

Contemporary Career Academies and Student Outcomes: Evidence from North Carolina

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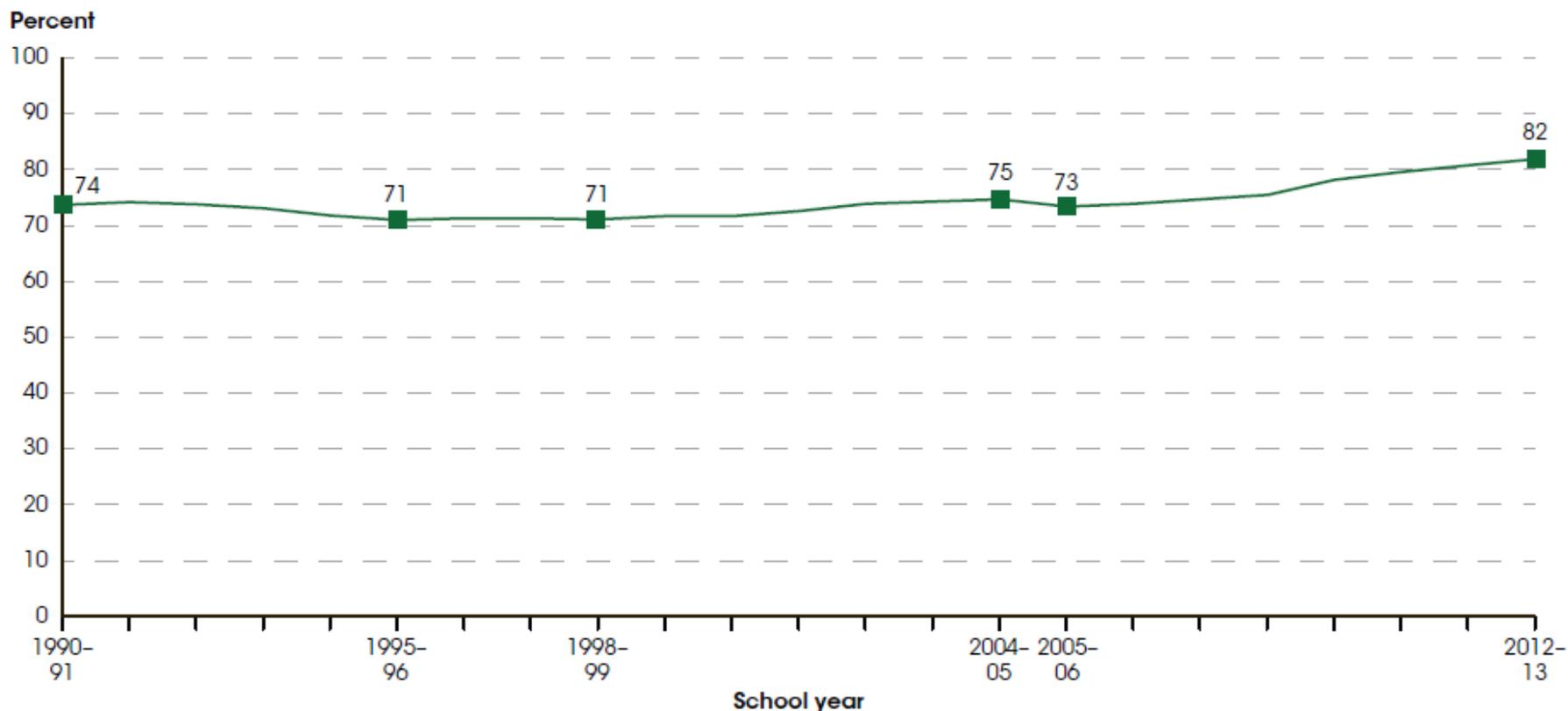
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Wake County Public School System

Career and Technical Education: Promise and Practice
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High School Completion

Figure 1. Averaged freshman graduation rate (AFGR) for public high school students: School years 1990-91 through 2012-13

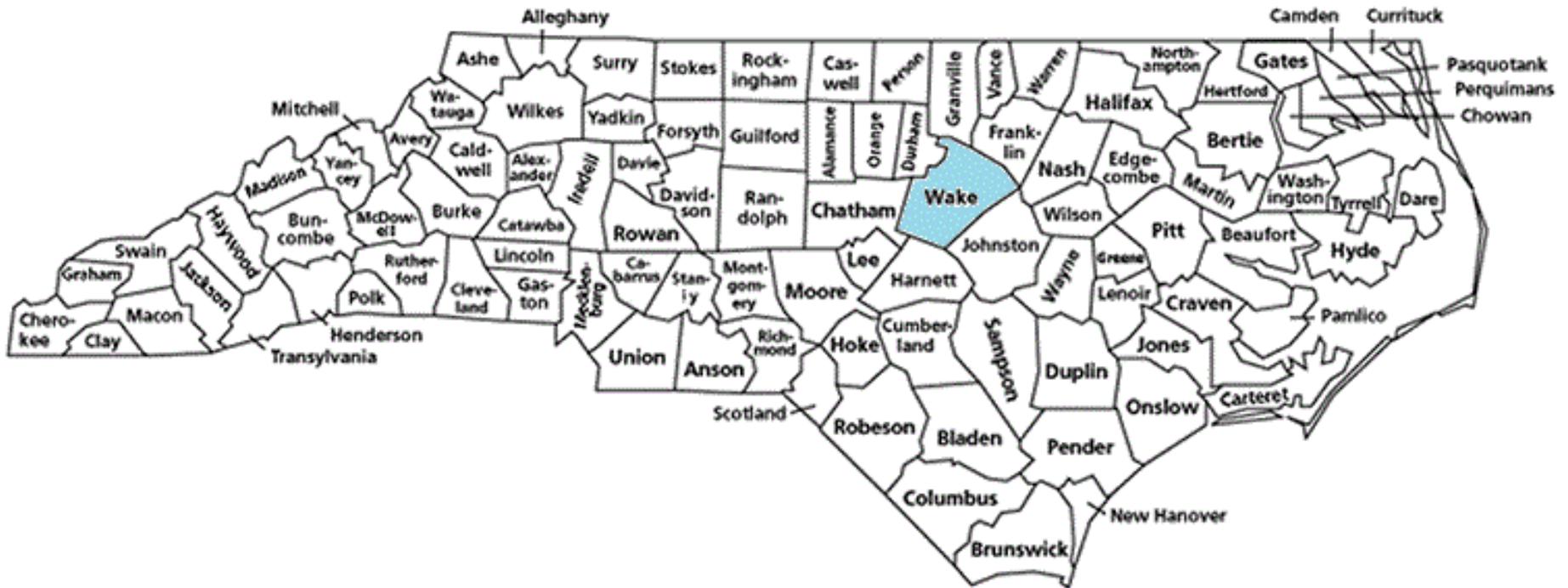


NOTE: The AFGR provides an estimate of the percentage of high school students who graduate within 4 years of first starting 9th grade. The rate uses aggregate student enrollment data to estimate the size of an incoming freshman class and aggregate counts of diplomas awarded 4 years later. SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education," 1986-1987 through 2009-10; "State Dropout and Completion Data File," 2005-06 through 2012-13; *Public School Graduates and Dropouts From the Common Core of Data, 2007-08 and 2008-09*. See *Digest of Education Statistics 2015*, table 219.10.

Career Academies (CAs)

- One packaging of CTE
- Recent emphasis on college-going and continued training
- Existing evidence on CAs
 - Pre-recession, pre-NCLB/accountability, and different labor market
 - Mostly correlational, not causal
 - Exception: MDRC study of academies in 1990s

Large NC District Expands CAs



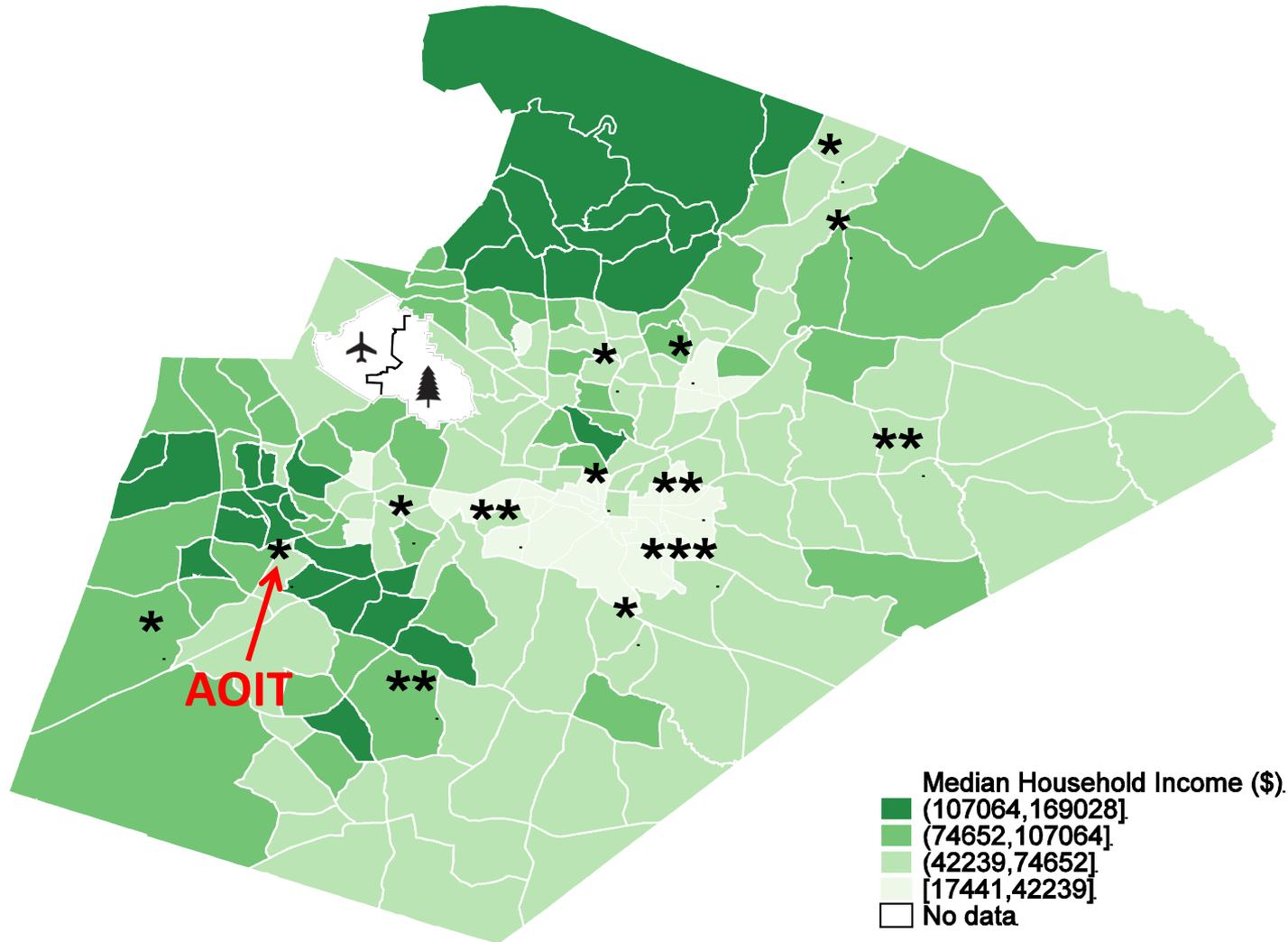
Wake County: Career Academies

1st academy = 1990

Slow growth in
1990s and 2000s

Rapid, recent growth
since 2000

Today =
20 academies



Outline

- 1) Profile of academy enrollees
- 2) Causal effects of participation in information technology academy on high school and college outcomes
- 3) Framework and cautions for wider applicability of findings

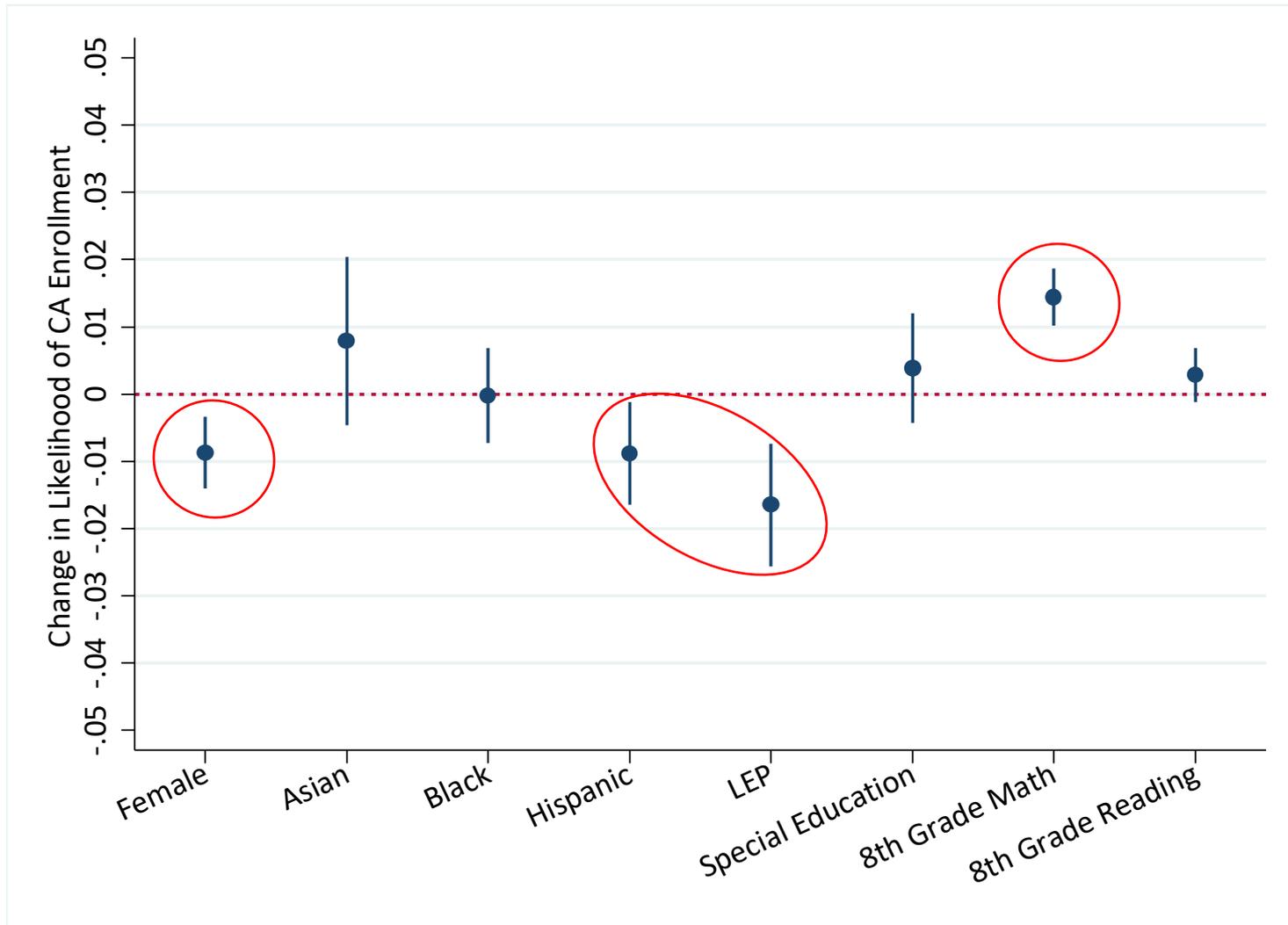
Profile of Academy Enrollees

	All Students		Technology Academies	
<i>Variable</i>	<i>9th Graders in Wake County</i>	<i>9th Grade CA Enrollees</i>	<i>Non-CA 9th Graders in Same HS</i>	<i>9th Grade CA Enrollees</i>
Female	0.50	0.45	0.49	0.41
Black, non-Hispanic	0.25	0.20	0.29	0.13
Hispanic	0.15	0.09	0.16	0.05
White, non-Hispanic	0.48	0.57	0.45	0.71
Asian, non-Hispanic	0.07	0.10	0.07	0.07
8 th Grade Math Score (std)	0.009 (0.999)	0.427 (0.931)	0.005 (1.046)	0.517 (0.889)
8 th Grade Reading Score (std)	0.002 (0.999)	0.316 (0.870)	-0.015 (1.070)	0.360 (0.873)
Academically Gifted (M or R)	0.28	0.43	0.31	0.46
<i>N(students)</i>	<i>20,968</i>	<i>993</i>	<i>5,524</i>	<i>309</i>

Notes: Analytic sample includes first-time 9th graders in WCPSS in 2014-15 and 2015-16. Standard deviations of continuous variables appear in parentheses.

Academy Enrollment Predictors

Outcome = Enroll in CA in 9th Grade



Notes: Analytic sample includes first-time 8th graders in WCPSS in 2013-14 and 2014-15. Model includes middle school fixed effects and indicators for 8th grade cohort.

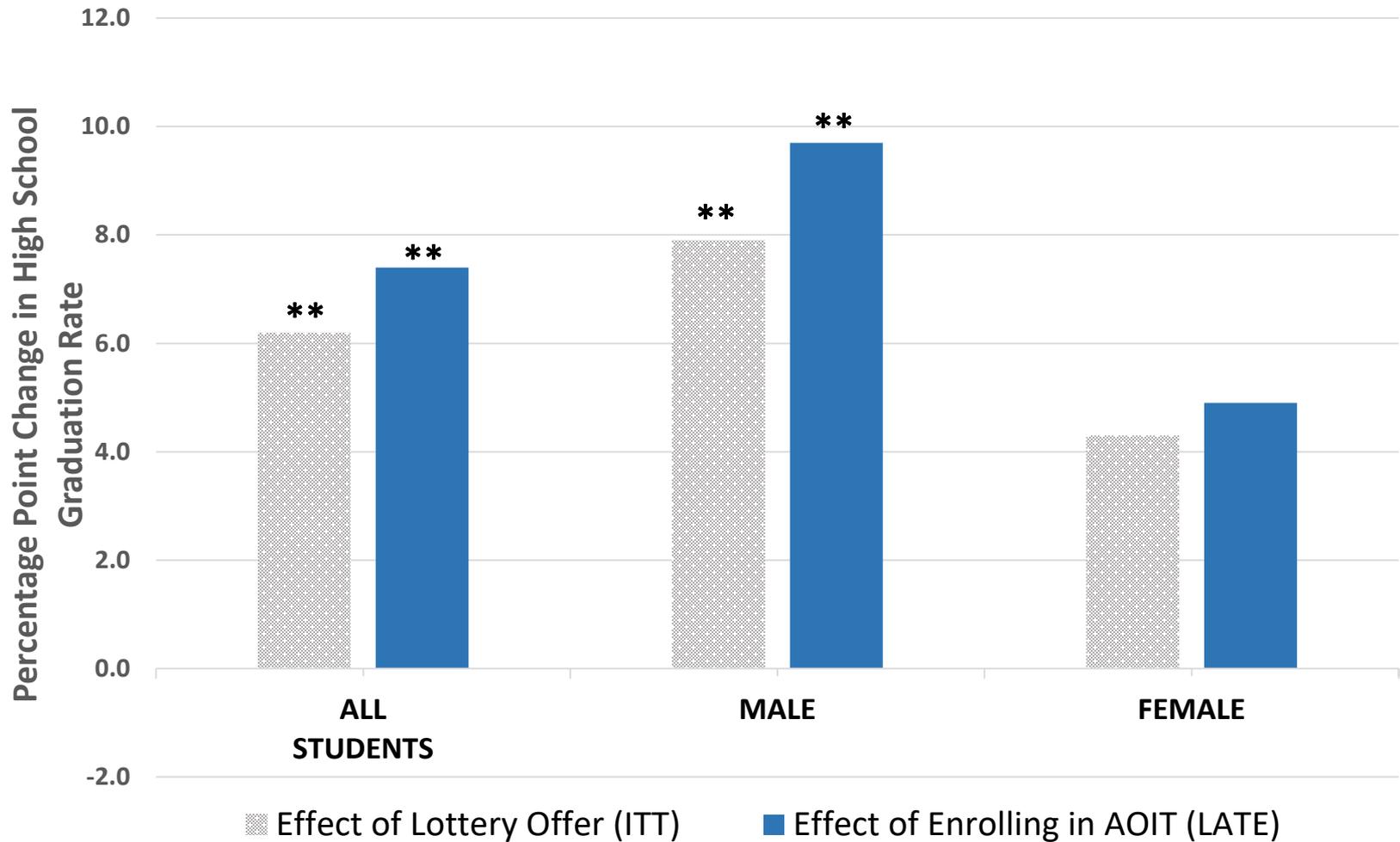
Apex Academy of Information Technology (AOIT)

- Oversubscribed!
 - Lots of interest, limited capacity...
- Use lottery to fairly select incoming cohorts
- Approximates randomized controlled trial
- 4 cohorts of 9th grade applicants
 - 2009-10 to 2012-13
 - Applicants score 0.6 to 0.8 SDs above district-wide average on baseline tests

AOIT: Treatment-Control Contrast

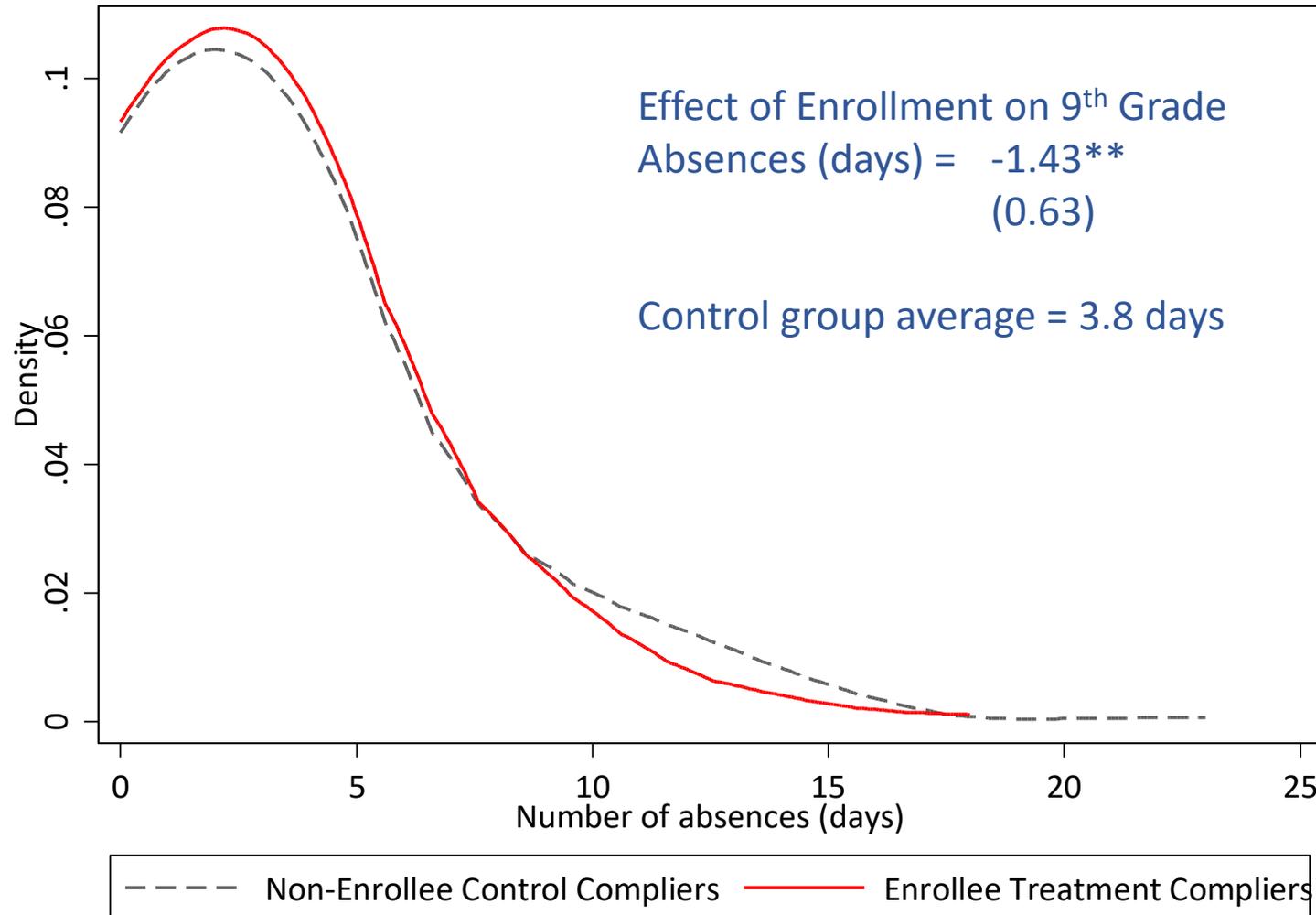
Dimension	AOIT Enrollees ("Treatment")	Apex HS Non-AOIT Enrollees ("Control")
Work-based Learning; Workplace Engagement	Paid internship in 11 th grade; Job shadowing and career-development day-trips	Not available to non-AOIT students
Non-Academic Supports	Networking through local Chamber of Commerce, resume preparation, mock interviews, job shadowing, and pre-internship training	Not available to non-AOIT students
Curriculum	Cohort-based progression; project-based learning; teachers of CTE and academic courses collaborate during common, weekly planning time	No cohort-based structure to curriculum
IT Courses (required electives)	Sequence of courses that reflects one of two themes: programming or multimedia/web design (= 1/3 of content)	Limited availability to non-AOIT students (5% to 10% of course enrollees drawn from wider high school)
Bridge to Postsecondary Study	Students take college-level IT course (either AP or articulated) during 12 th grade	No special encouragement or 12 th grade course requirements

High School Graduation

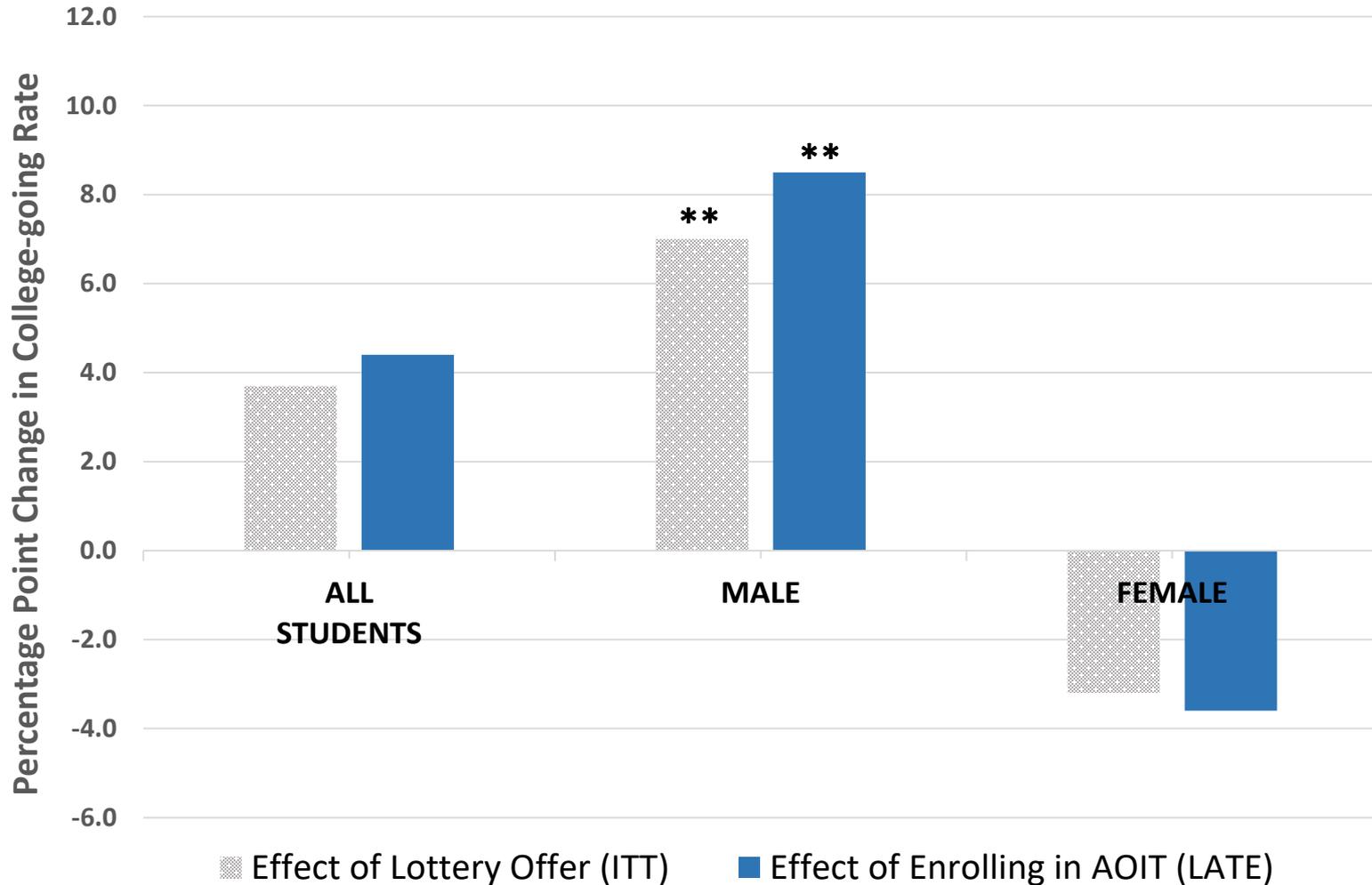


Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Effect on 9th Grade Absences



College Enrollment



Notes: *** p<0.01, ** p<0.05, * p<0.1.

Features of AOIT

- Evidence from limited case in NC – how to think about wider applicability of findings?

U T----->O S Ti

u t → o s ti

(Cook, 2014; Cronbach, 1982)

Summary and Implications

- Academy enrollees are higher performing than non-enrollee peers
- Enrollment in well-regarded CA boosts HS completion and college enrollment for males but not females
 - ↓ in absences and ↑ in industry-relevant certifications
- Academy in NC had strong support structures
 - Funding from community stakeholders
 - Required, well-run, paid 11th grade internship
 - Cohort-based progression starting in 9th grade

BONUS SLIDES

As good as random?

Variable	Treatment Group (N=208)	Control Group (N=261)	Difference (T - C)	p-value
<i><u>Demographics</u></i>				
Female	0.36	0.36	0.00	0.89
Black	0.06	0.04	0.02	0.32
Hispanic	0.03	0.02	0.01	0.33
White	0.77	0.81	-0.04	0.27
Asian	0.11	0.09	0.02	0.47
Students with Disabilities	0.07	0.09	-0.02	0.58
Academically Gifted	0.55	0.58	-0.03	0.51
Limited English Proficient	0.00	0.00	0.00	N/A
<i><u>Prior Achievement (std)</u></i>				
8th Grade Math	0.830	0.836	-0.006	0.93
8th Grade Reading	0.640	0.634	0.006	0.93
F-test of all observables				0.76