USING BIG DATA TO INFORM PREVENTION SCIENCE IN MARYLAND

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Society for Prevention Research, San Francisco, May 27, 2019

STRENGTHENING SOCIETY

UNIVERSITY of MARYLAND
SCHOOL OF SOCIAL WORK

GROWING USE OF ADMINISTRATIVE DATA FOR RESEARCH

- Big data, including administrative data, are increasingly being used to support evidence-based policy making (Figlio, 2017; Figlio et al., 2017)
- Challenges for researchers:
  - Data access
  - Record linkage
  - Legal agreements and prohibitions
  - Dissemination of findings and translation to policy

THE MLDS CENTER

PARTNERSHIP WITH THE UNIVERSITY OF MARYLAND

- The MLDS research branch conducts advanced statistical analyses and policy evaluation to provide actionable information for policy and practice.

MARYLAND "KIRWAN" COMMISSION ON INNOVATION AND EXCELLENCE IN EDUCATION

MARYLAND TASK FORCE ON RECONCILIATION AND EQUITY

Chapter 417

(Senate Bill 350)

AN ACT concerning

Morgan State University – Task Force on Reconciliation and Equity

FOR the purpose of requiring the Institute for Urban Research at Morgan State Uni
to convene a task force to foster reconciliation and inclusionary justice an
toward achieving racial equity by taking certain actions; requiring the task
include certain members; requiring, to the extent practicable, the member
task force to have expertise in certain matters and reflect a certain di
prohibiting a member of the task force from receiving certain compensati
authorizing the reimbursement of certain expenses; providing for the cha
staffing of the task force; authorizing the task force to establish
subcommittees; requiring the task force to consult with certain units o
government; authorizing the task force to consult with certain units of State
government; requiring, on request of the task force, a unit of State governm
provide information or staff support in a certain manner or to desig
representative to serve as a member or attend a meeting or hearing of the tas
requiring the task force to hold certain hearings and invite certain persons to
at the hearings, to study and make recommendations regarding certain matte
to monitor and evaluate the implementation of certain recommendations
certain criteria; prohibiting a certain person from retaliating against an individual
for giving testimony at a hearing held by the task force; requiring, on or before
certain dates, the Institute for Urban Research at Morgan State University to submit
certain preliminary and full reports to the Governor and the General Assembly;
providing for the termination of this Act; and generally relating to a task force on
reconciliation and equity convened by the Institute for Urban Research at Morgan
State University.

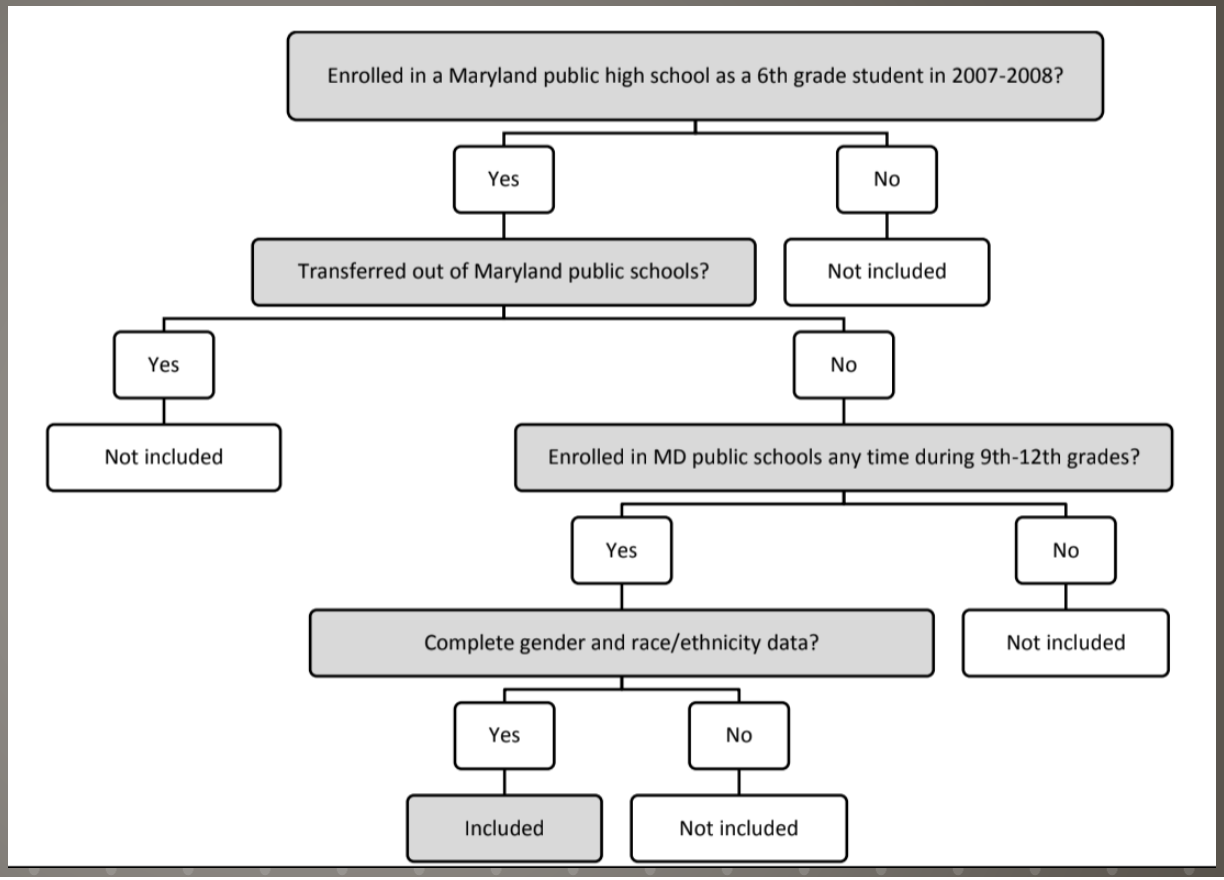
THE CURRENT STUDY

- Maryland currently provides supplemental state funds for each low-income ***student***
- The Kirwan Commission was considering ***additional*** supplemental funds for ***schools*** with high concentrations of poverty
- We were asked: What is the role of school concentrated poverty, over and above student poverty, in long-term academic and workforce outcomes?

METHODS

METHODS: SAMPLE SELECTION

- All MD public school 6th graders in 2007-2008 who did not transfer out of MD public schools (*N* = 52,610)

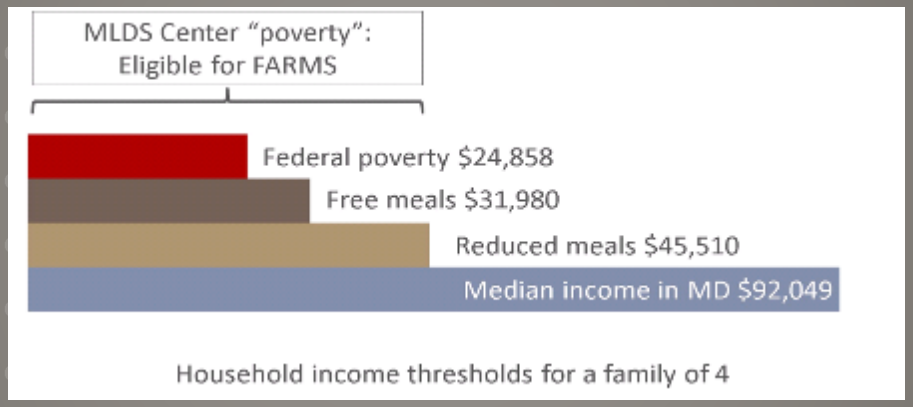


METHODS: DESCRIPTIVE STATISTICS

Student Characteristic (*N* = 52,610)	%
Male	50
Asian	5
Black	35
Hispanic	10
Other	4
White	45
Ever eligible for FARMS (6th-12th)	49
Ever English Learner (6th-12th)	3
Ever Special Education (6th – 12th)	14
Ever Homeless (6th – 12th)	4

METHODS: MEASURING POVERTY

- Education researchers typically use eligibility for the National Student Lunch Program (free/reduced meals; FARMS) measured at a single point in time



- 130% of federal poverty level → free meals
- 185% of federal poverty level → reduced-price meals

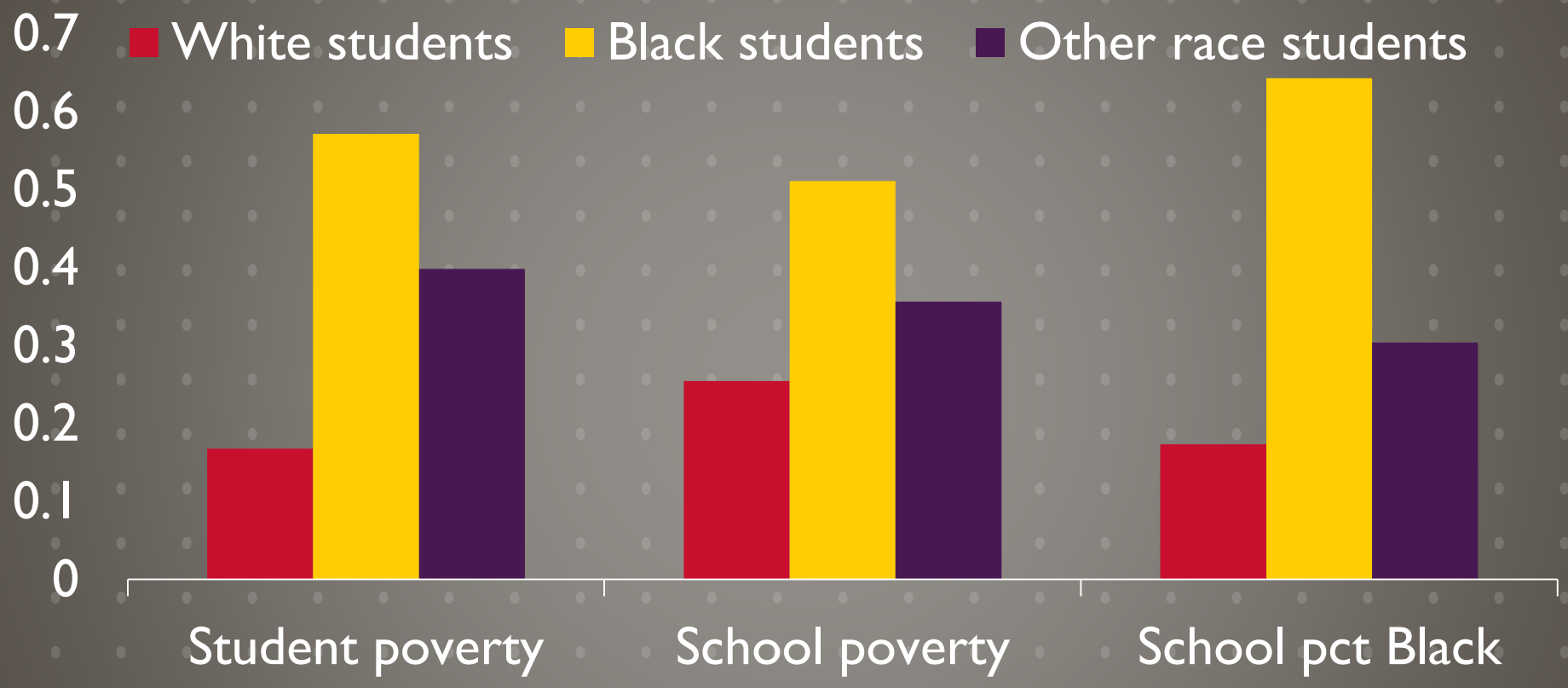
METHODS: MEASURING POVERTY

- Limitations in using FARMS at a single point in time
  - Fails to capture timing and duration of poverty
  - Community Eligibility Provision (CEP) and low rates in HS
  - Binary variable limits variation
- Michelmore & Dynarski (2016) proposed using the % of time eligible for FARMS
  - 6th-12th grade (*R* = 0-1; *M* = 0.36; *SD* = 0.42)
  - Aggregated to school level to measure school poverty (*M* = 0.49; *SD* = 0.25)

METHODS: MEASURING OUTCOMES

- High school graduation (ever)
- High school assessment (HSA) scores (Algebra, English 10)
- Enrollment in college (1 year post high school)
  - MD and out-of-state
  - 2-year and 4-year, public and private colleges
- Employment and earnings (1 year post high school)
  - MD employers subject to UI
  - Excludes federal and military, self-employment, out-of-state

POVERTY AND RACE



(*N* = 52,610)

METHOD: ANALYTIC APPROACH

Multiple Membership Multilevel Modeling (Chung & Beretvas, 2012)

Level 1 (Students):

$$Outcome_{i\{j\}} = \beta_{0j} + \beta_{1j} StPov_{i\{j\}} + \beta_{2j} Black_{i\{j\}} + \beta_{3j} Other_{i\{j\}} + \beta_{4j} MSA_{i\{j\}} + e_{i\{j\}}$$

Level 2 (Schools):

$$\beta_{0j} = \gamma_{00} + \gamma_{01} SchPov_{0\{j\}} + \gamma_{02} Black_{0\{j\}} + \gamma_{03} Other_{0\{j\}} + \gamma_{04} MSA_{0\{j\}} + \sum_{h \in \{j\}} w_{ih} u_{0h}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

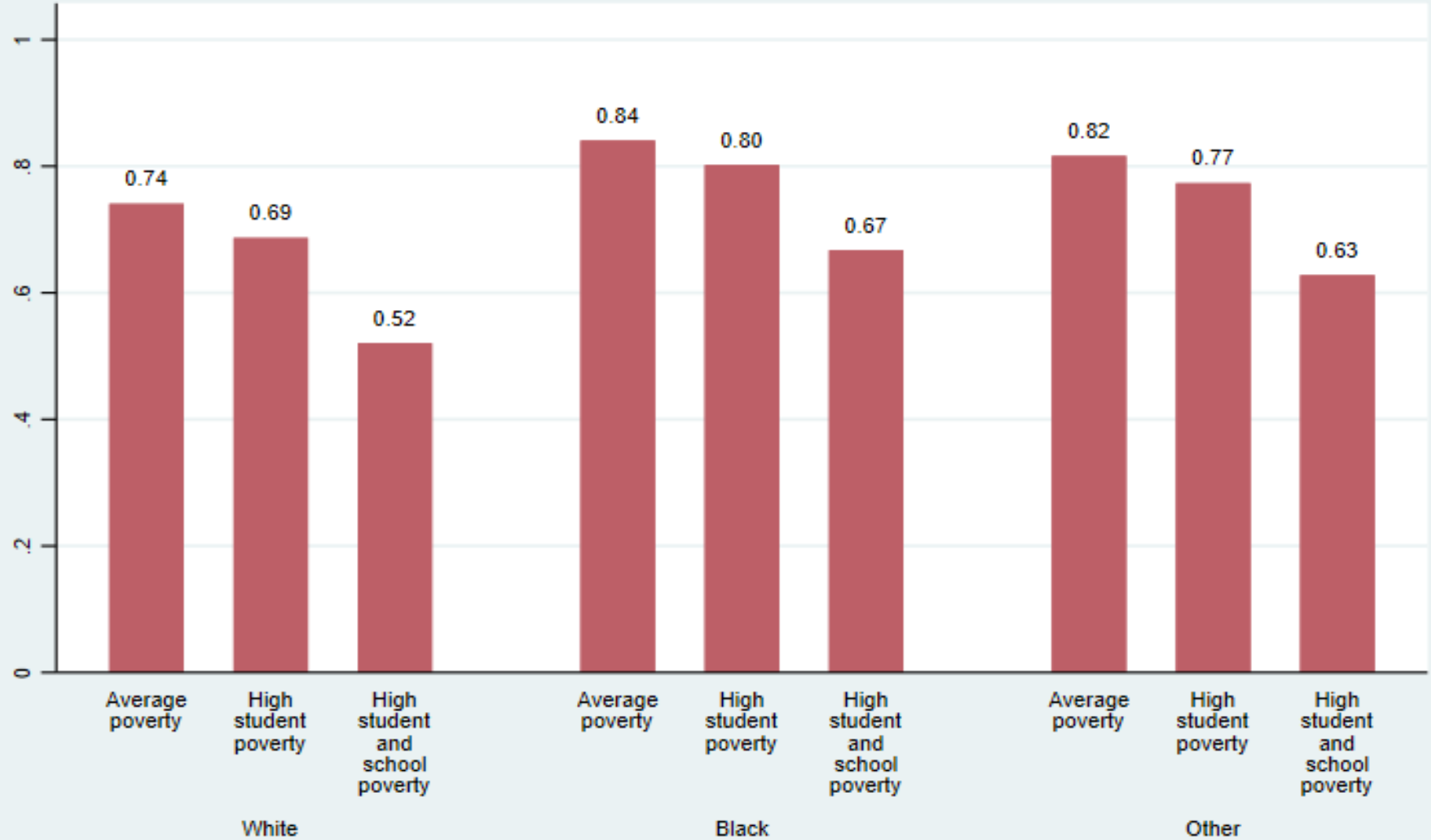
Disentangling the roles of student poverty, school concentration of poverty, student race/ethnicity, and school racial/ethnic composition

RESULTS

RESULTS: ENROLL IN POSTSECONDARY

	Model 1		Model 2		Model 3		Model 4	
	or	se	or	se	or	se	or	se
Intercept	1.97***	0.12	2.57***	0.12	2.68***	0.10	2.86***	0.10
Student poverty			0.91***	0.00	0.90***	0.00	0.93***	0.00
School poverty			0.73***	0.01	0.67***	0.01	0.73***	0.02
Black					1.31***	0.05	1.85***	0.07
Other					1.39***	0.05	1.56***	0.06
Sch pct Black					1.11***	0.02	1.12***	0.02
Sch pct Other					1.26***	0.03	1.24***	0.03
6th grade rdg							1.01***	0.00
6th grade math							1.01***	0.00
Sch 6th grade mean							1.02***	0.00

Predicted probability of enrolling in postsecondary within 1 year of on-time high school graduation



Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time, n=45,580.

White-Black gaps in predicted probability of enrolling in postsecondary

by school racial composition and student and school poverty

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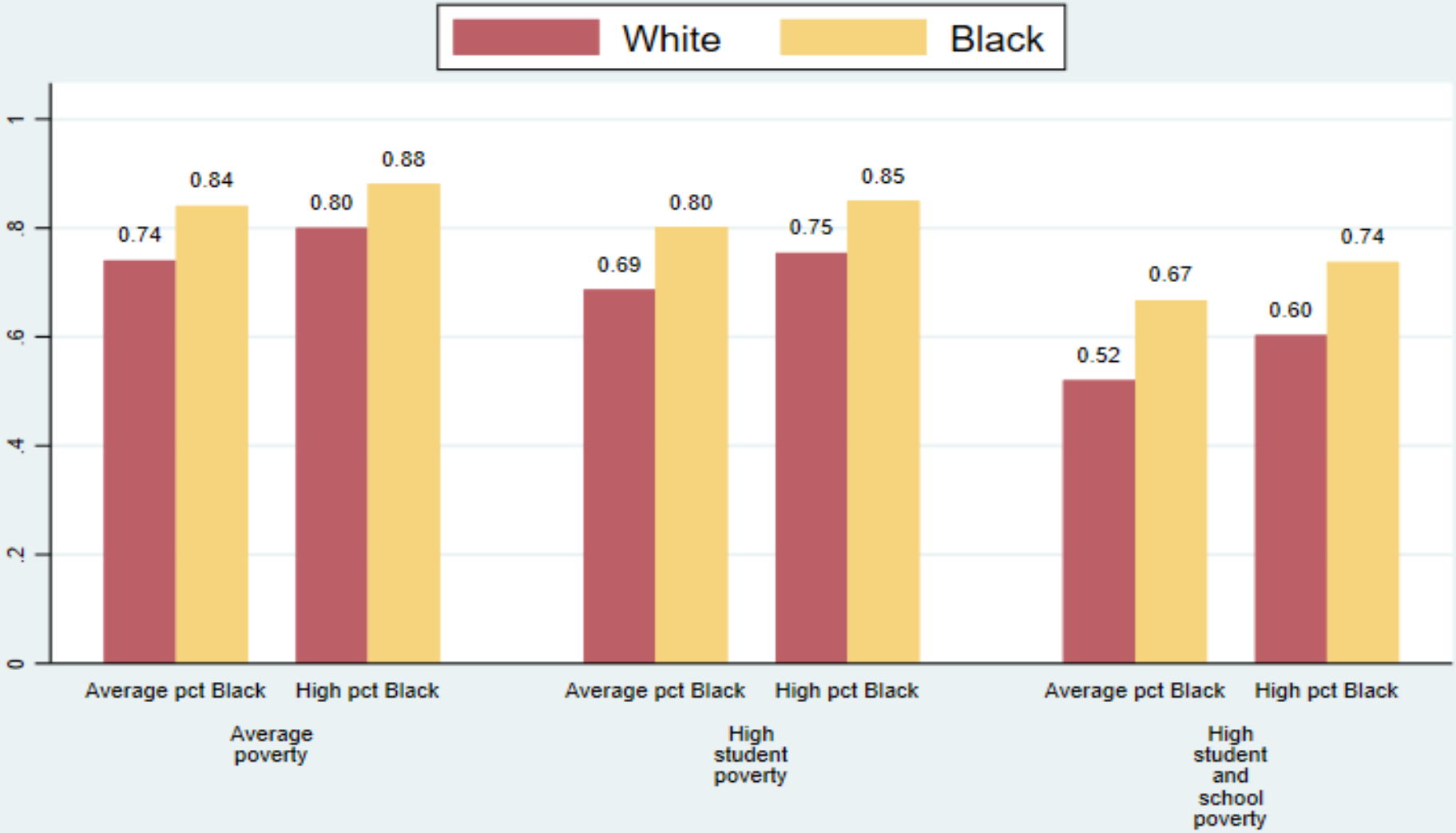
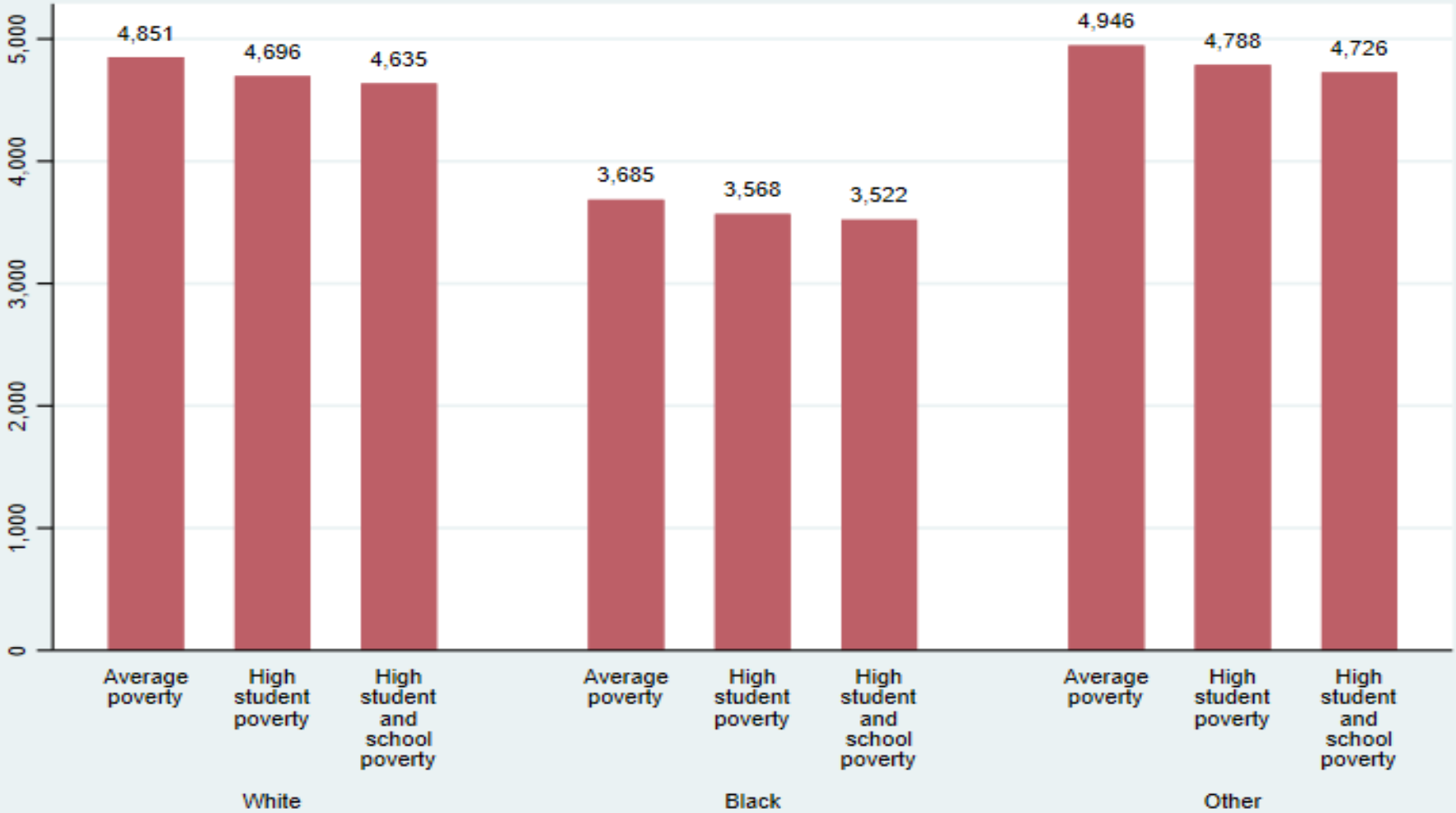


Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time, n=45,580.

RESULTS: LOG WAGES – NOT IN COLLEGE

	Model 1		Model 2		Model 3		Model 4	
	coef	se	coef	se	coef	se	coef	se
Intercept	8.45***	0.02	8.49***	0.02	8.49***	0.02	8.49***	0.02
Student poverty			-0.01***	0.00	-0.01*	0.00	-0.01*	0.00
School poverty			-0.04***	0.01	0.01	0.01	-0.01	0.01
Black					-0.27***	0.04	-0.27***	0.04
Other					0.03	0.05	0.02	0.05
Sch pct Black					-0.05***	0.01	-0.06***	0.01
Sch pct Other					-0.021	0.01	-0.02	0.01
6th grade rdg							-0.00*	0.00
6th grade math							0.00*	0.00
Sch 6th grade mean							-0.00**	0.00

Predicted MD wages - not enrolled in postsecondary within 1 year of on-time high school graduation



Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time and were not enrolled in postsecondary, n=8,529.

White-Black gaps in predicted MD wages - not enrolled in postsecondary

by school racial composition and student and school poverty

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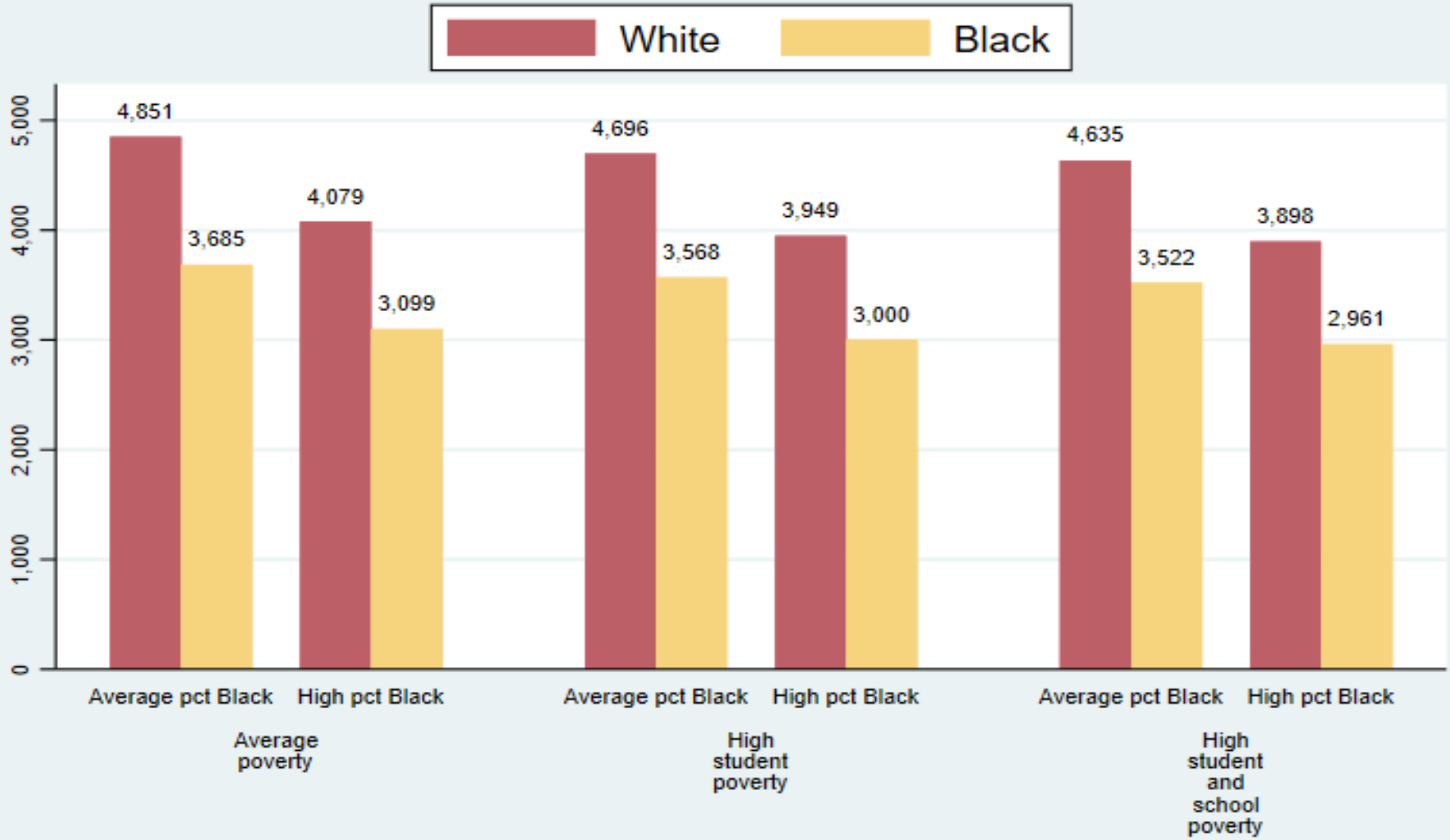
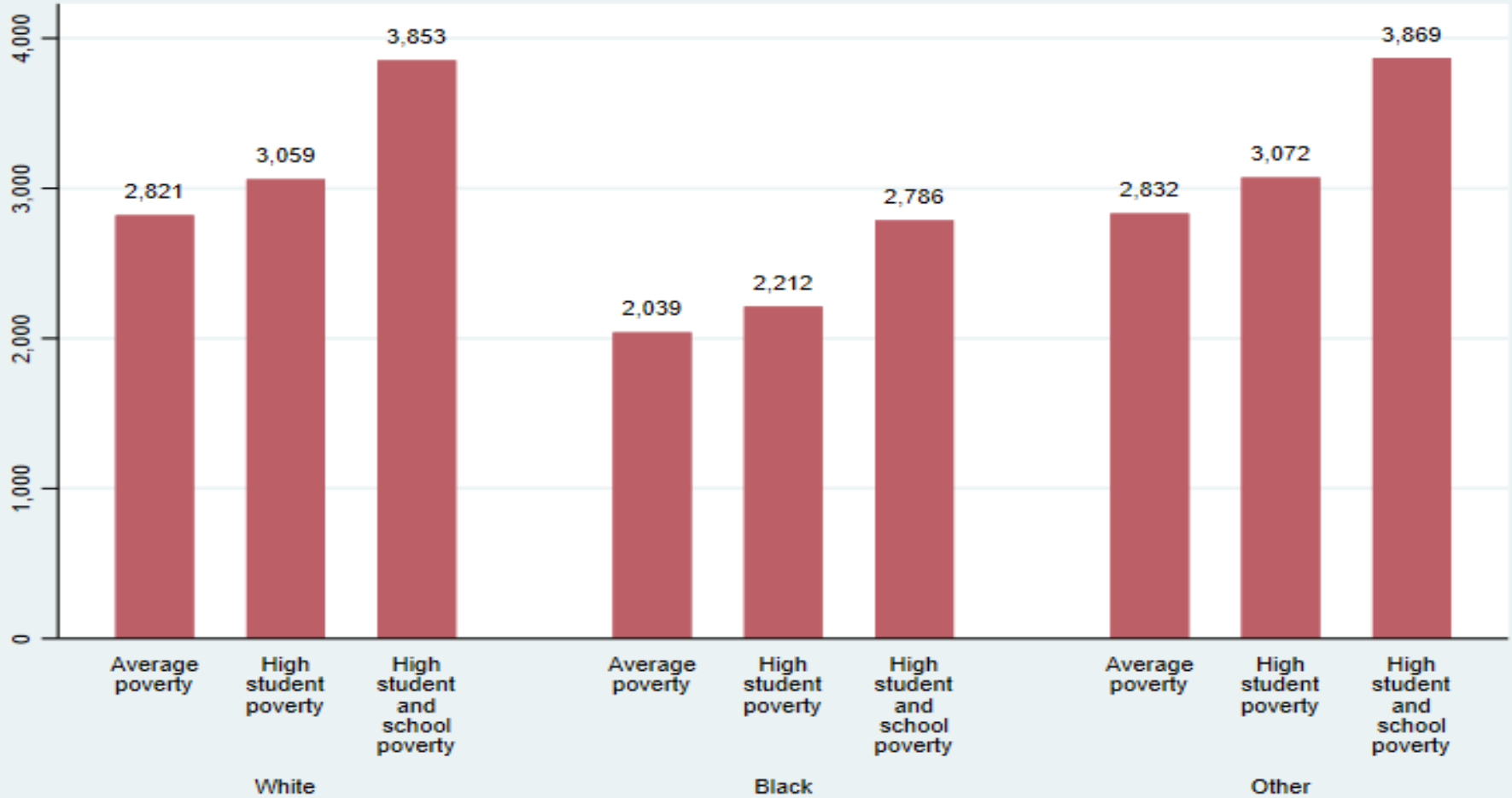


Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time and were not enrolled in postsecondary, n=8,529.

RESULTS: LOG WAGES – IN MD COLLEGE

	Model 1		Model 2		Model 3		Model 4	
	coef	se	coef	se	coef	se	coef	se
Intercept	7.90***	0.02	7.91***	0.02	7.90***	0.01	7.94***	0.01
Student poverty			0.03***	0.00	0.03***	0.00	0.02***	0.00
School poverty			0.05***	0.01	0.13***	0.01	0.10***	0.01
Black					-0.22***	0.03	-0.32***	0.03
Other					0.04	0.03	0.00	0.03
Sch pct Black					-0.08***	0.01	-0.09***	0.01
Sch pct Other					-0.08***	0.01	-0.08***	0.01
6th grade rdg							-0.00***	0.00
6th grade math							-0.00***	0.00
Sch 6th grade mean							-0.01***	0.00

Predicted MD wages - enrolled in MD postsecondary within 1 year of on-time high school graduation



Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time and were enrolled in postsecondary in MD, n=22,550.

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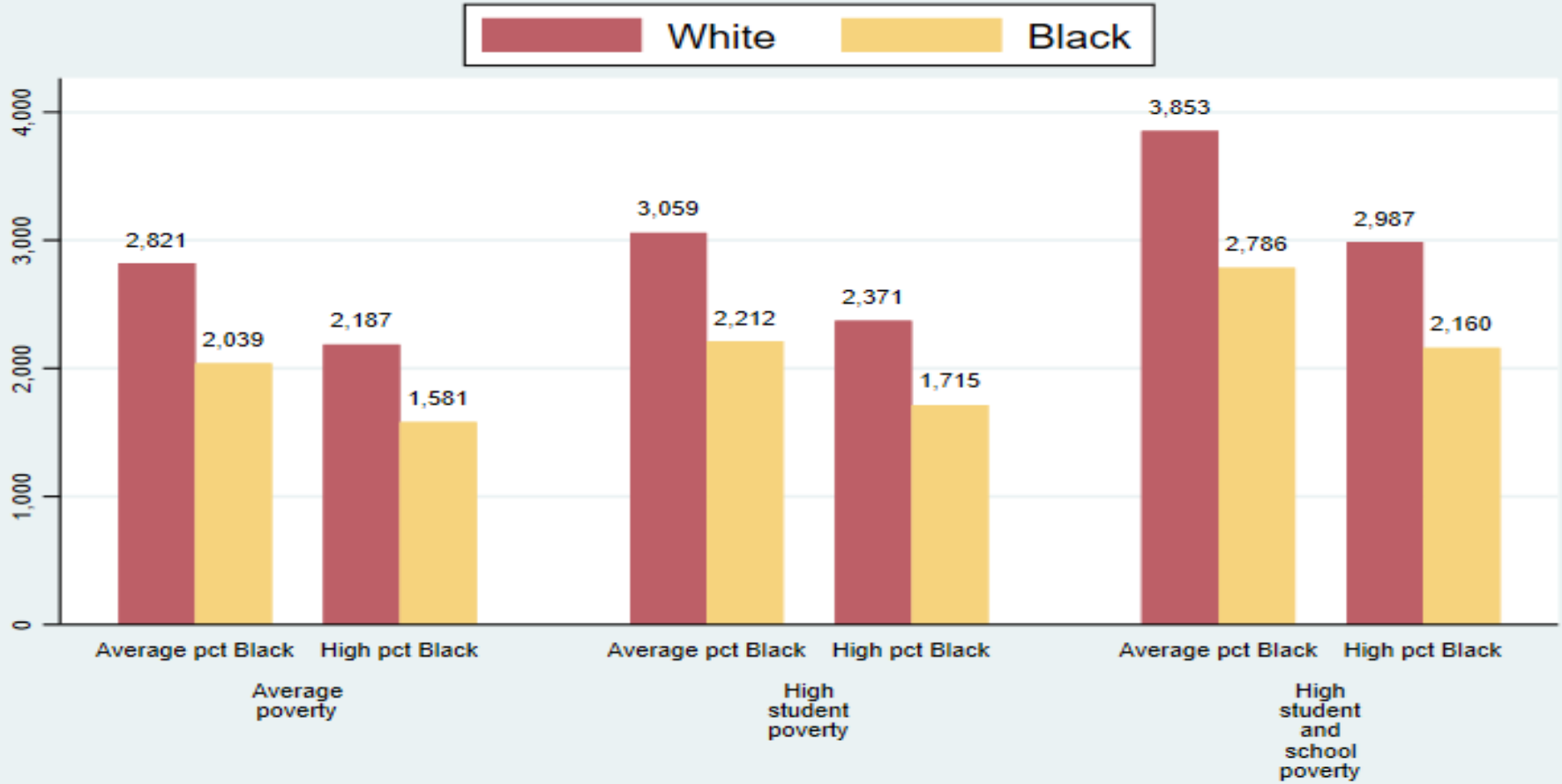
White-Black gaps in predicted MD wages - enrolled in MD postsecondary

by school racial composition and student and school poverty



Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time and were enrolled in postsecondary in MD, n=22,550.

SUMMARY OF RESULTS

- For most outcomes, higher levels of school poverty were significantly related to worse outcomes, after controlling for individual student poverty, race, and school membership
- Black students had more positive outcomes for high school graduation and college enrollment after controlling for student and school poverty and school composition
- In earnings, race played the largest role
  - Black students have lower earnings after controlling for other variables
  - Poverty is related to lower earnings for students not enrolled in college
  - Poverty is related to higher earnings for students enrolled in college

DISCUSSION

BIG DATA: BENEFITS & CHALLENGES

- Statewide, administrative data
  - Represents everyone – multiple stakeholders
- Communicating
  - Modeling approach enables "apples to apples" comparisons
  - Some stakeholders still want to see "apples to oranges" statistics that show the actual situation
  - Predicted outcomes can misleadingly look like actual data

POLICY IMPLICATIONS: POVERTY

SENATE BILL 1030

F1 9lr2562
CF HB 1413

By: **The President (By Request – Commission on Innovation and Excellence in Education) and Senators King, Pinsky, Ferguson, and Young**

http://dls.maryland.gov/policy-areas/commission-on-innovation-and-excellence-in-education#!

The Blueprint for Maryland's Future

FOR the purpose of stating findings and declarations of the General Assembly; establishing the public policy of the State; establishing principles of The Blueprint for Maryland's Future that are intended to transform Maryland's early childhood, primary, and secondary education system to the levels of high–performing systems around the world; stating certain actions necessary to achieve certain principles; stating certain requirements necessary to establish a world–class education system in Maryland under The Blueprint for Maryland's Future; altering a certain Consumer Price Index used for calculating the target per pupil foundation amount and the student transportation amount for education; requiring the State to provide a certain supplemental grant to certain county boards of education through a certain fiscal year; establishing a Concentration of Poverty School Grant Program; stating the purpose of the Program; requiring the State to distribute certain grants to each county board and the State Department of Education in certain fiscal years; requiring each county board to distribute a certain amount to each eligible school; requiring each eligible school to employ certain staff using certain grant funds; requiring certain eligible schools to use certain funds to provide wraparound services

POLICY IMPLICATIONS: EQUITY

- Stay tuned…

https://www.morgan.edu/iur/taskforceonreconciliationandequity

QUESTIONS AND CONTACT

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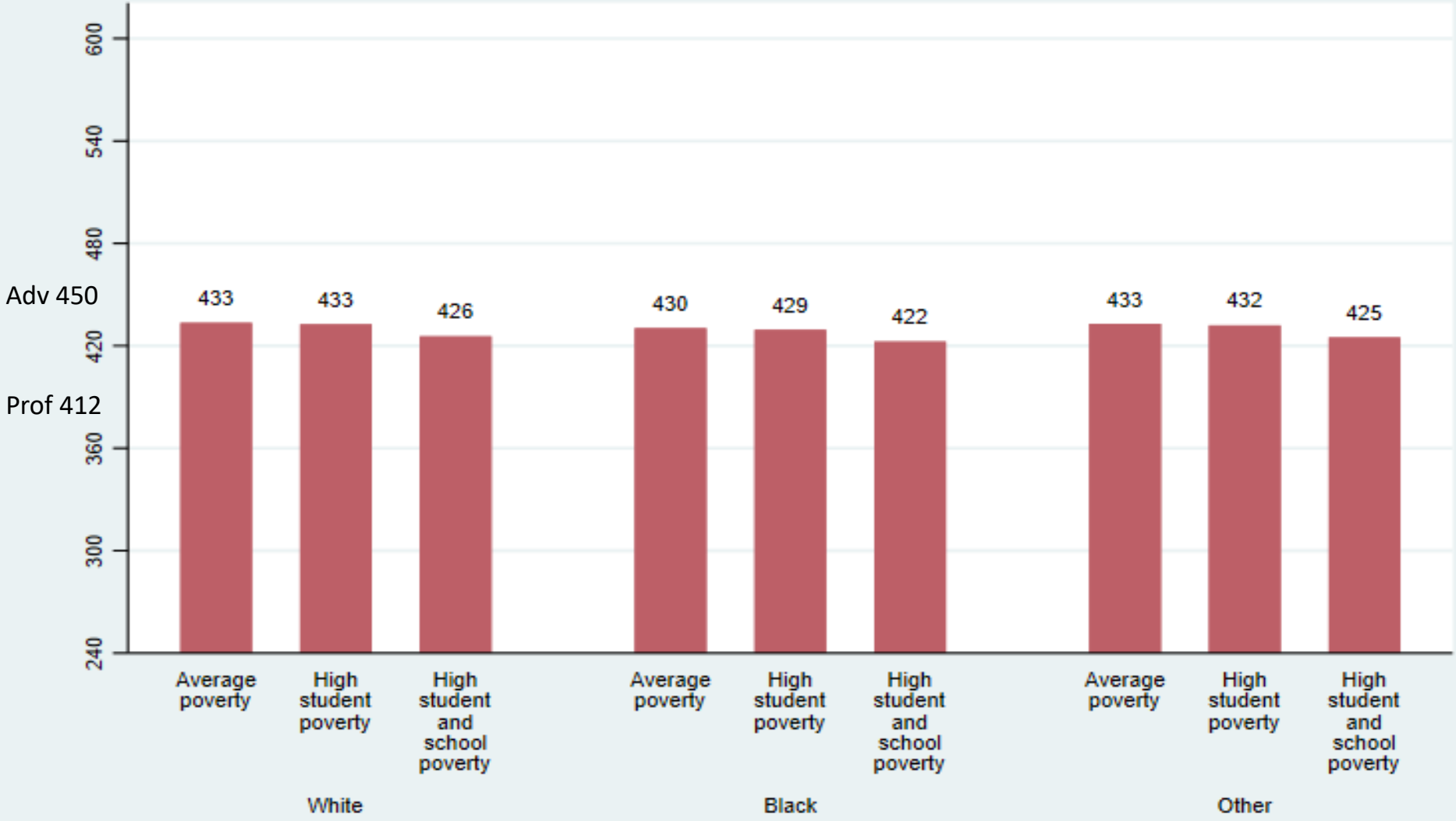
EXTRA SLIDES

RESULTS: ALGEBRA SCORES

	Model 1		Model 2		Model 3		Model 4	
	coef	se	coef	se	coef	se	coef	se
Intercept	425.04***	1.02	432.46***	0.73	432.81***	0.69	433.47***	0.47
Student poverty			-1.51***	0.03	-1.31***	0.03	-0.26***	0.03
School poverty			-7.13***	0.27	-5.82***	0.42	-3.20***	0.26
Black					-11.46***	0.37	-3.14***	0.27
Other					-1.96***	0.34	-0.62*	0.26
Sch pct Black					-1.31***	0.30	-1.31***	0.19
Sch pct Other					1.93***	0.43	0.88**	0.32
6th grade rdg							0.12***	0.00
6th grade math							0.43***	0.00
Sch 6th grade mean							0.42***	0.02

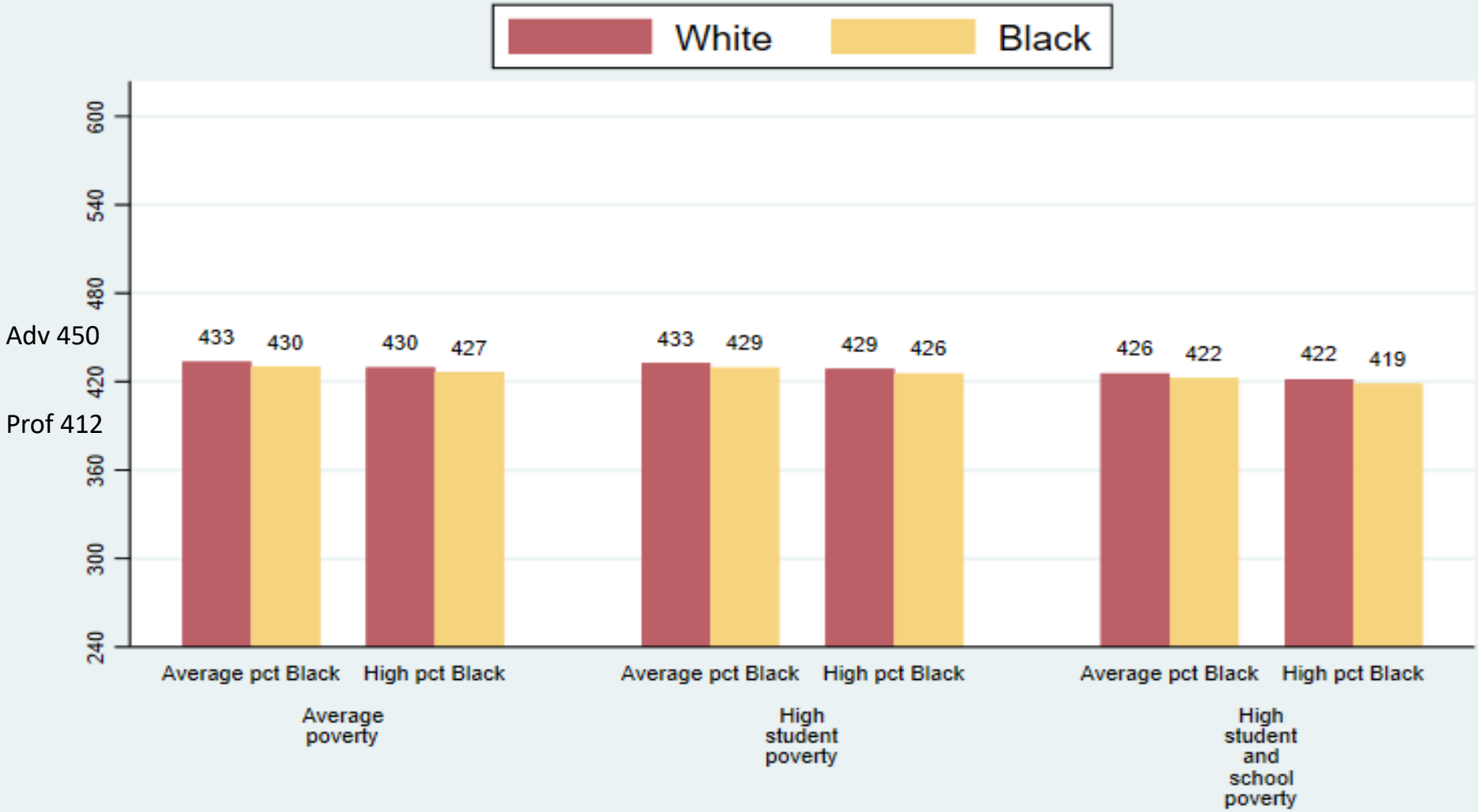
Predicted HSA Algebra score



Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 with HSA Algebra scores, n=51,012.

White-Black gaps in predicted HSA Algebra scores

by school racial composition and student and school poverty

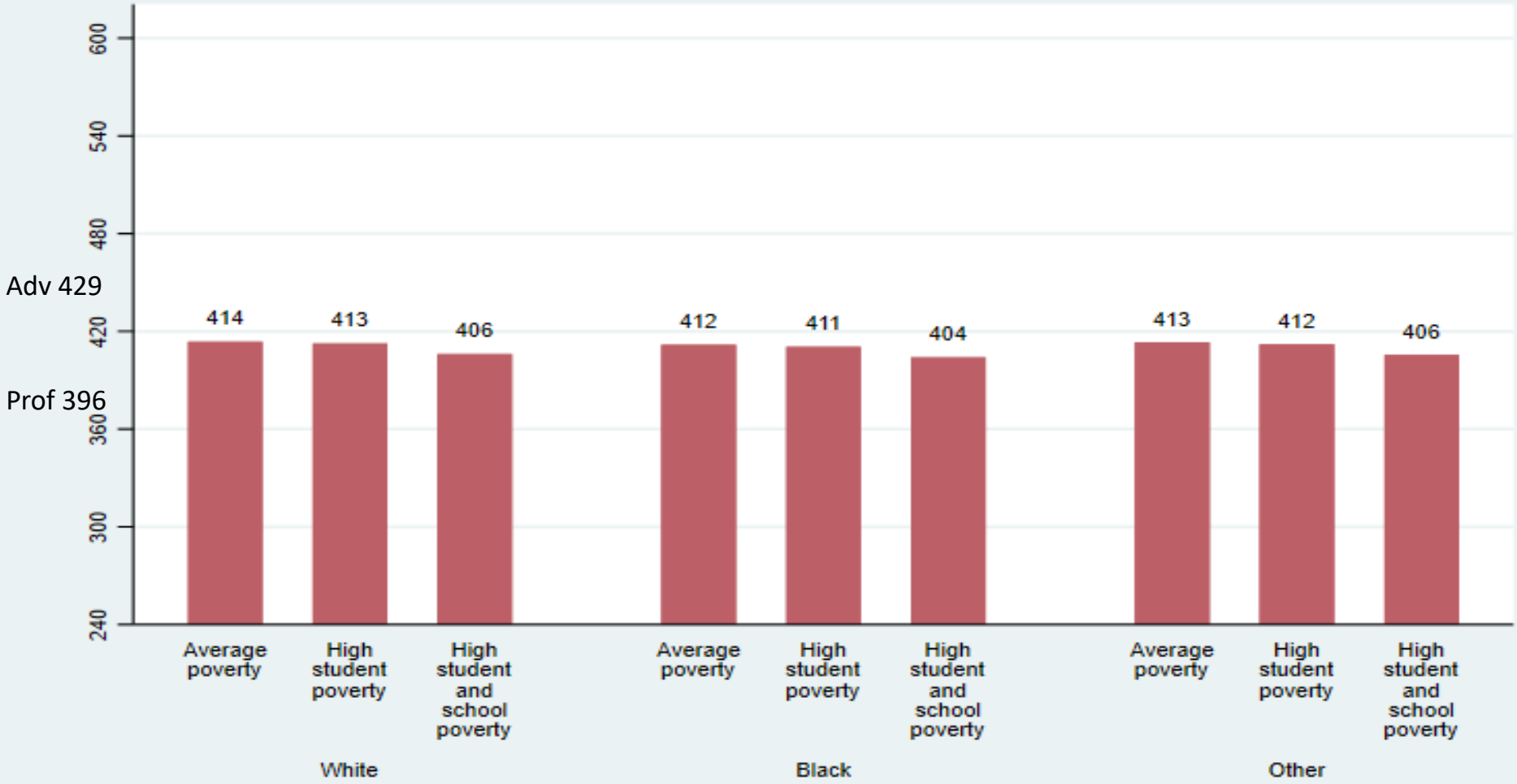


Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 with HSA Algebra scores, n=51,012.

RESULTS: ENGLISH 10 SCORES

	Model 1		Model 2		Model 3		Model 4	
	coef	se	coef	se	coef	se	coef	se
Intercept	407.66***	1.03	412.83***	0.64	413.37***	0.62	413.70***	0.39
Student poverty			-1.40***	0.03	-1.24***	0.03	-0.34***	0.02
School poverty			-5.38***	0.23	-5.26***	0.34	-2.94***	0.22
Black					-8.57***	0.32	-1.96***	0.23
Other					-2.34***	0.30	-0.52*	0.22
Sch pct Black					-0.11	0.25	-0.09	0.16
Sch pct Other					2.07***	0.37	1.43***	0.24
6th grade rdg							0.31***	0.00
6th grade math							0.17***	0.00
Sch 6th grade mean							0.36***	0.01

Predicted HSA English score

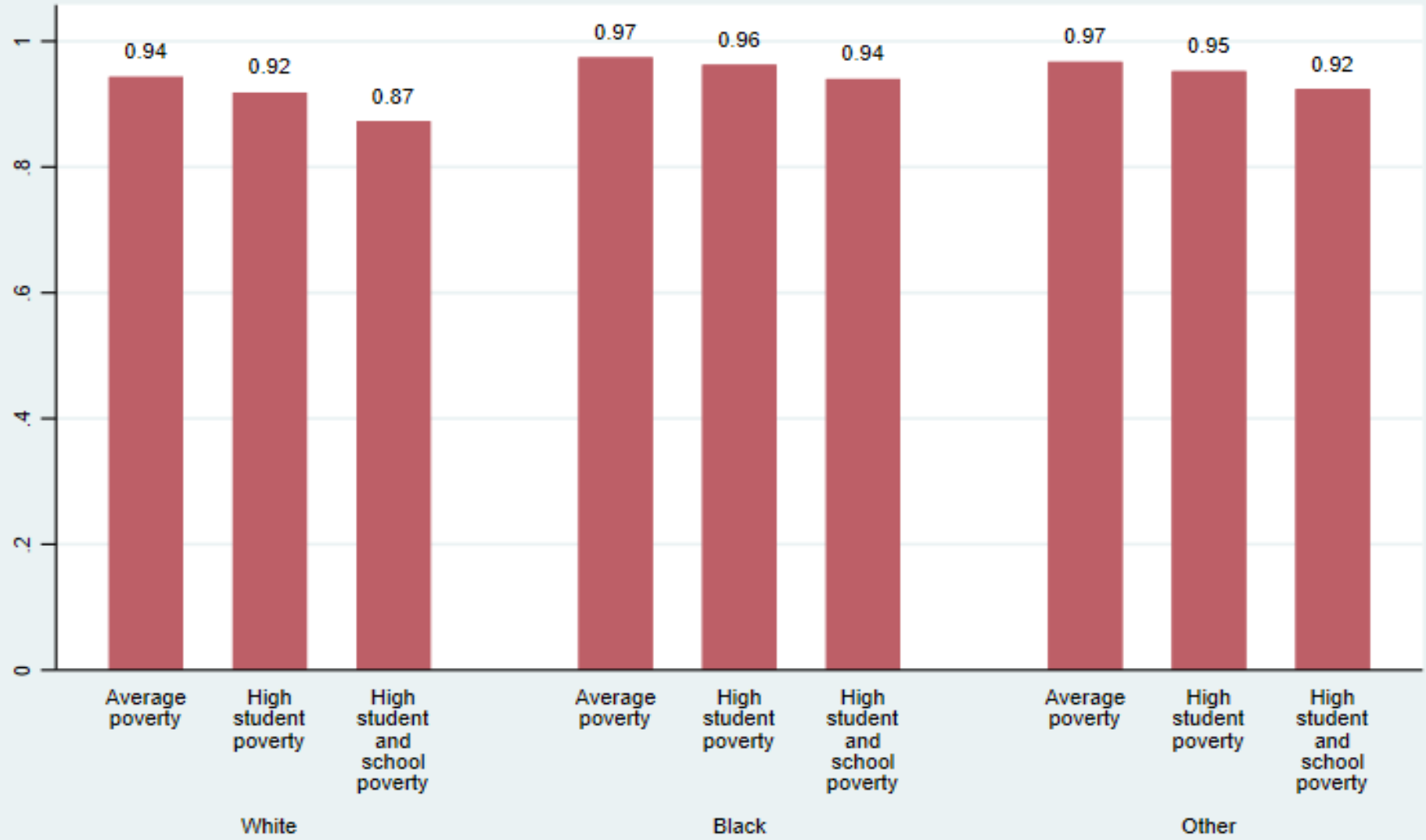


Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 with HSA English scores, n=49,481.

RESULTS: EVER GRADUATE FROM HS

	Model 1		Model 2		Model 3		Model 4	
	or	se	or	se	or	se	or	se
Intercept	8.44***	0.84	11.54***	0.81	12.95***	1.27	16.66***	1.53
Student poverty			0.88***	0.00	0.87***	0.00	0.89***	0.00
School poverty			0.72***	0.02	0.74***	0.05	0.80***	0.04
Black					1.70***	0.09	2.28***	0.13
Other					1.58***	0.09	1.77***	0.11
Sch pct Black					0.98	0.05	0.97	0.03
Sch pct Other					1.35***	0.09	1.26***	0.08
6th grade rdg							1.00***	0.00
6th grade math							1.02***	0.00
Sch 6th grade mean							1.02***	0.00

Predicted probability of ever graduating from high school



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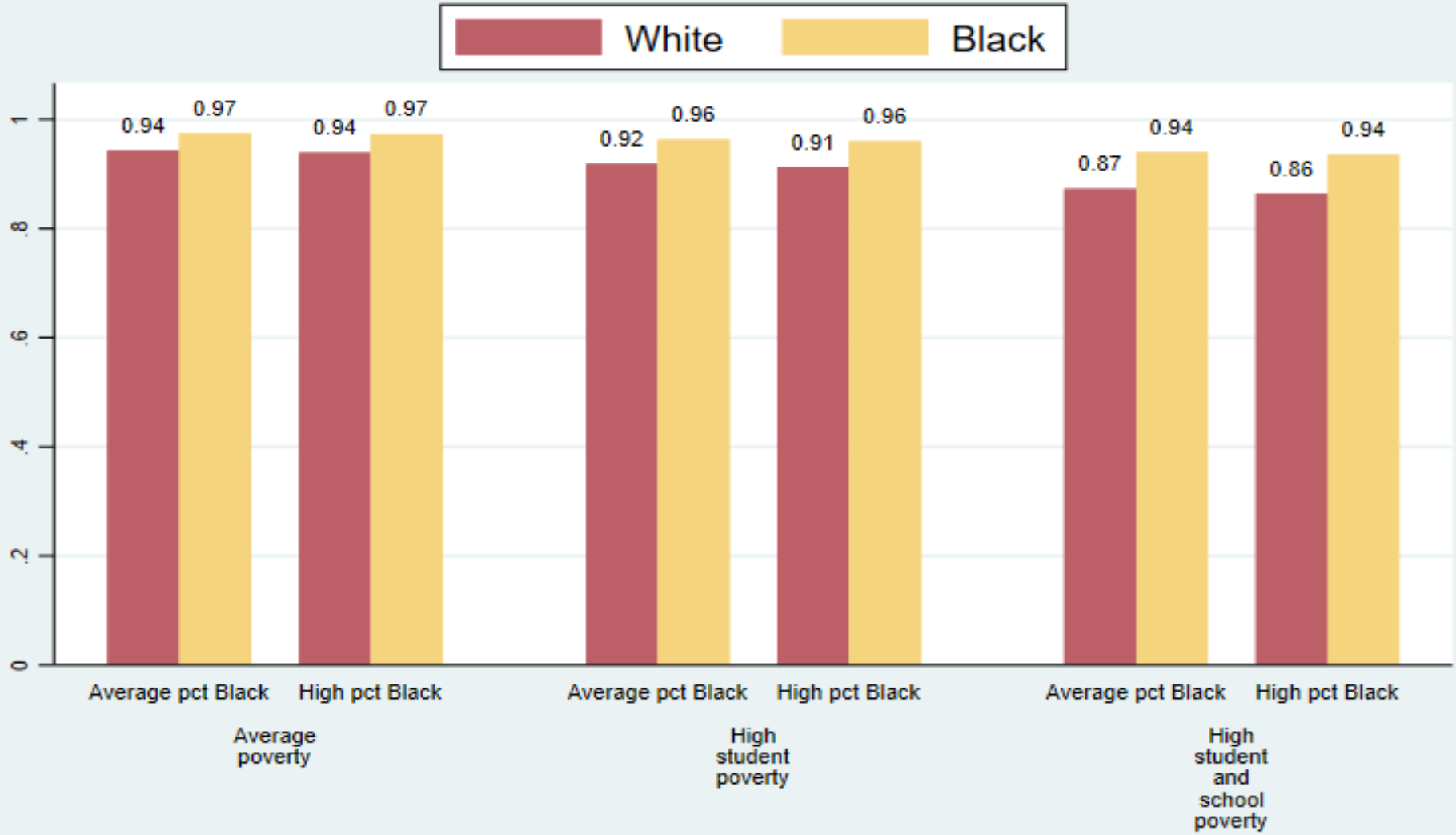
White-Black gaps in predicted probability of ever graduating from high school

by school racial composition and student and school poverty



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