The Impact of Same-Race Teachers on Student Behavioral Outcomes

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Abstract

Previous papers on the impacts of same-race teachers have documented that students taught by same-race teachers improve their performance on state exams. However, little is known about whether the positive impact extends beyond test scores to student behavioral outcomes. Using the random assignment of teachers to the U.S. public schools within the Measures of Effective Teaching (MET) project, I show that same-race teachers increase the effectiveness of communications with Black students. I find that this effect is driven by better teacher explanations and consequent improved student understanding, which aligns with the literature about culturally relevant pedagogy. Additionally, I do not find empirical evidence supporting two alternative explanations for the positive effects of a same-race teacher on communication: *i)* higher general communication ability of Black teachers and *ii)* more teacher attention directed towards same-race students.

Understanding the impacts of same-race teachers is of great importance, as student behavioral outcomes predict their success in the long-term perspective. Further, the findings may also suggest that training non-minority teachers in using culturally relevant pedagogy may improve the performance of disadvantaged minority students in the short-term by complementing diversification of the teacher labor force.

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JEL Codes: I20, I21, J15

Keywords: same-race teacher, teacher-student communication, teacher expectations, student beliefs

1 Introduction

Disparities in cognitive and socio-emotional skills between minority and non-minority students often arise in the period of early childhood[3]. Being disadvantaged in preschool can lead to ongoing suboptimal investments in human capital, which can decrease the probability a student will ultimately reach a higher level of attainment, future earnings, and employment. Teachers can play an essential role in mitigating preschool disadvantage. Previous studies have shown that the most effective teachers significantly improve student performance (Rothstein, 2010) and long-term outcomes (Chetty, Friedman, and Rockoff, 2014), compared to their less effective counterparts. As teacher effectiveness is a multidimensional and mutable attribute (Aucejo et al., 2019), the impacts of observable teacher characteristics, particularly race and gender, are the focus of many papers[4].

Previous studies have documented positive effects of same-identity teachers, e.g., same-race and same-gender teachers, on student test scores (e.g., Dee, 2004; Dee, 2005, Égalité et al., 2015). However, we need more evidence on whether the effect of a same-identity teacher extends beyond test scores[5], as test scores do not capture all socio-emotional and behavioral skills and may instead be more reflective of test preparedness. Examining the effects of same-identity teachers on behavioral outcomes is essential, as this type of outcome predicts student success in adulthood (Jackson, 2018). Particularly, the effectiveness of communication between teachers and students is of great importance, as it can help teachers to effectively engage students in learning activities and limit any disruptive behavior.

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[3] Bond and Lang (2018) find that the black-white test gap evolution does not have a racial component in human capital acquisition, but can be explained by differences in socioeconomic characteristics from childhood. However, this finding does not exclude the possibility that future investments may mitigate the initial disadvantage.

[4] For instance, Dee (2004), Dee (2005), Egalite, Kisida, and Winters (2015); Fairlie, Hoffmann, and Oreopoulos (2014); Lusher, Campbell, and Carrell (2018).

[5] Previous studies document the positive effects of a same-race teacher on teachers' higher expectations about student attainment (Gershenson, Holt, and Papageorge, 2016), more positive teacher perceptions of student behavioral outcomes (Dee, 2005), and behavioral outcomes (Lindsay and Hart, 2017; Holt and Gershenson, 2019). Hart, Hyman, Lindsay, and Papageorge (2018) provide evidence of the impacts of a same-race teacher on long-term educational outcomes.

In this paper, I examine the effects of a same-race teacher[6] on student test scores and behavioral outcomes, including student-teacher communication effectiveness, student perceptions of teacher expectations for their performance, and student beliefs on the returns to their efforts. I exploit the random assignment of teachers to classes within the U.S. Measures of Effective Teaching (MET) project to address the issues related to the systematic sorting of students and teachers. I use the information on student-level perceptions of teaching practices from the Student Perception Survey (SPS) and administrative data to measure student behavioral outcomes and test scores, respectively.

I find that exposure to a same-race teacher positively influences the performance of Black students on math test scores. However, the effects of a same-race teacher on English test scores are small and insignificant. These findings are consistent with previous findings[7] of the randomized STAR study (Dee, 2004) and more recent evidence from observational studies (Joshi, Doan, and Springer, 2018). Beyond the effect of a same-race teacher on test scores, I find that matched Black students generally have more effective communications with their same-race teachers than do their unmatched schoolmates. Importantly, the findings on the effects of a same-race teacher on separate dimensions of communication indicate that Black students understand explanations made by same-race teachers better than those of White teachers, and feedback from a same-race teacher is perceived as more helpful. These findings suggest that the effect of a same-race teacher on communication may be explained by a shared cultural background and culturally aligned instructions (Ladson-Billings, 1995; Dee and Penner, 2017).

The straightforward alternative explanation for the positive effect of same-race teachers on communication could be a higher general communicative ability of Black teachers. I exclude this possibility by showing that Black teachers have no impact on communication with students of other

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[6] I limit my analysis to the impact of a same-race teacher and cannot examine the effects of a same-gender teacher on student performance, as most teachers in my sample are female.
[7] The evidence from previous papers on the effects of same-race teacher is based on the Tennessee STAR project from the 1980s (Dee, 2004), which may be drastically different in terms of the school environment and administrative data from the specific school district or state; e.g., Florida (Egalite et al., 2015).

races. Furthermore, a higher level of attention from same-race teachers towards matched students could drive the positive effect of a same-race teacher on communication. To test this explanation, I examine whether the effect of a same-race teacher varies with the racial composition of classes, following Penney (2017b). I find that the effect does not change with racial classroom composition, which suggests that Black teachers do not allocate less (more) attention towards same-race students in classes with predominantly Black (White) students.

This paper adds to previous studies on the impacts of same-race teachers on student behavioral outcomes (Egalite and Kisida, 2018; Gershenson et al., 2016; Lindsay and Hart, 2017; Holt and Gershenson, 2019) and long-term outcomes (Hart, Hyman, Lindsay, and Papageorge, 2018) by providing evidence that the effects of same-race teachers extend beyond test scores and positively impact the effectiveness of communications between teacher and students. The findings on the positive effects of a same-race teacher are similar to the effects of a same-race doctor in terms of communications (Alsan, Garrick, and Graziani, 2019). The closest paper to my study, Gershenson et al. (2018), investigates the long-run effects of same-race teachers and provides suggestive evidence that teacher-student communications and a role model effect may explain these results. I complement Gershenson et al. (2018) by examining the direct effects of a same-race teacher on communication effectiveness, which may underlie the long-run effects of same-race teachers.

Furthermore, this paper aligns with the literature on culturally relevant pedagogy (Irvine, 1989; Ladson-Billings, 1995; Dee and Penner, 2017), according to which Black teachers are better at explaining concepts to same-race students because they often use more relevant examples, thanks to a higher degree of shared cultural background. I show that better explanations by same-race teachers, not more interesting content or intensified teacher attention, drive the positive effects of same-race teachers on communication effectiveness. This paper also relates to studies that examine teacher effectiveness using classroom observation scores (Garrett et al., 2015; Aucejo et al., 2019) by showing that same-race teachers are more effective in communication with matched students

conditional on observed teaching practices. While Aucejo et al. (2019) highlight the importance of teacher matching with different aspects of a classroom of students, such as higher/lower achievers, I show that teacher matching with same-race students leads to higher effectiveness in communication.

Overall, the findings of this paper indicate that Black students taught by same-race teachers benefit from better communication and higher student perceptions of teacher expectations, which can positively influence long-term student outcomes. The findings on the positive effects of a same-race teacher on dimensions of communication suggest that training non-minority teachers to use culturally relevant pedagogy can improve the performance of minority students through enhanced classroom communication. Such training may complement long-term policy interventions, particularly hiring more minority teachers, which requires extensive financing to attract minority graduates from alternative highly-paid non-teaching jobs (Gershenson et al., 2018).

2 Literature Review

This paper complements the literature on the impact of same-race teachers on student behavioral outcomes by providing new evidence on the effects of same-race teachers on student-teacher communication, student perceptions of teacher expectations, and student beliefs. Previous studies have also provided evidence on the positive effects of a same-race teacher on teacher expectations about student attainment (Gershenson, Holt, and Papageorge, 2016), teacher perceptions of student behavioral outcomes (Dee, 2005), student perceptions and attitudes (Egalite and Kisida, 2018), and behavioral outcomes (Lindsay and Hart, 2017; Holt and Gershenson, 2019). Parallel literature on same-gender teachers shows that female teachers increase female students' beliefs in returns to effort (Eble and Hu, 2020) and long-term outcomes (Carrell, Page and West, 2010; Lim and Meer, 2019).

Gershenson et al. (2018), the closest paper to my study, examines the effects of a same-race teacher on long-term outcomes, including high school graduation, college enrollment, and college test-taking decisions. Gershenson et al. (2018) provide suggestive evidence that the effectiveness of

student-teacher communication and role model effects may explain the long-run effects of same-race teachers by exploiting variation in the number of same-race teachers across years. Gershenson et al.'s (2018) findings suggest that same-race teachers serve as role models when students decide whether to take college entrance exams (diminishing effect of a second same-race teacher), and teacher-student communication effectiveness explains the positive effect of same-race teachers on college enrollment (increasing effect of a second same-race teacher). In comparison to Gershenson et al. (2018), I study whether exposure to a same-race teacher influences student-teacher communication, student perceptions of teacher expectations for their performance, and student beliefs, which may explain the long-term effects of a same-race teacher.

The findings of this paper indicate that exposure to a same-race teacher increases student-teacher communication, which aligns with the findings of Egalite and Kisida (2018) and Alsan, Garrick, and Graziani (2019)[8]. Similar to this paper, Egalite and Kisida (2018) examine the within-teacher racial gap in students' academic perceptions and attitudes, and show that Black students taught by a same-race teacher report better perceptions of teaching practices in comparison to White students. However, minority students report on average more positively about teaching practices than non-minority students regardless of a teacher's race. Hence, comparisons between the perceptions of minority and non-minority students may result in upward bias in the estimated racial gap in student perceptions of teaching practices. In comparison to Egalite and Kisida (2018), I compare student-teacher communication within a group of Black students, enabling me to circumvent bias related to the difference in student reporting across racial groups. Furthermore, I exclude students who exited their randomly assigned classes for other classes/schools in order to focus only on the sample of students initially enrolled in classes with randomly assigned teachers, which enables me to eliminate any bias related to student re-sorting.

This paper further fits into the literature of culturally relevant pedagogy (Irvine, 1989; Ladson-Billings, 1995; Dee and Penner, 2017), according to which Black teachers are better at

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[8] Alsan et al. (2019) document the positive effect of same-race doctors on communication with Black patients, which leads to increasing demand for preventive medical services by Black patients.

explaining concepts to same-race students using more relevant examples, as they often have a higher degree of shared cultural background. I find that better explanations by Black teachers to same-race students drive the effects of a same-race teacher on communication effectiveness, which aligns with the 'culturally relevant' hypothesis. I reject two alternative possibilities: that general higher communication effectiveness by Black teachers and more attention given to same-race students explain the effects of a same-race teacher on communication effectiveness. The findings of this paper suggest that training non-minority teachers in using culturally relevant pedagogy may complement diversification of the teacher workforce and, in the short term, may improve the performance of minority students.

3 Data

3.1 The MET Project

The Measures of Effective Teaching (MET) project aims to identify effective teachers by exploiting random assignment of teachers within schools (Kane, McCaffrey, Miller, and Staiger, 2013). The MET project took place in six urban school districts[9] over the 2009-2011 academic years. The measures of effective teaching include student perception surveys, classroom observations, principal surveys, and estimates of teacher value-added. The student perception survey contains information on student self-reported malleability of skills, perceptions of teaching practices, and students' effort in the classroom, which enables me to study the impacts of same-race teachers on behavioral outcomes.

The key advantage of the MET database is its random assignment of teachers to classes within schools, which provides exogenous variation in student assignments to same-race teachers. The randomization of teachers occurred in the summer of 2010 at the level of school-subject-grade, so-called randomization blocks (Kane et al., 2013). There should be at least two teachers who teach the same grade and subject randomly assigned to a class within each randomization block. Previous

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[9] In particular, the districts include New York City Department of Education, Charlotte-Mecklenburg Schools, Denver Public Schools, Memphis City Schools, Dallas Independent School District, and Hillsborough County Public Schools.

studies employed exogenous variation related to the random assignment of teachers to study the impacts of teacher effectiveness on student outcomes (Blazar and Kraft, 2017; Aucejo et al., 2019). However, they have not exploited it to study the impact of a same-race teacher on student performance. This paper takes advantage of the random assignment of teachers to study the impact of same-race teachers on student test scores and possible mechanisms behind the effect of interest.

3.2 Sample and Descriptive Statistics

The main analytical sample includes elementary school students in 4-5th grades and secondary school students in 6-8th grades whose teachers are randomly assigned[10] and participated in the MET project until the end of the 2010-2011 academic year. Furthermore, I restrict the sample to students who complied with random assignment to classrooms, and about whom there is available information on socio-demographic characteristics, student perceptions of teaching practices, and test scores. The resulting sample includes students from five school districts[11]. In most cases, primary-school students have one general elementary teacher and the same peers in both subjects for the school year. Secondary-school students have two subject specialist teachers: one each for Math and English.

Table A1 presents the summary statistics for the main analytical sample. The sample consists of 36% Black students, 27% White students, 26% Hispanic students, and 11% other-race students, including Asian, American Indian, and non-specified-race students. The sample is gender-balanced; 49% of students are Male. More than half (62%) qualify for the free or reduced-price lunch (FRL) program. 14% of students are English Language Learners (ELL), 8% are 'gifted,' and 7% are classified as having special educational needs.

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[10] From the core sample of the second year of the MET project (2,086 teachers from 310 schools), 1,559 randomly assigned teachers from 284 schools continued in the study and 184 teachers dropped out between the random assignment and the start of the school year. Specifically, the number of randomized teachers of grades 4-5 is 470.

[11] Initially, schools from six school districts participated in the MET project, however, I do not observe free and reduced-price lunch eligibility of students and prior observed teaching practices in one of the districts).

The racial representation of teachers in the sample includes 71% who are White and 29% who are Black[12]. The majority are female (94%). The overall fraction of students matched to same-race teachers is 41%; however, there is considerable heterogeneity across racial groups. White students have a considerably higher probability of being taught by same-race teachers at 84%, while Black students are matched at 51%.

Table A2 presents the mean of Black and White teacher characteristics. Black teachers in the sample have, on average, about two years less experience than their White counterparts, however, the p-value from the Kolmogorov-Smirnov test indicates that the difference is insignificant. Black teachers are more likely to have a Master's or higher degree than their White colleagues. In terms of prior observed teaching practices related to communication according to FFT protocol, and prior value-added in Math and English, there are no significant differences in these measures of teacher effectiveness between the Black and White teachers.

3.3 Measures of Student Perceptions of Teaching Practices

I use information on student perceptions of teaching practices from the Student Perception (or Tripod) Survey. The Survey contains information on how students evaluate seven dimensions of classroom instruction: Care, Control, Clarify, Challenge, Captivate, Confer, and Consolidate[13]. There are two versions of the survey for elementary-school and secondary-school students. In classes for general teachers, a randomly selected half of the class filled out the survey while thinking about their English class, and the other half completed the survey while thinking about

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[12] I restrict the sample to White and Black teachers, as the fraction of Hispanic and other-race teachers is negligible in the original sample.

[13] According to the description of instruments on the Measures of Effective Teaching Longitudinal Database website (https://www.icpsr.umich.edu/icpsrweb/content/METLDB/grants/instruments.html), these seven dimensions are defined as follows. "Care measures student perceptions of whether the classroom is a safe place. Clarify measures student perceptions of teacher behaviors that help students to better understand the content being taught. Challenge measures student perceptions of classroom rigor and required effort. Captivate measures student perceptions of how well the teacher captures the attention and interest of students. Confer measures student perceptions of how much a teacher takes students' points of view into account when teaching. Consolidate measures student perceptions of how much the teacher helps students cognitively represent what they have learned in a connected way and how well the teacher promotes student understanding of the interconnectedness of different curriculum topics".

their Math class[14]. Most questions on a Tripod survey use Likert-type response options with a 5-point scale (Totally Untrue to Totally True). I perform an exploratory factor analysis to define the number of dimensions of classroom instruction evaluated by students that are separable in the data. Appendix Table A3 shows the correlation between the different dimensions of classroom instruction evaluated by students and the loadings on each dimension after performing an oblique rotation of the factors. I can divide the student perceptions of teacher practices into two separable broad categories, communication and strictness. Five dimensions of teaching practices as perceived by students load on the first factor: care, captivate, consolidate, clarify, and confer. Challenge and control load on strictness. As challenge and control loadings have opposite signs, I use them separately in the regression. I exploit challenge as a measure of teacher expectations for student performance. Both factors together explain 66 % of the total variance in the data. I also exploit the scales of student effort and beliefs on the returns to effort from the student perception survey.

4. Identification and Estimation

4.1 Identification Assumption and Related Issues

This section describes my identification strategy and the related assumptions. The main identification assumption of the impact of same-race teachers is that the probability of being matched with a same-race teacher is not correlated with observable student characteristics, conditional on school-grade-subject fixed effects. I perform a range of balance tests to verify that my identification assumption holds. Columns 1 and 2 of Table A4 provide evidence that exposure to a same-race teacher for Black students within the randomization blocks does not depend on students' observed characteristics, including prior test scores, gender, English language learner (ELL) status, eligibility for free or reduced-price lunch (FRL), 'gifted' or special education needs (SPED) status, or enrollment in English and Math classes, respectively. The impact of these

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[14] The majority of students in the sample taught by generalist teacher (same teacher for both subjects), however, small fraction of students have two different teachers and should respond about both of them. However, there is very limited number of cases in which students respond about their perceptions of teaching practices of both of teachers.

variables on being assigned to same-race teachers is jointly insignificant (p-value of 0.61 and 0.29 for each subject, respectively). Columns 3 and 4 of Table 4 similarly show that White student's exposure to a same-race teacher does not depend on student characteristics. Hence, there is no evidence that the main identification assumption of the model does not hold.

Because teachers are randomly assigned to a classroom within the randomization block, the exogeneity of being assigned to a same-race teacher is ensured in the case of perfect randomization. However, there was teacher attrition from the first to the second year of the MET project. Attrition occurred because teachers were not scheduled to teach the grade and subject, or they chose not to participate (Kane et al., 2013). One hundred eighty-four teachers dropped out of the study between the random classroom assignment and the start of the second school year. Despite the teacher attrition, Kane et al. (2012) show that samples of teachers participating in the first and second years do not have different characteristics in terms of race and prior teaching experience.

Assignments to a same-race teacher may still be endogenous due to non-random student sorting into classes. If parents of Black students whose parents are more involved are more likely to choose a school/class with same-race teachers, or if high-ability Black students systematically sort into classes taught by Black teachers, the effects of same-race teachers may be overstated. I test whether classroom and teacher characteristics predict non-compliance of students to class assignment. Columns 1 and 2 of Table A5 show that classroom and teacher characteristics do not predict non-compliance of students to classes in Math and English. The exception is in the case of very experienced Math teachers, which is positively correlated with students actively enrolling in their classes, thus potentially violating the assumption of random sorting. However, the impact of classroom and teacher characteristics is jointly insignificant in Math (p-values is 0.74). Hence, systematic student sorting into classes in terms of observable characteristics is not likely to violate the identification assumption and affect the results.

Another potential identification issue is reverse causality between communication and student test scores. Students who earned higher test scores on state exams may report better

communication, and/or students who report effective communication may have a higher level of innate ability. However, the possibility of reverse causality is eliminated by the timing of student reporting on communication and taking state exams. The MET researchers administer the Student Perception Survey in the fall semester (the end of October/ the beginning of November), while state exams were administered at the end of the academic year (April-June). Hence, teacher evaluations of student performance and state exam scores did not influence student reports of their perceptions of teaching practices, which I use to measure teacher-student communication.

4.2 Model Specifications

To estimate the effect of a same-race teacher on student outcomes[15], I estimate a linear model:

$$Y_{isgk}^l = \alpha_0 + \alpha_1\, BS\_BT_i + \alpha_2\, WS\_BT_i + \alpha_3\, WS\_WT_i + \alpha_4 X_i + \theta_{sgk} + \varepsilon_{isgk} \quad (1)$$

where *i, s, g, and k* index students, school, grade, and subject, respectively. Upper index *l* denotes the set of student outcomes, including standardized test scores, teacher-student communication, teacher expectations, and student beliefs. BS_BT_i is a binary variable equal to one if a Black student *i* was taught by a Black teacher. WS_BT_i is a dummy variable equal to one if a White student is taught by a Black teacher and WS_WT_i is a dummy variable equal to one if a White student is taught by a White teacher. In the full regression, I also include the binary variables for racial interactions of Black and White teachers with Hispanic and other-race students. The comparison group is Black students taught by White teachers. The within-group comparison of Black students is particularly important for estimating the impact of a same-race teacher on non-exam academic outcomes since it allows me to address the differences in perceptions of teaching practices between students of different racial groups. X_i is a vector of predetermined characteristics of students and teachers, including student prior test scores, gender, English language learner (ELL) status, 'gifted'

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[15] Student outcomes include both exam scores and behavioral outcomes, e.g., teacher-student communication, teacher expectations, and student beliefs.

or special educational needs status (SPED), free or reduced- price lunch eligibility (FRLS), and teacher gender: prior teacher effectiveness is measured by value-added, teacher experience, prior teaching practices are measured according to classroom-based protocol, Framework For Teaching (FFT). θ_{sgk} are random block or school-grade-subject fixed effects, and ε_{ijt} is standard error. I cluster standard errors at the level of randomization blocks, which is equivalent to school-grade-subject. The main parameter of interest is α_1, which measures the average outcome gains for Black students from being taught by Black teachers compared to Black students taught by White teachers. The parameter related to other combinations of racial interactions, for instance, α_2, which stands for the effect of an Black teacher on the outcomes of White students, allows me to shed more light on whether the effect of a same-race teacher is/not confounded by better general teacher ability to communicate. A positive impact of Black teachers on communication with non-matched/other-race students would mean that Black teachers are more effective communicators. If Black teachers are on average better at communication with students of all racial groups, then the effect of a same-race teacher will be overstated.

To estimate the effect of a same-race teacher on test scores, I use two specifications of a linear model: a value-added specification that controls for prior test scores on the right-hand side, and a test score gains specification, a more restrictive model that assumes that the parameter on the prior test scores is equal to one. The value-added model specification may be highly sensitive to endogeneity bias when relevant inputs are omitted (Todd and Wolpin, 2003). Unlike Dee (2004), who investigates the effect of a same-race teacher on kindergarten and primary school students and does not observe measures of prior performance or ability, I control for prior student test scores.

5 Results

This section presents the main results on the effects of a same-race teacher on student performance and robustness checks. Subsection 5.1 demonstrates the effects of a same-race teacher on student test scores. Subsection 5.2 documents the impacts of a same-race teacher on student

behavioral outcomes, including student-teacher communication effectiveness, student perceptions of teacher expectations and student beliefs on the returns to their effort. Subsection 5.3 describes the robustness checks.

5.1 The Effects of a Same-Race Teacher on Test Scores

In this subsection, I demonstrate the findings on the impacts of same-race teachers on standardized test scores. While I find positive effects of a same-race teacher on Math test scores (Table 1), there is no evidence that a same-race teacher improves English test scores of Black students (Table A6).

The first two columns of Table 1 present the results of a value-added specification, in which the current Math test score is the outcome and a prior test score is the control, while the next two columns show the estimated results of a more restricted specification, so-called test score gains, where the outcome is the difference in Math test scores across two adjacent grades. The comparison group is Black students assigned to White teachers in the same school, grade, and subject. The effects of a same-race teacher on Math test scores[16] are positive and significant in all specifications and vary from 0.12 to 0.20 of SD. The results on the effects of a same-race teacher on Math test scores in specifications with two lagged test scores (Table A7) are consistent with the results in the main specification. Columns 2 and 4 of Table 1 show that the effects of a same-race teacher are robust to inclusion of teacher characteristics including gender, experience within school district, prior value-added[17], prior observed teaching practices according to FFT, and prior average student perceptions of teaching practices. The fact that results are robust to inclusion of teacher characteristics may suggest that systematic differences in teacher effectiveness and other teacher characteristics between Black and White teachers do not drive the result.

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[16] The effects of a same-race teacher on Math test scores does not vary with prior test scores in the specification which allows for the interaction of a same-race teacher with prior student test scores.

[17] The race of a teacher may be correlated with teacher quality and other observable characteristics that influence teacher ability to communicate and improve student performance. The common measure of teacher quality is teacher value-added, which is weakly correlated with the observable characteristics of teachers, in addition to experience (Rockoff, Jacob, Kane, and Staiger, 2011).

The second row of Table 1 provides evidence that being taught by Black teachers has small and insignificant impacts on the performance of White students on Math test scores, which may suggest that the positive effects of same-race teachers on Black students is not driven by higher effectiveness of Black teachers compared to their White counterparts. However, this result should be viewed with caution, as only five percent of White students are taught by Black teachers in the sample. This result may also suggest that Black students do not gain at the expense of other-race students. The evidence of the absence of a zero-sum game effect suggests that hiring more minority teachers would likely not harm the performance of other-race students.

Table 1. The Effects of a Same-Race Teacher on Math Test Scores of Black Students

Specifications	Value-added		Test score gain	
	(1)	(2)	(3)	(4)
Black T × Black S	0.134**	0.122**	0.201***	0.194***
	(0.059)	(0.061)	(0.066)	(0.067)
Black T × White S	0.064	0.047	0.004	-0.007
	(0.073)	(0.074)	(0.081)	(0.081)
White T× White S	0.061	0.064	-0.011	-0.008
	(0.039)	(0.039)	(0.041)	(0.041)
Male Teacher		-0.040		0.032
		(0.056)		(0.061)
Prior Teacher Value-Added		0.237*		0.219
		(0.132)		(0.145)
Teacher Experience Within School District		-0.001		-0.000
		(0.003)		(0.003)
Prior Teaching Practices FFT: Communicate		-0.012		-0.007
		(0.062)		(0.067)
R-squared	0.715	0.716	0.166	0.168
Observations	1,637	1,637	1,637	1,637

Notes: The comparison group is Black students taught by White teachers. The full model controls for dummies on the racial interactions between White students taught by White teachers, White students taught by Black teachers, and Hispanic and White students taught by Black and White teachers. Models include controls for student predetermined characteristics, including prior Math test scores, ELL status, SPED status, gifted status, gender, age, free and reduced-price lunch eligibility, and randomization block fixed effects. Standard errors in parentheses are clustered at the level of randomization block. $^{*}p < .10$, $^{**}p < .05$, $^{***}p < .01$ (two-tailed tests)

The estimated effects of a same-race teacher in Table 1 may be biased by exposure to a same-race teacher in previous grades. Penney (2017a) finds that the effect of having a second same-

race teacher is relatively small; however, earlier exposure to same-race teachers is more beneficial than in later grades. If the effect of a second same-race teacher is decreasing, the estimated effects in Table 1 may be understated and reflect a lower bound of the true estimates.

The findings here indicate that a same-race teacher improves Math test scores, but does not influence English test scores. This aligns with previous findings from the randomized STAR study (Dee, 2004)[18] and observational studies (Egalite et al., 2015). The findings of this paper complement previous findings by providing updated evidence on the effects of a same-race teacher for primary-school students and the presence of the effect for secondary-school students by exploiting the advantage of random classroom assignments.

5.2 The Effects of a Same-Race Teacher on Behavioral Outcomes

In this subsection, I examine the effects of same-race teachers on teacher-student communication, teacher expectations, and student beliefs. The odd columns of Table 2 present the estimated effects of a same-race teacher on behavioral outcomes in English classes, while the even columns demonstrate the estimates of same-race teachers in Math classes. The comparison group is Black students taught by White teachers. The results in Columns 1 and 2 indicate that Black teachers are more effective at student-teacher communication with Black students by 0.32 of SD and 0.32 of SD, respectively, in English and Math. Columns 3 and 4 show that Black students think that Black teachers have higher expectations for their performance than White teachers by 0.24 of SD and 0.33 of SD, respectively, in English and Math. This result is consistent with recent findings by Gershenson et al. (2016) and Papageorge, Gershenson, and Kang (2020), showing that Black teachers have higher expectations for same-race students. However, I do not find that exposure to a same-race teacher improves student beliefs about the returns to their efforts (Columns 5 and 6).

A possible explanation behind the positive effect of a same-race teacher on communication is better general teacher ability to communicate. To test this possibility, I estimate the effect of

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[18] I cannot directly compare the magnitudes of estimates, as Dee (2004) used a percentile rank based on test scores from different math and reading tests, and did not control for prior test scores.

Black teachers on communications with non-matched students. Results in Rows 2, 4, and 5 of Table 2 show that Black teachers have no effect on communication with White, Hispanic, and other-race students. These results may suggest that a better general ability to communicate does not drive the effect of a same-race teacher on communication. This result should be viewed with caution for two reasons: first, the small sample of White students taught by Black teachers may lead to imprecise estimates; second, White students on average report a lower level of communication than minority students. Hence, the estimated effects may reflect the level difference in reporting from different racial groups of students.

Table 2. The Impacts of a Same-Race Teacher on Behavioral Outcomes

	Communication		Teacher Expectations		Student Beliefs	
	English (1)	Math (2)	English (3)	Math (4)	English (5)	Math (6)
Black T × Black S	0.315**	0.323**	0.236***	0.328***	0.071	-0.041
	(0.157)	(0.143)	(0.085)	(0.116)	(0.103)	(0.125)
Black T × White S	0.048	0.020	0.056	0.170	-0.101	-0.226
	(0.172)	(0.164)	(0.092)	(0.103)	(0.119)	(0.160)
White T × White S	0.004	0.029	0.018	-0.021	0.038	-0.127
	(0.070)	(0.094)	(0.055)	(0.067)	(0.073)	(0.080)
Black T × Hispanic S	-0.084	0. 031	-0.067	0.087	-0.048	-0.004
	(0.162)	(0.152)	(0.099)	(0.110)	(0.107)	(0.112)
Black T × Other-race S	0.008	-0.071	0.012	0.083	-0.007	-0.303
	(0.125)	(0.221)	(0.086)	(0.146)	(0.149)	(0.205)
Observations	2,973	2,364	2,983	2,383	2,891	2,319
R-squared	0.200	0.193	0.161	0.174	0.201	0.170

Notes: The comparison group is Black students taught by White teachers. Models include controls for predetermined student characteristics, including prior test scores, student ELL status, SPED status, gifted status, gender, free and reduced-price lunch eligibility, teacher gender, prior value-added, prior FFT teaching practices, and randomization block fixed effects. Standard errors in parentheses are clustered at the level of randomization block. $^{*}p <$ .10, $^{**}p < .05$, $^{***}p < .01$ (two-tailed tests)

To understand the mechanisms behind the effect of a same-race teacher on communication effectiveness, I examine the effects of a same-race teacher on different dimensions of communication. Columns 1-5 of Table 3 indicate that of five dimensions of communication, the effect of Black teachers is the most substantial on two subdomains, Clarify and Consolidate. These results suggest that the effects of a same-race teacher on communication may be explained by

improved understanding by Black students due to common cultural background, which aligns with the literature on culturally relevant pedagogy (Irvine, 1989; Ladson-Billings, 1995; Dee and Penner, 2017). The effects of same-race teachers on other dimensions, including Confer, Care, and Captivate are insignificant, excluding the possibility that matched Black students report improved communication because of higher interest (Captivate), a better relationship with the teacher or more help from the teacher (Care), or stronger teacher consideration of student points of views (Confer).

Table 3. The Impact of a Same-Race Teacher on Components of Teacher-Student Communication

English-specific measures)	Clarify (1)	Confer (2)	Care (3)	Captivate (4)	Consolidate (5)
Black T × Black S	0.262***	0.130	0.178	0.206	0.184*
	(0.098)	(0.119)	(0.151)	(0.133)	(0.099)
Black T × White S	0.087	-0.020	0.062	0.079	-0.128
	(0.091)	(0.127)	(0.163)	(0.155)	(0.123)
White T × White S	0.028	-0.043	0.073	-0.062	-0.049
	(0.037)	(0.047)	(0.065)	(0.060)	(0.064)
Observations	3,138	3,141	3,136	3,141	3,129
R-squared	0.172	0.218	0.203	0.210	0.168

Notes: The comparison group is Black students taught by White teachers. Models include controls for predetermined student characteristics, including prior English test scores, student ELL status, SPED status, gifted status, free and reduced-price lunch eligibility, teacher gender, prior value-added, prior observed teaching practices in communication and randomization block fixed effects. Standard errors in parentheses are clustered at the level of randomization block. . $^{*}p < .10$, $^{**}p < .05$, $^{***}p < .01$ (two-tailed tests)

Another explanation for the positive effect of a Black teacher on communication effectiveness may be that same-race teachers pay more attention to matched students. As teacher attention towards a particular student is unobserved, I verify whether the effect of a same-race teacher varies with the fraction of matched students in the class. A teacher in classes with a large fraction of same-race students may give less attention to same-race students than in classes with a small fraction of same-race students due to time constraints. The results in the second row of Table 4 show that the interaction effect of a same-race teacher with dummy for the classes with predominantly Black students is small and insignificant. These results suggest that Black teachers do not allocate more attention towards same-race students at the expense of non-matched students.

Table 4. Heterogeneity of the Effect of a Same-Race Teacher on Communication: by Racial Composition of Class

Outcome =Communication	All classes	English classes	Math classes
Black T × Black S	0.358**	0.327	0.342*
	(0.145)	(0.204)	(0.178)
Black T × Black S × Predominantly Black Classes	-0.045	-0.025	-0.059
	(0.166)	(0.216)	(0.196)
Black T × White S	0.097	0.054	0.027
	(0.138)	(0.180)	(0.166)
White T × White S	0.019	0.007	0.031
	(0.056)	(0.070)	(0.093)
Predominantly Black Classes	0.242	0.175	0.796***
	(0.565)	(0.679)	(0.198)
Observations	5,372	2,973	2,364
R-squared	0.187	0.200	0.193

Notes: The comparison group is Black students taught by White teachers. Models include controls for predetermined student characteristics, including prior test scores, student ELL status, SPED status, gifted status, free and reduced-price lunch eligibility, teacher gender, prior value-added, prior observed teaching practices in communication and randomization block fixed effects. I define classes with predominantly Black students as those in which more than two-thirds of the students are Black. The first column additionally controls for subject fixed effects. Standard errors in parentheses are clustered at the level of randomization block. . $^{*}p < .10$, $^{**}p < .05$, $^{***}p < .01$ (two-tailed tests)

To learn more about who gains most from exposure to a same-race teacher, I conduct a heterogeneity analysis of the effects of a same-race teacher on communication with student characteristics. Column 1 of Table A8 shows that the effect of same-race teachers in the whole sample is larger for low-performing students and students with gifted status, suggesting that students in the bottom and top of the distribution gain more than students in the middle. For English classes, I find that the effect of a same-race teacher on communication is larger for students with low prior performance and students with English Learner status (Column 2).

The results in this subsection indicate that exposure to a same-race teacher increases communication effectiveness and student perceptions of teacher expectations. The effect of a same-race teacher on communication is driven by better explanations and feedback on learning from teachers. The magnitude of the estimated effects of a same-race teacher is comparable to the size of estimated effects of same-race doctors on communication with Black patients (Alsan et al., 2019).

5.3 Robustness Checks

In this subsection, I test whether the effect of a same-race teacher on communication is robust to inclusion of the measures of teacher effectiveness. Panels A and B of Table A9 show that the effect of a same-race teacher on communication effectiveness remains significant and does not change considerably after controlling for teacher experience, prior teacher value-added, and prior FFT teaching practices related to communication in English and Math classes.

To further test whether the positive effect of same-race teachers stems from same-race teachers being on average more effective at communication than other-race counterparts, I replace the teacher-student communication based on student perceptions with a fixed effect for each teacher to further analyze the teacher's ability to communicate. Afterward, I explore which teacher characteristics correlate with fixed effects estimates obtained from the regression with communication as an outcome variable (Table A10). Teacher race explains approximately 60% of the cross-sectional variation, but the effect of teacher race is small and insignificant. This implies that there is no significant difference in time-invariant teacher ability to communicate between Black and White teachers. In the next four columns of Table A10, I add dummies for whether a teacher taught in classes with predominantly Black classes, a content knowledge test, a principal survey rating (PSVY), and teacher experience within the district. The correlation between time-invariant teacher communication ability and those teacher characteristics is positive and insignificant, except for teacher experience. These teacher characteristics do not explain much about the variation in teacher fixed effects. These results provide suggestive evidence that there is no significant difference in time-invariant teacher ability to communicate between White and Black teachers.

6 Conclusion

This paper investigates the impacts of same-race teachers on student test scores and behavioral outcomes, particularly the effectiveness of communication between students and teachers, student perceptions of teacher expectations, and student beliefs. Exploiting the random

assignment of teachers to classes within MET project schools in the U.S., I show that having a same-race teacher improves Math test scores of Black students and does not influence English test scores. These results align with findings of previous studies (Dee, 2004; Egalite et al., 2015; Joshi et al., 2018). I also find that matched Black students may have more effective communication with same-race teachers than do their unmatched schoolmates.

This paper contributes to the literature on the effects of same-race teachers on student behavioral outcomes by providing evidence that the effects of same-race teachers extends beyond test scores and positively affects teacher-student communication effectiveness. The findings on the effect of a same-race teacher on the dimensions of teacher-student communication suggest that a better understanding of Black students and more helpful teacher feedback on student learning drive the positive effects of a same-race teacher. These findings are consistent with the literature hypothesis on culturally relevant pedagogy (Ladson-Billings, 1995; Dee and Penner, 2017), according to which the effects of a same-race teacher on communication may be explained by a shared cultural background. Additionally, I test two alternative explanations for the positive effect of a same-race teacher on communication effectiveness, including higher general communication ability of Black teachers and more teacher attention directed towards matched students.

This paper also fits the studies that examine teacher effectiveness by using classroom observation scores (Garrett et al., 2015; Aucejo et al., 2019) by showing that same-race teachers are more effective in communication with matched students conditional on observed teaching practices. While Aucejo et al. (2019) highlight the importance of teacher matching with different aspects of a classroom of students, such as higher/lower achievers, I show that teacher matching with same-race students leads to higher communicative effectiveness. The findings may suggest that training non-minority teachers in using culturally relevant pedagogy may improve the performance of disadvantaged minority students in the short-term by complementing diversification of the teacher labor force.

References

Alsan, M., Garrick, O., & Graziani, G. (2019). Does diversity matter for health? Experimental evidence from Oakland. *American Economic Review*, *109*(12), 4071-4111.

Aucejo, E. M., Coate, P., Fruehwirth, J. C., Kelly, S., Mozenter, Z., & White, B. (2019). Match Effects in the Teacher Labor Market: Teacher Effectiveness and Classroom Composition.

Blazar, D., & Kraft, M. A. (2017). Teacher and teaching effects on students' attitudes and behaviors. *Educational evaluation and policy analysis*, *39*(1), 146-170.

Bond, T. N., & Lang, K. (2018). The black–white education scaled test-score gap in grades k-7. *Journal of Human Resources*, *53*(4), 891-917.

Carrell, S. E., Page, M. E., & West, J. E. (2010). Sex and science: How professor gender perpetuates the gender gap. *The Quarterly Journal of Economics*, *125*(3), 1101-1144.

Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood. *American Economic Review*, *104*(9), 2633-79.

Dee, T. S. (2004). Teachers, race, and student achievement in a randomized experiment. *Review of Economics and Statistics*, *86*(1), 195-210.

Dee, T. S. (2005). A teacher like me: Does race, ethnicity, or gender matter?. *American Economic Review*, *95*(2), 158-165.

Dee, T. S., & Penner, E. K. (2017). The causal effects of cultural relevance: Evidence from an ethnic studies curriculum. *American Educational Research Journal*, *54*(1), 127-166.

Eble, A., & Hu, F. (2020). Child beliefs, societal beliefs, and teacher-student identity match. *Economics of Education Review*, *77*, 101994.

Egalite, A. J., & Kisida, B. (2018). The effects of teacher match on students' academic perceptions and attitudes. *Educational Evaluation and Policy Analysis*, *40*(1), 59-81.

Egalite, A. J., Kisida, B., & Winters, M. A. (2015). Representation in the classroom: The effect of own-race teachers on student achievement. *Economics of Education Review*, *45*, 44-52.

Fairlie, R. W., Hoffmann, F., & Oreopoulos, P. (2014). A community college instructor like me: Race and ethnicity interactions in the classroom. *American Economic Review*, *104*(8), 2567-91.

Garrett, Rachel, and Matthew P. Steinberg. "Examining teacher effectiveness using classroom observation scores: Evidence from the randomization of teachers to students." *Educational Evaluation and Policy Analysis* 37.2 (2015): 224-242.

Gershenson, S., Hart, C., Hyman, J., Lindsay, C., & Papageorge, N. W. (2018). *The long-run impacts of same-race teachers* (No. w25254). National Bureau of Economic Research.

Gershenson, S., Holt, S. B., & Papageorge, N. W. (2016). Who believes in me? The effect of student–teacher demographic match on teacher expectations. *Economics of Education Review*, *52*, 209-224.

Holt, S. B., & Gershenson, S. (2019). The impact of demographic representation on absences and suspensions. *Policy Studies Journal*, *47*(4), 1069-1099.

Irvine, J. J. (1989). Beyond role models: An examination of cultural influences on the pedagogical perspectives of Black teachers. *Peabody Journal of Education*, *66*(4), 51-63.

Jackson, C. K. (2018). What do test scores miss? The importance of teacher effects on non–test score outcomes. *Journal of Political Economy*, *126*(5), 2072-2107.

Joshi, E., Doan, S., & Springer, M. G. (2018). Student-teacher race congruence: New evidence and insight from Tennessee. *AERA Open*, *4*(4), 2332858418817528.

Kane, T. J., & Staiger, D. O. (2012). Gathering Feedback for Teaching: Combining High-Quality Observations with Student Surveys and Achievement Gains. Research Paper. MET Project. *Bill & Melinda Gates Foundation*.

Kane, T. J., McCaffrey, D. F., Miller, T., & Staiger, D. O. (2013). Have we identified effective teachers? Validating measures of effective teaching using random assignment. In *Research Paper. MET Project. Bill & Melinda Gates Foundation*

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American educational research journal*, *32*(3), 465-491.

Lim, J., & Meer, J. (2019). Persistent effects of teacher-student gender matches. *Journal of Human Resources*, 0218-9314R4.

Lindsay, C. A., & Hart, C. M. (2017). Exposure to same-race teachers and student disciplinary outcomes for Black students in North Carolina. *Educational Evaluation and Policy Analysis*, *39*(3), 485-510.

Lusher, L., Campbell, D., & Carrell, S. (2018). TAs like me: Racial interactions between graduate teaching assistants and undergraduates. *Journal of Public Economics*, *159*, 203-224.

Papageorge, N. W., Gershenson, S., & Kang, K. M. (2020). Teacher expectations matter. *Review of Economics and Statistics*, *102*(2), 234-251.

Penney, J. (2017a). Racial interaction effects and student achievement. *Education Finance and Policy*, *12*(4), 447-467.

Penney, J. (2017b). An instructor like me: Uncovering the channels of racial interactions. Unpublished manuscript.

Rockoff, J. E., Jacob, B. A., Kane, T. J., & Staiger, D. O. (2011). Can you recognize an effective teacher when you recruit one?. *Education finance and Policy*, *6*(1), 43-74.

Rothstein, J. (2010). Teacher quality in educational production: Tracking, decay, and student achievement. *The Quarterly Journal of Economics*, *125*(1), 175-214.

Todd, P. E., & Wolpin, K. I. (2003). On the specification and estimation of the production function for cognitive achievement. *The Economic Journal*, *113*(485), F3-F33.

Appendix

Table A1. Descriptive Statistics

Panel A: Student Characteristics	Mean	St. deviation	Min	Max
Black	0.21	0.41	0.00	1.00
Hispanic	0.40	0.49	0.00	1.00
White	0.28	0.45	0.00	1.00
Other race	0.11	0.31	0.00	1.00
Male	0.48	0.50	0.00	1.00
English Language Learner (ELL)	0.14	0.34	0.00	1.00
Gifted Status	0.10	0.30	0.00	1.00
Special Education Status	0.07	0.25	0.00	1.00
Free and Reduced-Price Lunch Eligibility	0.60	0.49	0.00	1.00
Student Age	10.48	1.51	7.62	14.56
Prior Math Test Scores	0.25	0.91	-3.00	3.17
Prior English Test Scores	0.25	0.94	-2.93	2.87
Panel B: Teacher Characteristics				
Black	0.26	0.44	0.00	1.00
White	0.74	0.44	0.00	1.00
Male	0.17	0.37	0.00	1.00
Experience within district	8.26	7.34	0.00	41.00
Master degree	0.27	0.45	0.00	1.00
Prior Teaching Practices FFT: Communication	2.62	0.35	1.59	3.50
Prior Value-Added	0.09	0.216	-1.06	0.67
Panel C: Outcomes				
Communication	0.06	0.91	-4.49	1.77
Student beliefs	0.02	0.84	-1.56	1.78
Teacher expectations	0.03	0.67	-3.50	0.95
Clarify	0.04	0.59	-3.31	1.43
Confer	0.02	0.68	-3.62	1.36
Care	0.06	0.79	-3.27	1.44
Consolidate	0.05	0.79	-2.54	1.20
Captivate	0.03	0.79	-2.51	1.24

Notes: The sample size is 5,579 and comprises data on the 2010-2011 school year in which teacher were randomly assigned to classes within randomization blocks.

Table A2. Teacher Characteristics and Quality

	Years of Experience	Master Degree	Prior Teaching Practices FFT: Communication Math	Prior Teaching Practices FFT: Communication English	Prior Value-Added in Math	Prior Value-Added in English
	(1)	(2)	(3)	(4)	(5)	(6)
Black mean	6.84	0.49	2.58	2.61	0.035	-0.003
White mean	8.73	0.21	2.65	2.70	0.009	0.003
P values	0.110	0.000	0.460	0.198	0.217	0.441
Observation	383	416	211	253	213	252

Notes: Tables report means of teacher characteristics by race. P-values are taken from the Kolmogorov-Smirnov test.

Table A3. "7C" Student Perception Correlations and Factor Loadings

	Clarify	Care	Confer	Consolidate	Captivate	Challenge	Control	Communic. loadings	Strictness loadings
Clarify	1							0.8597	0.0230
Care	0.7373	1						0.7956	0.0771
Confer	0.7219	0.6788	1					0.8407	-0.0781
Consolidate	0.5664	0.5371	0.5836	1				0.6606	0.0007
Captivate	0.5175	0.5022	0.4713	0.4124	1			0.5498	0.1559
Challenge	0.4552	0.3860	0.4551	0.3171	0.2435	1		0.5407	-0.1646
Control	0.4869	0.4478	0.4089	0.3246	0.3409	0.2551	1	0.4998	0.1175
Observations				10,727					

Note: The first seven columns show correlations between "7C" student perception components of teaching practices. The last two columns present factor loadings from exploratory factor analysis after performing an oblique rotation and keeping the first two factors. The first factor explains 55% of the variance in the data, and the second explains another 11% of variance.

Table A4. Balance Tests

Outcome = Same-Race Teacher	Black students		White students	
	English (1)	Math (2)	English (3)	Math (4)
Prior test score	-0.024	-0.031	0.008	0.006
	(0.016)	(0.021)	(0.09)	(0.012)
English language learner	-0.107	-0.067	0.005	-0.046
status	(0.144)	(0.099)	(0.09)	(0.039)
Free or reduced-price	-0.021	0.001	0.003	-0.008
lunch eligibility	(0.026)	(0.027)	(0.024)	(0.015)
'Gifted' status	0.038	0.070	0.000	0.031
	(0.063)	(0.063)	(0.031)	(0.026)
Male Student	-0.021	0.013	-0.014	0.003
	(0.020)	(0.016)	(0.018)	(0.018)
SPED Student	0.001	-0.041	0.014	-0.006
	(0.045)	(0.056)	(0.031)	(0.019)
Observations	1,050	875	1,032	807
R-squared	0.6465	0.6975	0.5621	0.7348
Joint test F-statistics	0.75	1.24	0.22	0.76
[p-value]	0.6125	0.2929	0.9697	0.6064

Notes: The dependent variable is an indicator for being taught by a same-race teacher in 2011, regressed on student characteristics, controlling for randomization block or school by grade by subject fixed effects. Standard errors in parentheses are clustered at the level of randomization block.

Table A5. Non-Compliance of Students to Classes Taught by Randomly Assigned Math Teachers

Outcome = Non-complier	Math Classes (1)	English Classes (2)
Black Teacher	0.025	0.016
	(0.029)	(0.023)
Male Teacher	0.012	0.083
	(0.021)	(0.064)
Prior Value-Added	-0.026	0.050
	(0.051)	(0.058)
Teacher Experience	0.003*	-0.001
	(0.002)	(0.001)
Prior Classroom Average Test Score	0.013	0.007
	(0.038)	(0.039)
Fraction of Black students	0.031	0.066
	(0.181)	(0.198)
Fraction of Hispanic students	-0.079	0.003
	(0.117)	(0.202)
Fraction of Other-race students	-0.056	0.328
	(0.101)	(0.304)
Fraction of ELL students	-0.099	-0.121
	(0.101)	(0.130)
Fraction of 'Gifted' students	-0.119	-0.054
	(0.211)	(0.106)
Fraction of Male students	-0.008	-0.020
	(0.121)	(0.198)
Fraction of FRL students	0.117	-0.029
	(0.158)	(0.090)
Classroom SPED students	0.048	0.138
	(0.155)	(0.158)
Observations	5,156	5,861
R-squared	0.7212	0.6426
F-statistic	0.73	0.42
p-value	0.7434	0.9656

Note: This table reports the results from the one regression in which the outcome variable is non-compliance status of students, which equals one if student is a non-complier and zero otherwise. Non-compliers are students who were initially assigned to a class with randomly assigned teachers but specifically opted out for another class or school. Students who were initially assigned to classes taught by teachers with more experience are more likely to be non-compliers. The impact of these variables is jointly insignificant (F-statistics= 0.73, p-value is 0.7434)

Table A6. The Effect of a Same-Race Teacher on English Test Scores

Specifications	Value-added		Test score gain	
	(1)	(2)	(3)	(4)
Black T × Black S	-0.001	-0.026	0.068	0.053
	(0.051)	(0.053)	(0.054)	(0.057)
Black T × White S	-0.101	-0.133*	-0.162**	-0.181**
	(0.072)	(0.073)	(0.008)	(0.081)
White T× White S	0.004	0.005	-0.055	-0.056
	(0.043)	(0.043)	(0.047)	(0.047)
Male Teacher		-0.059		-0.049
		(0.058)		(0.063)
Prior Teacher Value-Added		0.064		0.014
		(0.138)		(0.160)
Teacher Experience Within School District		0.006**		0.003
		(0.003)		(0.002)
Prior Teaching Practices FFT: Communicate		-0.095		-0.069
		(0.072)		(0.073)
R-squared	0.683	0.684	0.163	0.164
Observations	2,052	2,052	2,052	2,052

Notes: The comparison group is Black students taught by White teachers. Models include controls for student predetermined characteristics, including student prior test score, ELL status, SPED status, 'gifted' status, gender, free and reduced-price lunch eligibility, and randomization block fixed effects. Standard errors in parentheses are clustered at the level of randomization block. $^{*}p < .10$, $^{**}p < .05$, $^{***}p < .01$ (two-tailed tests)

Table A7. The Effect of a Same-Race Teacher on Math Test Score: Specification with Two Lags

Outcome= Math Test Score	(1)	(2)	(3)	(4)
Black T × Black S	0.137*	0.203**	0.131*	0.196**
	(0.076)	(0.087)	(0.078)	(0.089)
Black T × White S	0.034	0.010	0.028	0.005
	(0.077)	(0.086)	(0.078)	(0.088)
White T× White S	-0.004	-0.059	0.001	-0.059
	(0.043)	(0.047)	(0.043)	(0.047)
Male Teacher			-0.036	-0.011
			(0.055)	(0.061)
Teacher Experience Within School District			-0.002	-0.001
			(0.003)	(0.003)
Prior Teaching Practices FFT: Communicate			-0.035	0.025
			(0.068)	(0.078)
R-squared	0.755	0.161	0.755	0.161
Observations	1,180	1,180	1,180	1,180

Table A8. Heterogeneity of the Effect of a Same-Race Teacher on Communication: by Student Characteristics

	Both Subjects (1)	English Classes (2)
Black T × Black S (Same-race teacher)	0.433*** (0.133)	0.397** (0.171)
Same-race teacher × Prior Test Score	-0.093* (0.054)	-0.134** (0.064)
Same-race teacher × FRL Status	-0.155* (0.090)	-0.126 (0.129)
Same-race teacher × Male Student	-0.103 (0.066)	-0.137 (0.099)
Same-race teacher × English Learner Status	0.127 (0.550)	0.459*** (0.162)
Same-race teacher × Gifted Status	0.479** (0.199)	0.354 (0.228)
Observations	5,372	2,973
R-squared	0.188	0.202

Notes: The comparison group is Black students taught by White teachers. Models include controls for predetermined student characteristics, including prior test scores, student ELL status, SPED status, 'gifted' status, free and reduced-price lunch eligibility, teacher gender, prior value-added, prior observed teaching practices in communication, and randomization block fixed effects. The first column additionally controls for subject fixed effects. Standard errors in parentheses are clustered at the level of randomization block. . $^*p < .10$, $^{**}p < .05$, $^{***}p < .01$ (two-tailed tests)

Table A9. The Effect of Same-Race Teachers on Communication Effectiveness: Robustness Check

Panel A. English classes

Outcome = Communication	(1)	(2)	(3)	(4)
Same-Race teacher (Black T × Black S)	0.326**	0.356**	0.343**	0.332***
	(0.163)	(0.157)	(0.151)	(0.151)
Teacher experience		-0.015**	-0.015**	-0.002
		(0.007)	(0.007)	(0.003)
Prior Value-Added			0.746*	0.770*
			(0.433)	(0.428)
Prior Teaching Practices FFT Communication				-0.094
				(0.201)
Observations	2,970	2,970	2,970	2,970
R-squared	0.193	0.199	0.204	0.205

Panel A. Math classes

Outcome = Communication	(1)	(2)	(3)	(4)
Same-Race teacher (Black T × Black S)	0.335**	0.295**	0.287**	0.280*
	(0.140)	(0.141)	(0.141)	(0.142)
Teacher experience		-0.014**	-0.015**	-0.015**
		(0.007)	(0.007)	(0.007)
Prior Value-Added			0.174	0.149
			(0.409)	(0.399)
Prior Teaching Practices FFT Communication				0.053
				(0.154)
Observations	2,364	2,364	2,364	2,364
R-squared	0.192	0.197	0.198	0.198

Notes: The comparison group is Black students taught by White teachers. Controls include prior test scores, student gender, ELL status, SPED status, 'gifted' status, teacher gender, and randomization block fixed effects. Standard errors in parentheses are clustered at the randomization block level. $^{**}p < .05$, $^{***}p < .01$ (two-tailed tests).

Table A10. Correlations between Teacher FE and Teacher Characteristics

	Teacher FE				
	(1)	(2)	(3)	(4)	(5)
Black Teacher	0.032	0.043	0.094	0.118	0.232
	(0.175)	(0.182)	(0.281)	(0.187)	(0.373)
Taught in predominantly black classes		0.104			
		(0.329)			
Content Knowledge Test			0.002		
			(0.013)		
Principal Survey Rating (PSVY)				0.103	
				(0.064)	
Experience					-0.075
					(0.074)
Observations	111	111	99	102	55
R-squared	0.6060	0.6064	0.6075	0.6227	0.7035

Notes: The subsample includes randomized teachers. Teacher fixed effects are calculated from the regression of communication on teacher fixed effects controlling for student characteristics.

Abstrakt

Dřívější studie o dopadech rozdílnosti rasy učitele a studentů ukázaly, že studenti vyučovaní učiteli stejné rasy mají lepší výsledky státních zkoušek. Nicméně jen velmi málo je známo o tom, zda pozitivní dopad platí i pro behaviorální výsledky. S použitím náhodného přiřazení učitelů do různých veřejných škol v USA v rámci projektu Measures of Effective Teaching (MET) ukazuji, že učitelé stejné rasy zvyšují efektivitu komunikace se studenty černé barvy pleti. Zjišťuji, že tento efekt je dán lepším vysvětlením a následným pochopením probírané látky. To je v souladu s literaturou o kulturně relevantní pedagogice. Zároveň nenacházím empirické důkazy podporující možná alternativní vysvětlení pozitivního efektu shodné rasy učitele a studentů: i) obecně vyšší schopnosti černošských učitelů vysvětlit látku a ii) učitel věnuje více pozornosti žákům stejné rasy.

Pochopení dopadů shodné rasy je důležité, jelikož behaviorální výsledky předvídají úspěch studentů v dlouhodobém horizontu. Výsledky mohou dále naznačovat, že školení učitelů patřících k většinové populaci v oblasti kulturně relevantní pedagogiky může zvýšit výkonnost znevýhodněných studentů. Školení může v krátkém období doplňovat diverzifikaci učitelské pracovní síly.

Klíčová slova: učitel stejné rasy, komunikace učitel-student, očekávání učitele, přesvědčení studenta