

High School Dual Enrollment programs: Are we fast-tracking students too fast?

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Dual Enrollment (DE)

- Allows high school students to enroll in college and earn college credits
- Becoming widespread
 - 5% of all HS students nationwide; 71% of public HS offer DE
- DE believed to increase college attainment
 - Though effect is theoretically ambiguous
- Little empirical evidence about DE impact (Bailey & Karp, 2003; Lerner & Brand, 2006)
 - Challenge: Selection problem

Objective: evaluate DE using Florida data

- What is the effect of DE programs on college access and success?
- Address selection by using quasi-experimental method (regression discontinuity “RD”) that exploits variation in DE participation generated by cutoff policies in Florida
- Preliminary findings
 - Little evidence of significant effect of DE overall
 - Large effect of DE college Algebra on degree attainment

DE in Florida

- Highly-structured fully-funded DE program
 - Students earn *both* HS and college credit
 - State pays for DE (tuition, fees, and books!)
 - State pays *both* high school and college for DE
- Eligibility requirements for DE participation:
 - Students must demonstrate college readiness through college placement test (CPT) and a 3.0 un-weighted GPA (FL Statute 1007.271)
 - Common practice: require a CPT Math (English) satisfactory score for Math (English) courses
 - Two RDs: Exploit both general GPA eligibility and course-specific CPT requirements for measuring effect of *DE (any subject)* and effect of *DE college Algebra*, respectively

Florida Data



- Two public HS senior cohorts (2000 & 2001)
 - Student transcripts on all courses in HS & college (till 2007)
 - National Student Clearinghouse data (enrollment only)
 - Basic demographic and standardized test scores
- Treatment (12th grade DE):
 - DE Academic
 - DE Algebra (MAC 1105)
- Outcomes:
 - HS diploma (any type)
 - College access (PSE enroll; First PSE at 4yr college)
 - College success (Persist 2nd term & 2nd year, 5/6 yr AA & BA, 1st yr non-DE GPA)

Typical DE experience in Florida

DE participation characteristics

Participation rate	14.3%
DE in 12th grade	82.0%
DE courses attempted	3.7
DE credits earned	9.9
DE success rate (course grade C or higher)	77.0%
DE college algebra (MAC 1105) in 12th grade	18.3%
DE English Composition (ENC 1101) in 12th grade	29.5%

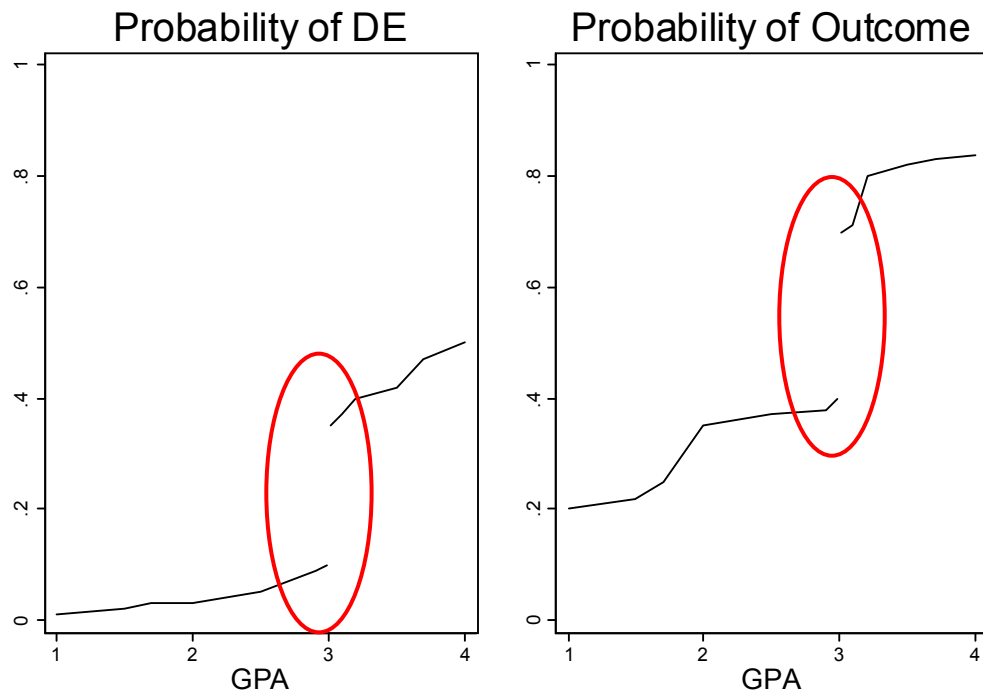
DE location

DE courses at both Community College & High School	57.8%
DE courses at Community College only	37.3%
DE courses at High School only	4.9%

Number of dual enrollment students	32,980
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Source: Florida K-20 Education Data Warehouse (2000 & 2001 High School cohorts)

Empirical Strategy: “Fuzzy” RD

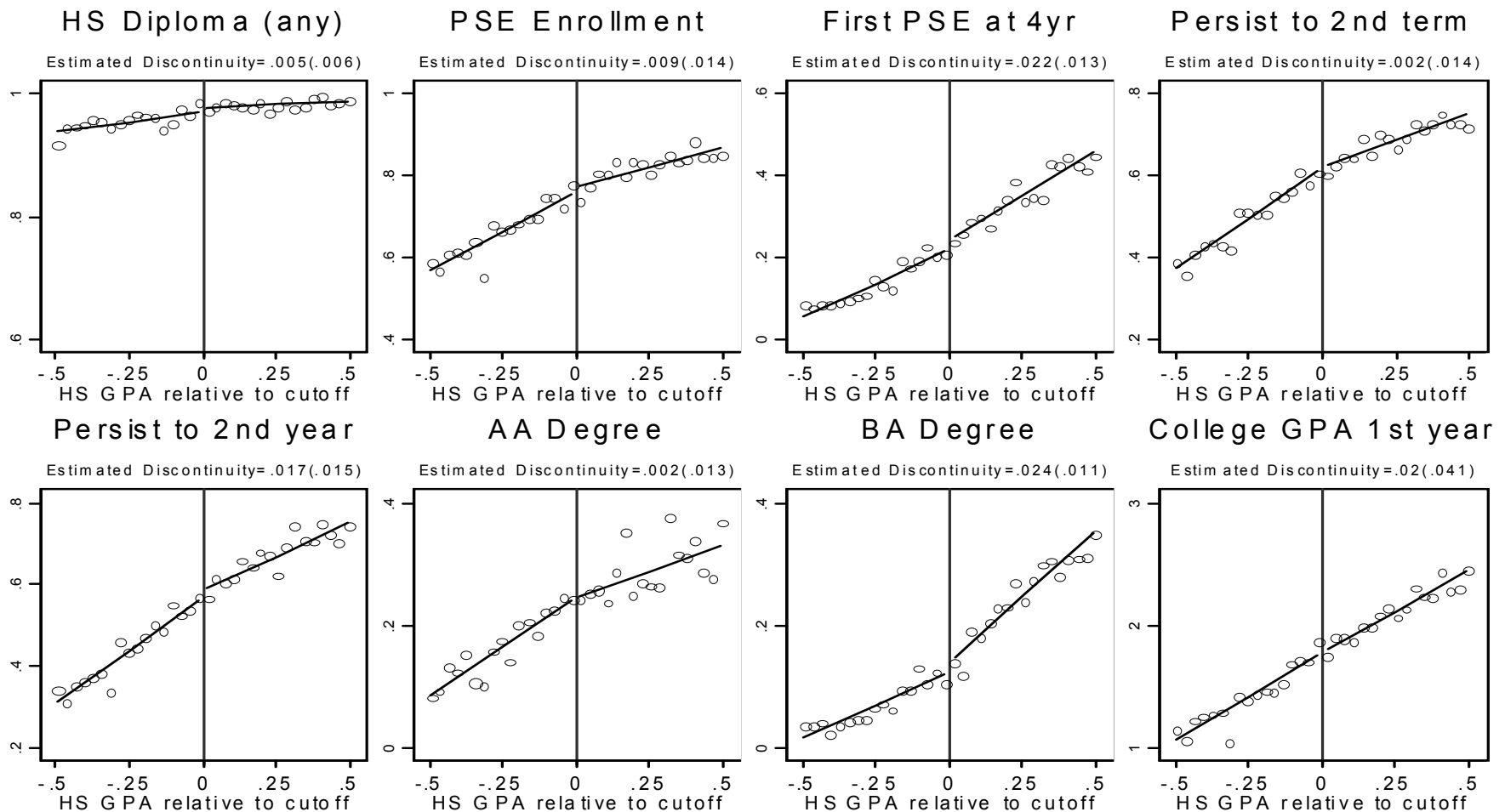


Intuition RD: compare outcomes of students above and below eligibility cutoff adjusting for non-compliers and no-take-ups

“Local average treatment effect”

- In reality: not a significant discontinuity in DE participation at official cutoffs in most colleges
- College Selection: “GPA sample” (N=5) “CPT sample” (N=4)

Impact of DE (any subject): Preview

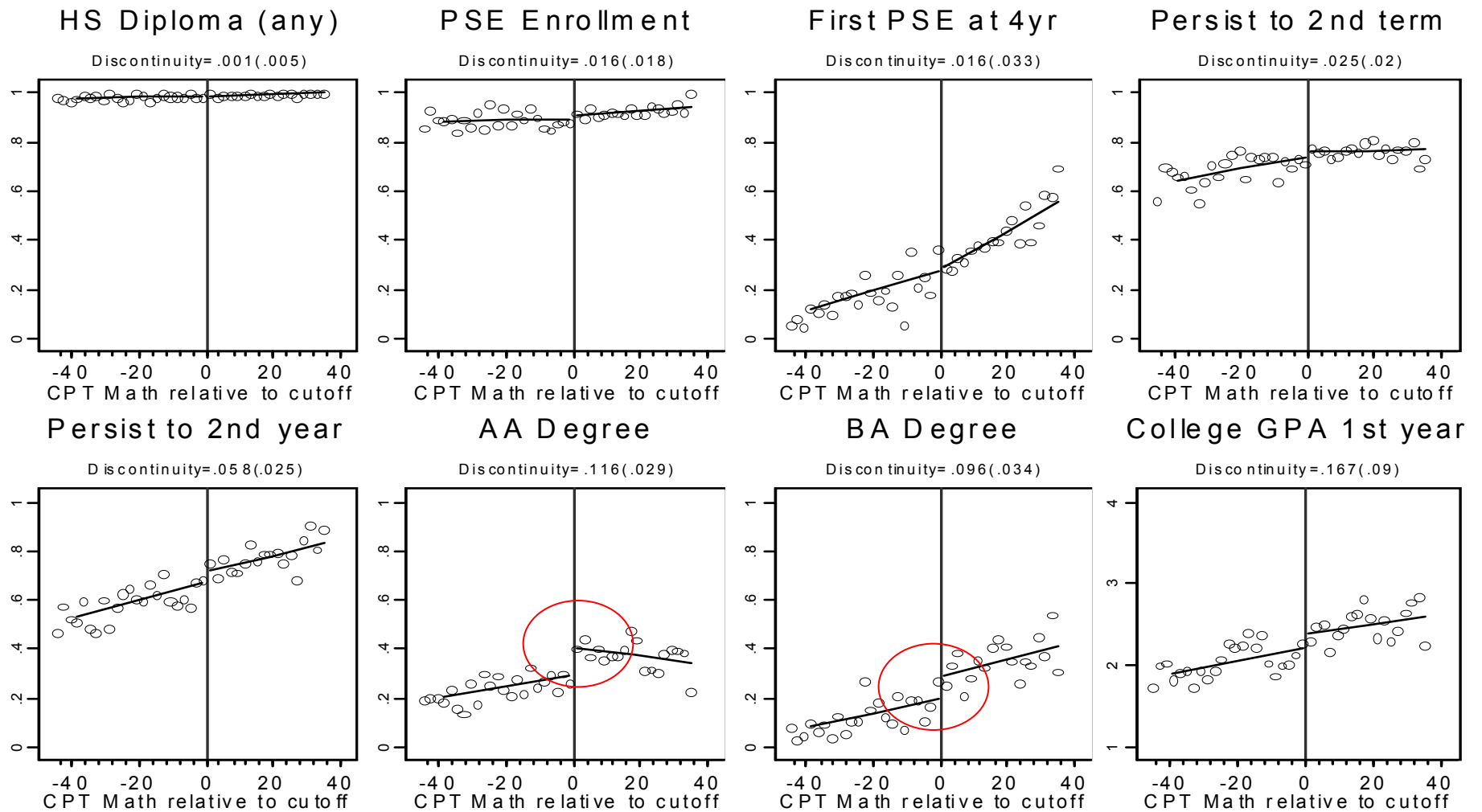


Impact of DE (any subject): RD

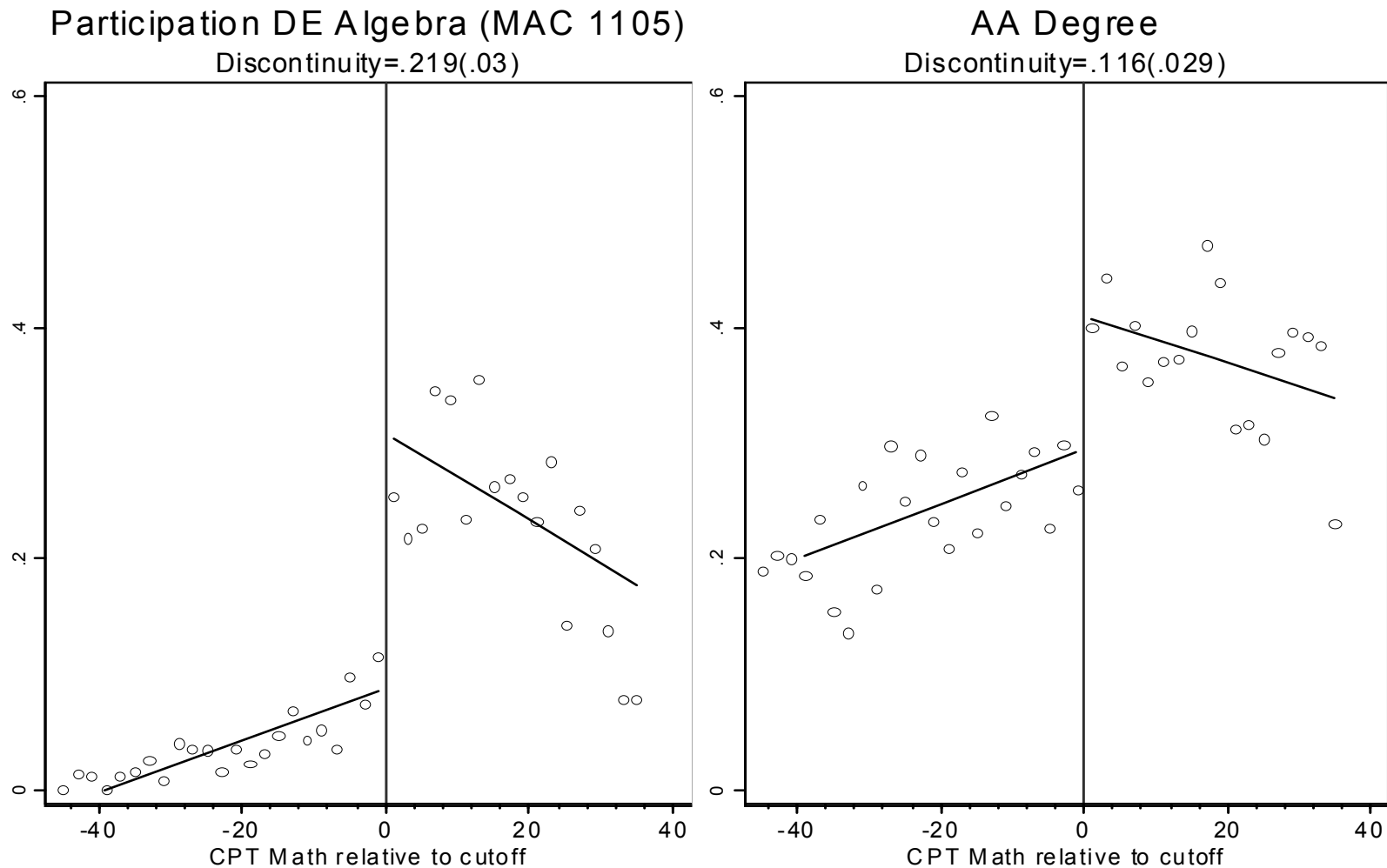
Data Bandwidth	± 0.5	± 0.4	± 0.3
	Controls	Controls	Controls
HS diploma (any)	0.052 (0.060)	0.101 (0.073)	0.131 (0.097)
Postsecondary Enroll	0.095 (0.140)	0.031 (0.182)	0.135 (0.243)
First Enroll 4yr institution	0.217 (0.131)*	0.122 (0.164)	0.153 (0.219)
Persistence through 2nd term	0.024 (0.141)	0.045 (0.177)	0.208 (0.232)
Persistence through 2nd year	0.169 (0.143)	0.150 (0.177)	0.331 (0.241)
Associate degree	0.024 (0.134)	-0.033 (0.178)	0.040 (0.238)
Bachelor degree	0.239 (0.112)**	0.163 (0.139)	0.058 (0.185)
College GPA Y1 (non-DE)	0.197 (0.406)	-0.027 (0.533)	-0.133 (0.736)
Number students	12,883	10,406	8,029

Notes : *s ignificant at 10%; **s ignificant at 5%. Local Linear Regression RD estimates using GPA sample (5 colleges).

Impact of DE college algebra: Preview



Impact of DE algebra on AA



Potential source of bias: eligible student decide to take the course after high school

Impact of DE college algebra: RD

Data Bandwidth	± 60		± 40	± 20
	Controls	No Controls	Controls	Controls
HS diploma (any)	0.019 (0.020)	0.017 (0.022)	0.006 (0.023)	0.015 (0.041)
Postsecondary Enroll	0.023 (0.072)	0.025 (0.085)	0.072 (0.082)	0.232 (0.127)*
First Enroll 4yr institution	0.075 (0.131)	-0.070 (0.194)	0.072 (0.149)	-0.020 (0.231)
Persistence through 2nd term	0.037 (0.091)	0.055 (0.104)	0.112 (0.093)	0.221 (0.143)
Persistence through 2nd year	0.203 (0.099)**	0.175 (0.123)	0.266 (0.118)**	0.448 (0.187)**
Associate degree	0.442 (0.122)**	0.423 (0.121)**	0.527 (0.152)**	0.683 (0.273)**
Bachelor degree	0.440 (0.157)**	0.368 (0.163)**	0.438 (0.183)**	0.446 (0.327)
College GPA Y1 (non-DE)	0.669 (0.361)*	0.448 (0.396)	0.763 (0.442)*	1.751 (0.836)**
Number students	5,401	5,401	4,009	2,418

Notes: *significant at 10%; **significant at 5%. Local Linear Regression estimates based on CPT sample (4 colleges).

Discussion

- Little evidence that taking DE in general significantly helps students on the margin of eligibility
 - DE might conceal important variation in course experience
- Algebra appears to be promising strategy to increase degree attainment
 - Estimates might be upward biased; will investigate extent of bias in future work
- Limited external validity of results:
 - Local Average Treatment Effect
 - Evidence from few colleges in Florida
 - Evidence from CPT takers (DE algebra analysis)
- Future research needed to better understand the mechanisms (e.g., course type, student subgroup) by which DE may have greater return

Thank you AIR!



Questions/Comments?

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Extra Slides



Empirical Strategy: “Fuzzy” RD

- Intuition of RD: compare outcomes of students above and below eligibility cutoff adjusting for non-compliers and no-take-ups

- Local Linear Regression (RD-2SLS)

$$(1) DE_i = \delta_1 \text{Above}_i + \delta_2 (\text{Score}_i * \text{Above}_i) + \delta_3 (\text{Score}_i * \text{Below}_i) + X_i \delta + \varphi_{cc} + \varphi_{co} + \varepsilon_i$$

$$(2) Y_i = \beta_1 DE'_i + \beta_2 (\text{Score}_i * \text{Above}_i) + \beta_3 (\text{Score}_i * \text{Below}_i) + X_i \beta + \varphi_{cc} + \varphi_{co} + \varepsilon_i$$

$DE_i = 12^{\text{th}}$ grade participation

$\text{Score}_i = 11^{\text{th}}$ grade GPA or CPT

$\text{Above}_i = \text{Eligible GPA or CPT}$

→ β_1 is the local average treatment effect

Why need to select colleges?

