

Examining the Predictors and Consequences of 6th Grade Retention

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Agenda

- Research Questions
- Policy Review
- Literature Review
- Predictors of 6th grade retention
- Consequences of 6th grade retention
- Predictors of 9th grade on-track status
- Summary and directions for future research



Research Questions

- Can prior performance predict 6th grade retention?
- What are the short-term academic consequences of 6th grade retention?
- Can prior performance predict 9th grade on-track status?



CPS Retention Policy Timeline

- 1996: Introduction of promotion gates (Vallas)
 - High-stakes testing introduced in grades 3, 6, and 8
 - Mandated retention for students failing to achieve benchmark scores on spring district-wide test administration
 - Based on Iowa Test of Basic Skills stanine scores (grade level equivalents)
- 2000-02: Revisions to policy (Duncan)
 - Discretionary passage based on summer school attendance and/or classroom grades introduced for some students
 - Stanine-based cutoff scores replaced by nationally norm-referenced percentile rankings (NPR)



CPS Retention Policy

- 2005: Comprehensive policy rewrite (Duncan)
 - Provisional passage for students scoring between 25-34th percentile (AL2) conditioned on summer school attendance (no retesting required)
 - Students in AL3 (below 25th NPR) required to pass the summer retest, in addition to mandated summer school attendance
 - One retention per grade cycle rule introduced; Attendance requirements tightened
- With minor technical revisions, and incorporation of district writing assessment, the 2005 policy remains in effect today



CPS Retention Policy: Implications for Analysis

- Students identified as eligible for special educational services (IEPs) and limited English proficiency (LEP) excluded from all analyses
- Pre-2005 test scores excluded from testing-based models to avoid ITBS/ISAT score compatibility concerns
- Insufficient data available to incorporate non-academic causes of retention into analysis & models



Literature Review: What Do We Know

- Predictors of Retention
 - Limited research suggests possible predictors of retention: gender, race/ethnicity, school mobility, welfare receipt, early school performance
- Predictors of On-track Status
 - Developed by the Consortium for Chicago School Research
 - Freshman-year GPA, number of semester course failures, and Freshman-year absences found to predict on-track status
 - Limited research on pre-9th grade predictors of on-track status



Retention: What do we know?

- What happens to students when they are retained in 6th grade?
 - Scores increase in gate years
 - Scores increase in post-gate years
 - Benefits in school systems that don't utilize high-stakes testing
 - ✓ Positive effects for 3rd grade students, negligible for 6th grade students
 - Gains from retention fade over time
 - Negative consequences for high school graduation
 - ✓ Counterbalanced by positive effects for non-retained students



Predictors of 6th grade retention

Can prior performance predict 6th grade retention?



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The Sample

Cohort 506: In 3rd grade for the first time in 2005-06

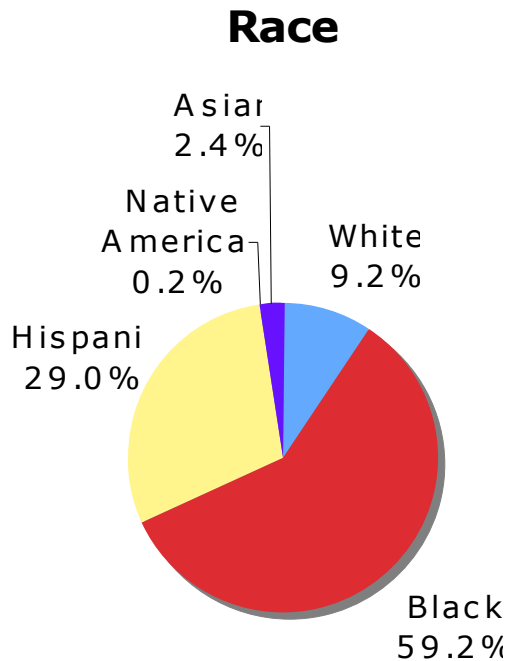
The Analysis

Probit Regression: Regressing math and reading scores in 3rd grade and a variety of controls on the probability of being retained in 6th grade



Summary Statistics

Cohort 506 (n=13,598)



- 53.7% female
- 8.5% retained in 3rd grade
- 3.1% retained in 6th grade
- 35.4% attend summer school in 3rd
- 85.5% on free or reduced lunch
- Avg reading percentile in 3rd: 56.0
- Avg math percentile in 3rd: 51.5



Summary Statistics: Cohort 506

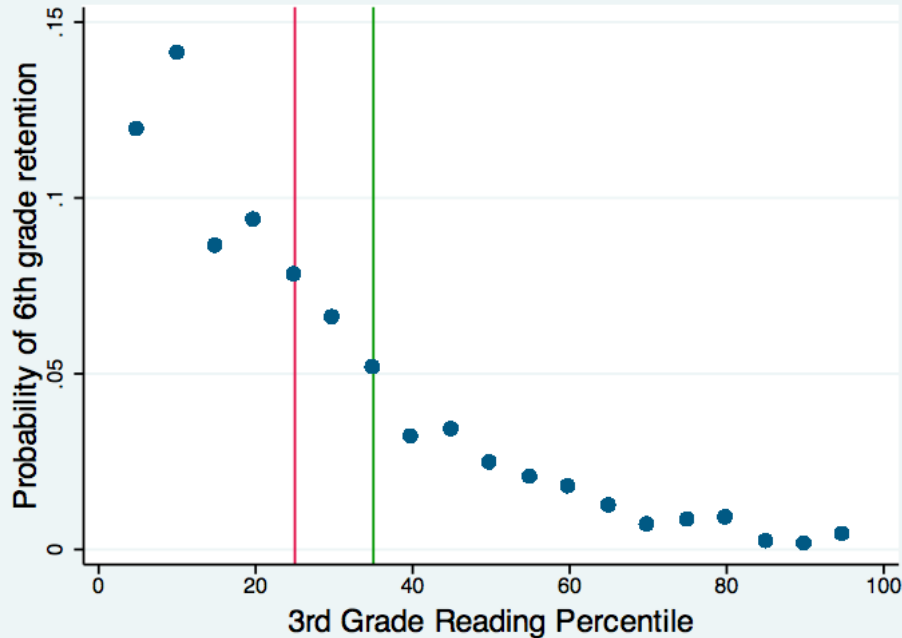
3rd grade students in 2005-06

- Compared to non-retained students, those who will be retained in 6th grade:
 - Have lower 3rd grade ISAT math and reading scores
 - More likely to be male
 - More likely to be on free or reduced lunch
 - More likely to have attended summer school and/or be retained in 3rd grade
- Black students are over-represented in the sample of retained students, as compared to the total sample

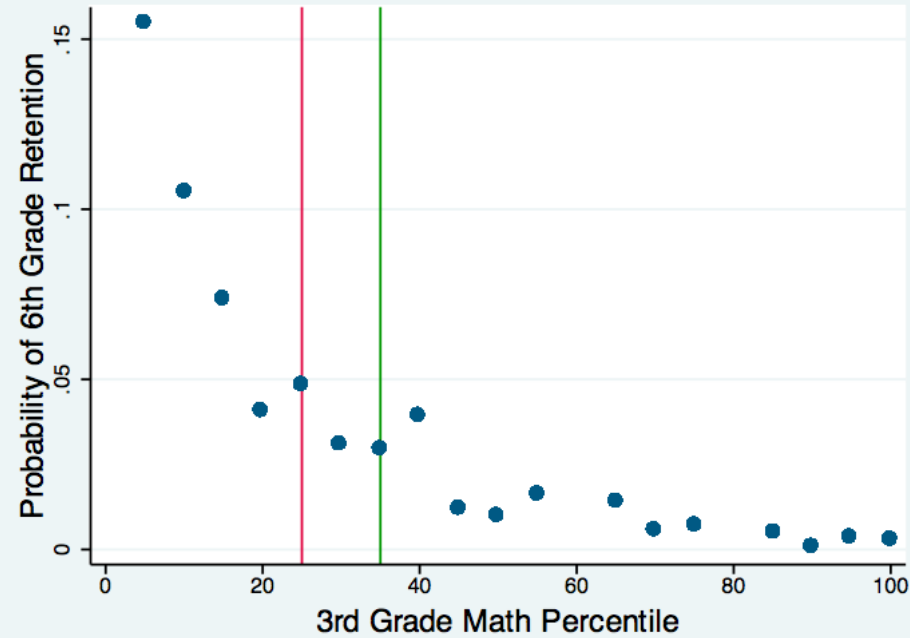


The higher a student's test scores in 3rd grade, the less likely s/he will be retained in the 6th grade

Reading



Math



Probit Regression

- Probability of being retained in 6th grade based on:
 - 3rd grade math and reading scores
 - Attending summer school in 3rd grade
 - Being retained in 3rd grade
 - Controls: Gender, Race, Free/Reduced Lunch status



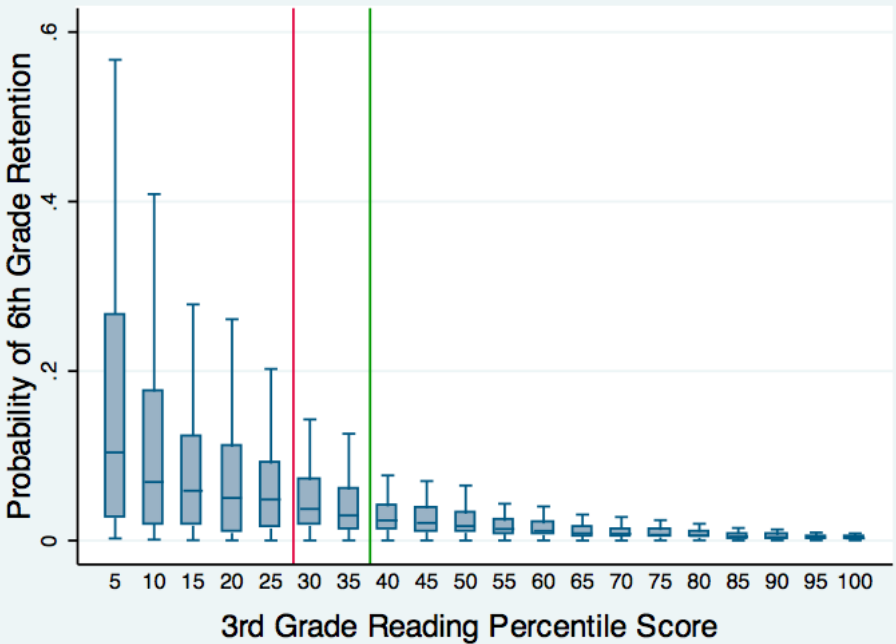
Factors that predict 6th grade retention

- Factors that decrease the probability of being retained in 6th
 - Higher math and reading scores in 3rd grade
 - Female and/or Hispanic students
 - Retained in 3rd grade
- Factors that increase the probability of being retained in 6th
 - Free or Reduced lunch status
- Factors that do not affect the probability of 6th grade retention
 - All races other than Hispanic
 - Attending summer school in 3rd grade

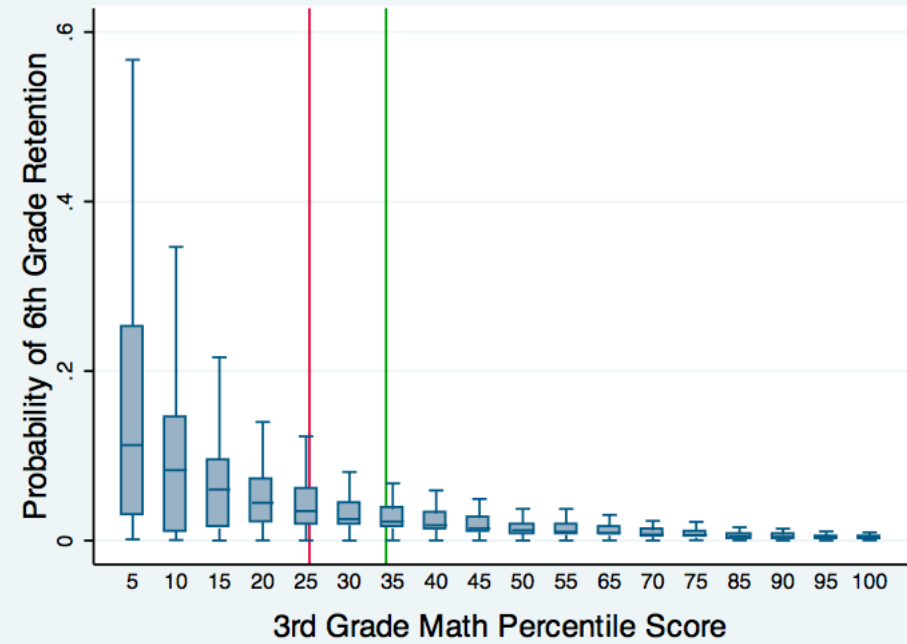


The higher a student's 3rd grade math and reading scores, the lower the likelihood of retention in 6th grade

Reading



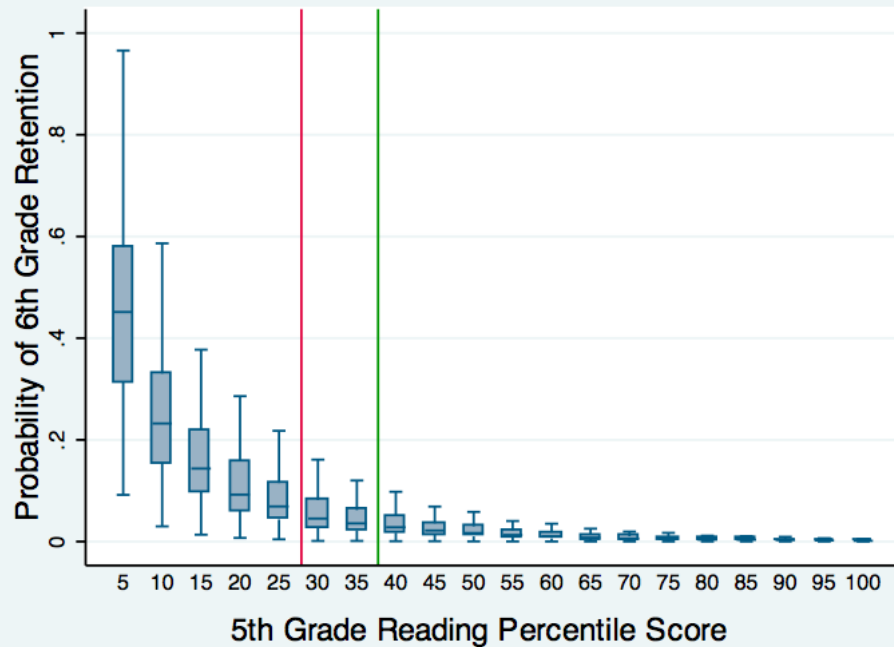
Math



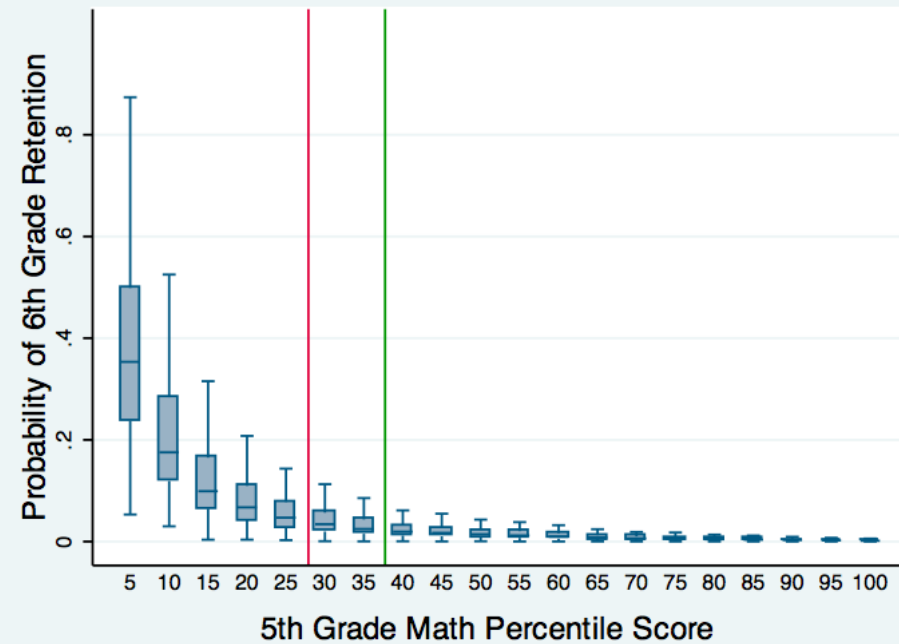
Results for 5th grade students are similar to that of 3rd grade students

- Cohorts 304, 405, 506 (n=45,813)

Reading



Math



Consequences of 6th grade retention

What are the short-term academic consequences of 6th grade retention?



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The Sample

This study follows one cohort of students: those who were in 3rd grade in the 2004/2005 school year

The Analysis

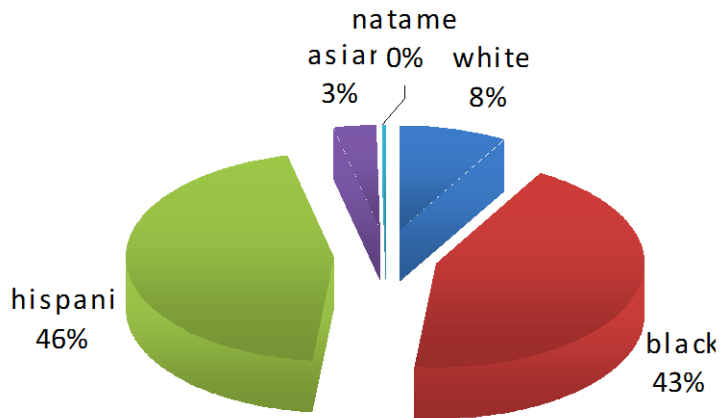
The analysis will focus on two groups of students:

- 1) Those who were retained in 6th grade
- 2) Those who were not

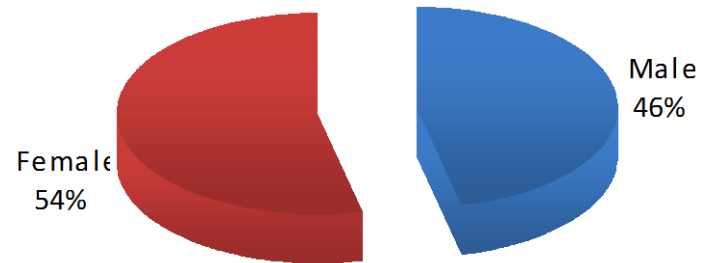


Sample Statistics

Racial Distribution



Gender Distribution



14,143 Students

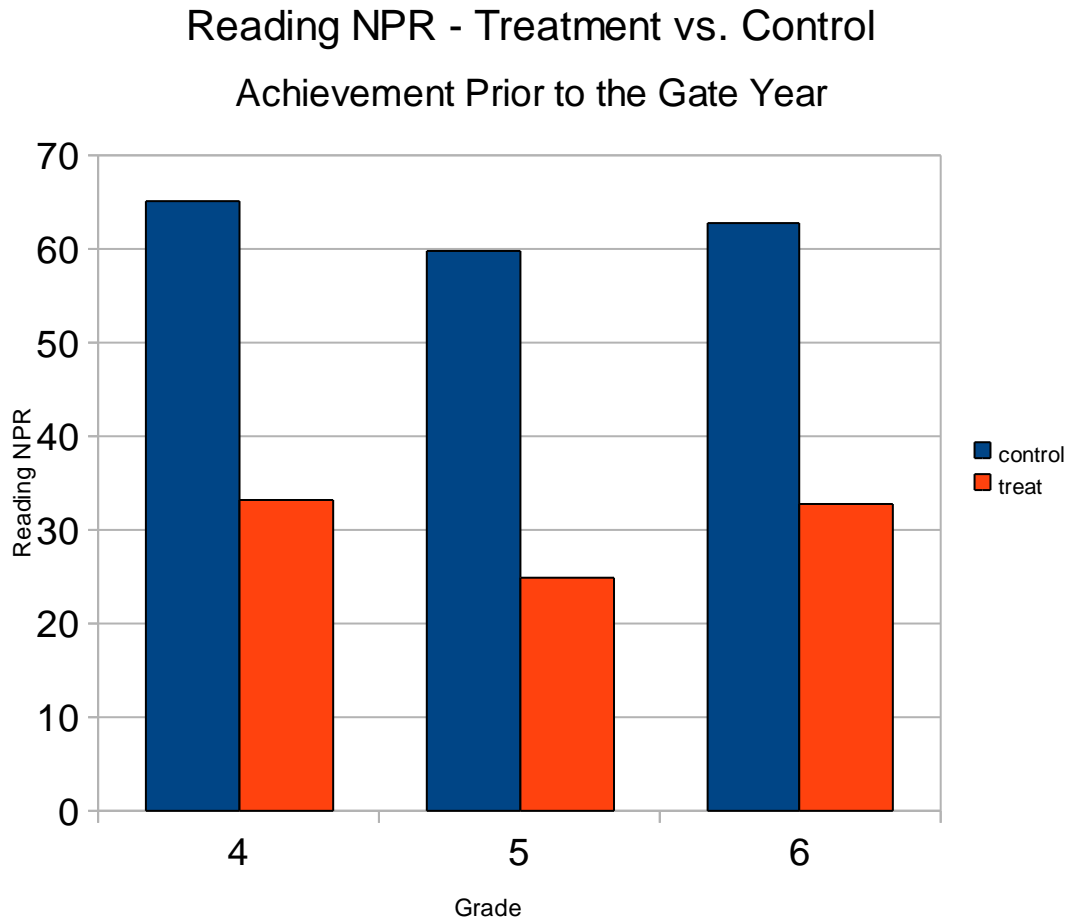


Terminology

- **Treatment Group** - Students retained in 6th grade
- **Control Group** - Students not retained in 6th grade
- **Treatment Effect** - Effect of being retained on ISAT test scores
- **Gate Year** - Year a student's ISAT score is used to make a retention decision (3rd, 6th, and 8th grades)
- **NPR** - National Percentile Rankings

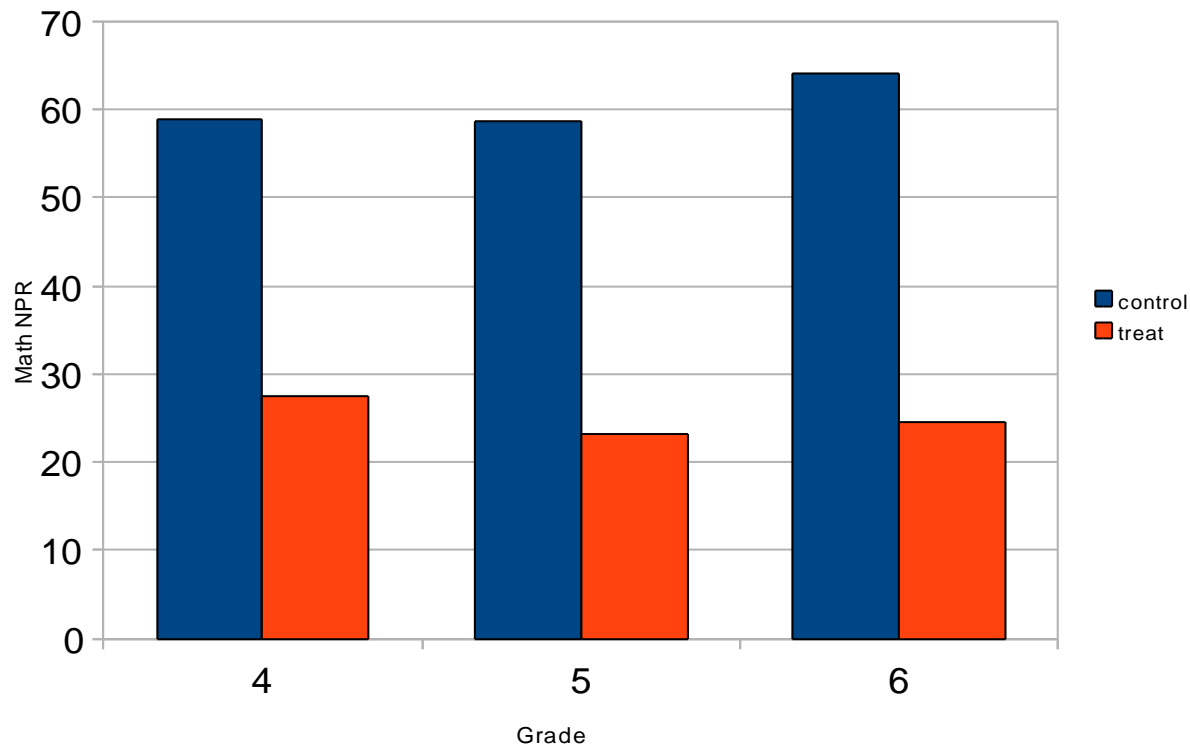


Average reading scores of the treatment group are consistently lower than those of the control group



Average math scores of the treatment group are consistently lower than those of the control group

Math NPR - Treatment vs. Control
Achievement Prior to the Gate Year

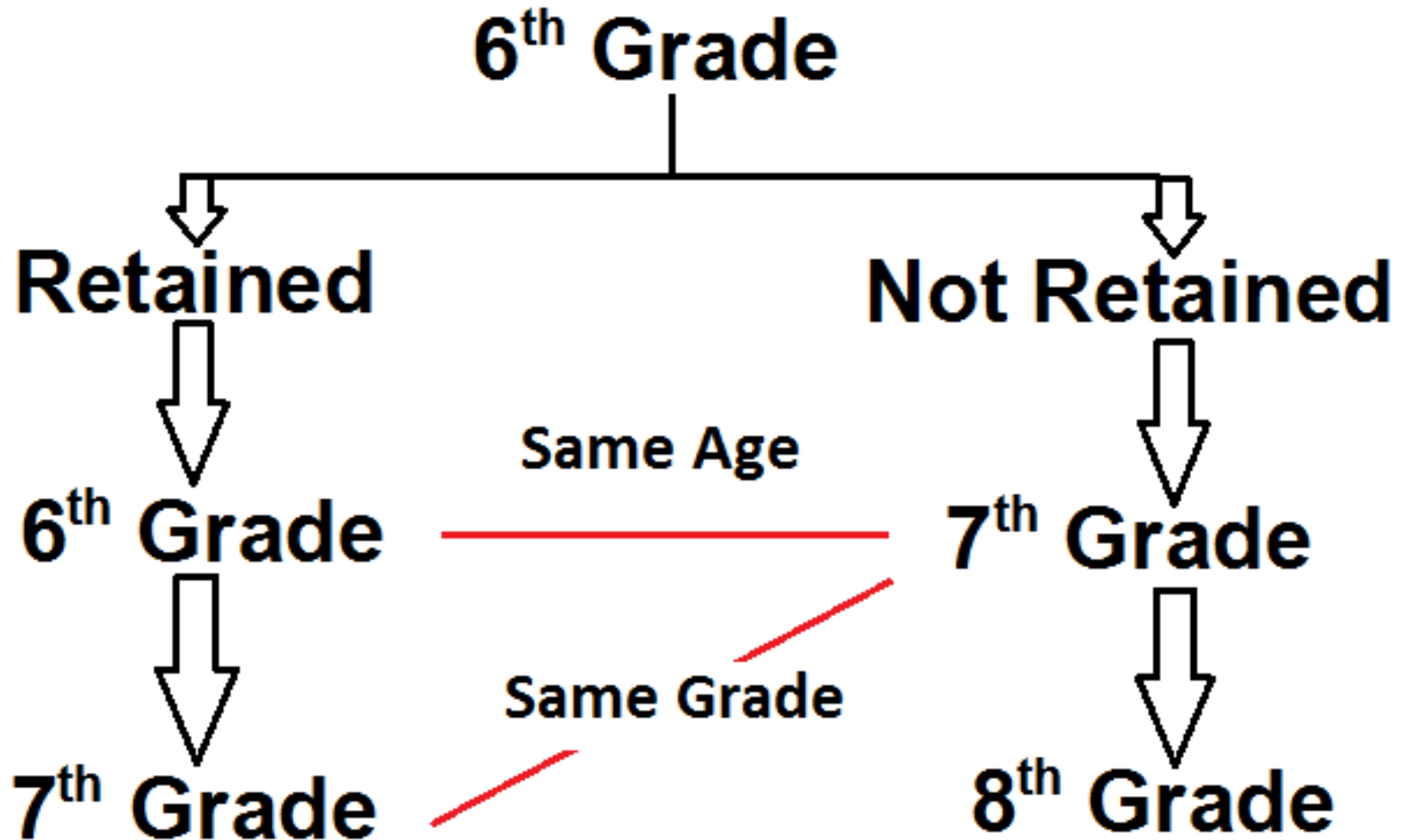


Methodology

- Significant differences between treatment and control groups prior to treatment
- Propensity Score: Probability of being retained
- Matching students on similar characteristics
- Compare those who were treated to those who were not

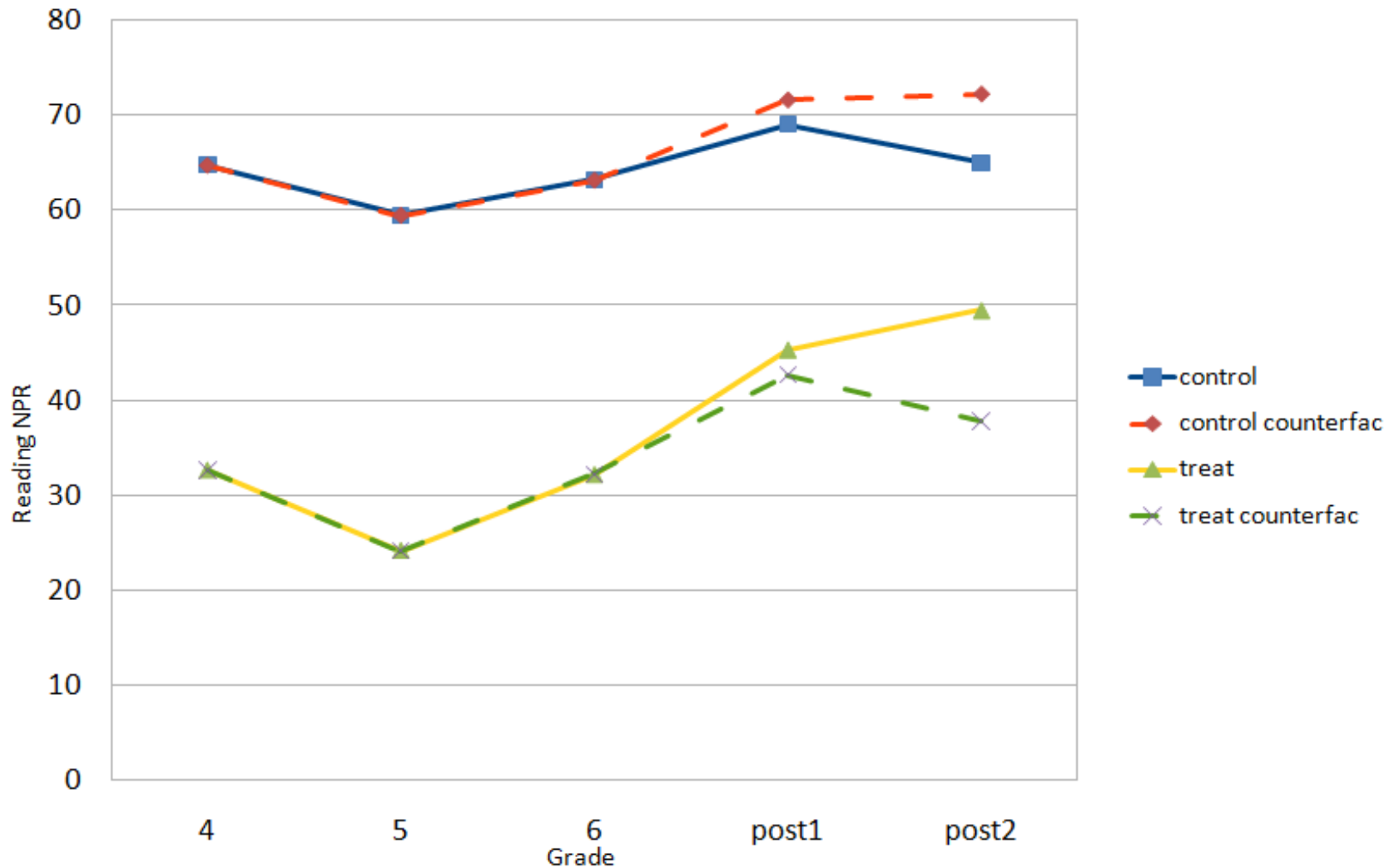


“Same Age” vs. “Same Grade”



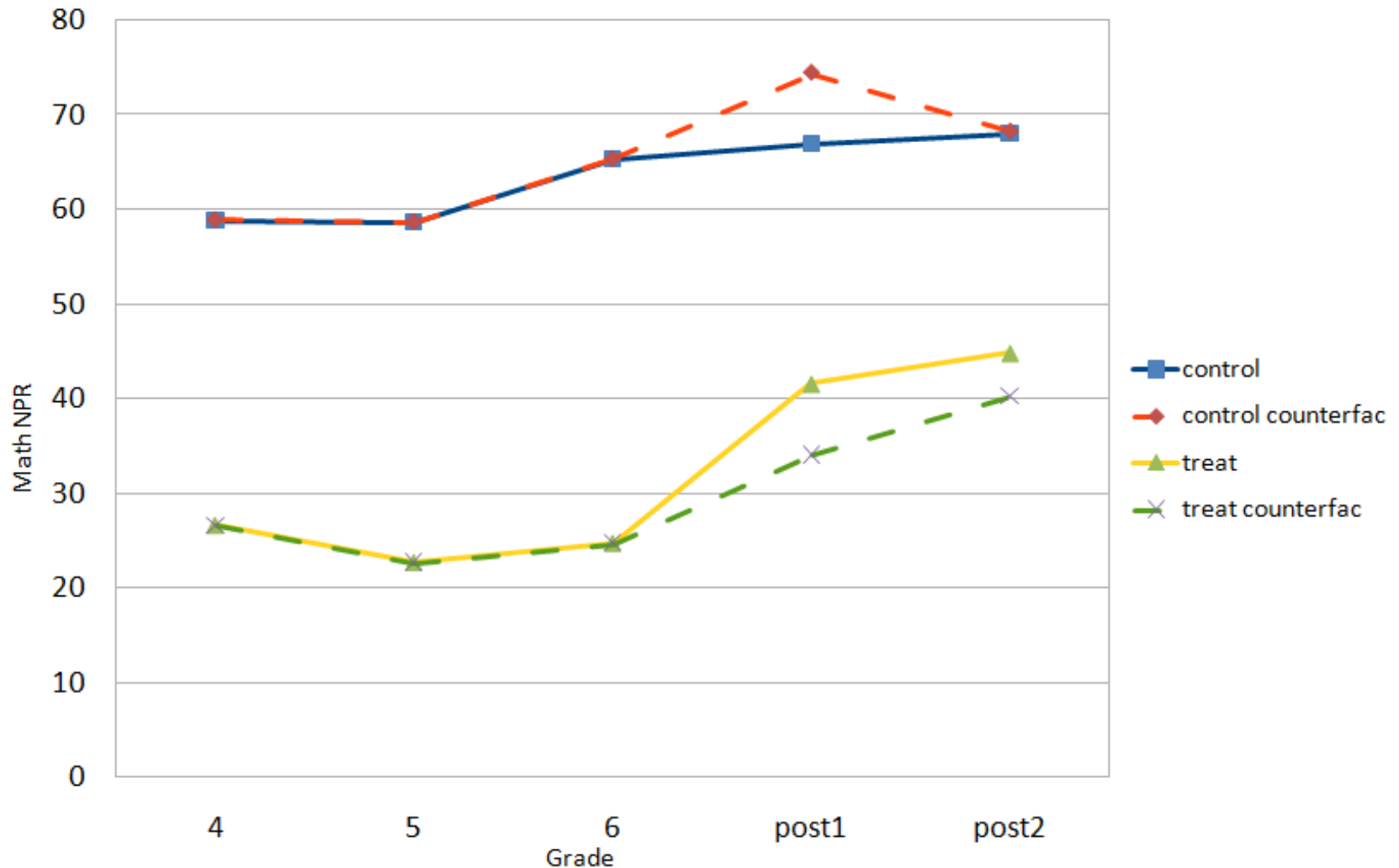
Retention Boosts Scores

Estimation of the Effect of Retention on Reading Scores



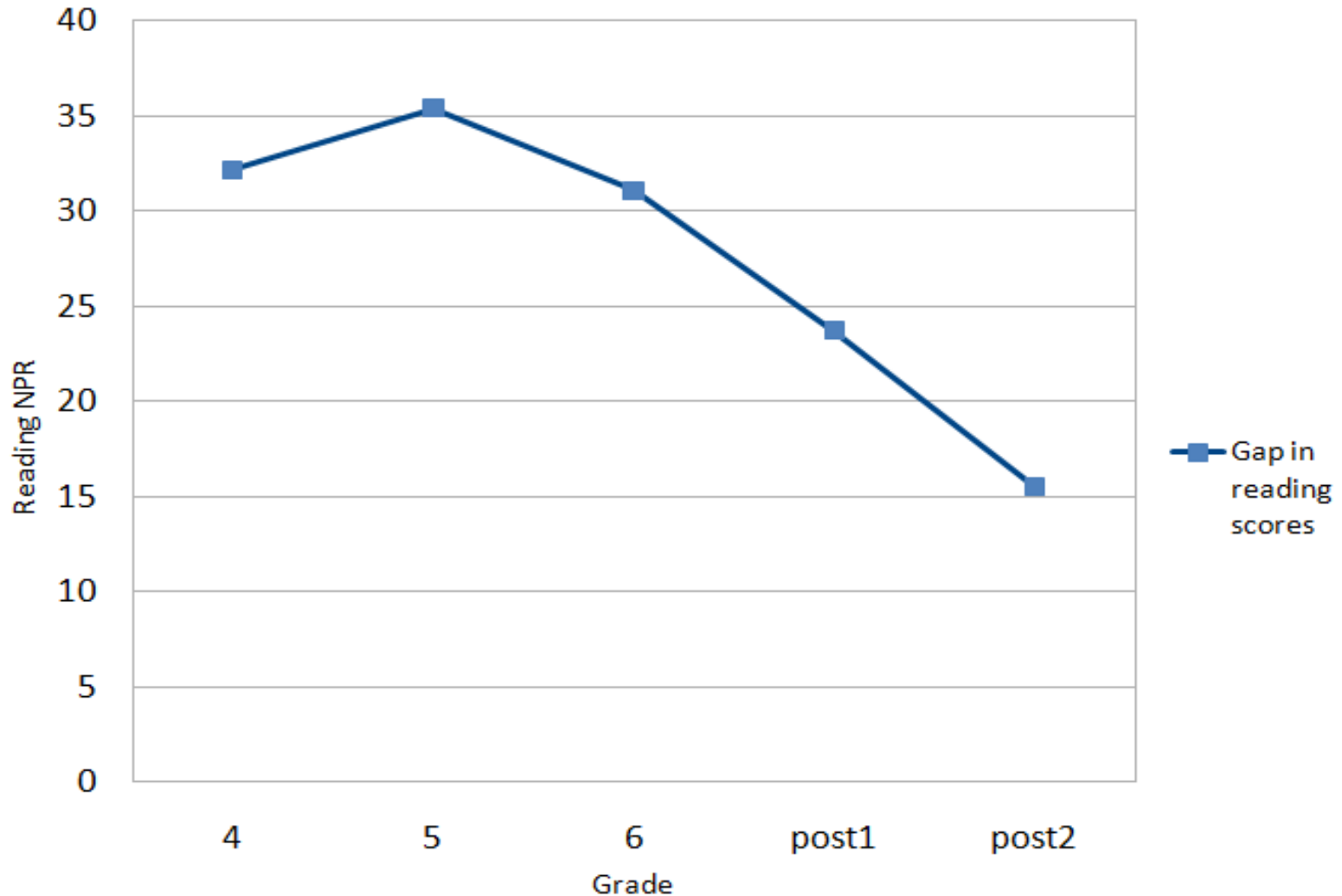
Retention Boosts Scores

Estimation of the Effect of Retention - Math



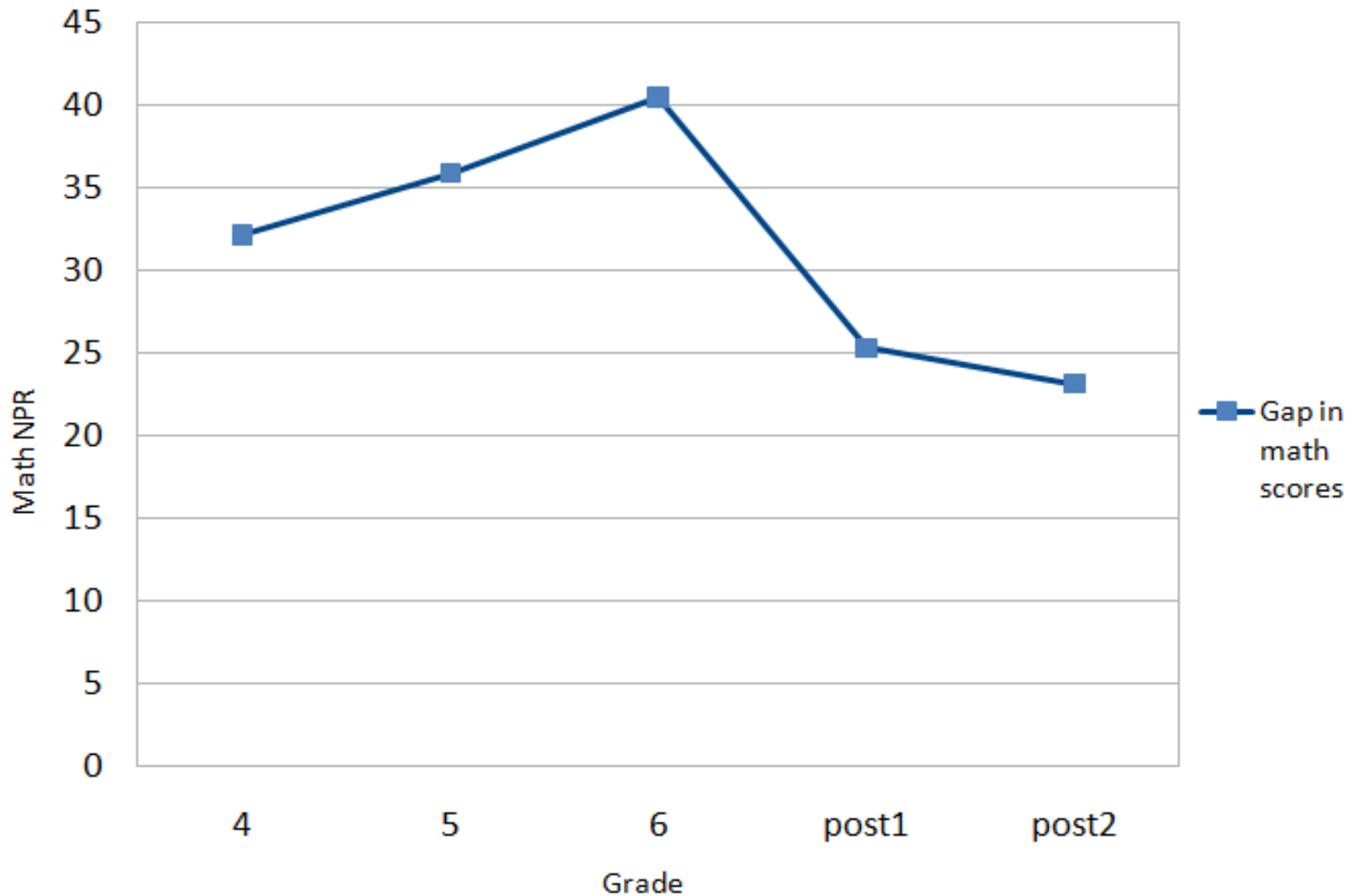
Retention reduces disparities in NPR

Gap in Reading Scores - Retained vs. Promoted



Retention reduces disparities in NPR

Gap in Math Scores - Retained vs. Promoted



Predictors of 9th grade on-track status

Does prior performance predict 9th grade on-track status?



The Sample

- 25,929 students total
- Cohort 203: 3rd grade in 2002-03 (n=14,861)
- Cohort 304: 3rd grade in 2003-04 (n=11,068)

The Analysis

Probit Regressions: Regressing the probability of being on-track in 9th grade on a students' ISAT math and reading scores in 6th and 8th grades



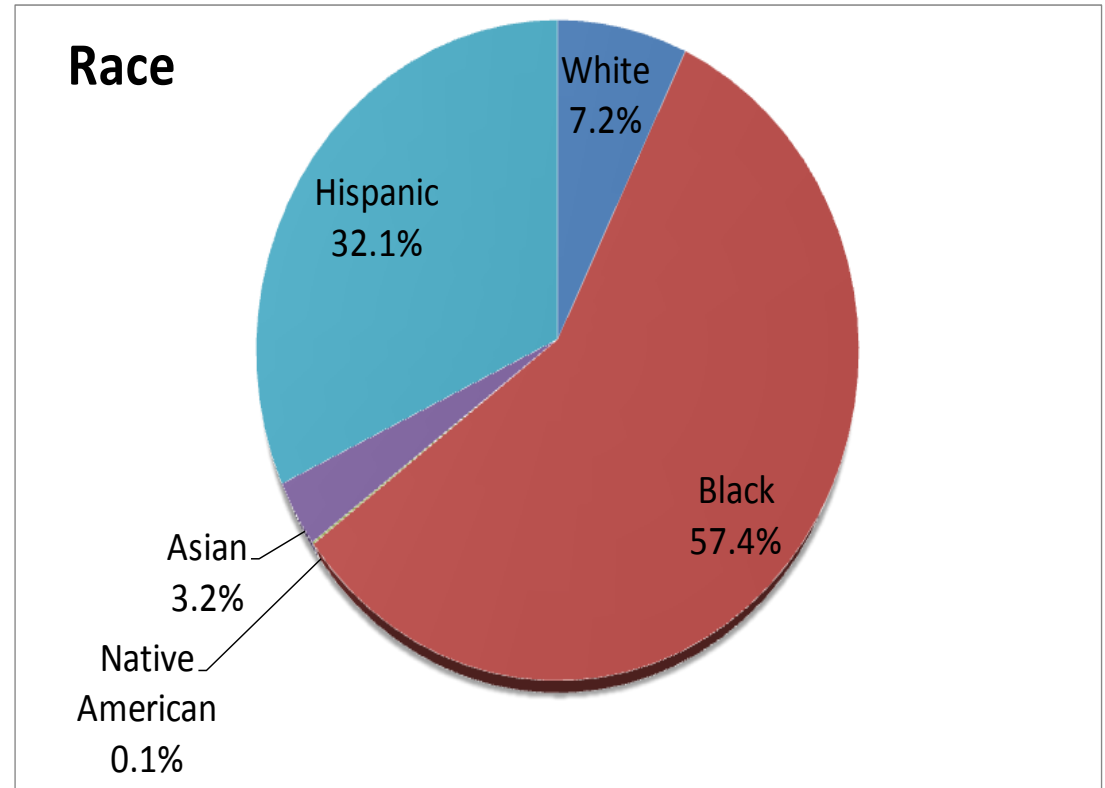
Demographics

- **Gender:**

- 55.1% Female
(n=14,294)

- **SES**

- 86% of students on Free/Reduced Lunch



Retention Levels

- Retention: 11.4% (2,967) retained at least once between 3rd and 8th grade
- Retention in promotion gate years:
 - 6.4% retained in 3rd grade
 - 1.7% retained in 6th grade
 - **0.3% retained in 8th grade**



Definitions

On-time

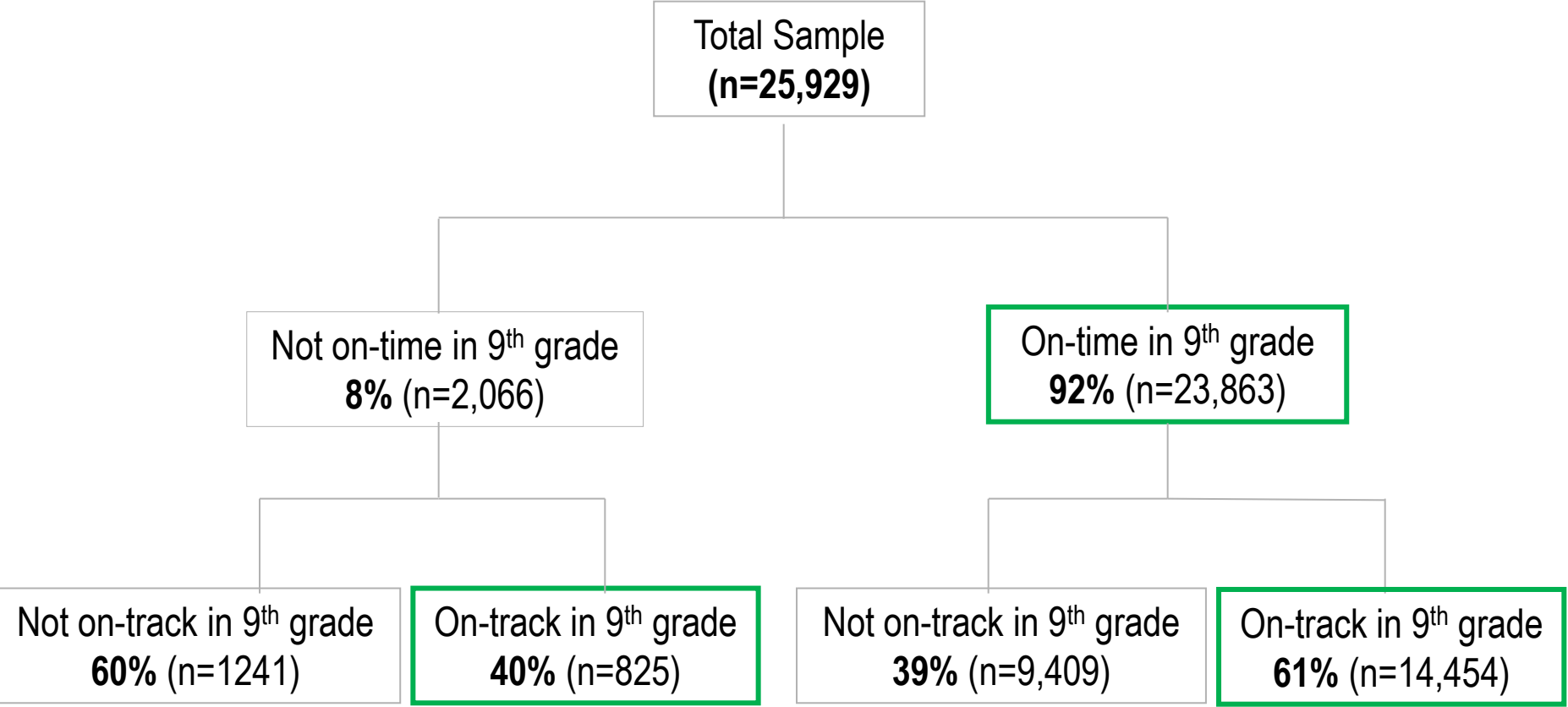
Cohort	6th Grade	8th Grade (On-Time)	9th Grade (On-Time)
203	2005-06	2007-08	2008-09
304	2006-07	2008-09	2009-10

On-track

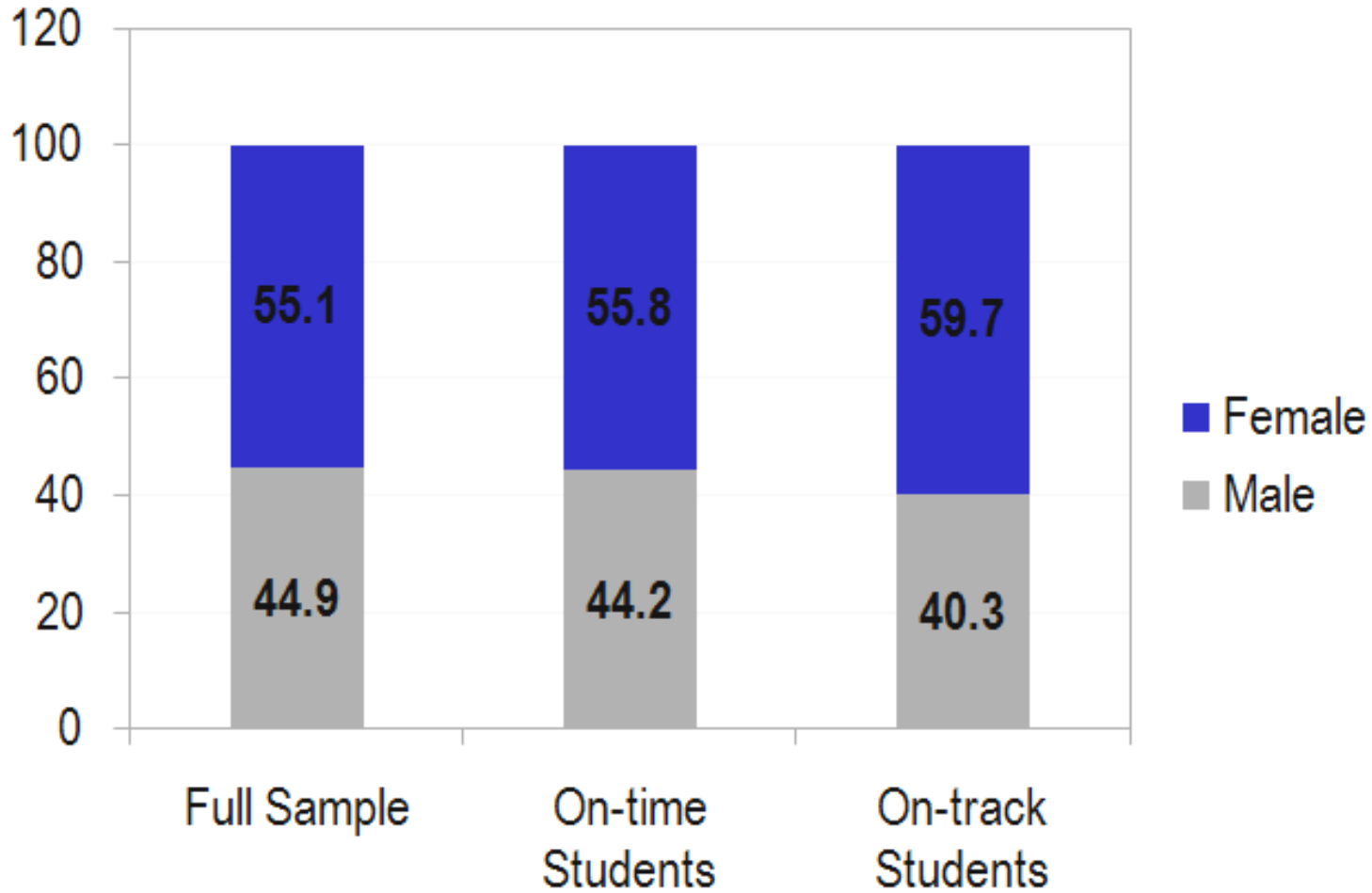
- Indicator for students in 9th grade
- Defined by CCSR as “students who had at least 10 semester credits (5 full-year course credits) and no more than 1 semester F in a core course by the end of their first year in high school.”
- Shown to help predict on-time graduation rates



59% of Students in Sample are On-track (n=15,323)

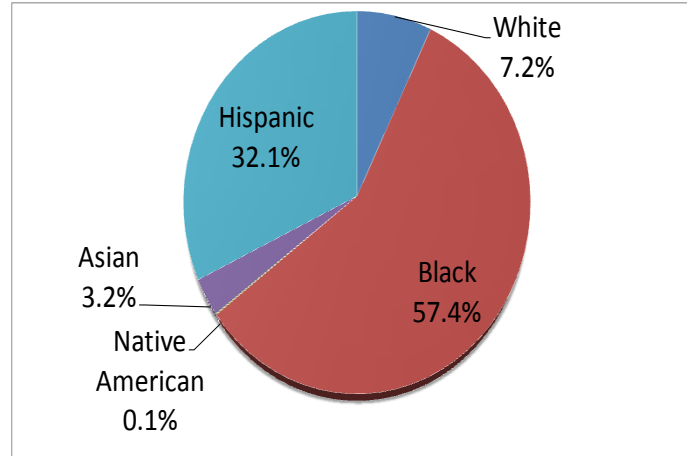


On-time & On-track Status by Gender

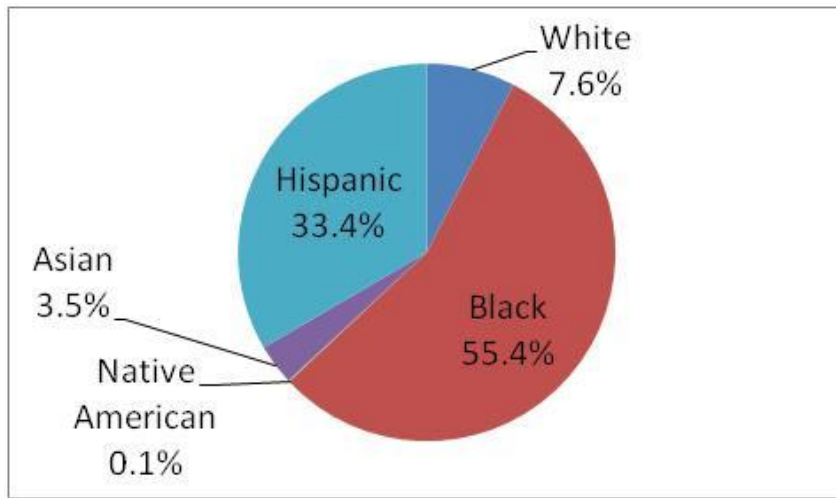


On-time & On-track Status by Race

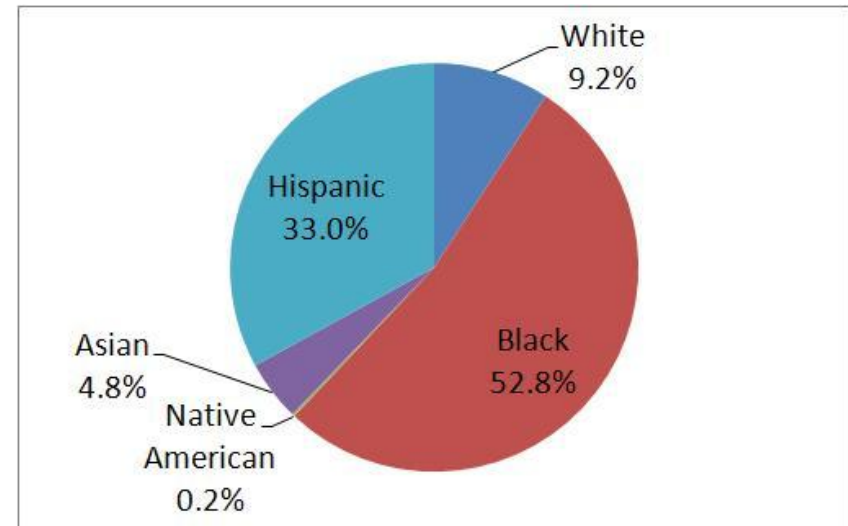
Full Sample



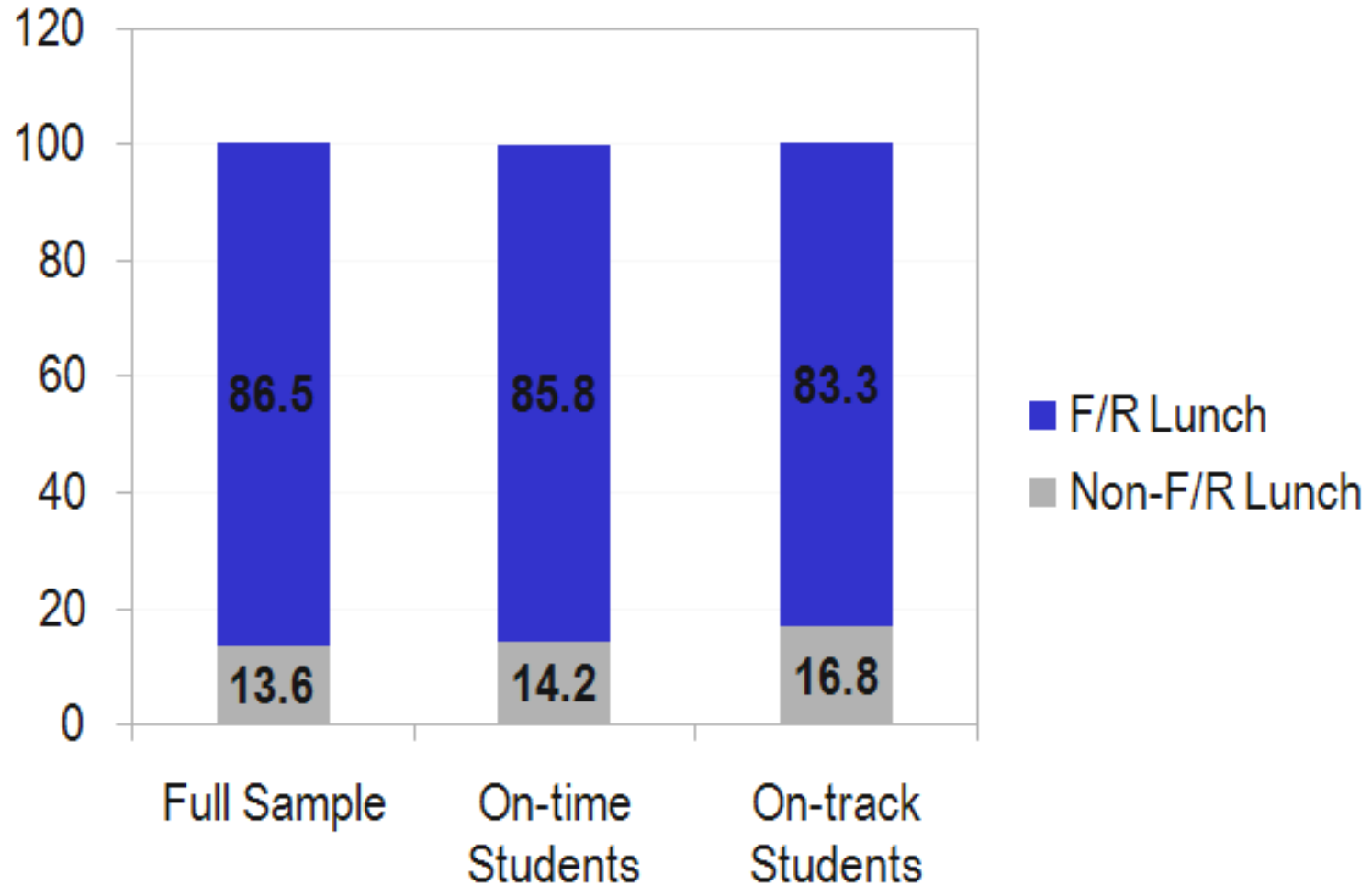
On-time Students



On-track Students



On-time & On-track Status by Lunch



Controls incorporated, by model

	6 th grade ISAT on on-track	8 th grade ISAT on on-track
Free/Reduced Lunch	X	X
Gender	X	X
Race (white as control)	X	X
Prior academic performance	none	6 th ISAT only
Retention	6 th & prior years	8 th and prior years (incl. 6 th)
Summer School	3 rd and 6 th	3 rd , 6 th , and 8 th
Variables of Interest	6th ISAT performance on-track status	8th ISAT performance on track status

Factors that positively affect the likelihood of being on-track in 9th grade

- Gender: female
- Race (white used as control): Asian
- 8th ISAT:
 - Math & reading scores significant over all models
- 6th ISAT:
 - Math score retains significance over all models
 - Reading scores lose significance when 8th grade reading scores are incorporated in the model



Factors that negatively affect the likelihood of being on-track in 9th grade

- Race (white used as control): Black, Hispanic
- Eligibility for free/reduced lunch
- Retention: significant at 6th, 8th, all non-gate years
- Summer school: promotion gate years only
- Cohort: students in cohort 304 less likely to have finished 9th grade on track than students in cohort 203

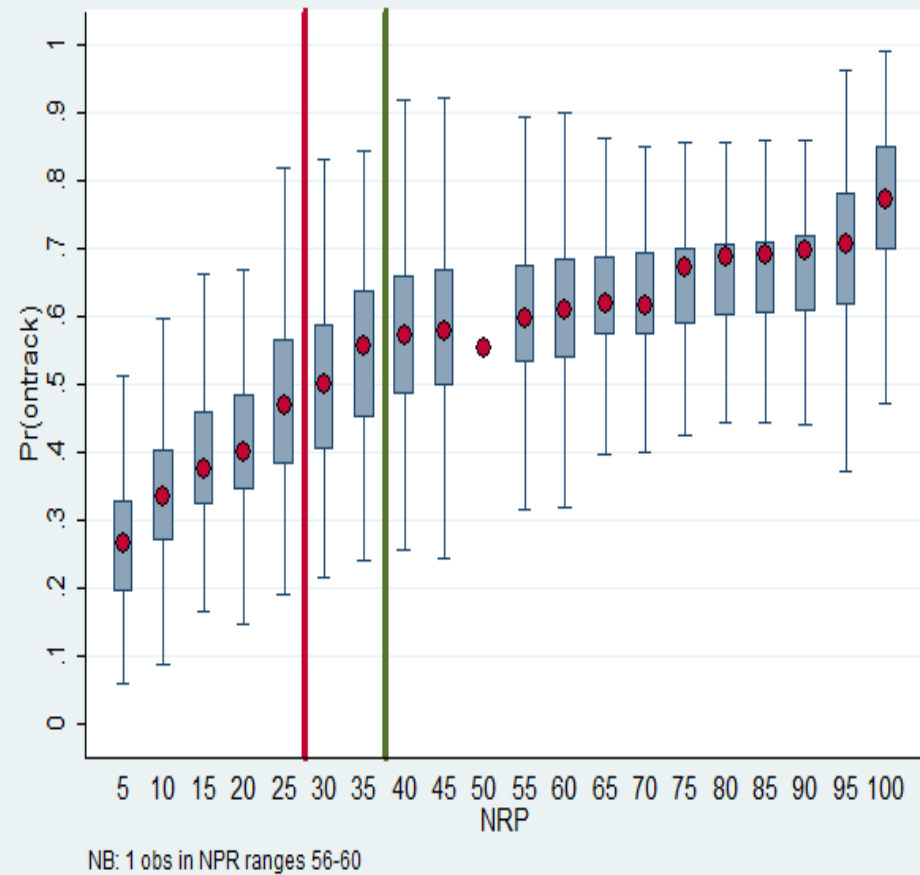
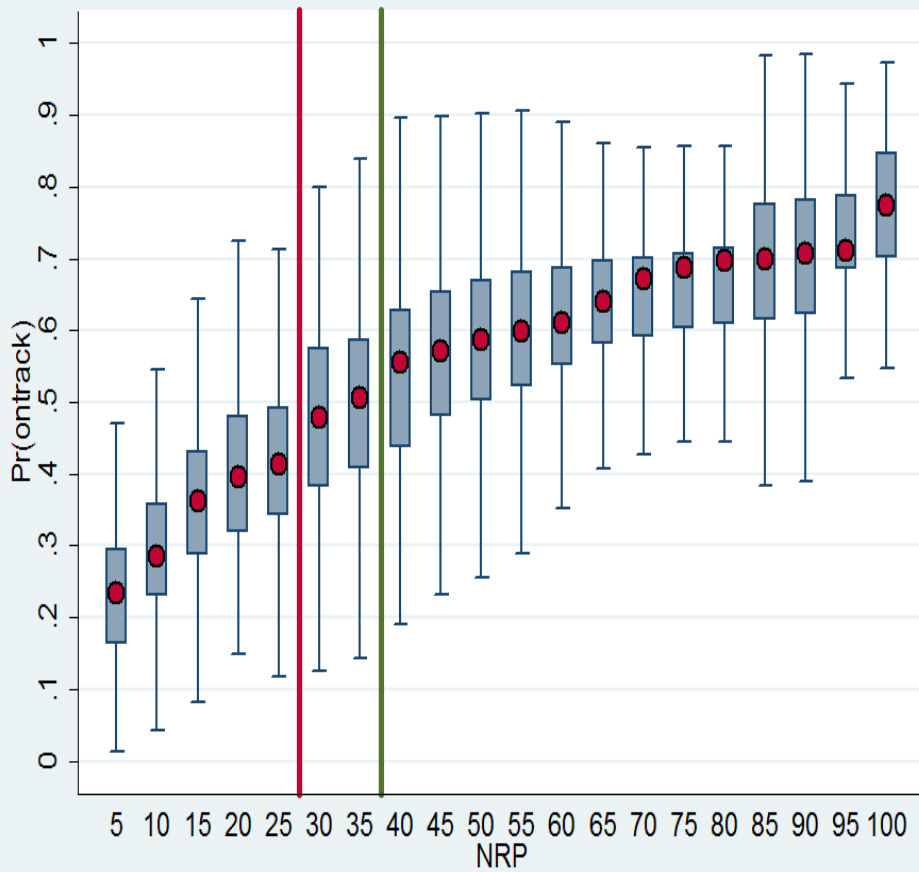


Factors that lack significance in predicting 9th grade on-track status

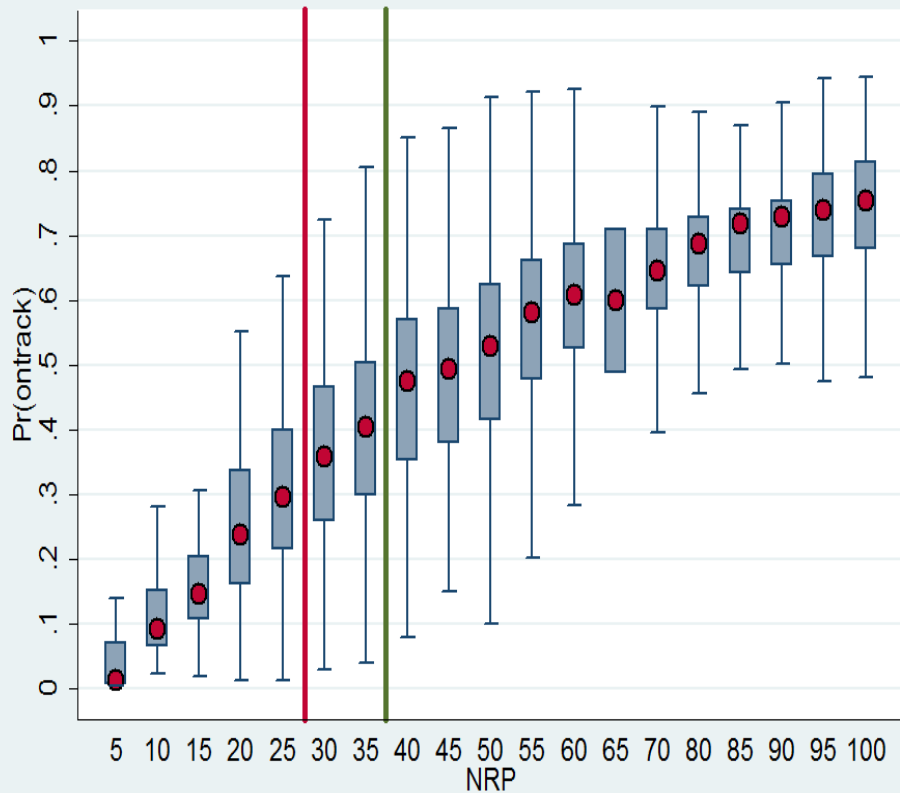
- Race: Native American
- 3rd Retention: insignificant across all models
- 6th ISAT Reading:
 - Significant in models which excluded 8th grade ISAT scores
 - Lost significance in models where 8th ISAT scores were included
 - 6th grade math scores retained their significance in all models



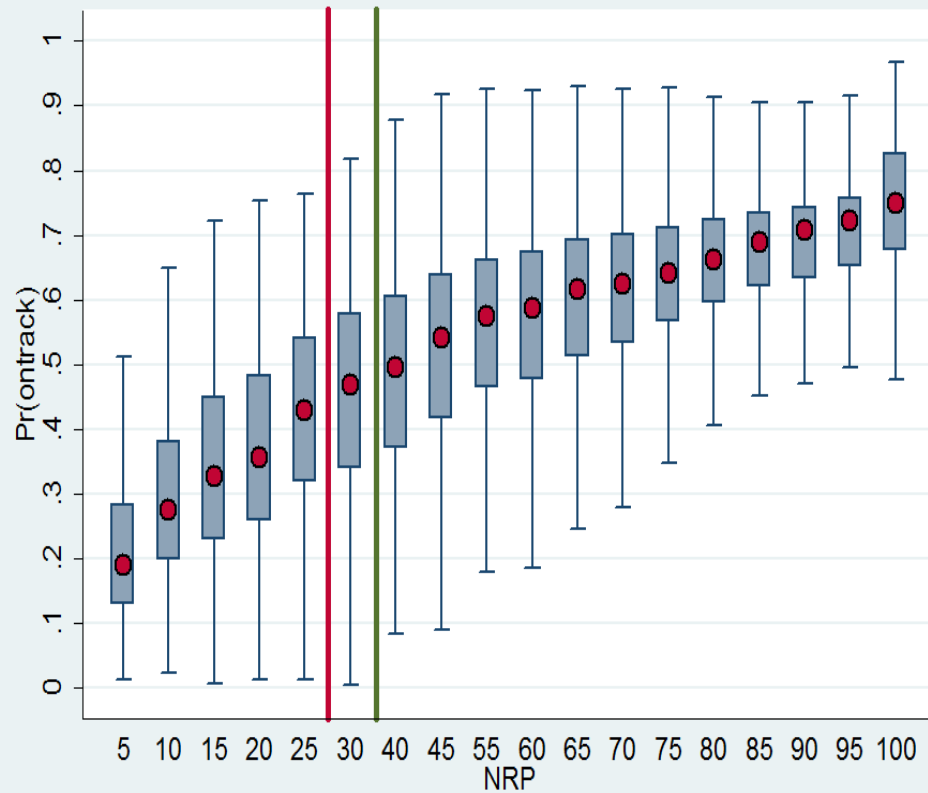
6th Grade ISAT Reading & Math Scores v. Predicted On-Track Status



8th Grade ISAT Reading & Math Scores v. Predicted On-Track Status



NB: 3 obs in NPR range 61-65



NB: 0 obs in NPR ranges 31-35, 46-40



Summary of Findings

- Math and reading ISAT scores in 3rd and 5th grade are highly predictive of 6th grade retention
- 6th grade retention increases student math and reading ISAT scores in the two years following retention
- 6th and 8th grade ISAT scores are highly predictive of 9th grade on-track status
- Retention in 6th grade negatively impacts 9th grade on-track status; 3rd grade retention has no significant impact



Possible directions for future research

- Incorporate non-academic causes of retention into models (attendance, student conduct/discipline, student mobility)
- Examine which subgroups of students benefit most from retention and/or summer school
- Explore causes & consequences of retention across the middle grades (6th – 8th)
- Examine the ability to predict 8th grade academic outcomes from 6th grade performance



Questions?



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