2: Amount of Annual Cash Allowance Awarded to Applicants with an FNA Score of 3 Points, as Function of their Parents’ Taxable Income

Notes: The figure shows the amount of annual cash allowance awarded in 2009 to BCS grant applicants with a family needs assessment (FNA) score of 3 points (median value), as a function of their parents’ taxable income two years before the application. Applicants eligible for a level 0 grant qualify for fee waivers only. Applicants eligible for higher levels of grant qualify for fee waivers and an annual cash allowance, the amount of which varies with the level of grant: 1,476 euros (level 1), 2,223 euros (level 2), 2,849 euros (level 3), 3,473 euros (level 4), 3,988 euros (level 5) and 4,228 euros (level 6). Income thresholds and allowance amounts are expressed in 2011 euros.

Source: Fack and Grenet (2014)
**Figure 5:** College Enrollment Rate of Grant Applicants at Different Income Eligibility Thresholds

(a) Fee Waiver (L0/No grant Cutoffs)

(b) €1,500 Allowance (L1/L0 Cutoffs)

(c) €600 Increment (L6/L5 to L2/L1 Cutoffs)

Notes: The circles represent the mean college enrollment rate of grant applicants per interval of relative income-distance to the eligibility thresholds. The solid lines are the fitted values from a third-order polynomial approximation which is estimated separately on both sides of the cutoffs. The vertical lines identify the eligibility cutoffs.

Source: Fack and Grenet (2014)
Figure 6: RD for College enrollment. Full sample.

Note: Each dot represents average college enrollment in an interval of 2 PSU points. The dashed lines represent fitted values from a 4th order spline and 95% confidence intervals for each side. The vertical line indicates the cutoff (475). These graphs show the full sample of students fulfilling all requirements to be eligible for college loans and taking the PSU immediately after graduating from high school.

Source: Solis (2013)
student’s score to be the minimum of these normalized scores. As such, students pass if and only if this normalized score is nonnegative. The dots are cell means, and the lines are fitted values from a regression of diploma receipt on a fourth-order polynomial in the score (estimated separately on either side of the passing cutoff). The fraction of students with a diploma increases sharply as scores cross the passing threshold, from around 0.4 to 0.9. This implies that barely passing the last-chance exam substantially increases the probability of earning a diploma.

A. Main Estimates

We use fuzzy regression discontinuity methods (Angrist and Lavy 1999; Hahn et al. 2001) to exploit this discontinuity. In particular, we use passing status on the last-chance exam as an instrumental variable for diploma receipt in models that control for flexible functions of the exam scores (i.e., the variable on the horizontal axis in fig. 1). More formally, we estimate the following equations:

\[ Y_i = \beta_0 + \beta_1 D_i + f(p_i) + \epsilon_i, \]  

(1)
tus even in the last-chance sample of students who remain in school until the end of grade 12. We return to this point in our discussion of the findings. Third, there is no indication of any jump in earnings at the passing cutoff.

The estimated discontinuities reported in table 3 are consistent with this last assertion. For each earnings outcome (i.e., for each year grouping), columns 1–4 report estimated discontinuities for first- through fourth-order polynomials, where the polynomials are fully interacted with an indicator for passing the last-chance exam. For each outcome, the estimated discontinuities are small in magnitude, small relative to the mean earnings of those who barely failed the exam (col. 1) and statistically indistinguishable from zero. Moreover, the estimates are robust to the choice of polynomial. Goodness-of-fit statistics suggest that the second-order polynomial is the preferred specification, and column 5 reports estimates from a model that uses this preferred polynomial and controls for baseline covariates. In column 6 we report estimates from a model in which the coefficients of the polynomial are restricted to be the same on either side of the passing cutoff. These estimates are more pre-

Fig. 2.—Earnings by last-chance exam scores. The graphs are based on the last-chance samples. See table 1 and the text. Dots are test score cell means. The scores on the x-axis are the minimum of the section scores (recentered to be zero at the passing cutoff) that are taken in the last-chance exam. Lines are fourth-order polynomials fitted separately on either side of the passing threshold.

Source: Clark and Martorell JPE’14
Mobility Report Cards: The Role of Colleges in Intergenerational Mobility

Raj Chetty, John N. Friedman, Emmanuel Saez, Nicholas Turner, and Danny Yagan

Which colleges in America contribute the most to helping children climb the income ladder? How can we increase access to such colleges for children from low income families? We take a step toward answering these questions by constructing publicly available mobility report cards – statistics on students’ earnings in their early thirties and their parents’ incomes – for each college. We estimate these statistics using de-identified data from the federal government covering all students from 1999-2013, building on the Dept. of Education’s College Scorecard.

Using these mobility report cards, we document four results.

1. Access. Access to colleges varies substantially across the income distribution, for example as shown between Columbia and SUNY-Stony Brook in the figure above. At “Ivy-Plus” colleges (Ivy League colleges, U. Chicago, Stanford, MIT, and Duke), more students come from families in the top 1% of the income distribution than the bottom half of the income distribution. Despite the generous financial aid offered by these institutions, students from the lowest-income families are particularly under-represented, even relative to middle-income students. Children with parents in the top 1% are 77 times more likely to attend an Ivy-Plus college than children with parents in the bottom 20%. More broadly, looking across all colleges, the degree of income segregation is comparable to income segregation across neighborhoods in the average American city. These findings challenge the perception that colleges foster interaction between children from diverse socioeconomic backgrounds.

Visit www.equality-of-opportunity.org for the full paper, college-level data, and more
2. Outcomes. At any given college, students from low- and high-income families have very similar earnings outcomes. For example, about 60% of students at Columbia reach the top fifth from both low and high income families. In this sense, colleges successfully “level the playing field” across enrolled students with different socioeconomic backgrounds. This finding suggests that students from low-income families who are admitted to selective colleges are not over-placed, since they do nearly as well as students from more affluent families. This result also suggests that colleges do not bear large costs in terms of student outcomes for any affirmative action that they grant students from low-income families in the admissions process.

3. Mobility Rates. We characterize differences in rates of upward mobility between colleges by defining a college’s upward mobility rate as the fraction of its students who come from a family in the bottom fifth of the income distribution and end up in the top fifth. Each college’s mobility rate is the product of access, the fraction of its students who come from families in the bottom fifth, and its success rate, the fraction of such students who reach the top fifth.

Mobility rates vary substantially across colleges because there are large differences in access across colleges with similar success rates. Ivy-Plus colleges have the highest success rates, with almost 60% of students from the bottom fifth reaching the top fifth. But certain less selective universities have comparable success rates while offering much higher levels of access to low-income families. For example, 51% of students from the bottom fifth reach the top fifth at SUNY–Stony Brook. Because 16% of students at Stony Brook are from the bottom fifth compared with 4% at the Ivy-Plus colleges, Stony Brook has a bottom-to-top-fifth mobility rate of 8.4%, substantially higher than the 2.2% rate on average at Ivy-Plus colleges.

The colleges that have the highest upward mobility rates, listed in the table below, are typically mid-tier public schools that have many low-income students and very good outcomes.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Mobility Rate</th>
<th>Access</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cal State University – LA</td>
<td>9.9%</td>
<td>33.1%</td>
<td>29.9%</td>
</tr>
<tr>
<td>2</td>
<td>Pace University – New York</td>
<td>8.4%</td>
<td>15.2%</td>
<td>55.6%</td>
</tr>
<tr>
<td>3</td>
<td>SUNY – Stony Brook</td>
<td>8.4%</td>
<td>16.4%</td>
<td>51.2%</td>
</tr>
<tr>
<td>4</td>
<td>Technical Career Institutes</td>
<td>8.0%</td>
<td>40.3%</td>
<td>19.8%</td>
</tr>
<tr>
<td>5</td>
<td>University of Texas – Pan American</td>
<td>7.6%</td>
<td>38.7%</td>
<td>19.8%</td>
</tr>
<tr>
<td>6</td>
<td>City Univ. of New York System</td>
<td>7.2%</td>
<td>28.7%</td>
<td>25.2%</td>
</tr>
<tr>
<td>7</td>
<td>Glendale Community College</td>
<td>7.1%</td>
<td>32.4%</td>
<td>21.9%</td>
</tr>
<tr>
<td>8</td>
<td>South Texas College</td>
<td>6.9%</td>
<td>52.4%</td>
<td>13.2%</td>
</tr>
<tr>
<td>9</td>
<td>Cal State Polytechnic – Pomona</td>
<td>6.8%</td>
<td>14.9%</td>
<td>45.8%</td>
</tr>
<tr>
<td>10</td>
<td>University of Texas – El Paso</td>
<td>6.8%</td>
<td>28.0%</td>
<td>24.4%</td>
</tr>
</tbody>
</table>

*Note: Table lists highest-mobility-rate colleges with more than 300 students per cohort.*

Visit www.equality-of-opportunity.org for the full paper, college-level data, and more
The differences in mobility rates across colleges are not driven by differences in the distribution of college majors or other institutional characteristics. The estimates are similar when we measure children’s income at the household instead of individual level or adjust for differences in local costs of living.

If we measure “success” in earnings as reaching the top 1% of the income distribution instead of the top 20%, we find very different patterns. The colleges that channel the most children from low- or middle-income families to the top 1% are almost exclusively highly selective institutions, such as UC-Berkeley and the Ivy-Plus colleges, where 13% of students from the bottom fifth reach the top 1%. No college in the U.S. currently offers a high rate of upper-tail (top 1%) success while providing very high levels of access to low-income students.

4. Trends. Finally, we examine how access and mobility rates have changed since 2000, when our data begin. Despite substantial tuition reductions and other outreach policies, the fraction of students from low-income families at the Ivy-Plus colleges increased very little across a range of income percentiles (e.g., below the 20th, 40th, or 60th percentile). This is illustrated by the trend in the fraction of students from the bottom quintile at Harvard in the figure below. This result does not imply that the increases in financial aid had no effect on access; absent these changes, the fraction of low-income students might have fallen, especially given that real incomes of low-income families fell due to widening inequality during the 2000s.

The increase in our percentile-based measures of access at elite private colleges is smaller than suggested by the increase in the fraction of students receiving federal Pell grants – a widely-used proxy for low-income access – because the Pell eligibility threshold rose in the 2000s and the real income.

Meanwhile, access at institutions with the highest mobility rates (e.g., SUNY-Stony Brook and Glendale Community College in the figure above) fell sharply over the 2000s, perhaps because
Figure B2.1. Public and private expenditure on educational institutions, as a percentage of GDP (2013)

From public\textsuperscript{1} and private\textsuperscript{2} sources

Note: Public expenditure figures presented here exclude undistributed programme.

1. Including public subsidies to households attributable to educational institutions, and direct expenditure on educational institutions from international sources.
2. Net of public subsidies attributable for educational institutions.
4. Public does not include international sources.

Countries are ranked in descending order of expenditure from both public and private sources on educational institutions.


Statlink: http://dx.doi.org/10.1787/888933297710
Chart PF1.2.A Expenditure on education as % of GDP, by level of education and source of funds, 2013

Expenditure on primary, secondary and post-secondary non-tertiary and on tertiary education by public or private source, as % of GDP

Panel A. Public expenditure

Panel B. Private expenditure

a) Data for Canada refer to 2012 and for Chile to 2014
b) Public expenditure includes public subsidies to households attributable for educational institutions and direct expenditure on educational institutions from international sources. Private expenditure is presented net of public subsidies attributable for educational institutions.
c) Public does not include international sources.
d) The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD Education at a Glance 2016
Figure 10.15. The rise of the social State in Europe, 1870-2015

Interpretation. In 2015, fiscal revenues represented 47% of national income on average in Western Europe and were used as follows: 10% of national income for regalian expenditure (army, police, justice, general administration, basic infrastructure: roads, etc.); 6% for education; 11% for pensions; 9% for health; 5% for social transfers (other than pensions); 6% for other social spending (housing, etc.). Before 1914, regalian expenditure absorbed almost all fiscal revenues. Note. The evolution depicted here is the average of Germany, France, Britain and Sweden (see figure 10.14). Sources and series: see piketty.pse.ens.fr/ideology.
Notes: This figure plots the fraction of children in the 1980-82 birth cohorts in our analysis sample who attend college at any time during or before the year in which they turn ages 22, 28, and 32, by parent income ventile. This figure is constructed directly from the individual-level microdata.
Parent Income Distributions by Quintile for 1980-82 Birth Cohorts
At Selected Colleges

Harvard University
UC Berkeley
SUNY-Stony Brook
Glendale Community College

Parent Income Quintile 1

Top 1%