



Professional Staff Diversity and Student Outcomes: Extending Our Understanding of Race/Ethnicity- Matching Effects in Education

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Motivation

- Same-race/ethnicity teachers have positive effects on students':
 - **test score performance** (Dee, 2004; Egalite et al., 2015)
 - **suspensions and expulsions** (Lindsay & Hart, 2017)
 - **absences** (Holt & Gershenson, 2019)
 - **academic expectations** (Papageorge & Gershenson, 2016)
 - **longer-run outcomes in college** (Gershenson et al., 2018).
- Several theorized levers driving these effects:
 - **role modeling** (Villegas & Lucas, 2004; Fordham & Ogbu, 1986)
 - **specific teaching/classroom practices** (i.e., culturally responsive teaching, holding students to higher expectations; Irvine, 1989; Ladson-Billings, 1995)
- If role modeling effects are a primary channel, then **other professionals in the school** may also serve as role models affecting student outcomes, even if a student does not work with and learn from those individuals directly.
- RQ: *What is the relationship between professional staff-student racial/ethnic matching and short-term educational outcomes (i.e., test scores, suspensions, absences)?*

Data and Methods

- Administrative records from the Maryland Longitudinal Data System Center, between 2012-13 and 2018-19 school years.
 - Focus on elementary school students, where role modeling effects may be largest.
 - Focus on **Black** and **Hispanic** students (Bristol & Martin-Fernandez, 2019; Redding, 2019).
- Key independent variable: (i) proportion of **own teachers** in the school of same-race/ethnicity as the student, and (ii) proportion of **professional staff** in the school of the same race/ethnicity as the student.
 - Professional staff include: (i) not-own teachers, (ii) instructional leads (e.g., coaches), (iii) nurses, (iv) social workers, (v) counselors, (vi) special education leads, and (vii) administrators.
 - Exclude principals, as principals hold unique function in school; principal turnover likely correlated with a number of changes to school culture.
- Outcomes of interest: end-of-year **test scores** in math and ELA (for grades 3 through 5), and dummy variables for ever **suspended** that year and chronically **absent** (for grades K to 5).
- We exploit plausibly random **variation in the demographics of school staff** within students and within schools over time:
 - Models include **fixed effects** for: (i) students, (ii) school-grade, and (iii) year (Egalite et al., 2015; Holt & Gershenson, 2019; Lindsay & Hart, 2017)
 - In preferred models also include **principal fixed effects**.

Student Characteristics

	Person		Person/year	
	N	Prop	N	Prop
White	376,363	0.357	1,090,879	0.381
Black	351,294	0.333	953,090	0.332
Hispanic	196,564	0.186	483,449	0.169
Asian	74,099	0.070	184,251	0.064
Other	55,781	0.053	154,829	0.054
Female	514,875	0.488	1,396,359	0.487
Free-Reduced Price Lunch Eligibility	500,976	0.475	1,368,615	0.477
English-Language Learner	145,857	0.138	333,626	0.116
Total	1,054,101		2,866,498	

Teacher and Staff Characteristics

	Teachers				Professional staff			
	Person		Person/year		Person		Person/year	
	N	Prop	N	Prop	N	Prop	N	Prop
White	49,836	0.706	227,469	0.740	9,225	0.693	36,081	0.703
Black	13,273	0.188	52,070	0.169	3,303	0.248	12,520	0.244
Hispanic	2,188	0.031	7,918	0.026	250	0.019	915	0.021
Asian	2,549	0.036	10,585	0.034				0.014
Other	2,717	0.039	9,346	0.030				0.018
Female	58,235	0.825	258,282	0.840	11,325	0.851	44,297	0.863
Total	70,563		307,388		13,308		51,309	

Comparatively, Black *students* make up roughly 1/3 of MD's elementary school population.

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Black	13,273	0.188	52,070	0.169	3,303	0.248	12,520	0.244
Hispanic	2,188	0.031	7,918	0.026	319	0.024	1,069	0.021
Asian	2,549	0.036	10,585	0.034	Comparatively, Hispanic <i>students</i> make up roughly 1/5 of MD's elementary school population.			0.014
Other	2,717	0.039	9,346	0.030				0.018
Female	58,235	0.825	258,282	0.840	11,525	0.851	44,297	0.863
Total	70,563		307,388		13,308		51,309	

Independent and Dependent Variables

	All Students		Black Students		Hispanic Students	
	Mean	SD	Mean	SD	Mean	SD
<u>Independent Variables</u>						
N Same-Race/Ethnicity Own Teachers	2.103	2.165	1.228	1.379	0.181	0.442
% of Own Teachers Same-Race/Ethnicity	0.445	0.423	0.272	0.289	0.037	0.091
N Same-Race/Ethnicity Professional Staff	17.816	17.221	11.483	9.718	2.029	2.584
% of Professional Staff Same-Race/Ethnicity	0.452	0.393	0.308	0.239	0.039	0.048
N Own Teachers of Color	1.025	1.299	1.613	1.513	1.360	1.399
% of Own Teachers of Color	0.218	0.268	0.356	0.310	0.273	0.267
N Professional Staff of Color	10.455	10.294	15.483	11.130	15.401	11.365
% of Professional Staff of Color	0.253	0.239	0.405	0.264	0.326	0.231
<u>Dependent Variables</u>						
Math Test Scores	0	0.897	<div style="border: 1px solid black; padding: 5px; text-align: center;"> While Hispanic students do not have access to many Hispanic teachers or professional staff, they do have greater access to teachers and professional staff of color (largely Black). </div>			
Reading Test Scores	0	0.908				
Absences	9	0.188				
Suspensions	0.056	0.332				
	0.643	0.123	0.991	0.021		

Results: Black Students

	Math (SD)	ELA (SD)	Suspended (0/1)	Chronic Absence (0/1)
<u>Panel A: Of Color</u>				
Proportion Own Teachers of Color	0.0257+ (0.0135)	0.0101 (0.0113)	-0.00659*** (0.00182)	-0.00930** (0.00294)
Proportion Other Professionals of Color	-0.0290 (0.0538)	0.00701 (0.0460)	-0.0203* (0.00845)	-0.00948 (0.0132)
<u>Panel B: Same-Race/Ethnicity</u>				
Proportion Black Own Teachers	0.0366* (0.0149)	0.0149 (0.0127)	-0.00882*** (0.00214)	-0.0126*** (0.00340)
Proportion Own Teachers of Color/Not Black	-0.00305	-0.00290	-0.00115	-0.00122
Proportion Black Other Professionals				
Proportion Other Professionals of Color/Not Black	-0.0819 (0.0765)	0.0484 (0.0650)	-0.0131 (0.0115)	0.00523 (0.0195)
Observations (student/year)	398959	397714	850849	850849
Student and school level controls	Y	Y	Y	Y
Student, school-grade, year, principal fixed effects	Y	Y	Y	Y

Similar patterns as other analyses: access to same-race teachers associated with increased test scores and decreased suspensions and absences of Black students.

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Proportion Own Teachers of Color/Not Black	-0.00305 (0.0209)	-0.00290 (0.0169)	-0.00115 (0.00256)	-0.00122 (0.00451)
Proportion Black Other Professionals	-0.00706	-0.00910	-0.0229*	-0.0150
Proportion Other Professionals of Color/Not Black	(0.0765)	(0.0650)	(0.0115)	(0.0195)
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For Black students, access to non-Black teachers of color does not appear to be impactful

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Proportion Black Other Professionals	-0.00706 (0.0588)	-0.00910 (0.0500)	-0.0229* (0.00924)	-0.0150 (0.0145)
Proportion Other Professionals of Color/Not Black	-0.0819 (0.0765)	0.0484 (0.0650)	-0.0131 (0.0115)	0.00523 (0.0195)
Observations (student/year)	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Access to Black school professional staff associated with decreased suspensions. Relationship to test scores close to zero → professional staff less connected to academic content. </div>			
Student and school level controls				
Student, school-grade, year, principal				

Results: Hispanic Students

	Math (SD)	ELA (SD)	Suspended (0/1)	Chronic Absence (0/1)
<u>Panel A: Of Color</u>				
Proportion Own Teachers of Color	0.0487** (0.0186)	0.0414* (0.0167)	0.000140 (0.00114)	-0.00563 (0.00371)
Proportion Other Professionals of Color	0.0777 (0.0773)	-0.0310 (0.0737)	0.00626 (0.00546)	-0.00319 (0.0170)
<u>Panel B: Same-Race/Ethnicity</u>				
Proportion Hispanic Own Teachers	0.0669+ (0.0354)	0.0218 (0.0342)	-0.000594 (0.00246)	-0.000556 (0.00827)
Proportion Own Teachers of Color/Not Hispanic	0.0459*	0.0447*	0.000276	-0.00634
Proportion Hispanic Other Professionals				
Proportion Other Professionals of Color/Not Hispanic	0.0543 (0.0804)	-0.0292 (0.0777)	0.00434 (0.00578)	-0.0158 (0.0178)
Observations (student/year)	195927	191582	432079	432079
Student and school level controls	Y	Y	Y	Y
Student, school-grade, year, principal fixed effects	Y	Y	Y	Y

For Hispanic students, we also positive associations between same-race teachers and math test scores. Other studies generally find no relationship, or are underpowered (see Redding, 2019 for review).

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	Math (SD)	ELA (SD)	Suspended (0/1)	Chronic Absence (0/1)
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Proportion Own Teachers of Color	0.0487** (0.0186)	0.0414* (0.0167)	0.000140 (0.00114)	-0.00563 (0.00371)
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Proportion Own Teachers of Color/Not Hispanic	0.0459* (0.0197)	0.0447* (0.0179)	0.000276 (0.00123)	-0.00634 (0.00393)
Proportion Hispanic Other Professionals	0.237	-0.0382	0.0199	0.0845*
Proportion Other Professionals of Color/Not Hispanic	(0.0804)	(0.0777)	(0.00578)	(0.0178)
Observations (student/year)	195927	191582	432079	432079
Student and school level controls	Y	Y	Y	Y
Student, school-grade, year, principal fixed effects	Y	Y	Y	Y

Different from Black students, Hispanic students' test scores also appear to benefit from teachers of color generally.

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Proportion Own Teachers of Color/Not Hispanic	0.0459* (0.0197)	0.0447* (0.0179)	0.000276 (0.00123)	-0.00634 (0.00393)
Proportion Hispanic Other Professionals	0.237 (0.190)	-0.0382 (0.156)	0.0199 (0.0123)	0.0845* (0.0417)
Proportion Other Professionals of Color/Not Hispanic	0.0543 (0.0804)	-0.0292 (0.0777)	0.00434 (0.00578)	-0.0158 (0.0178)
Observations (student/year)	105027	101582	122070	122070

Observations (student/year)

Student and school

Student, school-grad

For professionals, patterns inconsistent, and estimates often underpowered. Potential positive relationship to math test scores...but also potentially more suspensions and absences.

Discussion

- Results for exposure to same-race/ethnicity teachers are consistent with what other scholars have found.
 - Black students benefit from being exposed to all not-white minority teachers and to all Black teachers, specifically in math test scores and the likelihood of being suspended or being chronically absent.
 - Hispanic students also benefit from being exposed to all not-white minority teachers and to all Hispanic teachers, but only in math and ELA test scores.
- Above and beyond exposure to same-race/ethnicity teachers, we find that:
 - For Black students, exposure to all not-white and same-race/ethnicity professional staff is associated with a reduction of 0.02 percentage points in the likelihood of being suspended. The coefficient on the likelihood of being chronically absent is in the expected direction, but not statistically different from zero.
 - For Hispanic students, the coefficients of exposure to all not-white professional staff on ever suspended and chronic absence, and the coefficient of exposure to all Hispanic professional staff on chronic absence are positive. The latter is statistically different from zero: the likelihood of being chronically absent increases by 8 percentage points when Hispanic students are exposed to an all-Hispanic professional staff.
 - Professional staff seem to have no clear association with test scores.

Conclusion & Next Steps

- Our preliminary findings point to a need to hire and support diverse school-based staff not just amongst teachers but also amongst professionals who contribute to student success.
 - However, we need to better understand the effects of minority staff members and Hispanic students.
- Overall, we may learn more from a larger sample → adding middle and high-school students may allow us to better estimate the parameters, considering that:
 - Race/ethnicity staff-matching proportion is very small for Hispanic students.
 - Suspensions and absences are more likely to occur in later grade levels.



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Thank you!

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