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Impact of TRIO Program on College Choice Process

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Overview

(Work-in-progress)

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Introduction

- Disadvantaged students typically are hindered in accessing and completing college (Perna, 2005; Toutkoushian et al., 2015; McDonough & Fann, 2007; Wies, 2016).
- The US Department of Education has launched the federal TRIO program, Talent Search (TS) and Upward Bound (UB) to help disadvantaged students complete their high school certificates and go on to attend college.
- Examples (Policy briefs published by US Department of Education):
 - Overall, 86% of UB participants in the 2013-14 high school graduation cohort immediately enrolled in colleges and universities.
 - Post-secondary enrollment outcomes for Talent Search participants between 2011-12 and 2013-14 were about 80% across the years.

Federal TRIO Program



- Federal outreach and student services programs in the United States
- Services for students from disadvantaged backgrounds, first generation or low-income students
- Talent Search: identifies and assists disadvantaged students who have the potential to succeed in higher education.
- Upward Bound: provides opportunities to succeed in precollege performance and higher education pursuits.
- Provides academic instruction, tutoring, financial and economic literacy, assistance in completing college admissions and financial aid applications, assistance in preparing for college entrance exams, etc.

Eligibility for TRIO Program

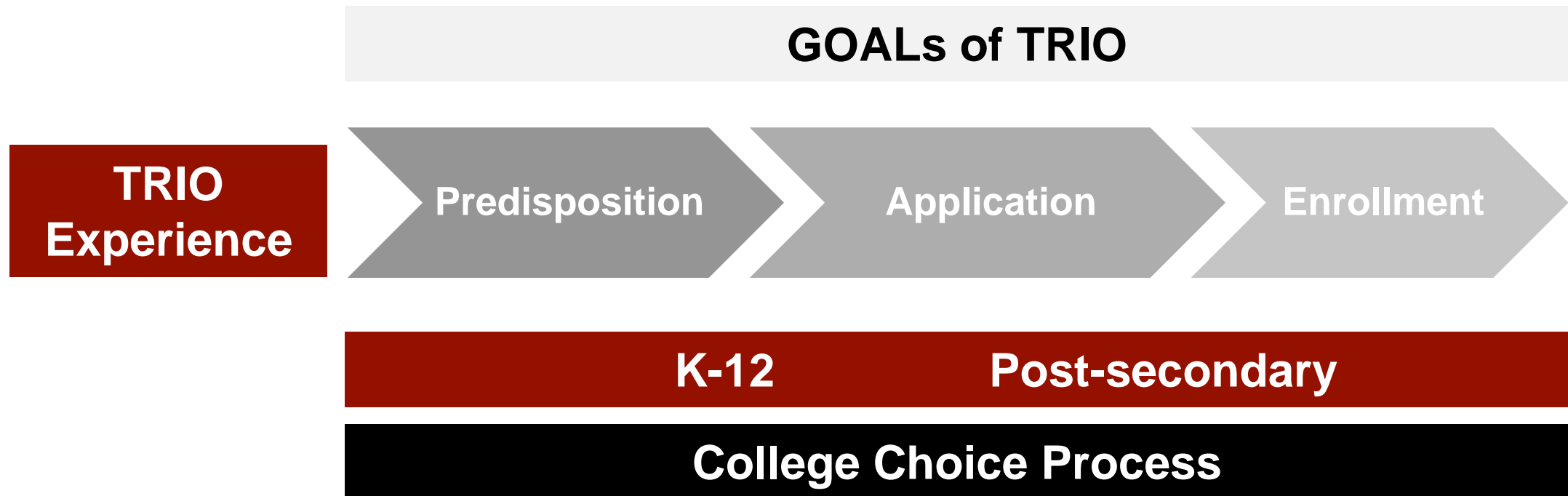
- The eligibility criteria:
 - 1) Either from low-income families or first-generation students, or 2) both low-income and first-generation
- First-generation:
 - Defined as a) an individual with neither parent holding a BA; or b) an individual who has regularly resided with and received support from only one parent without a BA
- A low-income individual:
 - Defined as an individual from a family whose taxable income for the preceding year did not exceed 150 percent of the federal poverty level as established by the Bureau of the Census.

Literature Review

- Students' socioeconomic status discourse on college access and choice
 - College access and choice are influenced by socioeconomic status (SES) (Astin & Oseguera, 2004; Pascarella & Terenzini, 2005; Perna, 2006)
 - Family income and parental education: important factors in student decisions about post-secondary education (Chen & DesJardins, 2010; Toutkoushian et al., 2015; Perna & Titus, 2015)
 - Conceptual model: 'Five Stage Model of the College Choice Process (Predisposition-Initial search-Application-Admission-Enrollment)' as suggested by Toutkoushian & Paulsen (2016)
- Past empirical studies on the effect of the TRIO program
 - Many studies are concerned with the effect of the TRIO on college access and educational outcomes.
 - Several limitations: limited sample, sample selection, misleading causal effect

Goals of the Study

- Purpose: To explore the impact of the implementation of TRIO, specifically Upward Bound and Talent Search, on the college choice process (college predisposition, college application, and college enrollment).



Data and Sample

- National dataset:
 - High School Longitudinal Study of 2009, 2011, and 2016 (HSLs:2009/11/16), collected by the National Center for Education Statistics (NCES)
- Original sample:
 - Dataset includes approximately 20,000 nine graders in 944 public and private schools in the U.S.
- Sample for this study:
 - Only non-first-generation students—about 9,000 students

Data and Sample

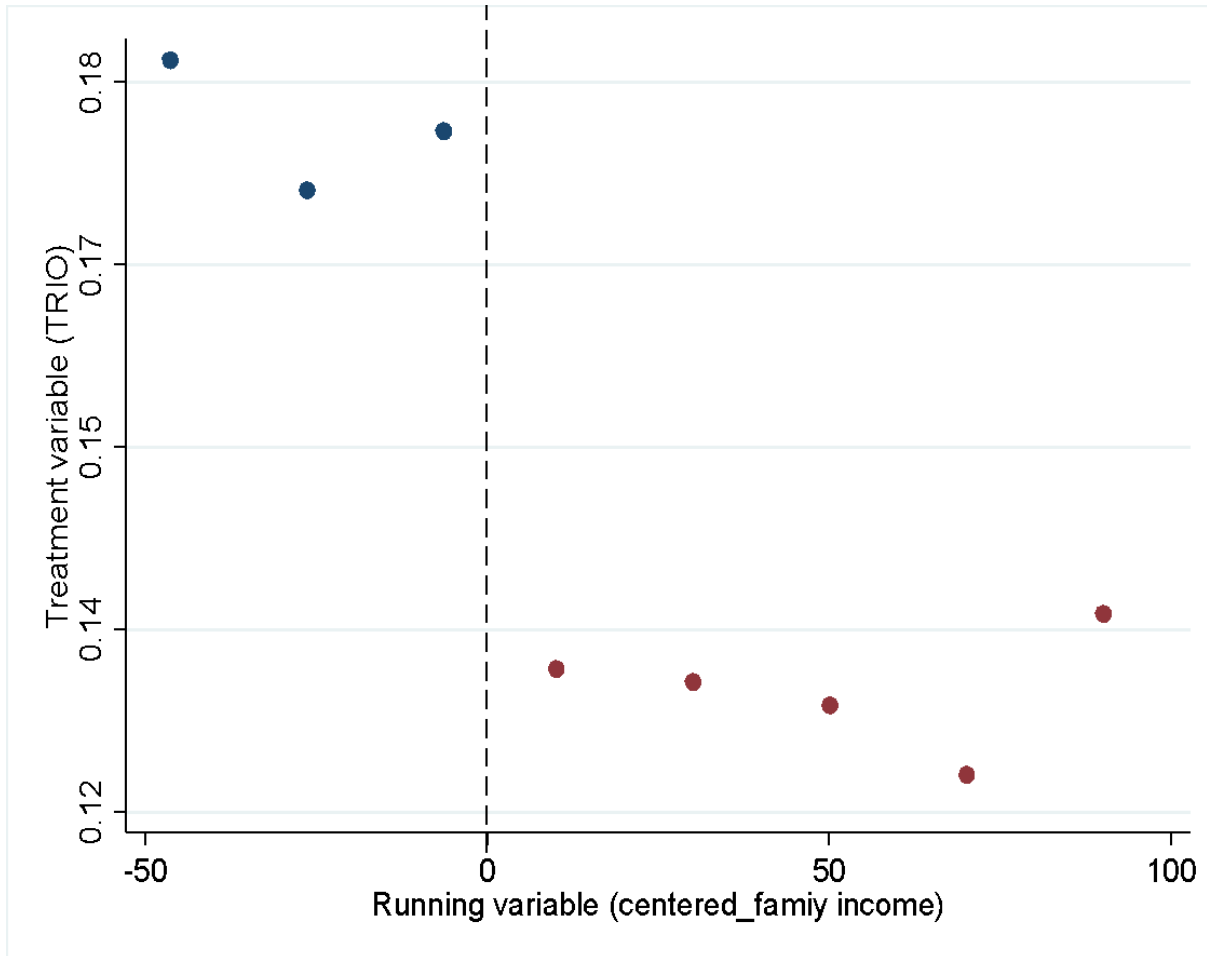
Ratio of the Treatment (TRIO) in Sub-sample

	Non-participants in TRIO (%)	Participants in TRIO (%)	Total
Non-first-generation	86.95	13.05	100
First-generation	86.96	13.04	100
Total	86.96	13.04	100

Regression Discontinuity Design (RDD)

- Regression discontinuity design (RDD) is a quasi-experimental design where subjects are assigned to the treatment and control groups based on a score or continuous values on some pre-specified criterion.
- For our data, some individuals below the cut-off point did not participate in the TRIO and some individuals above the cut-off point participated in the program; thus, it is referred to as a “fuzzy” design (Battistin & Rettore, 2008).

Graph (Treatment (TRIO) and Running Variable)



- Noncompliance: inaccurate income and/or first-generation family changes between when students actually participated in TRIO and when students responded to the HSLS survey.
- To achieve precise analysis, the sample has been limited to non-first-generation students to diminish cross-over possibilities at the cut-off point.

Running Variable

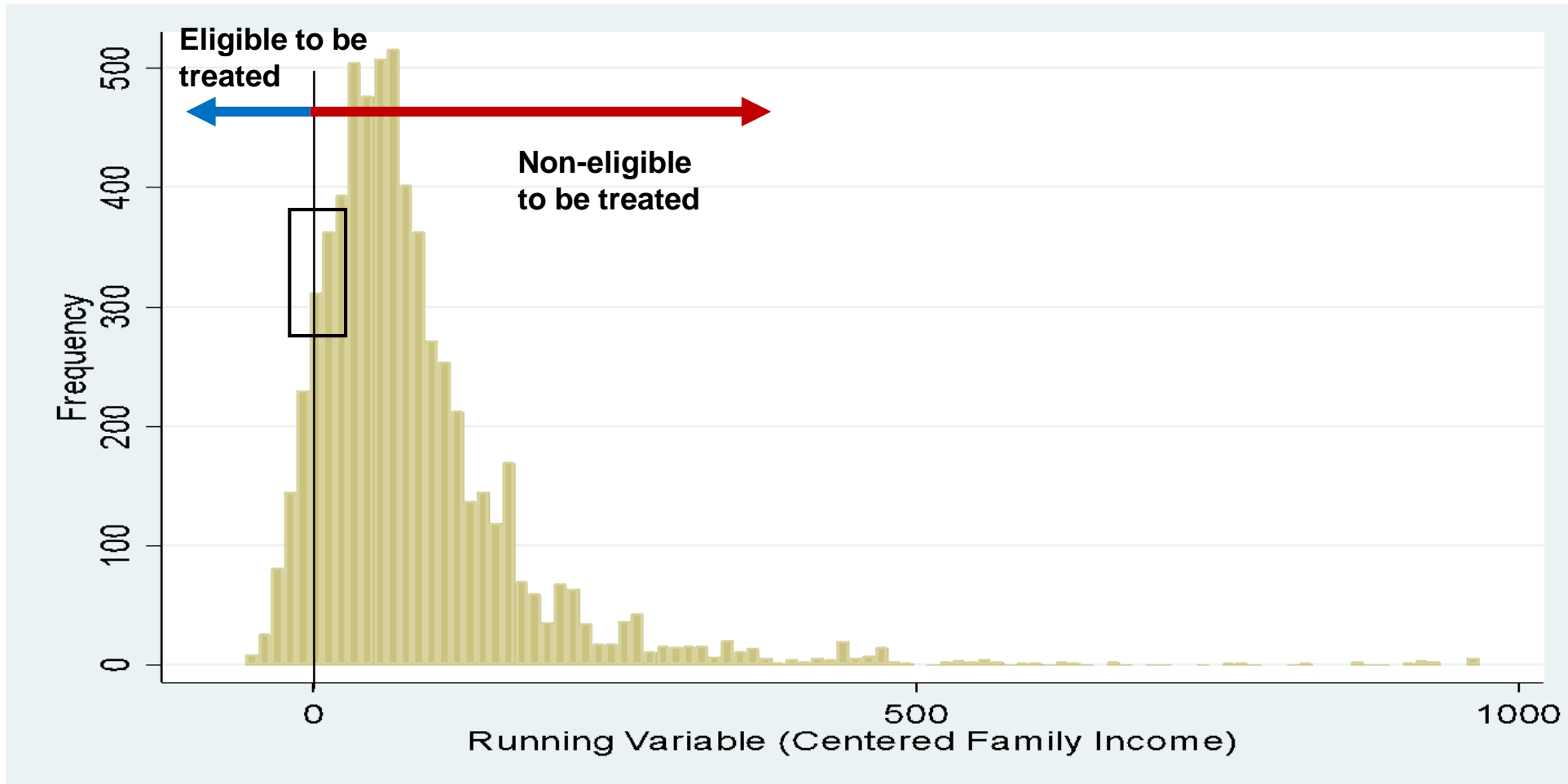
Federal TRIO Programs 2011 Annual Low-Income Levels

Size of Family Unit	48 Contiguous States, D.C., and Outlying Jurisdictions	Alaska	Hawaii
1	\$16,335	\$20,400	\$18,810
2	\$22,065	\$27,570	\$25,395
3	\$27,795	\$34,740	\$31,980
4	\$33,525	\$41,910	\$38,565
5	\$39,255	\$49,080	\$45,150
6	\$44,985	\$56,250	\$51,735
7	\$50,715	\$63,420	\$58,320
8	\$56,445	\$70,590	\$64,905

Note: This information is retrieved from the website: <https://www2.ed.gov/about/offices/list/ope/trio/2011-low-income.html>. For family units with more than eight members, add the following amount for each additional family member: \$5,730 for the 48 contiguous states, the District of Columbia and outlying jurisdictions; \$7,170 for Alaska; and \$6,585 for Hawaii. The poverty guidelines were published by the U.S. Department of Health and Human Services in the [Federal Register](#), Vol. 76, No. 13, January 20, 2011, pp. 3637-3638.

- Re-centering family income to align with the size of the family unit, and residential state.
- Family income as reported to HSLs in 2011 (may differ from the actual income used by the government to determine TRIO eligibility).
- The size of the family unit was derived from the total numbers of 2012 household members (which was collected in the first follow-up survey).
- The state information was determined by the state in which the students' schools were located in 2011.

Graph (Running variable: Family income)



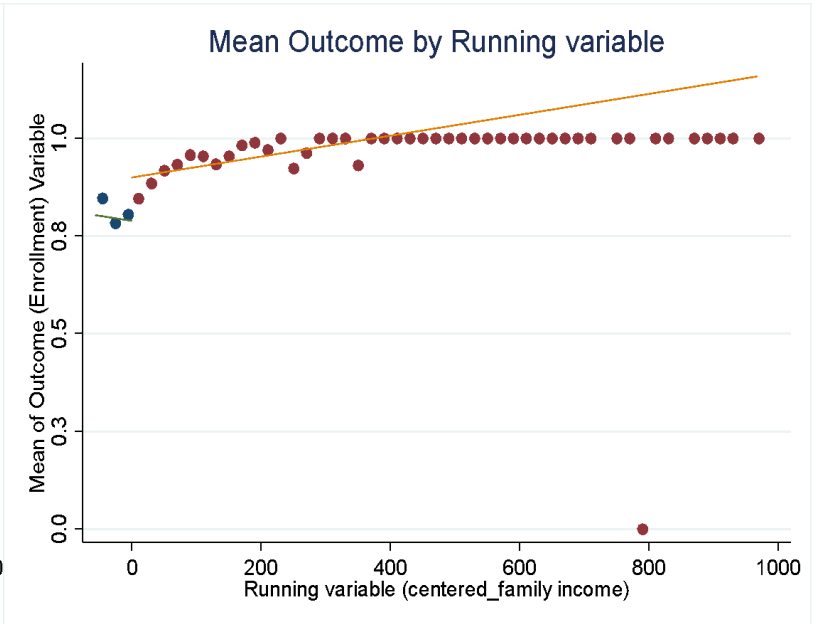
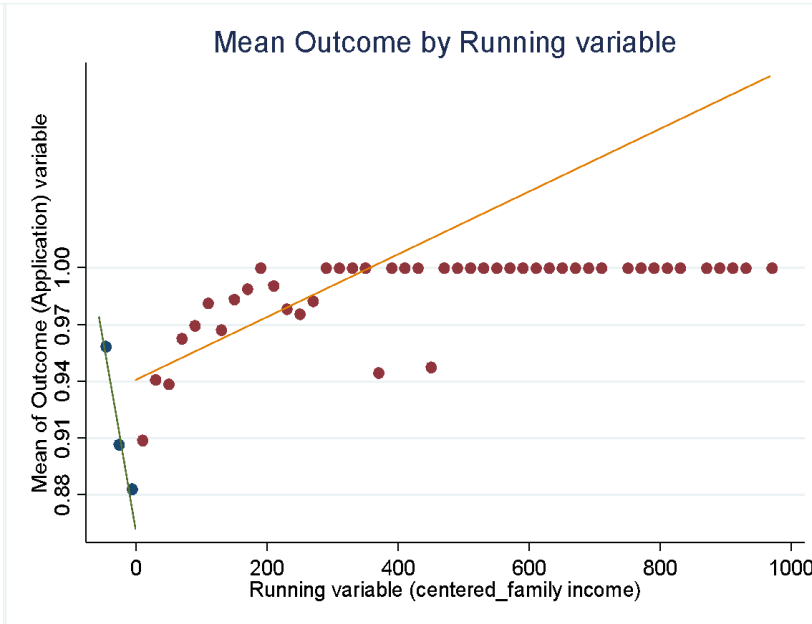
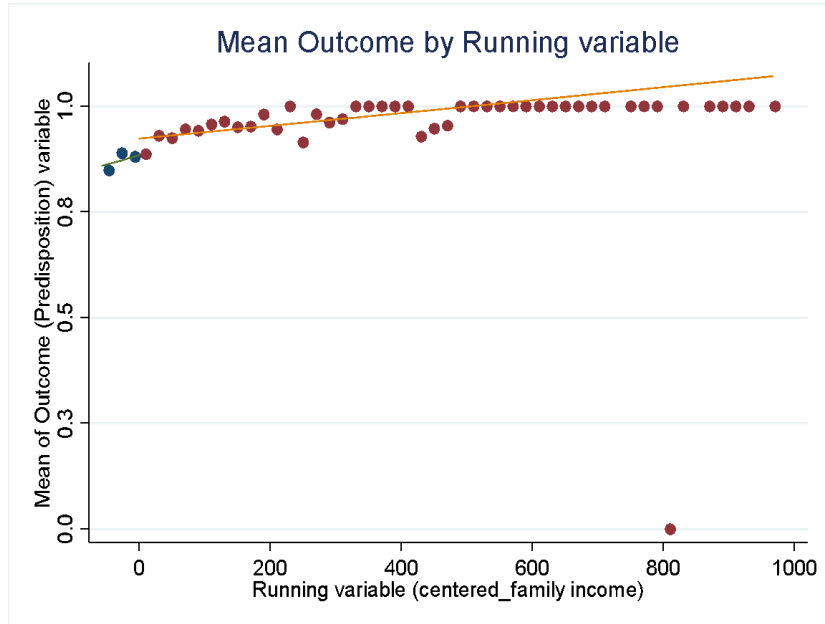
Treatment Variable

- **Treatment variable**
 - TRIO—whether the student had ever participated in the TRIO program (Upward Bound/Talent Search) before the 11th grade.
 - The same for both Upward Bound and Talent Search, since the main purpose and eligibility requirements of the programs are the same.

Outcome Variables

- Based on Model of College Choice Process (Toutkoushian & Paulsen, 2016):
 - 1) College predisposition—whether students are sure about their attainment of a Bachelor's degree in 11th grade
 - 2) College applications—whether students applied to colleges or universities in 12th grade
 - 3) College enrollment—whether students enrolled in college and the level of post-secondary education after high school completion
 - The alignment with the goals of TRIO (Talent Search and Upward Bound).

Graph (Running variable vs. Outcomes)



Covariates

Covariates	Mean	Std. Dev.	Min	Max
Gender (Female vs. Male)	0.48	0.50	0.00	1.00
White, non-Hispanic	0.63	0.48	0.00	1.00
Asian, non-Hispanic	0.11	0.31	0.00	1.00
Black, non-Hispanic	0.08	0.27	0.00	1.00
Multiple race, non-Hispanic	0.08	0.27	0.00	1.00
Hispanic	0.09	0.29	0.00	1.00
American Indian/Hawaiian, non-Hispanic	0.01	0.09	0.00	1.00
Control (Public vs. Private)	0.28	0.45	0.00	1.00
Region1_ Northeast	0.16	0.37	0.00	1.00
Region2_ Midwest	0.28	0.45	0.00	1.00
Region3_ South	0.40	0.49	0.00	1.00
Region4_ West	0.16	0.36	0.00	1.00
Locale1_ City	0.33	0.47	0.00	1.00
Locale2_ Suburb	0.32	0.47	0.00	1.00
Locale3_ Town	0.10	0.30	0.00	1.00
Locale4_ Rural	0.25	0.43	0.00	1.00
Average GPA	3.05	0.70	0.00	4.00

Statistical Methods

- Parametric approach:
 - Use regression analysis to model relationship between outcome, treatment, and running variables to measure the jump
 - Uses the whole sample; Depends on good estimates of functional form
- Non-parametric approach: (“local linear regression”)
 - Subjects near the cut point for the running variable are as good as randomly assigned to the treatment
 - Focuses on subset of observations near the cutoff—limits the sample

Statistical Methods

- Software: Stata 15.1
- Non-parametric:
 - Bandwidth: optimal bandwidth that Stata calculated (mserd)
 - ‘mserd’ specifies one common MSE-optimal bandwidth selector for the RD treatment effect estimator. (‘mserd’ is the default.)
- Both parametric and non-parametric:
 - Polynomial functional forms: linear, quadratic, and cubic.
 - In order for robust analysis, weighting and placebo tests were applied, when applicable.

Preliminary Findings-Parametric

First-Stage Model (ITT effect)

	Linear	Linear with Interaction	Quadratic	Quad with Interaction	Cubic	Cubic with Interaction
	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)
College Predisposition						
ITT (Intent to Treat)	0.061* (0.024)	0.057* (0.024)	0.054* (0.024)	0.049* (0.024)	0.042+ (0.024)	0.038 (0.024)
Sample Size	6241	6220	6241	6220	6241	6220
College Application						
ITT (Intent to Treat)	0.046+ (0.025)	0.043+ (0.025)	0.026 (0.026)	0.023 (0.026)	0.010 (0.029)	0.007 (0.029)
Sample Size	5710	5692	5710	5692	5710	5692
College Enrollment						
ITT (Intent to Treat)	0.111*** (0.032)	0.111*** (0.032)	0.081* (0.033)	0.081* (0.033)	0.056 (0.035)	0.056 (0.035)
Sample Size	5451	5435	5451	5435	5451	5435

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Preliminary Findings-Parametric

ATE (two-stage least squares 2SLS)

Outcomes (obs.)	Linear	Linear with Interaction	Quadratic	Quad with Interaction	Cubic	Cubic with Interaction
	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)
College predisposition (n=6201)	-0.629 (0.446)	-0.581 (0.411)	-0.292 (0.349)	-0.293 (0.356)	-0.038 (0.442)	-0.026 (0.351)
College application (n=5846)	-0.640 (0.448)	-0.583 (0.404)	-0.331 (0.362)	-0.317 (0.350)	-0.166 (0.444)	-0.132 (0.347)
College enrollment (n=5435)	-1.568+ (0.812)	-1.617+ (0.893)	-1.055+ (0.620)	-1.151 (0.737)	-0.925 (0.806)	-0.766 (0.625)

+ $p < .10$

Preliminary Findings-Parametric

ATE (two-stage least squares 2SLS) (with the covariates included model)

Outcomes (obs.)	Linear	Linear with Interaction	Quadratic	Quad with Interaction	Cubic	Cubic with Interaction
	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)
College predisposition (n=5821)	-0.285 (0.481)	-0.253 (0.427)	-0.054 (0.388)	-0.056 (0.386)	0.165 (0.543)	0.126 (0.403)
College application (n=5514)	-0.361 (0.418)	-0.330 (0.379)	-0.198 (0.351)	-0.190 (0.336)	-0.121 (0.474)	-0.093 (0.350)
College enrollment (n=5131)	-1.272 (0.898)	-1.262 (0.925)	-0.891 (0.666)	-0.962 (0.767)	-0.781 (0.864)	-0.600 (0.613)

Preliminary Findings-Non-parametric

Local Average Treatment Effect (LATE)

Outcomes (obs.)	Linear	Linear with Interaction	Quadratic	Quad with Interaction	Cubic	Cubic with Interaction
	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)
College predisposition (n=1062)	0.027 (0.039)	0.029 (0.038)	0.027 (0.039)	-0.017 (0.067)	0.026 (0.039)	-0.018 (0.067)
College application (n=857)	0.016 (0.044)	0.028 (0.040)	0.016 (0.044)	0.005 (0.059)	0.017 (0.045)	0.002 (0.062)
College enrollment (n=758)	0.019 (0.059)	0.041 (0.051)	0.022 (0.058)	0.107+ (0.059)	0.024 (0.059)	0.105+ (0.062)

+ $p < .10$

Preliminary Findings-Non-parametric

LATE (with the covariates included model)

Outcomes (obs.)	Linear	Linear with Interaction	Quadratic	Quad with Interaction	Cubic	Cubic with Interaction
	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)	Coef. (s.e.)
College predisposition (n=1006)	-0.000 (0.037)	0.000 (0.036)	-0.000 (0.037)	-0.047 (0.065)	-0.000 (0.037)	-0.050 (0.065)
College application (n=820)	0.030 (0.038)	0.039 (0.037)	0.030 (0.038)	0.047 (0.061)	0.030 (0.038)	0.048 (0.062)
College enrollment (n=726)	0.039 (0.046)	0.056 (0.044)	0.043 (0.046)	0.175** (0.060)	0.045 (0.046)	0.179** (0.060)

** $p < .01$

Summary

- Impact of TRIO on several college choice outcomes (college predisposition, application, and enrollment), employing a fuzzy regression discontinuity analysis on data from HSLS.
- No statistically significant impact on college predisposition (Stage1)
- No statistically significant impact on college application (Stage3)
- Statistically significant impact on college enrollment (Stage5)
- Further analyses possibly include: 1) looking into the dependent variables in a more extended way (e.g., 2-year vs. 4-year), 2) estimating the impact on other outcomes (college searches; college admissions) in the College Choice Model, 3) and using propensity score matching to estimate the impact for low-income and/or first-generation students.

THANK YOU

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