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Professional Staff Diversity and Student Outcomes:

Extending Our Understanding of Race/Ethnicity-Matching Effects in Education

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MLDS Research Series

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Motivation

- Quantitative studies from the education "production function" tradition show that access to 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)
- Analyses have focused primarily on race-matching effects for Black students, but some evidence of positive effects for Hispanic students (see Redding, 2019 for a review)

Motivation

- Several theorized levers driving these teacher-student race/matching effects:
  - specific **teaching/classroom practices** (Irvine, 1989; Ladson-Billings, 1995)
    - culturally responsive teaching
    - holding students to high expectations
  - **role modeling** (Villegas & Lucas, 2004; Fordham & Ogbu, 1986)
  - (lack of) racially-motivated **exclusionary policies** (Fenning & Rose, 2007)

- **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.
  - support non-exclusionary policies at the school level

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Research Question

What is the relationship between exposure to professional staff-student racial/ethnic matching and short-term educational outcomes (i.e., test scores, suspensions, absences), above and beyond exposure to same-race/ethnicity teachers?

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Data and Sample from MLDS

- 2012-13 through 2018-19 school years (start with year when have teacher-student links)
- Focus on elementary school students, where race/ethnicity-matching effects have been largest (e.g., Egalite et al., 2015)
- Focus on **Black (not Hispanic)** and **Hispanic** students (Bristol & Martin-Fernandez, 2019; Redding, 2019).

Key Independent Variables

- proportion of **own teachers** in the school of same-race/ethnicity as the student
- 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 staff, and (vii) some administrators.
  - Exclude principals, who hold unique function in school; principal turnover likely correlated with a number of changes to school culture.

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Student Outcomes

- End-of-year **test scores** in math and ELA
  - grades 3 through 5
  - standardized at the grade/year level
- Ever **suspended** in a given year
  - grades K to 5
  - 0 = never suspended, 1 = any suspension
- Chronically **absent** in a given year
  - grades K to 5
  - 0 = less than 17 absences, 1 = 17 or more absences

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Methods

- Broadly, we exploit *plausibly random* **variation in students' *exposure*** to a more/less diverse teaching/school professional staff due to turnover within schools and across years.
- Turnover due to nature of maternity leaves, retirements, etc. plausibly unrelated to race/ethnicity matching (Gershenson et al., 2018).
- To do so, specify models that include **fixed effects** for:
  - (i) students, (ii) school-grade, and (ii) year (Egalite et al., 2015; Holt & Gershenson, 2019; Lindsay & Hart, 2017)
  - in preferred models also include **principal fixed effects**.

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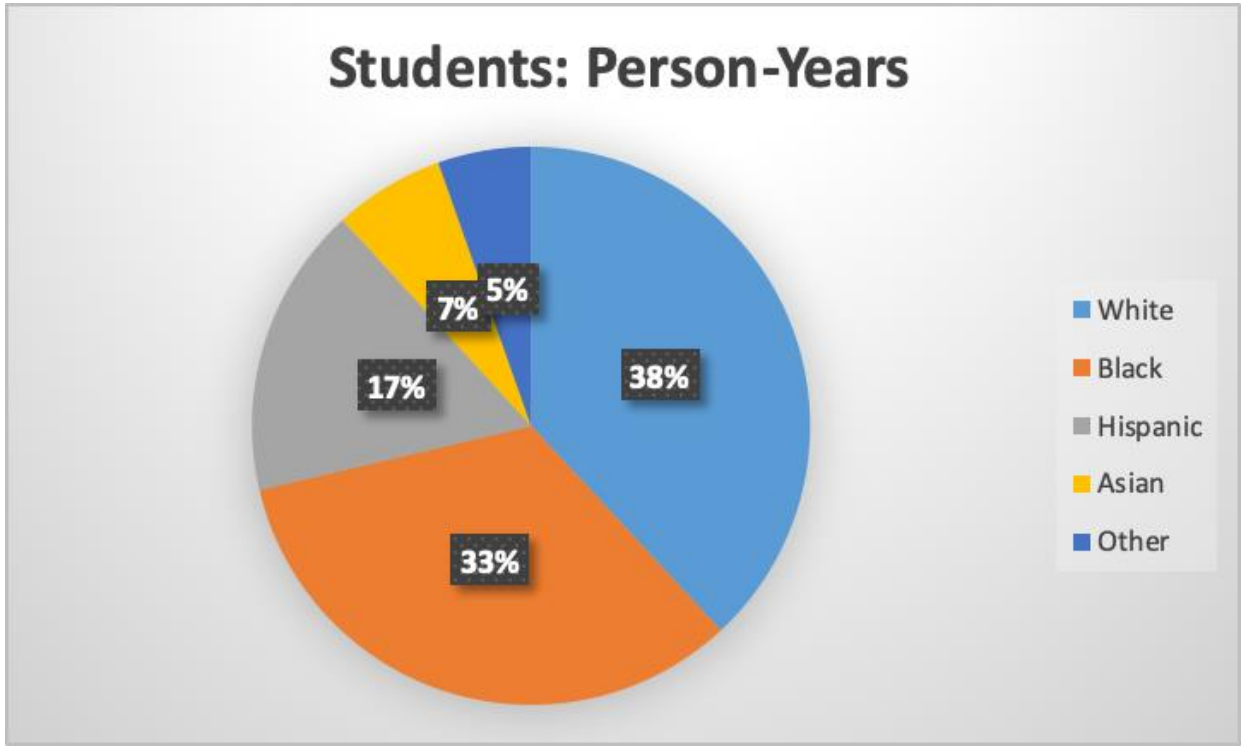
DESCRIPTIVE STATISTICS

Student Race/Ethnicity



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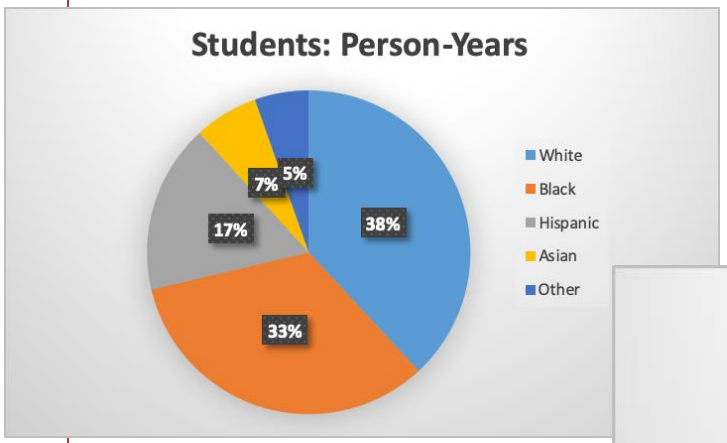
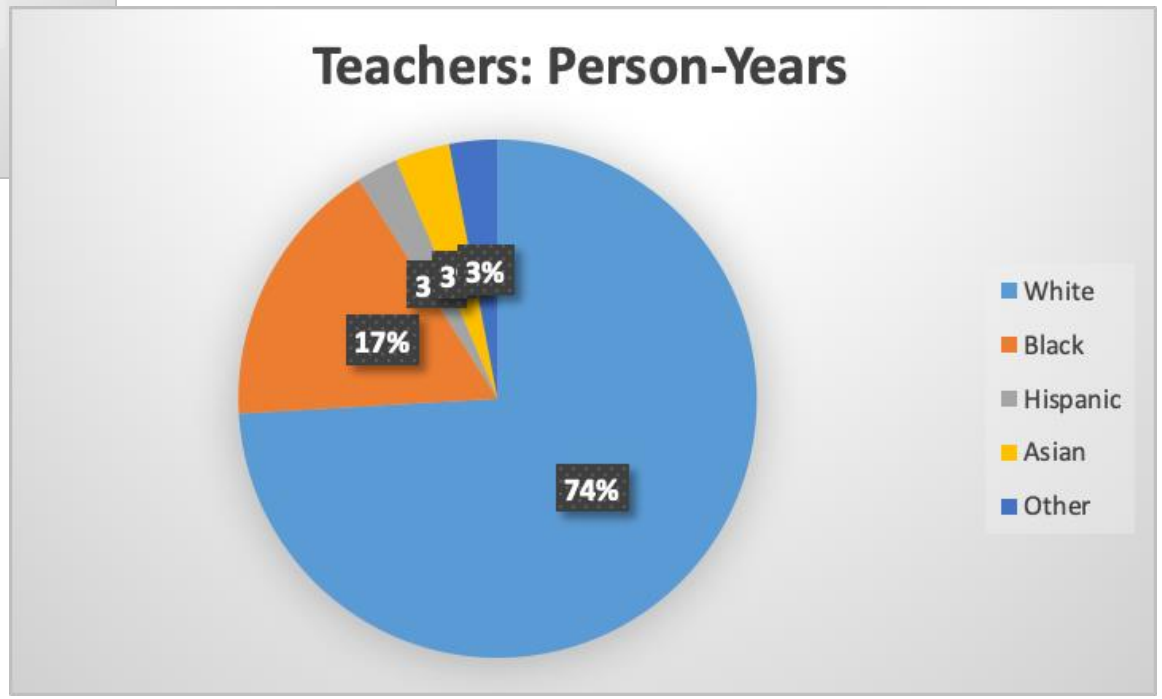
Teacher Race/Ethnicity





Roughly 2x as many White teachers as White students

…1/2 as many Black teachers as Black students

…1/5 as many Hispanic teaches are Hispanic students

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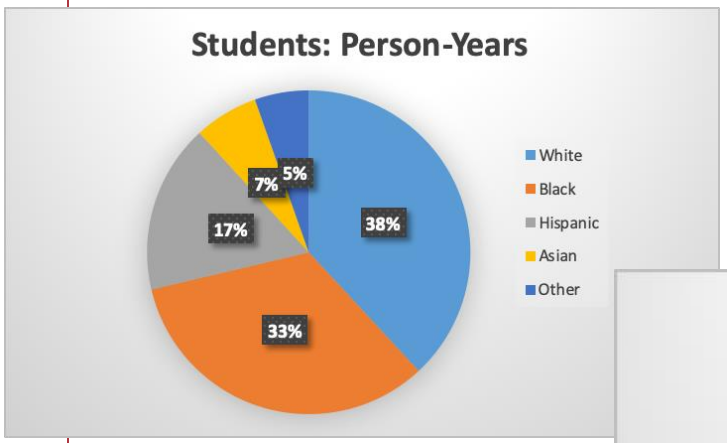
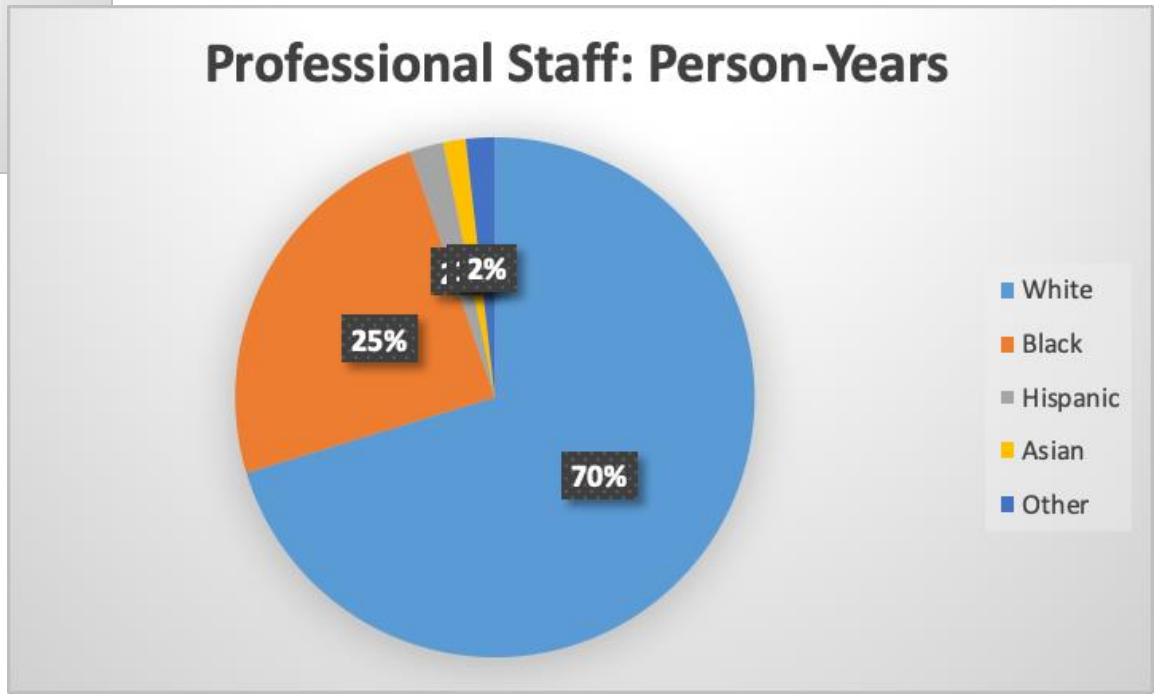
Prof. Staff Race/Ethnicity





Similar story here…

…with slightly higher percentage of Black professional staff (relative to teachers)

…and slightly lower percentage of Hispanic staff

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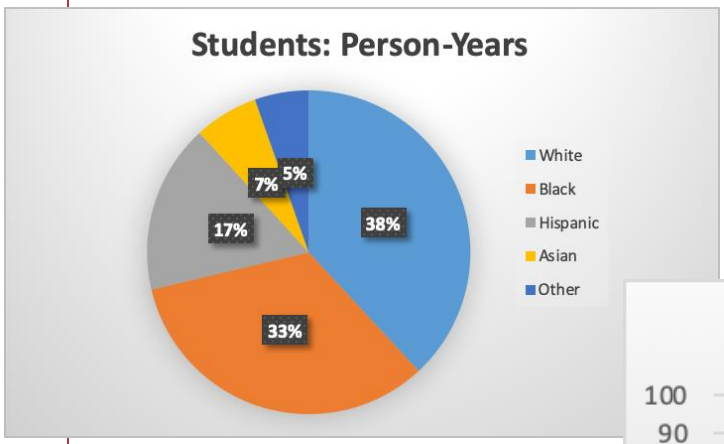
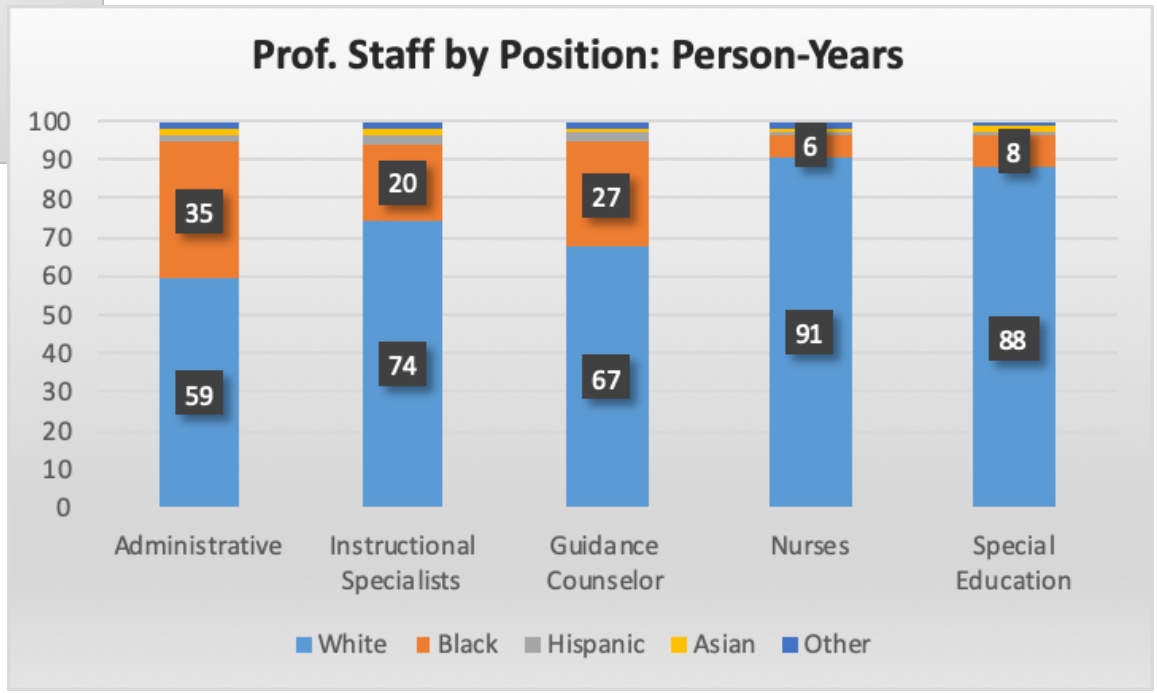
Prof. Staff Race/Ethnicity by Position



Closer match between Black administrators and Guidance Counselors and Black students.

More divergence for Nurses and Special Education staff.



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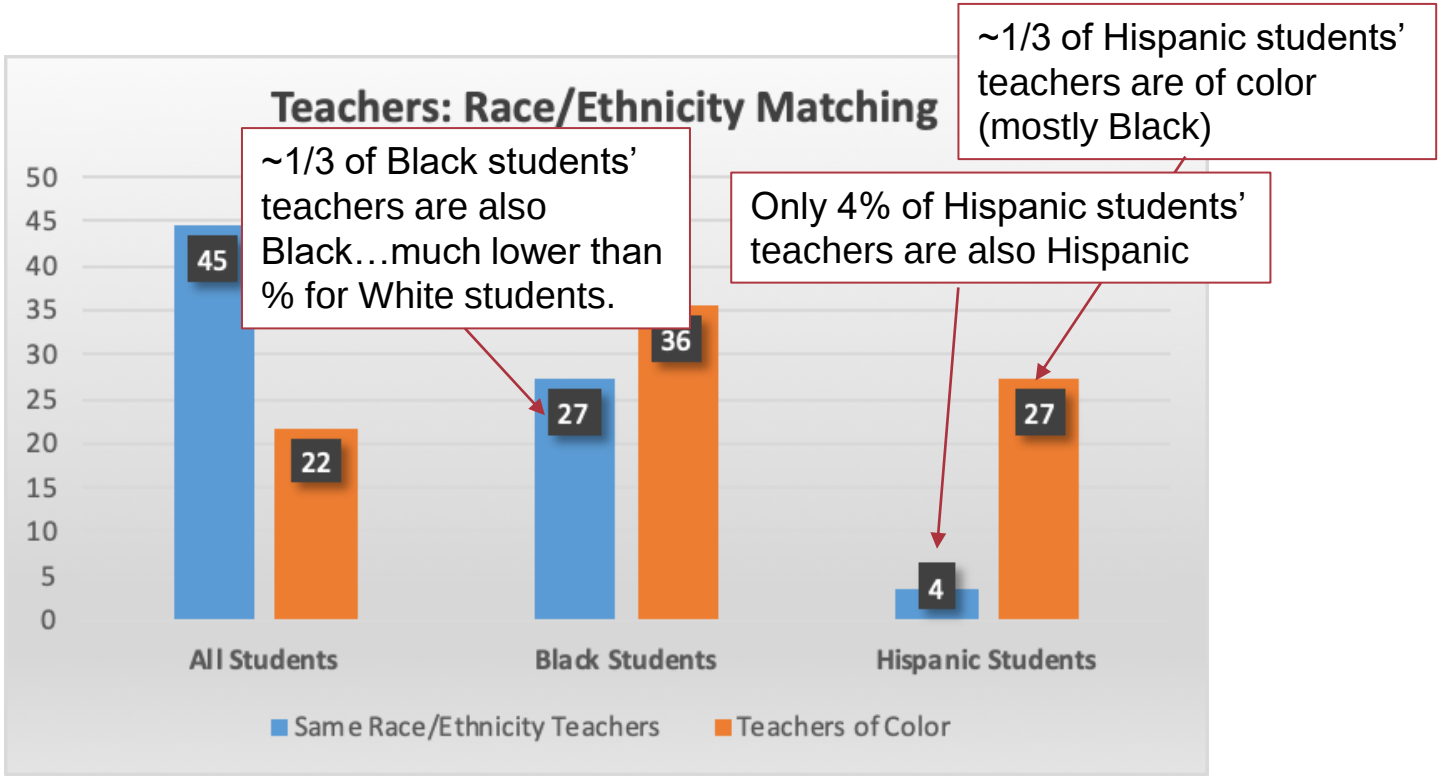
Independent Variables: Race/Ethnicity Matches



Bars show % of students' teachers in a given year that are same race/ethnicity or of color

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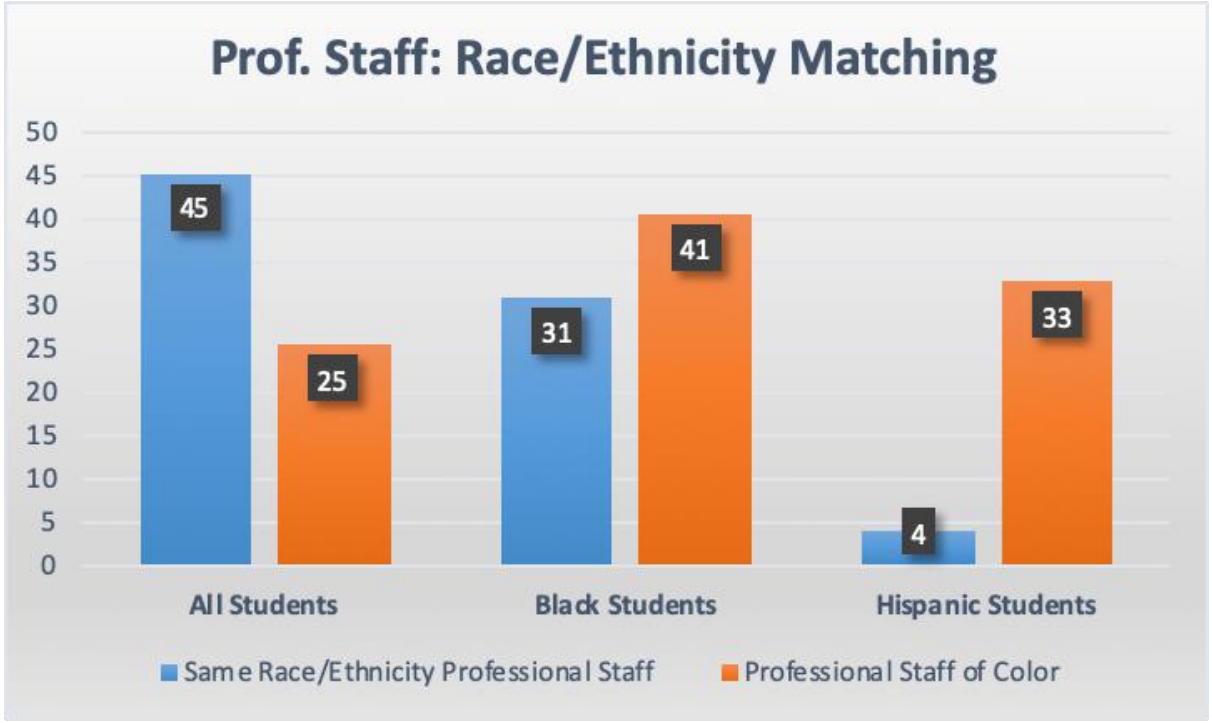
Independent Variables: Race/Ethnicity Matches



Similar story for exposure/access to same-race/ethnicity professional staff

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MAIN RESULTS

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Black Students

	Math (SD)	ELA (SD)	Suspended (0/1)	Chronic Absence (0/1)
Proportion Black Own Teachers	0.0366*	0.0149	-0.00882***	-0.0126***
	(0.0149)	(0.0127)	(0.00214)	(0.00340)
Proportion Own Teachers of Color/Not Black	-0.00305	-0.00290	-0.00115	-0.00122
Proportion Black Other Professi				
Proportion Other Professionals				
Observations (student/year)				
Student and school level contro				
Student, school-grade, year, pri				

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

Specifically, **relative to Black students with zero exposure to same-race teachers, those with 100% exposure to Black teachers is associated with 0.04 SD increase in math test scores, and 1 percentage point decrease in ever suspended and chronically absent.**

["Results in" rather than "associated with" if trust the fixed effects approach.]

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Black Students

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Proportion Own Teachers of Color/Not Black	-0.00305	-0.00290	-0.00115	-0.00122
	(0.0209)	(0.0169)	(0.00256)	(0.00451)
Proportion Black Other Profess				
Proportion Other Professionals of Color/Not Black	-0.0819	0.0484	-0.0131	0.00523
	(0.0765)	(0.0650)	(0.0115)	(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

For Black students, access to non-Black teachers of color does not appear to be impactful

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	(0.0209)	(0.0169)	(0.00256)	(0.00451)
Proportion Black Other Professionals	-0.00706	-0.00910	-0.0229*	-0.0150
	(0.0588)	(0.0500)	(0.00924)	(0.0145)
Proportion Other Professiona				
Observations (student/year)				
Student and school level con				
Student, school-grade, year,				

Access to Black school professional staff associated with decreased suspensions.

Relationship to test scores close to zero, potentially due to facet that professional staff are less connected to academic content than teachers.

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Hispanic Students

	Math (SD)	ELA (SD)	Suspended (0/1)	Chronic Absence (0/1)
Proportion Hispanic Own Teachers	0.0669+	0.0218	-0.000594	-0.000556
	(0.0354)	(0.0342)	(0.00246)	(0.00827)
Proportion Own Teachers of Color/Not Hispanic	0.0459*	0.0447*	0.000276	-0.00634
	(0.0197)	(0.0179)	(0.00123)	(0.00393)
Proportion Hispanic Other Pro				
Proportion Other Professional				
Observations (student/year)				
Student and school level contr				
Student, school-grade, year, p				

For Hispanic students, we also observe positive associations/effects between same-ethnicity teachers and math test scores.

Notable, as other studies generally find no relationship of ethnicity-matching for Hispanic students, or are underpowered (see Redding, 2019 for review).

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Proportion Own Teachers of Color/Not Hispanic	0.0459*	0.0447*	0.000276	-0.00634
	(0.0197)	(0.0179)	(0.00123)	(0.00393)
Proportion Hispanic Other Professionals	0.237	-0.0382	0.0199	0.0845*
Proportion Other Professionals				
Observations (student/year)				
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 (mostly Black teachers).

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	(0.0197)	(0.0179)	(0.00123)	(0.00393)
Proportion Hispanic Other Professionals	0.237	-0.0382	0.0199	0.0845*
	(0.190)	(0.156)	(0.0123)	(0.0417)
Proportion Other Professionals of Color/Not Hispanic	0.0543	-0.0292	0.00434	-0.0158
	(0.0804)	(0.0777)	(0.00578)	(0.0178)
Observations (student/year)	195927	191582	432079	432079
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For professionals, patterns inconsistent, and estimates often underpowered.

Potential positive relationship to math test scores…but also *more* suspensions and chronic absenteeism.

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Discussion: Compare to Other "Teacher Like Me" Literature

- Similar to other literature:
  - Teacher-student race-matching effects for Black students consistent with what other scholars have found (see Redding, 2019 for review).
  - Black students' suspensions and absences decrease when exposed to all Black teachers (Holt & Gershenson, 2019; Lindsay & Hart, 2017).
- Different from/extensions of other literature:
  - Hispanic students' test scores also benefit from being exposed to same-ethnicity teachers.
  - Unlike for Black students, Hispanic students also benefit from exposure to non-Hispanic teachers of color (namely Black teachers).

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Discussion: Professional Staff Results

- For Black students:
  - same-race professional staff associated with reduced suspensions
  - coefficient on the likelihood of being chronically absent is in the expected direction, but not statistically different from zero
- For Hispanic students:
  - relationship between same-ethnicity professional staff and math test scores quite large (0.2 SD), but we are underpowered
  - *increased* chronic absenteeism is inconsistent with theory
  - overall, have small sample size of Hispanic professional staff, so interpret results with caution

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Preliminary Conclusions

- 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.

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Limitations

- Fixed effects models remove some but not all omitted variables bias due to non-random sorting of students to schools and to teachers.
- Teacher and professional staff matching for Hispanic students is infrequent, affecting our understanding of the association for this group of students.
- Results do not allow us to rule in or out the underlying mechanisms for the association.

Next Steps/Future Research

- 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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Acknowledgement

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Thank you! And questions

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