MLDS Center
Maryland Longitudinal Data System

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School Diversity, Academic Outcomes, and the Operationalization of Race-Ethnicity Peer Effects

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Motivation

- Recent demographic changes in the US → increased diversity in the school system

- Peer effects literature has divergent perspectives on the effects of school diversity, especially for students of color

  - Some argue for potential benefits of diversity associated with access to resources found predominantly in white or affluent schools (Harris et al., 2006; Herring, 2009)

  - Others propose that homogeneous schooling environments may better target population's needs (Braddock & Eitle, 2004; Mickelson & Nkomo, 2012)

Research Questions

- Gaps in the literature
  - Operationalization of peer effects
  - Long term effects

- Research questions

  - *What is the relationship between racial/ethnic diversity in schools and academic outcomes? How does this relationship change depending on the operationalization of peer characteristics and diversity?*
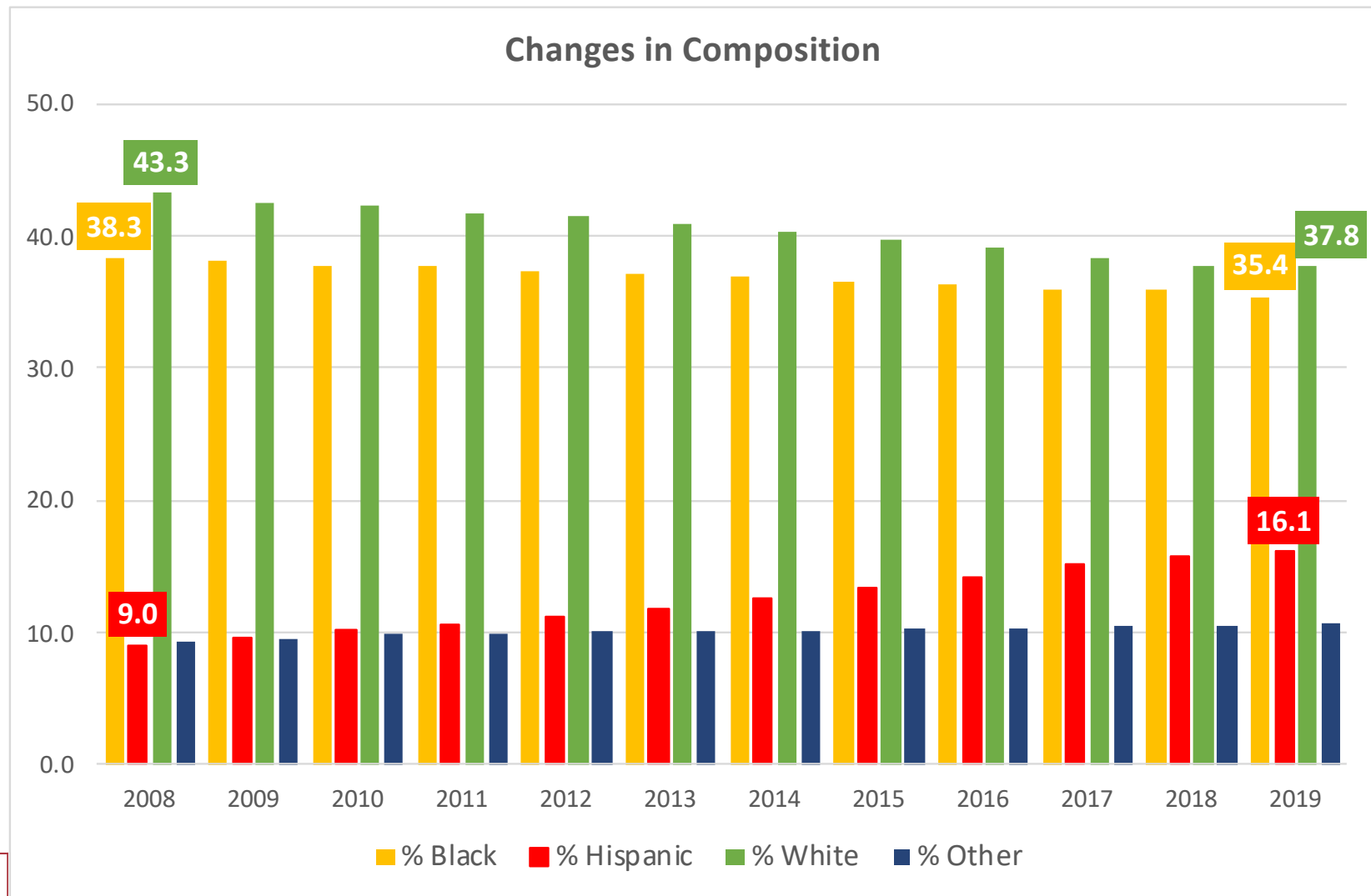
Data and Measures from MLDS

○ 2007-08 through 2018-19 school years

○ Outcomes:

  ○ Short-term: math and ELA test scores, ever suspended

  ○ Long-term: college enrollment (at age 20), college graduation (2-yr or 4-yr program, at age 23)

○ Independent variables:

  ○ School percentage of students of different race-ethnicities

  ○ 3 models of peer effects:

    ○ Linear-in-means: % students of color (continuous)

    ○ Boutique/tracking: majority of students of the same race-ethnicity (dichotomic)

    ○ Rainbow: different populations represented in schools (dichotomic)

Empirical Strategy and Sample

○ Short-term effects:
  ○ Student, school, and year fixed effect (robustness: similar results when adding grade fixed effects; potential extension: value added approach)
  ○ Sample: elementary students (extension/robustness: running results with all K-12 students, but so far similar)

○ Long-term effects:
  ○ School and year fixed effects
  ○ Sample: 9th grade students (extension: working on starting with other grade level high school cohorts)

○ Student (gender, ELL, special education, and FARMs status) and school control variables (total enrollment, proportion FARMs)

○ Results clustered at the school level

Limitations

- Long term models cannot include student fixed effects (no variation in the outcome at the individual level)
  - Potential bias due to endogenous assignment of students to peers.
  - I partially deal with this by including lagged test scores and suspensions as control variables.
- Long term estimations focus on college enrollment and graduation.
  - Due to sample restrictions in the wages data (only individuals working in Maryland and only in some sectors), I do not include wages in my estimations.

Preliminary Results

○ I focus on the three largest groups of students in Maryland, i.e., Black, Hispanic, and white.

○ In the short term, students from these race-ethnicity groups seem to benefit from being with peers like themselves

  ○ Black students' math and ELA test scores increase as the % of students of color increase or when enrolled in majority Black schools.

  ○ Hispanic students' suspensions decrease as the % of students of color increase.

  ○ White students' ELA test scores increase when enrolled in majority white schools.

○ Results are robust to different cut off points for boutique/tracking and rainbow models of peer effects

Short-Term

	Black			Hispanic			White		
	Math	ELA	Ever suspended	Math	ELA	Ever suspended	Math	ELA	Ever suspended
Linear-in-means									
% student of color	0.0041**	0.0027*	-0.0003	0.0028	0.0018	-0.0003*	-0.0009	-0.0019	0.0001
	(0.0013)	(0.0011)	(0.0002)	(0.0019)	(0.0016)	(0.0001)	(0.0014)	(0.0011)	(0.0001)
Boutique/tracking									
Majority same race/ethnicity	0.0171	0.0303*	-0.0019	-0.0375	-0.0058	0.0013	0.0100	0.0300*	-0.0005
	(0.0214)	(0.0152)	(0.004)	(0.0266)	(0.0214)	(0.0016)	(0.0164)	(0.0142)	(0.0011)
Rainbow									
Black/Hispanic, white representative	-0.0171	-0.0086	0.0018	-0.0178	-0.0204	0.0009	-0.0109	-0.0022	-0.0003
	(0.0139)	(0.0109)	(0.0032)	(0.0189)	(0.015)	(0.0013)	(0.0131)	(0.011)	(0.0012)
Observations	*594,640*	*592,940*	*1,271,435*	*265,540*	*260,221*	*600,989*	*701,943*	*700,340*	*1,489,867*
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y

Preliminary Results

○ In the long term, the association between peer composition and academic outcomes goes in the opposite direction

  ○ Black and Hispanic students' college enrollment and/or graduation from college decreases as the proportion of peers of color in their 9th grade school cohort increases or when enrolled in majority same-race schools in 9th grade.

  ○ Hispanic and white students' college graduation increases when enrolled in diverse/representative schools in 9th grade.

○ Again, results are robust to different cut off points for boutique/tracking and rainbow models of peer effects

Long-Term

	Black			Hispanic			White		
	Enrollment	Grad 2 yr program	Grad 4 yr program	Enrollment	Grad 2 yr program	Grad 4 yr program	Enrollment	Grad 2 yr program	Grad 4 yr program
Linear-in-means									
% student of color	-0.0028*	-0.0015	-0.0039	-0.0017	0.0016	-0.0086**	0.0006	0.0008	-0.0032
	(0.0011)	(0.0009)	(0.0025)	(0.0019)	(0.0025)	(0.0030)	(0.0010)	(0.0014)	(0.0026)
Boutique/tracking									
Majority same	-0.0012	-0.0131*	0.0160	-0.0191	-0.0837***	-0.0036	-0.0037	-0.0005	0.0037
race/ethnicity	(0.0104)	(0.0052)	(0.0125)	(0.0232)	(0.0063)	(0.0099)	(0.0111)	(0.0078)	(0.0079)
Rainbow									
Black/Hispanic, white	-0.0114	-0.0309	0.0205	0.0118	-0.0003	0.1194***	0.0024	0.0282***	0.0008
representative	(0.0198)	(0.0288)	(0.0191)	(0.0310)	(0.0208)	(0.0285)	(0.0072)	(0.0049)	(0.0248)
Observations	*111,432*	*47,858*	*47,858*	*29,559*	*12,021*	*12,021*	*135,336*	*57,948*	*57,948*
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y

Discussion and Next Steps

○ Operationalization of peer effects is relevant

  ○ Linear-in-means models provide only a partial picture (e.g., if looking only at the linear association between white students and the % of peers of color, we may conclude that composition is not relevant in the short or long run)

○ Mixed evidence between short- and long-term effects points to the need of understanding the mechanisms

  ○ For short-term effects, one mechanism to explore is the proportion of same-race teachers/staff → As the percentage of students of color increases, the likelihood of having a teacher of color also increases. In diverse (rainbow) schools, however, that likelihood decreases.

○ Next steps: 1) complete the analysis, extensions, and robustness; 2) explore mechanisms.

Thank you!

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