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SCHOOL OF SOCIAL WORK

# **Using Longitudinal Data to Assess Long-Term Outcomes Associated with Poverty in Maryland Students**

Dawnsha Mushonga, PhD, Angela Henneberger, PhD, Bess Rose, PhD, & Boyoung Nam, MSW

SSWR Annual Conference

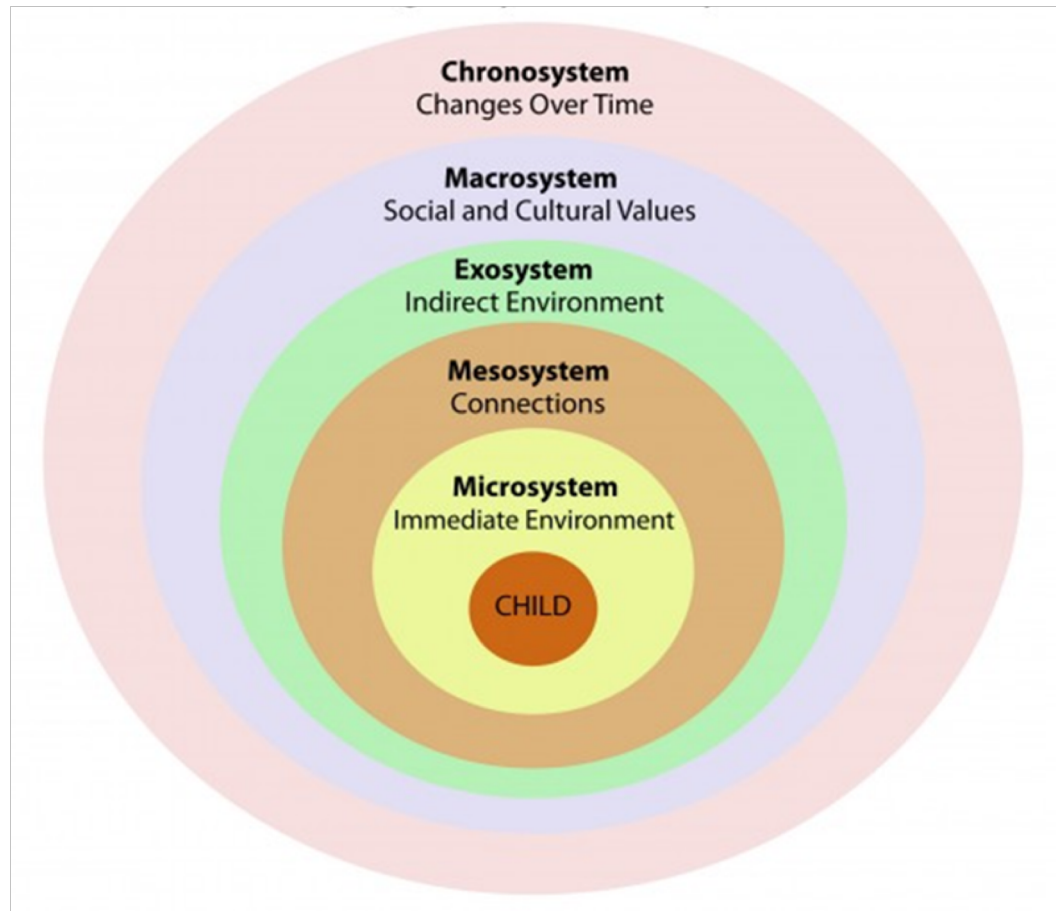
San Francisco, CA

January 19, 2019

# Student and School Poverty

- Poverty has been linked to poor physical health, low academic achievement, poor social and emotional functioning, fewer completed years of education, and lower workforce earnings (Duncan, Magnuson, Kalil, & Ziol-Guest, 2012; Leventhal & Brooks-Gunn, 2000; McLoyd, 1998).
- Students' educational outcomes depend on the schools they attend because the education provided by each school reflects the available resources, curriculum, and student body composition of the school (Borman & Dowling, 2010).
- Evidence from observational studies suggests that prolonged residence in poor neighborhoods is detrimental to educational outcomes (Burdick-Will et al. 2011; Harding 2003; Sampson, Sharkey, & Raudenbush 2008; Wodtke, Harding, & Elwert 2011).

# Bronfrenbrenner's Ecological Systems



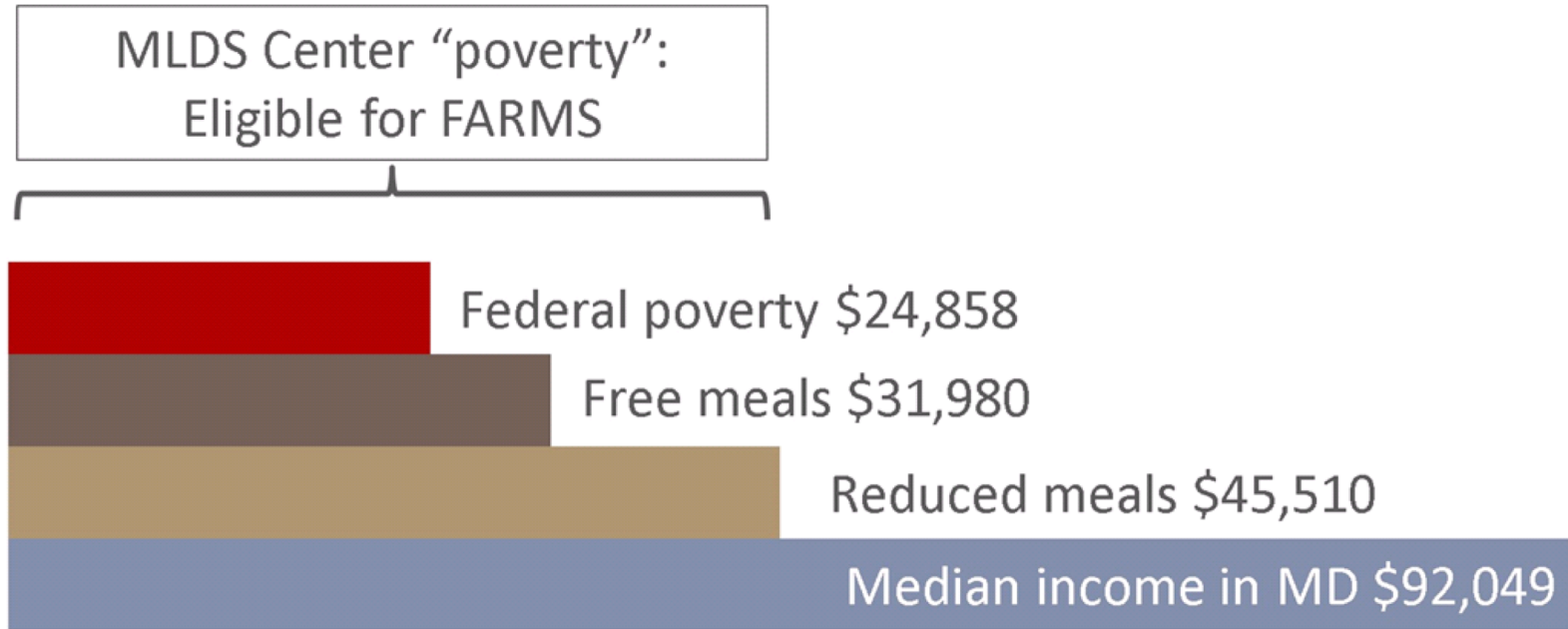
# The Current Study

- **Goal:** inform state commission on school funding about role of school concentration of poverty
- Disentangle the roles of student and school factors...
  - Student household poverty
  - School concentration of poverty
  - Student race/ethnicity
  - School racial/ethnic composition
- Examined students' long-term educational and career outcomes, including:
  - Standardized test scores
  - High school graduation and dropout
  - Postsecondary enrollment
  - Wages

# Method: Data

- Linked data sources for K-12, postsecondary, and workforce data
- 6 years of administrative records from MLDS
  - 63,282 students- 6<sup>th</sup> grade cohort
  - All 24 local school systems in Maryland
- Inclusion criteria
  - Did not transfer out of the MD public school system
  - Enrolled some point during 9<sup>th</sup>-12<sup>th</sup> grades
  - Complete demographic data available (gender, race/ethnicity)

# Method: Measuring Poverty



Household income thresholds for a family of 4

\*Student poverty duration = length of time eligible for FARMS from 6<sup>th</sup> - 12<sup>th</sup> grades

# Method: Measures

- Independent Variables
  - Level One- student characteristics
    - Student poverty- duration of time FARMS eligible
    - Student race/ethnicity
  - Level Two- school characteristics
    - School poverty- mean poverty duration of all students in the school
    - School racial/ethnic composition
- Outcome Variables
  - High school graduation (on-time)
  - High School Assessment (HSA) Algebra scores
  - College enrollment (within one year of HS graduation)
  - Workforce wages (within first year after HS graduation)

# Method: Analyses

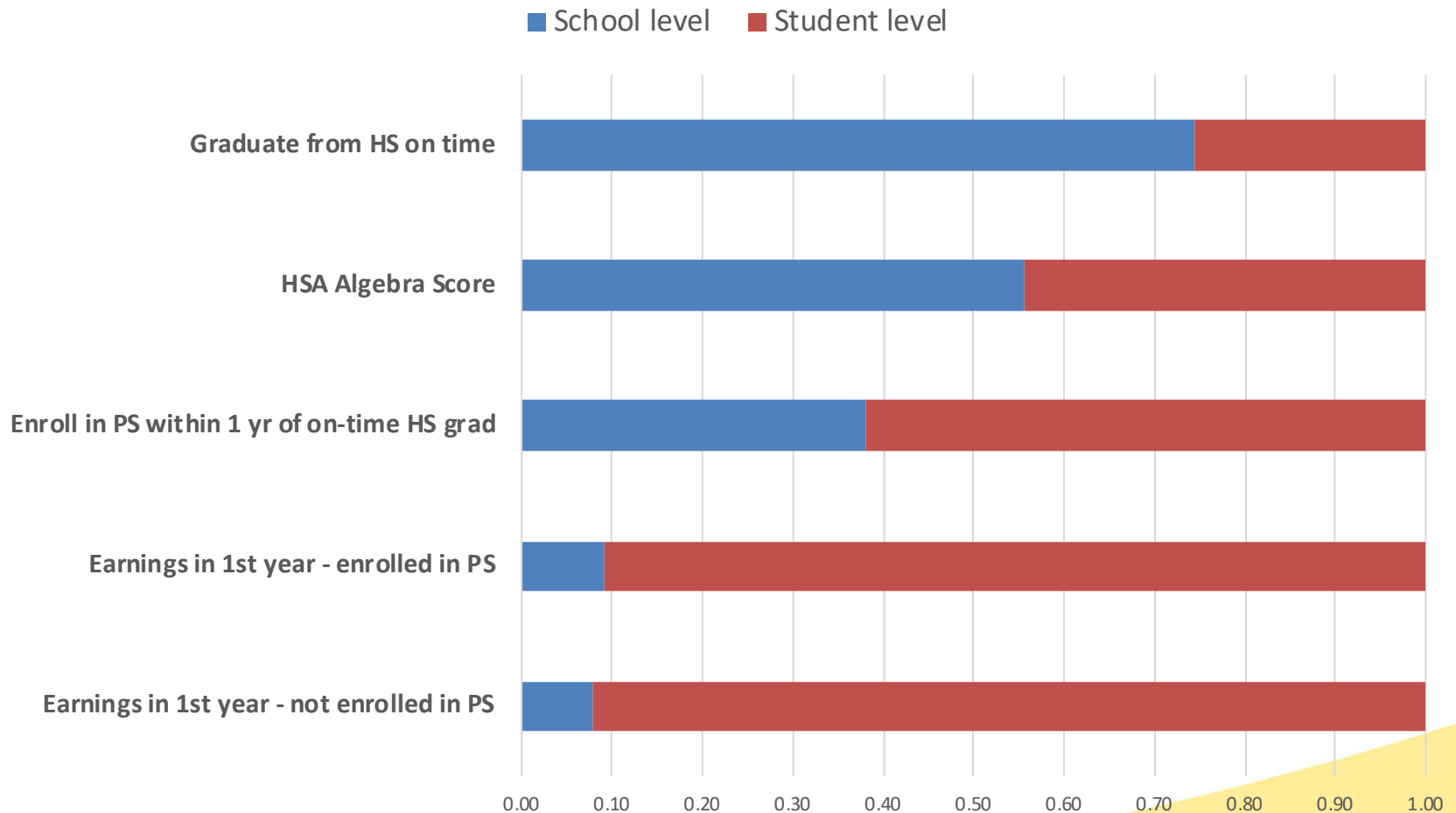
- Multiple Membership Multilevel Modeling
  - Two-level model (Students nested within schools)
- Random effects to model the intercepts
- Fixed effects for the independent variables
- Student poverty, school poverty, school racial composition were standardized ( $M = 0$ ;  $SD = 1$ )
- Student race variables were grand mean centered



# Descriptive Statistics

<b>Variable</b>	<b>Category</b>	<b>%</b>
<b>Race/Ethnicity</b>	Asian	5
	Black	35
	Hispanic	10
	White	45
	Other	4
<b>Gender</b>	Male	50
<b>Experiences between 6th and 12th Grades</b>	Ever in English Language Learner	3
	Ever in Special Education	14
	Ever Homeless	4
	Ever Eligible for FARMS	49

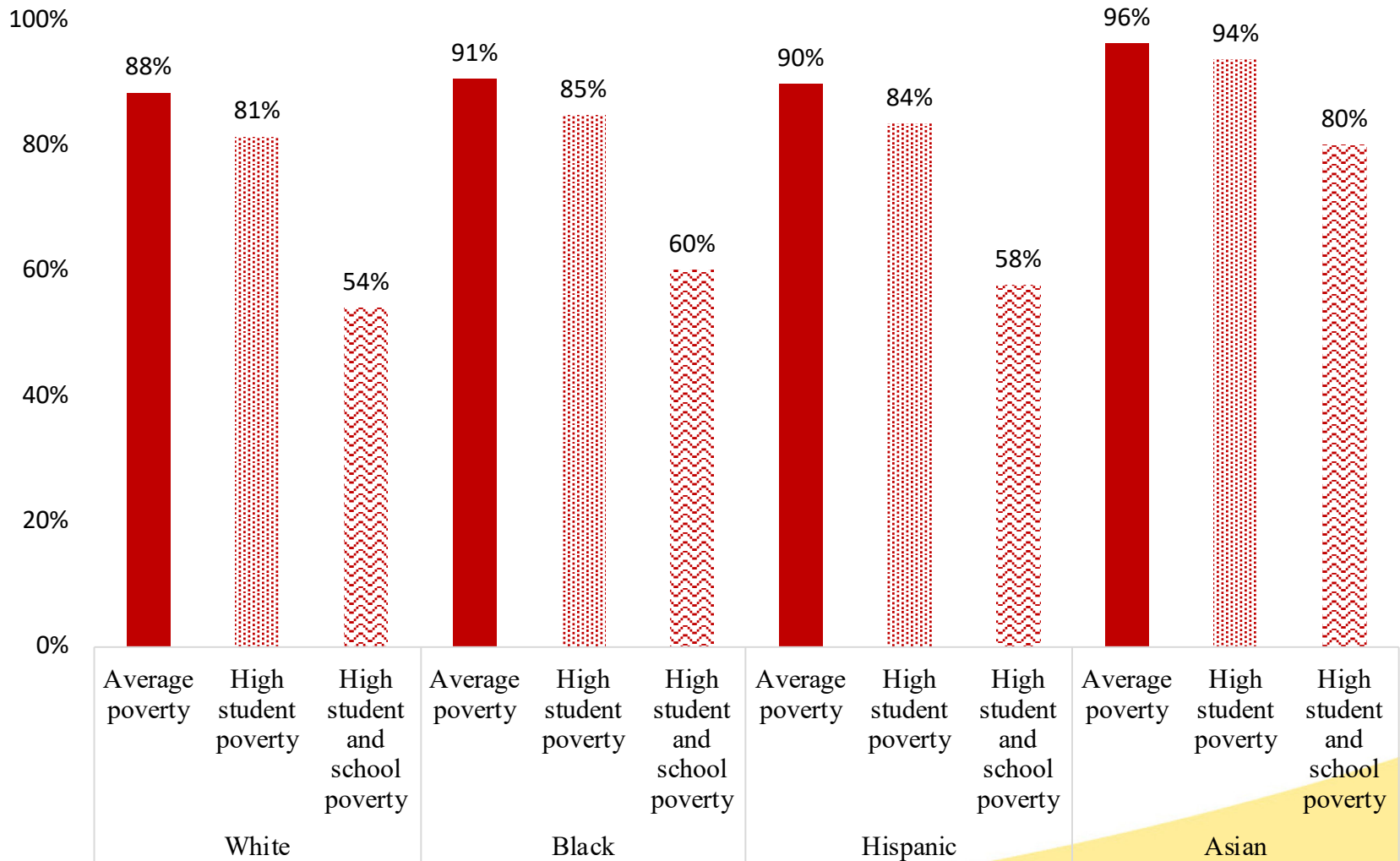
# Proportion of variance at school and student levels



# Results: High School Graduation

On-Time High School Graduation	Model 2: Poverty Main Effects (n=54465)				Model 3: Poverty and Race (n=54465)			
	$\beta$	SE	OR	Cohen's d	$\beta$	SE	OR	Cohen's d
Intercept	1.99***	0.13	7.32		2.03***	0.15	7.65	
Level 1								
Student poverty duration	-0.54***	0.02	0.58	-0.20	-0.55***	0.02	0.57	-0.20
Hispanic					0.15*	0.06	1.16	0.04
Black					0.23***	0.05	1.28	0.07
Asian					1.23***	0.12	3.43	0.22
Other					0.34***	0.09	1.40	0.09
Level 2								
School mean poverty duration	-0.86***	0.10	0.42	-0.35	-1.31***	0.12	0.27	-0.60
School % Hispanic					0.28***	0.08	1.32	0.07
School % Black					0.53***	0.11	1.70	0.13
School % Asian					-0.13	0.11	0.88	-0.04
School % Other					0.03	0.07	1.03	0.01

# Results: Predicted Likelihood HS Graduation (On-time)



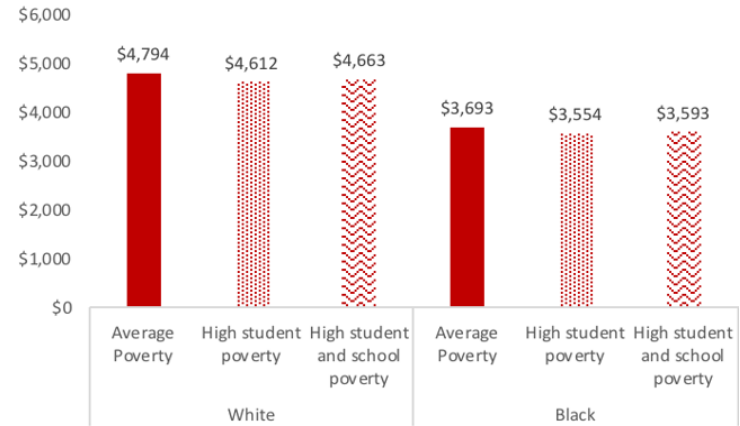
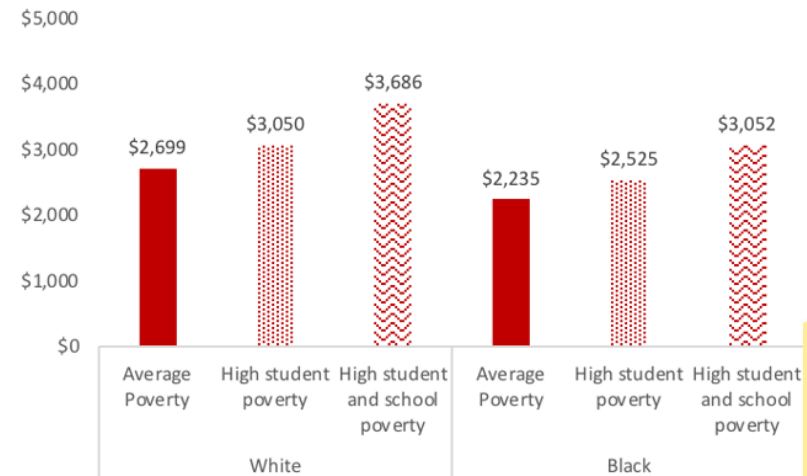
**Note:** Average student poverty = 0.36; Average school poverty = 0.37  
Predictions are for students in schools with average racial/ethnic composition

# Academic Outcomes

Outcome	Model 2 Results (Poverty Only)	Model 3 Predicted Outcomes (Poverty and Race/Ethnicity)												
HSA Algebra (Proficient = 412; Advanced = 450)	<p>A 1 SD increase in student poverty duration was associated with a 6 point decrease in HSA Algebra score (<math>d = .20</math>)</p> <p>A 1 SD increase in school mean poverty duration was associated with a 12 point decrease in HSA Algebra score (<math>d = .39</math>)</p>	<table border="1"> <caption>HSA Algebra Scores by Race and Poverty Level</caption> <thead> <tr> <th>Race</th> <th>Average Poverty</th> <th>High student poverty</th> <th>High student and school poverty</th> </tr> </thead> <tbody> <tr> <td>White</td> <td>433</td> <td>428</td> <td>419</td> </tr> <tr> <td>Black</td> <td>421</td> <td>416</td> <td>407</td> </tr> </tbody> </table>	Race	Average Poverty	High student poverty	High student and school poverty	White	433	428	419	Black	421	416	407
Race	Average Poverty	High student poverty	High student and school poverty											
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College Enrollment (Within one year following on-time HS graduation)	<p>A 1 SD increase in student poverty is associated with a .41 decrease in the log odds of enrolling in college (<math>d = .20</math>)</p> <p>A 1 SD increase in student poverty is associated with a .46 decrease in the log odds of enrolling in college (<math>d = .23</math>)</p>	<table border="1"> <caption>College Enrollment Rates by Race and Poverty Level</caption> <thead> <tr> <th>Race</th> <th>Average Poverty</th> <th>High student poverty</th> <th>High student and school poverty</th> </tr> </thead> <tbody> <tr> <td>White</td> <td>74%</td> <td>64%</td> <td>52%</td> </tr> <tr> <td>Black</td> <td>78%</td> <td>69%</td> <td>58%</td> </tr> </tbody> </table>	Race	Average Poverty	High student poverty	High student and school poverty	White	74%	64%	52%	Black	78%	69%	58%
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**Note:** Model 3 results control for student race/ethnicity and school racial composition

# Annual Wages

Outcome	Model 2 Results (Poverty Only)	Model 3 Predicted Outcomes (Poverty and Race/Ethnicity)																
Annual Wages (Non-Postsecondary)	A 1 SD increase in student poverty is associated with a .05 decrease in annual log wages ( $d = .04$ )	 <table border="1"> <caption>Model 3 Predicted Outcomes (Poverty and Race/Ethnicity) - White</caption> <thead> <tr> <th>Poverty Level</th> <th>White Annual Wages</th> </tr> </thead> <tbody> <tr> <td>Average Poverty</td> <td>\$4,794</td> </tr> <tr> <td>High student poverty</td> <td>\$4,612</td> </tr> <tr> <td>High student and school poverty</td> <td>\$4,663</td> </tr> </tbody> </table> <table border="1"> <caption>Model 3 Predicted Outcomes (Poverty and Race/Ethnicity) - Black</caption> <thead> <tr> <th>Poverty Level</th> <th>Black Annual Wages</th> </tr> </thead> <tbody> <tr> <td>Average Poverty</td> <td>\$3,693</td> </tr> <tr> <td>High student poverty</td> <td>\$3,554</td> </tr> <tr> <td>High student and school poverty</td> <td>\$3,593</td> </tr> </tbody> </table>	Poverty Level	White Annual Wages	Average Poverty	\$4,794	High student poverty	\$4,612	High student and school poverty	\$4,663	Poverty Level	Black Annual Wages	Average Poverty	\$3,693	High student poverty	\$3,554	High student and school poverty	\$3,593
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Annual Wages (Postsecondary)	A 1 SD increase in student poverty is associated with a .12 increase in annual log wages ( $d = .09$ )	 <table border="1"> <caption>Model 3 Predicted Outcomes (Poverty and Race/Ethnicity) - White</caption> <thead> <tr> <th>Poverty Level</th> <th>White Annual Wages</th> </tr> </thead> <tbody> <tr> <td>Average Poverty</td> <td>\$2,699</td> </tr> <tr> <td>High student poverty</td> <td>\$3,050</td> </tr> <tr> <td>High student and school poverty</td> <td>\$3,686</td> </tr> </tbody> </table> <table border="1"> <caption>Model 3 Predicted Outcomes (Poverty and Race/Ethnicity) - Black</caption> <thead> <tr> <th>Poverty Level</th> <th>Black Annual Wages</th> </tr> </thead> <tbody> <tr> <td>Average Poverty</td> <td>\$2,235</td> </tr> <tr> <td>High student poverty</td> <td>\$2,525</td> </tr> <tr> <td>High student and school poverty</td> <td>\$3,052</td> </tr> </tbody> </table>	Poverty Level	White Annual Wages	Average Poverty	\$2,699	High student poverty	\$3,050	High student and school poverty	\$3,686	Poverty Level	Black Annual Wages	Average Poverty	\$2,235	High student poverty	\$2,525	High student and school poverty	\$3,052
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A 1 SD increase in school poverty is associated with a .04 increase in annual log wages ( $d = .03$ )																		

**Note:** Model 3 results control for student race/ethnicity and school racial composition

# Summary of Results

- Both student and school-level poverty were related to long-term academic outcomes, even after controlling for individual student race and school racial/ethnic composition.
- School concentration of poverty, regardless of individual poverty experience and race, usually predicts worse educational outcomes.
- Poverty related to lower annual wages for students not enrolled in college and higher annual wages for those enrolled in college.
- Racial and ethnic gaps in standardized test scores persist regardless of student and school-level poverty.
- Racial and ethnic gaps in high school graduation and postsecondary enrollment disappear or are reversed when controlling for student and school-level poverty and school's racial/ethnic composition.

# Discussion

- Prior research reports that income-related achievement gaps are established before kindergarten and persist throughout K-12 education (Reardon, 2011; Reardon, 2013)
- May be due to a number of factors, including:
  - Insufficient resources (Jencks & Mayer, 1990)
  - Lower quality teachers (Lankford, Loeb, & Wyckoff, 2002)
  - Unequal access to social capital (Putnam, 2000)
- Racial/ethnic gaps in most outcomes disappear after controlling for poverty, which may be consistent with cultural differences in achievement motivation (Trumbull & Rothstein-Fisch, 2011)
- The persistence of racial/ethnic gaps in test scores even after controlling for poverty is consistent with literature on stereotype threat (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010)



# Discussion

- In this study, poverty was related to lower annual wages for students not enrolled in college and higher annual wages for those enrolled in college
- Education promotes economic success and social mobility and serves a protective effect against the detrimental role of poverty (Engle; 2007; Ruzojcic et al., 2018)
  - May help to explain why poverty is related to lower annual wages for students not enrolled in college
- Even after receiving financial aid for college, a considerable portion of need typically remains unmet, especially for students from low-income backgrounds (Pike et al., 2008; Long & Riley, 2007)
  - May help to explain why poverty is related to higher annual wages for students who were enrolled in college

# Limitations

- Data only available starting 2007-08 academic year
- Excluded Maryland students not attending public schools
- Poverty indicator (FARMS eligibility) may not accurately capture true student and school poverty
- Workforce data excluded federal employees, private contractors, or self-employed individuals
- Additional variables at the student and school level were not included
- Excluded student's employment status (full or part-time)


# Future Research

- Examine the protective role of additional student and school level characteristics
- Include elementary levels to assess effects of poverty during the entire K-12 experience
- Examine additional college and career outcomes (e.g. college persistence and degree attainment, workforce trajectories)
- Compare measures of poverty (FARMS vs Census data vs Title I)

# Implications


- Implementation of additional programs and policies for students living in poverty and schools with high concentrations of poverty.
- Focus on strengths within high-poverty schools to better support students.
- Establish partnerships within the surrounding community to increase academic and career success.

# For More Information



**Poverty and Student Outcomes:  
Disentangling the Effects of Student and School Poverty**  
Bess A. Rose, Dawmsha R. Muzhonga, and Angela K. Henneberger  
May 3, 2018  
University of Maryland, School of Social Work

DRAFT



**The Role of Concentrated Poverty and Race in Long-Term Academic Outcomes**  
Commission on Innovation and Excellence in Education  
July 13, 2018

<https://mldscenter.maryland.gov>



**Poverty and Long-Term Educational Outcomes:  
Variation by Level of School Poverty, Student Poverty, and Local School System**  
Commission on Innovation and Excellence in Education  
August 15, 2018

<https://mldscenter.maryland.gov>

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# Thank You

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