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Understanding Racial/Ethnic Diversity Gaps Among Early Career Teachers

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The growing evidence on the importance of teacher representation points to the need to better understand the factors shaping the lack of racial/ethnic diversity in the teacher workforce. In this study, we examine the extent to which college major choice explains racial/ethnic gaps in teaching. Drawing on data from the Baccalaureate and Beyond Longitudinal Study, we find that White college graduates are close to twice as likely to major in education compared to Black, Latinx, and other graduates of color. Even among college graduates, respondents who identify as White are 5 percentage points more likely to enter teaching than respondents who identify as Black and 2 percentage points more likely to enter teaching than graduates who identify as Latinx. Regression and decomposition analyses demonstrate that the observed racial/ethnic gaps in entry to teaching can largely be explained by whether a graduate studied education in college.

Keywords: *diversity, educational policy, regression analyses, secondary data analysis, teacher education/development*

Introduction

A WAVE of recent literature attests to the unique educational contributions extended to students when assigned to a teacher of one's own race or ethnicity. Being assigned to a same-race teacher is linked with more positive teacher perceptions of students (Dee, 2005; Fox, 2016; Gershenson, Holt, & Papageorge, 2016; McGrady & Reynolds, 2013; Ouazad, 2014) as well as student outcomes as varied as attendance (Holt & Gershenson, 2015), disciplinary infractions (Lindsay & Hart, 2017), assignment to gifted and talented programs (Grissom & Redding, 2016), and student achievement (Dee, 2004; Egalite, Kisida, & Winters, 2015; Joshi, Doan, & Springer, 2018; Yarnell & Bohrnstedt, 2018). The benefits of racial congruence are particularly pronounced for Black students (e.g., Fox, 2016; Grissom & Redding, 2016), a point underscored by a recent study by Gershenson, Hart, Lindsay, and Papageorge (2017) that finds long-lasting benefits for Black students in terms of graduating from high school.

Despite the importance of representation for underserved as well as other student populations (Grissom, Kern, & Rodriguez, 2015; Irvine, 1989; Quiocho & Rios, 2000; Villegas & Irvine, 2010; Zeichner, 2003), teaching remains a predominantly White and female profession (Guarino, Santibañez, & Daley, 2006). In the 2011–2012 school year, 82.7% of teachers identified as White, but only 51% of students identified as White (Ingersoll & Merrill, 2017). While teachers who identify as Latinx or Asian now fill a larger share of the teacher workforce than in previous decades, data from the Schools and Staffing Survey indicate that the percentage of Black teachers has decreased from 7.5% in the 1987–1988 school year to 6.4% in the 2011–2012 school year. Researchers have attributed the lack of racial/ethnic diversity in the teacher workforce to three main factors: (a) inequitable educational opportunities for students from historically underserved racial/ethnic groups, (b) labor market discrimination, and (c) differential attrition among teachers of color (B. B. Flores, Clark, Claeys, & Villarreal, 2007; Ingersoll & May, 2011; Madkins, 2011; Torres, Santos, Peck, & Cortes, 2004). Underlying all three of these potential motivating factors is a historical trend of policies created with the express purpose of minimizing the number of teachers of color (Carter Andrews et al., 2019).[1]

First, the lack of access to high-quality educational opportunities for traditionally underserved students results in their lower rates of high school graduation, college attendance, persistence, and graduation (Snyder, de Brey, & Dillow, 2016). It remains to be seen, however, if conditional on college graduation, people of color are still less represented in

the teacher workforce and if there is a gap, what factors may explain it. Second, features of the licensure and hiring process may restrict access to teaching for aspiring teachers of color. Prospective teachers who identify as Black or Latinx tend to score lower on licensure exams, which can limit access to the credentials needed to become a teacher (Angrist & Guryan, 2008; Goldhaber & Hansen, 2010; Petchauer, 2012; Tyler, 2011). District hiring procedures—including the lack of targeted hiring of candidates of color or discriminatory hiring protocol—may provide an additional barrier (D'Amico, Pawlewicz, Earley, & McGeehan, 2017; Koniske-Graf, Partelow, & Benner, 2016). Finally, teachers of color are more likely to work in hard-to-staff schools with more challenging working conditions, conditions that predict higher attrition rates (Achinstein, Ogawa, Sexton, & Freitas, 2010; Ingersoll & May, 2011).

An additional explanation that has received less attention in the literature is that people of color are becoming less likely to choose teaching as a career, a decision that often begins with the selection of a college major. There is some evidence that increased labor market opportunities for Black college graduates in recent decades have led fewer to select a career in teaching (Bacalod, 2007). A recent report by the U.S. Department of Education (2016) and follow-up report by the Brookings Institute and National Council on Teacher Quality (Putnam, Hansen, Walsh, & Quintero, 2016) provide further evidence of this proposition, pointing to racial differences in enrollment in education programs, with 8% of White students enrolled in a baccalaureate program majoring in education compared to 5% of Black students and 6% of Latinx students.

In this paper, we identify the factors of a graduate's undergraduate education, such as their college major or participation in teacher preparation activities, that are related to whether someone becomes a teacher in the years following college graduation. To motivate the importance of these educational activities in shaping the transition into the teaching profession, we document racial/ethnic gaps in majoring in education and entry into teaching among recent college graduates and investigate the extent to which other characteristics and experiences are associated with who becomes a teacher. With recent research presenting a clear need for more teachers of color, understanding how these educational features differentially predict who pursues teaching in the years following college graduation is a critical first step in crafting policy interventions to ameliorate the underrepresentation of racial/ethnic minority graduates in the teacher labor force. Importantly, by focusing our analysis on recent college graduates, we implicitly account for racial/ethnic disparities in educational attainment, allowing us to highlight elements of the teacher education pipeline that could be changed to improve the racial/ethnic diversity of the teacher workforce.

Literature Review

Who Majors in Education

Majoring in education is one of the strongest indicators of whether a college student will enter the teaching profession (Henke, Chen, & Geis, 2000). Evidence suggests that students differ in their major choice due to varying amounts of academic preparation, labor market discrimination leading to differential pecuniary benefits depending on individual characteristics, different preferences or tastes, and inhospitable climates associated with certain fields (Dickinson, 2010; Speer, 2017; Wiswall & Zafar, 2015). Some research on college major choice has found that women and students of color are more likely to major in fields like education when compared to their White male peers both when first enrolling and at graduation when controlling for prior student achievement and student background characteristics (e.g., Dickinson, 2010). However, other research (e.g., Ma, 2009) has found more mixed evidence. Holding all else constant, Ma (2009) found that compared to White women, Asian and Black women were more likely to major in technical, life/health sciences, and business fields instead of social sciences/education. The author also found that Asian women were more likely to major in the humanities. Men were more likely to major in technical, business, and humanities fields and less likely to major in life/health sciences fields.

The gender and racial/ethnic findings on education major choice are difficult to reconcile due to the methodological decisions required of the prior research. Researchers generally must group majoring in education with other fields of study, which can complicate the interpretation of findings. For example, Dickinson (2010) includes education in the "humanities and other majors" group, which also includes: architecture, fine arts, general studies, humanities, individualized/interdisciplinary, military sciences, other, social work, and technical/vocational. Ma (2009) includes education in the "social science/education" group and does not delineate what fields are included within that category. It is difficult to tease out if these findings are about majoring in education or majoring in the broader categories.

An exception to this major classification pattern is Speer's (2017) study of racial and gender gaps in college majors using data from the 1979 and 1997 iterations of the National Longitudinal Survey of Youth. Speer examined gender major gaps by using a measure of the average number of credits students completed in six fields—math, humanities, business, social science, education, and science/engineering—linked to the final major of the student (collected from Baccalaureate and Beyond). The author found that even when controlling for precollege test scores (Armed Services Vocational Aptitude Battery), there remained a consistent gender gap in who majored in fields that required more education courses. While the author did not examine any interactions between race and gender, supplementary analysis did

show that Black students were also less likely to major in a field that required more education courses when compared to White students. This work, while usefully including an outcome measure specifically focused on completion of education courses, did not specifically study the actual behavior of majoring in college and did not allow for interactions in the relationship between race and gender.

Also, researchers using multiple linear regression must select a reference group for both the major choice variables and the student demographic variables. The prior research on major choice is not consistent on these selections. For example, Dickinson (2010) does not include the education major category as the reference group in a multinomial logistic regression. Therefore, the findings give evidence on selection of education as a major compared to one other category (instead of all other major options). The findings are also difficult to interpret when White men was used for the reference group as our field of interest is predominantly comprised of women (and researchers rarely test for significant differences across regression coefficients).

Scholars have found that on average, gender differences explain more of the variation in major choice than racial/ethnic identity (e.g., Dickinson, 2010). There has been consistent evidence that women, on average, are more likely to choose a major linked to lower-salary occupations than men (e.g., Goyette & Mullen, 2006; Zafar, 2013). Zafar (2013) investigated the gender differences in selecting a college major at Northwestern University. He found that the primary differences in major choice selection between men and women in the sample were driven by male students' prioritization of monetary benefits. Porter and Umbach (2006) found that students' personalities and preferences have a strong relationship with their major choice. Wiswall and Zafar (2015) found a similar relationship; students' "taste" for a certain major was the most significant predictor of their major selection.

Qualitative accounts of students' experiences in traditional, university-based teacher preparation programs indicate that the climate of these programs may have a bearing on students' decision to major in education. While teacher educators have worked to create better recruitment and training for college students of color (Darling-Hammond, 2010), teacher preparation programs are often implicitly geared toward the majority-White student populations (Sleeter, 2001). Recent research has also described how prospective teachers of color in preservice programs are met with a curriculum that does not reflect their ethnoracial experiences, in addition to facing overt and covert racism (Bristol & Goings, 2019; Brown, 2009; Endo, 2015; Frank, 2003; Sleeter & Milner, 2011; Woodson & Pabon, 2016). All of this research links to major selection as students of color attending predominantly White institutions, including those who are interested in becoming teachers, may decide not to major in education because of the climate of these programs (Carter Andrews et al., 2019).

Therefore, prior research suggests that when controlling for other demographic characteristics and collegiate experiences, gender and race/ethnicity are still associated with students' decision to major in education. Though, due to the previously outlined methodological variation, the direction of the relationship is not consistent across prior research. Further, even when controlling for concerns about future earnings, scholars have found that students' preference for a specific major is the primary predictor of whether the students will pursue that major.

Racial Identity and Selection Into the Teaching Profession

Historically, scholars have attributed the underrepresentation of teachers of color to inequitable educational opportunities for students from historically underserved racial/ethnic groups, insufficient recruitment of these college students of color by teacher education programs, testing and training requirements (coupled with insufficient training by education programs for these standards), outright discrimination in the hiring process (D'Amico et al., 2017; Koniske-Graf et al., 2016), and the increasing availability of other, more desirable occupations (Bacolod, 2007). Other research has found suggestive evidence that Black and Latinx college graduates with above average amounts of undergraduate student loans are less likely to become teachers (Baker, Lindsay, & Lockard, 2018).

Part of the low number of teachers of color and decline in the share of Black teachers is attributed to the opening of other occupations with more desirable pecuniary and nonpecuniary benefits (Bacolod, 2007). This finding creates a difficult tension as teachers of color are more likely to work and persist in high-need schools with significant numbers of students of color (Reininger, 2012; Villegas & Irvine, 2010). Those individuals of color who do become teachers often report making that decision because of a desire to help other racial/ethnic minority students have the opportunity to better their lives (see Villegas & Irvine, 2010, for an overview).

There are examples of how teacher preparation programs can make structural changes to improve the recruitment, preparation, and retention of racial/ethnic minority teacher candidates, although evidence on the efficacy of these approaches is just emerging. One promising approach is offering baccalaureate degrees in education at community colleges or forming partnerships between four-year institutions and community colleges (Baum, Little, & Payea, 2011; B. B. Flores et al., 2007). Alternative certification programs that offer a pathway into teaching outside of a standard four- or five-year university-based program might provide an appealing pathway into teaching for many teachers of color (Humphrey & Wechsler, 2007; Redding & Smith, 2016; Sleeter & Milner, 2011).

In this paper, we draw on data from the Baccalaureate and Beyond Longitudinal Study, 2008 (B&B:2008) to examine

the extent to which there are racial/ethnic differences in majoring in education and entrance into teaching in the years following college graduation and the factors that may explain these gaps. We ask three research questions:

Research Question 1: To what extent are Black, Latinx, and other college graduates of color more or less likely than White college graduates to major in education or enter teaching in the four years following graduation?

Research Question 2: To what extent do background characteristics of recent college graduates or the characteristics of their undergraduate institutions explain racial/ethnic differences in college major or entry into teaching?

Research Question 3: To what extent do undergraduate preparation activities such as enrollment in teacher preparation programs, student teaching, and teacher certification exams explain this gap in entry into teaching?

Data and Measurement

In this study, we draw on the Baccalaureate and Beyond 2008 cohort (B&B:08/12). Administered by the National Center for Education Statistics (NCES), B&B:08/12 is a nationally representative, longitudinal survey of students who graduated with a baccalaureate degree between July 1, 2007, and June 30, 2008. Participants were interviewed during the 2007–2008 academic year, in the year following graduation, and again four years after graduation. As the current survey only follows participants in the immediate years following graduation, our results only generalize to recent college graduates and therefore overlook delayed entrants into teaching. Yet, unlike the Schools and Staffing Survey that only studies individuals who have entered the teaching profession, this data set provides the unique opportunity to follow teachers from college and examine the factors predictive of a decision to begin their career as a teacher. An additional benefit of this survey is that a subset of respondents completed supplemental questions if they indicated an interest in a career in teaching. We draw on this survey to build on our main analysis.

A limitation of this survey, as with most federally administered surveys, is that data are missing for key dependent and independent variables of interest. To account for the approximately 15% of values that are missing for some independent variables, we use multiple imputation to account for this missing data. After dropping 2,580 cases missing our two dependent variables and imputing missing values, our analytic sample includes the 13,320 respondents who remained responsive to the surveys over time. When we focus on individuals who report an interest in a career in teaching, the sample is limited to 2,390 respondents. All sample sizes are rounded to the nearest 10 in accordance with NCES nondisclosure guidelines. Panel survey weights are used in all analyses. Additional details on the construction of the analytic sample are included in the supplementary file available online.

Measures

This study uses two dependent variables. The first dependent variable indicates whether a graduate majored in education. The second dependent variable for this study indicates whether the respondent had worked as a regular, itinerant, support, or long-term substitute teacher between graduation from college and the 2012 follow-up interview. The main independent variable of interest is an indicator for whether respondents identify as White, Black, Latinx, or other race (Asian, American Indian/Alaska Native, other, or two or more races). We make these general distinctions as the majority of the research on this topic has focused on the experiences of prospective Black and Latinx teachers. To supplement our main analysis of this overly general category of other race graduates, in supplementary analyses reported in the online appendix, we separate our main results for Asian, multiracial, and American Indian/Alaska Native and other graduates. Other variables include demographic characteristics (gender, age, marital status, number of dependents, and mother's highest education level), undergraduate institution characteristics (public, Historically Black College/University [HBCU], selectivity, in the same state as the respondent's legal residence), and the undergraduate educational experience (bachelor's in education, college entrance exam, employment during college, ever switched major, and cumulative loans borrowed). We selected these variables based on the review of the literature focused on the individual and institutional characteristics associated with becoming a teacher. Of particular interest in this set of variables is the indicator of whether a respondent earned his or her bachelor's in education, which we expect to have a strong relationship with becoming a teacher. We recognize that this variable is not limited to those within teacher preparation programs. As a result, we interpret this variable similar to others, as a proxy for interest in a career in teaching (Putnam et al., 2016). To ensure that we do not adjust for variables measured after a respondent graduated or begins teaching, all variables are measured during the baseline survey.

Additional variables include activities specifically related to the preparation for a career in teaching. These preparation activities include entrance to a teacher education program, completion of student teaching, completion of the PRAXIS or other teacher certification exam, and application to a nontraditional or alternative teacher program. Given that only a subset of respondents answer these questions and that the questions themselves do not reflect policy relevant outcomes

(e.g. completion of teacher preparation program, passing teacher certification exam), we view the analysis of these preparation variables as exploratory. The specific measurement of each variable is described in greater detail in Table 1.

Data Analysis

To document racial/ethnic gaps in majoring in education and the entry to teaching and the factors related to these gaps, we rely on regression and decomposition analyses. We begin with a basic mediation analysis (Baron & Kenny, 1986). Through this analysis, we model the role that majoring in education plays in becoming a teacher and how this relationship differs by teacher racial identity. We use a linear probability model (LPM) to estimate the factors associated with majoring in education and entry into teaching in the four years following college graduation. The first of this series of LPMs can be expressed as:

$$\Pr\left(BA\ education\right)_i = \beta_0 + \beta_1 race_i + \boldsymbol{D}_i\beta_2 + \boldsymbol{I}_{ij}\beta_3 + \boldsymbol{E}_i\beta_4 + \gamma_k + e_{ijk}, \quad (1)$$

where the probability of earning a bachelor's in education is a function of the graduate's self-identified race/ethnicity ($race_i$), a vector of demographic characteristics ($\boldsymbol{D}_i$), a vector of the institution characteristics from their graduating institution ($\boldsymbol{I}_{ij}$), a vector of variables related to their undergraduate education ($\boldsymbol{E}_i$), a fixed effect for the state where the graduate graduated college (γ_k) to adjust for state-level conditions such as labor market conditions and teacher certification requirements that likely influence whether a college graduate enters teaching, and an error term (e_{ijk}).

Next, we estimate a corresponding model predicting entry to teaching within four years after graduating from college. This model can be written:

$$\Pr\left(teacher\right)_i = \beta_0 + \beta_1 race_i + \boldsymbol{D}_i\beta_2 + \boldsymbol{I}_{ij}\beta_3 + \boldsymbol{E}_i\beta_4 + \gamma_k + e_{ijk}. \quad (2)$$

We extend this model by controlling for earning a bachelor's in education to understand the extent to which undergraduate major mediates the relationship between racial/ethnic identity and entry into teaching. If the estimated differences between White and Black, Latinx, and other graduates of color decrease or lose statistical significance, it would provide evidence that becoming a teacher is mediated by whether they majored in education. The results from the LPM are comparable in direction and level of significance to logistic regression models.

We present the LPM results for ease of interpretation and comparability to mean differences and decomposition results across tables presented in the paper. All models are estimated with heteroskedastic-robust standard errors.

A limitation of this mediation analysis is that it does not indicate how differences in individual or groups of characteristics contribute to gaps in entry into teaching between Black and White and Latinx and White graduates, respectively. To better understand the extent to which these factors explain the racial gaps in entry into teaching, we decompose the White-Black, White-Latinx, and White-other race gaps using a nonlinear decomposition method developed by Fairlie (2005) and extended by Sinning, Hahn, and Bauer (2008).

This decomposition method has been used to understand turnover gaps among charter and traditional public school teachers (Stuit & Smith, 2012), gender gaps in access to elite higher education institutions (Bielby, Posselt, Jaquette, & Bastedo, 2014), and racial gaps in college completion (S. M. Flores, Park, & Baker, 2017). Similar to the Blinder-Oaxaca decomposition for linear regression models, this analytic approach decomposes intergroup differences as a function of observable characteristics and the differential due to the difference in coefficient estimates (Fairlie, 2005). This decomposition can be expressed as:

$$\bar{Y}_A - \bar{Y}_B = \left[\sum_{i=1}^{N_A}\frac{F\left(X_{iA}\hat{\beta}_A\right)}{N_A} - \sum_{i=1}^{N_B}\frac{F\left(X_{iB}\hat{\beta}_A\right)}{N_B}\right] + \left[\sum_{i=1}^{N_B}\frac{F\left(X_{iB}\hat{\beta}_A\right)}{N_B} - \sum_{i=1}^{N_B}\frac{F\left(X_{iB}\hat{\beta}_B\right)}{N_B}\right], \quad (3)$$

where the average difference in entry into teaching between racial groups *A* and *B* ($\bar{Y}_A - \bar{Y}_B$) is decomposed into variation in measured group differences for covariates in the model (the first bracketed term) and variation based on differential due to coefficient differences (the second bracketed term). *F* is the cumulative distribution function from logistic regression predicting entry into teaching as a function of demographic characteristics, characteristics of the graduate's undergraduate institution, and variables related to respondents' undergraduate education. *N* is the sample size for the graduate's race or ethnicity. In this model, coefficients indicate the variable's contribution to the gap in entry to teaching.

Results

Describing Racial/Ethnic Gaps in Majoring in Education and Entry Into Teaching

We begin by presenting conditional means by race/ethnicity for graduates' demographic characteristics, undergraduate institution characteristics, and undergraduate education, including preparation to enter teaching. We use *t* tests to examine evidence of statistically significant differences between White college graduates and Black, Latinx, and other graduates of color, respectively. With regards to our first research question concerning rates of graduating

TABLE 1
Definition of Measures

Bachelor's in education	A dichotomous variable where 1 = majored in education and 0 = majored in another field.
Worked as teacher four years after graduation	A dichotomous variable where 1 = worked as a regular, itinerant, support, or long-term substitute teacher as the 2012 follow-up interview and 0 = have not worked as a teacher.
Demographic characteristics	
Race/ethnicity	A categorical variable where 0 = White, 1 = Black, 2 = Latinx, and 3 = other race (Asian, American Indian/Alaska Native, other, or two or more races).
Female	A dichotomous variable where 1 = female and 0 = male.
Under 30 years old	A dichotomous variable where 1 = individual is 30 years of age or younger and 0 = individual is older than 30 at time of bachelor's degree receipt.
Married	A dichotomous variable where 1 = married and 0 = single, never married, separated, divorced, or widowed in 2007–2008.
No dependents	A dichotomous variable where 1 = no dependents and 0 = more than one dependent in 2007–2008.
One dependent	A dichotomous variable where 1 = one dependent and 0 = no dependents or more than one dependent in 2007–2008.
Two or more dependents	A dichotomous variable where 1 = two or more dependents and 0 = less than two dependents in 2007–2008.
Mother's highest education level	A categorical variable ranging between 0 and 4, indicating mother's highest education level in 2007–2008; education levels include did not complete high school, high school diploma or equivalent, some college/associate's degree, bachelor's degree, and master's degree or higher.
Undergraduate institution characteristics	
Public	A dichotomous variable where 1 = bachelor's degree–granting institution is a public college/university and 0 = bachelor's degree–granting institution is a private college/university.
Historically Black College/University	A dichotomous variable where 1 = bachelor's degree–granting institution is Historically Black College/University (HBCU) and 0 = graduate from another college/university.
Selective admissions	A dichotomous variable where 1 = bachelor's degree–granting institution is very selective and 0 = moderately selective, minimally selective, open admission, or not public or private nonprofit 4-year institution. The variable SELECTV2 was used to generate this measure.
Attend institution in state of legal residence	A dichotomous variable where 1 = attended institution in state of legal residence and 0 = attended institution not in state of legal residence in 2007–2008.
Undergraduate education	
Bachelor's in education	A dichotomous variable where 1 = majored in education and 0 = majored in another field.
Employment during college	A categorical variable where 0 = no job while enrolled, 1 = part-time job while enrolled, and 2 = full-time job while enrolled.
Cumulative loans borrowed ($10,000)	A categorical variable of the cumulative amount borrowed from all sources for the respondent's undergraduate education through June 30, 2008, where 0 = no student loans, 1 = $1 to $27,999, and 2 = $28,000+.
College entrance exam (standardized)	A standardized, continuous variable of average score on either the ACT or SAT. College entrance exams were standardized.
Preparation to enter teaching	
Applied/entered teacher education program	A dichotomous variable where 1 = applied to a teacher education program as of 2007–2008 and 0 = had not applied.
Had taken/was taking teacher certification course	A dichotomous variable where 1 = had taken courses to prepare for a state-issued K–12 teacher certification as of 2007–2008 and 0 = had not taken teacher certification courses.
Completed K–12 student teaching assignment	A dichotomous variable where 1 = completed student teaching assignment as of 2007–2008 and 0 = had not completed student teaching assignment.
Had taken PRAXIS/teaching certification exam	A dichotomous variable where 1 = had taken the PRAXIS or other teacher certification exam as of 2007–2008 and 0 = had not taken a teacher certification exam.
Had applied to nontraditional teacher program	A dichotomous variable where 1 = applied to nontraditional K–12 teacher program as of 2007–2008 and 0 = had not applied.

TABLE 2
Conditional Means, by Race/Ethnicity

	White	Black	Latinx	Other Race
Bachelor's in education	0.09	0.05***	0.05***	0.04***
Bachelor's in education, did not teach after graduation	0.02	0.02	0.01*	0.01
Bachelor's in education, taught after graduation	0.07	0.02***	0.04***	0.03**
Worked as teacher four years after graduation	0.13	0.08**	0.11+	0.06***
Demographic characteristics				
Female	0.56	0.68***	0.62**	0.54
Under 30 years old	0.88	0.7***	0.85	0.9*
Married	0.17	0.17	0.18	0.11***
No dependents	0.89	0.71***	0.84**	0.92**
One dependent	0.05	0.12***	0.07+	0.04
Two or more dependents	0.06	0.16***	0.09*	0.04*
Mother's highest education level				
Did not complete high school	0.29	0.44***	0.52***	0.4***
High school diploma or equivalent	0.05	0.08*	0.05	0.04*
Some college/associate's degree	0.23	0.2*	0.2	0.16**
Bachelor's degree	0.26	0.15***	0.13***	0.25
Master's degree or higher	0.17	0.12**	0.1***	0.16
Undergraduate institution characteristics				
Public	0.63	0.61	0.66	0.67+
Historically Black College/University	0.003	0.16***	0.004	0.01
Selective admissions	0.29	0.24*	0.27	0.45***
Attend institution in state of legal residence	0.81	0.82	0.91***	0.81
Undergraduate education				
College entrance exam (standardized)	−0.03	−0.87***	−0.57***	−0.01
No job	0.25	0.21*	0.23	0.34***
Part-time	0.54	0.44***	0.48	0.52
Full-time	0.21	0.35***	0.28*	0.15***
Cumulative loans borrowed ($10,000)	1.63	2.25***	1.7	1.35*
No student loans	0.35	0.21***	0.31	0.4*
$1–$27,999 student loans	0.44	0.43	0.45	0.44
$28,000+ student loans	0.21	0.36***	0.24	0.16**
Ever formally changed major	0.31	0.29	0.29	0.25
Observations	9700	1210	1080	1330
Preparation to enter teaching				
Entered K–12 teacher education program as of 2007–2008	0.49	0.20***	0.28***	0.26***
Had taken exam for teaching certificate/license as of 2007–2008	0.41	0.22***	0.27**	0.24**
Completed K–12 student teaching assignment	0.33	0.19**	0.14***	0.14***
Had applied to nontraditional K–12 teacher program	0.12	0.09	0.15	0.19
Observations	1,780	230	210	170

Note. t tests of statistical significance for White college graduates compared to Black, Latinx, and other race graduates, respectively. Respondents to "preparation to enter teaching" questions expressed an interest in teaching. Sample size rounded to the nearest 10 in accordance with National Center for Education Statistics guidelines.
$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

with a bachelor's in education and entry into teaching, in Table 2, we find that White college graduates are much more likely to have earned a bachelor's in education than Black, Latinx, and other graduates of color. Nine percent of graduates who identify as White graduated with a bachelor's in education compared to 5% of graduates identifying as Black or Latinx, respectively, and 4% of other graduates of color. White college graduates are also more likely to teach within four years of graduation than Black, Latinx, or other graduates of color. Thirteen percent of graduates who identify as White worked as a teacher after graduation compared to 8% of graduates identifying as Black, 11% of

graduates identifying as Latinx, and 6% of other graduates of color. This difference between White and Latinx graduates is only marginally significant, however. When we separate these results by whether those with a bachelor's in education pursued teaching within four years of graduation, a striking pattern emerges. Whereas a small and generally consistent share of graduates earn a bachelor's in education and do not become a teacher, White graduates are most likely to have earned a bachelor's in education and taught after graduation.

There are other significant descriptive differences between individuals identifying as Black, Latinx, and White that may explain the lower rates of entry into teaching. To the extent that teachers are hired based on their academic record, graduates identifying as Black and to a lesser extent, Latinx have lower college entrance exam courses and in the case of Black graduates, were less likely to have graduated from a more selective college or university than graduates identifying as White. Graduates identifying as Black or Latinx were also more likely to have dependents, work full-time during college, and particularly for Black graduates, have accumulated more student loans. No evidence is found for racial/ethnic differences in the proportion of graduates who ever switched majors. While this finding provides suggestive evidence that the racial/ethnic gaps in majoring in education are likely not attributable to differential attrition from education programs, the data used in this, that observes students at graduation, preclude us from completely ruling out this hypothesis.

With evidence that White graduates were close to twice as likely to have an education major, it is not surprising that they were consistently more likely to have entered a teacher education program, taken a teacher certification exam, and completed student teaching. Following graduation, we do not find evidence of differential applications to nontraditional teacher programs across racial/ethnic groups. Among respondents to the supplemental survey for those interested in a career in teaching, 49% of White graduates had entered a teacher education program compared to 20% of Black graduates, 28% of Latinx graduates, and 26% of other graduates of color. Although the proportion of White graduates who had taken a certification exam or completed student teaching was smaller than entering a teacher education program, compared to graduates of color, these differences are large and consistently significant.

We find that White graduates are roughly twice as likely to have majored in education as Black, Latinx, or other graduates of color. These differences in majoring in education extend to working as a teacher within four years of graduation. Graduates who identify as White were between 2 and 7 percentage points more likely to work as a teacher after graduation compared to Black, Latinx, or other graduates of color. In the next section, we systematically test for the ways in which these observable demographic, institutional, and educational characteristics can explain the racial/ethnic gaps in majoring in education or entering teaching following graduation.

Explaining Racial/Ethnic Gaps in Majoring in Education and Entry Into Teaching

Our second research questions asks the extent to which recent college graduates' background characteristics or characteristics of their undergraduate institution explain the observed gaps in majoring in education and entry into teaching in the immediate years following graduation. Table 3 presents the results from the mediation analysis predicting graduating with a bachelor's in education (Columns 1 and 2) and being employed as a teacher within four years of college graduation (Columns 3 to 6). The first column mirrors the finding from Table 2 that Black, Latinx, and other graduates of color were between 4.3 percentage points and 5.7 percentage points less likely to graduate with a bachelor's in education. In Column 2, we add to the model controls related to the graduate's demographic characteristics and undergraduate education and state fixed effects. The estimated racial/ethnic gaps in graduating with a bachelor's in education increase for Black and Latinx graduates, holding all else constant. Graduates identifying as Black are 6.8 percentage points less likely to have majored in education than White graduates ($p < .001$). Graduates identifying as Latinx are 5.3 percentage points less likely to have majored in education than White graduates ($p < .001$).

We next turn to the models estimating employment as a teacher within four years of college graduation. The third column replicates the finding from Table 2 that graduates who identify with Black, Latinx, and either Asian or Pacific Islander, American Indian, or multiracial (the other race category) are predicted to enter teaching at lower rates than graduates who identify as White. When controls and state fixed effects are added to the model, similar to the results for majoring in education, Column 4 shows the estimated racial/ethnic gap in entry into teaching increases for Black and Latinx graduates, holding all else constant. The probability that graduates identifying as Black enter teaching is 6.4 percentage points less than graduates who identify as White ($p < .001$). The probability that graduates identifying as Latinx enter teaching is 2.9 percentage points less than graduates who identify as White ($p = .05$). In summary, when accounting for state-level conditions such as labor market conditions and teacher certification requirements that likely influence whether a college graduate enters teaching, we find Black and Latinx graduates are predicted to enter teaching at even lower rates.

It is only when we control for majoring in education in Columns 5 and 6 that the observed White-Black and White-Latinx gaps in entry to teaching disappear. When including all the controls in the model (Column 6), the probability

TABLE 3
Predicting Major in Education and Employment as a Teacher Within Four Years of College Graduation, Linear Probability Model

	Dependent Variable = Bachelor's in Education		Dependent Variable = Employment as Teacher Within Four Years of College Graduation			
	(1)	(2)	(3)	(4)	(5)	(6)
Black	−0.048***	−0.068***	−0.046**	−0.064***	−0.014	−0.019
	(0.010)	(0.012)	(0.013)	(0.015)	(0.013)	(0.014)
Latinx	−0.043***	−0.053***	−0.020	−0.029*	0.008	0.006
	(0.009)	(0.010)	(0.014)	(0.015)	(0.013)	(0.013)
Other race	−0.057***	−0.052***	−0.065***	−0.058***	−0.027**	−0.024*
	(0.008)	(0.009)	(0.011)	(0.012)	(0.009)	(0.010)
Bachelor's in education					0.663***	0.656***
					(0.019)	(0.019)
Constant	0.095***	0.058	0.128***	0.093*	0.065***	0.055
	(0.004)	(0.040)	(0.005)	(0.044)	(0.004)	(0.034)
Controls		x		x		x
State fixed effect		x		x		x
Observations	13,320	13,320	13,320	13,320	13,320	13,320

Note. Heteroskedastic-robust standard errors in parentheses. Sample size rounded to the nearest 10 in accordance with National Center for Education Statistics guidelines.
*$p < .05$. **$p < .01$. ***$p < .001$.

other graduates of color enter teaching is 1.9 percentage points less than White teachers ($p = .01$), a finding driven by American Indian and Native Hawaiian graduates' low likelihood of entering teaching, even when conditioning on majoring in education as seen in online Table A3. Not surprisingly, we find evidence of a strong relationship between earning a bachelor's in education and entry to teaching: The probability of entry into teaching is 65.6 percentage points greater for graduates who studied education compared to those who did not, holding all else constant ($p < .001$). We will explore the significance of this finding in the next section by looking at how specific teacher preparation activities further exacerbate racial/ethnic gaps in becoming a teacher after graduation.

Given the role racial and gender identity play in shaping an individual's decision to enter teaching, in Table 4, we next present the results from a linear probability model with separate estimates for individuals who identify as White men, Black women, Black men, Latina, Latino, other race women, and other race men, all in reference to individuals who identify as White women.[2] All identity groups are significantly less likely to major in education and become teachers following graduation than White women. In addition, within racial/ethnic groups, men are less likely to major in education and become a teacher. Wald tests indicate that these differences are significantly different for Black ($F = 4.12$, $p = .04$) and Latino graduates ($F = 16.34$, $p < .001$) in terms of majoring in education. When controls are added to the model predicting whether a graduate earned his or her bachelor's in education, these differences remain large and statistically significant. For instance, the smallest gaps are between Latina graduates and White female graduates, although Latina graduates are still 6.7 percentage points less likely to have graduated with an education degree than White female graduates ($p < .001$). Black male graduates, who earn a bachelor's in education at the lowest rates of any racial/ethnic and gender group, are 12.6 percentage points less likely to have earned a bachelor's of education than White female graduates. That other background characteristics do little to narrow the observed differences in majoring in education between White women and other racial/ethnic and gender groups points to the concentration of White females among graduates of education programs.

For White, Black, and other race men, these differences also persist when predicting entry into teaching. Holding all else constant, the probability that a graduate who identifies as a White man enters teaching is 3.8 percentage points less than a White woman ($p < .001$). These gaps are even larger for Black and other race men. Black male graduates are 5.1 percentage points less likely to enter teaching than White women ($p = .02$). That being said, adding controls—including bachelor's in education, importantly—reduces the magnitude of these estimates by roughly 60% for most racial/ethnic and gender groups, underscoring the importance of the decision to major in education in explaining a considerable portion of the variation in entering teaching across groups.

We extend this analysis with the nonlinear decomposition in Table 5. The first row reports the estimated gaps in entry into teaching, reporting the results from a separate decomposition for the White-Black gap, White-Latinx gap, and

TABLE 4

Predicting Major in Education or Employment as a Teacher Within Four Years of College Graduation, Race and Gender Differences

	Bachelor's in Education		Teacher	
	(1)	(2)	(3)	(4)
White male	−0.097***	−0.090***	−0.101***	−0.038***
	(0.007)	(0.007)	(0.009)	(0.008)
Black female	−0.080***	−0.086***	−0.075***	−0.023
	(0.014)	(0.016)	(0.018)	(0.018)
Black male	−0.113***	−0.126***	−0.121***	−0.051*
	(0.012)	(0.013)	(0.020)	(0.022)
Latina	−0.064***	−0.067***	−0.059**	−0.015
	(0.014)	(0.015)	(0.018)	(0.015)
Latino	−0.121***	−0.123***	−0.073**	0.001
	(0.009)	(0.011)	(0.024)	(0.023)
Other race female	−0.089***	−0.083***	−0.087***	−0.026+
	(0.013)	(0.013)	(0.016)	(0.015)
Other race male	−0.113***	−0.103***	−0.136***	−0.060***
	(0.011)	(0.012)	(0.013)	(0.011)
Bachelor's in education				0.656***
				(0.019)
Constant	0.137	0.140	0.172	0.090
	(0.006)	(0.041)	(0.007)	(0.035)
Controls		x		x
State fixed effect		x		x
Observations	13,320	13,320	13,320	13,320

Note. Estimates in reference to White females. Heteroskedastic-robust standard errors in parentheses. Sample size rounded to the nearest 10 in accordance with National Center for Education Statistics guidelines.

$^{+}p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

White-other race gap. The first row mirrors the results from Column 5 of Table 3. The second row reports the portion of this gap that can be explained by the observable factors included in the model. Of the 4.6 percentage point gap in entering teaching between Black and White graduates, 2.8 percentage points are explained by the variables in the model, or roughly 60% of the gap. That more of the White-Latinx gap is explained than exists suggests that if Latinx and White college graduates had the same observed characteristics, there would actually be more Latinx teachers than White teachers. Four percentage points of the 6.5 percentage point gap between White and other graduates of color can also be explained, although a 2.5 percentage point gap remains.

In the remainder of Table 5, we report the coefficients for each variable as well as the estimated collective contribution of demographic characteristics, undergraduate institution, and undergraduate education. Coefficients can be interpreted as the predicted change in the racial/ethnic gaps in entry into teaching, holding constant all other variables in the model. Graduating with a bachelor's in education explains a large portion of the racial disparities in entry to teaching. A bachelor's in education is associated with a 3.4 percentage point reduction in the gap entry into teaching between Black and White graduates ($p < .001$), or close to 75% of the overall gap. A bachelor's in education explains more of the Latinx-White gap than exists. A bachelor's in education is associated with a 4.1 percentage point reduction in the gap entry into teaching between White and other graduates of color ($p < .001$), or nearly two-thirds of the overall gap. Notably, a bachelor's in education predicts more than the overall explained variance as several demographic and institutional characteristics are associated with a larger gap between White and Black and Latinx graduates, respectively.

Other features of respondents' undergraduate education, including college entrance exam scores and working part-time, also explain a smaller segment of the estimated gaps. Importantly, even among college graduates, differences in college entrance exam scores explain close to 20% of the Black-White and Latinx-White gaps in entry into teaching. We suggest a few potential consequences of this finding in the discussion. The statistically significant coefficients on most other variables are negative, indicating that these predict *increased* racial gaps in entry to teaching. One such factor is gender, which is related to a larger gap in the entry to teaching for respondents identifying as Black, Latinx, or

TABLE 5

Decomposition of the Racial/Ethnic Gaps in Early Career Entry to Teaching

	White-Black Gap	White-Latinx Gap	White-Other Race Gap
Estimated gap	0.046	0.020	0.065
Explained	0.028	0.032	0.040
Demographic characteristics (total)	−0.001	−0.004+	−0.003*
	(0.004)	(0.002)	(0.001)
Female	−0.005***	−0.004***	−0.002***
	(0.001)	(0.001)	(0.001)
Under 30 years old	0.003+	0.000+	−0.001
	(0.002)	(0.000)	(0.000)
Married	−0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.001)
One dependent	0.000	0.000	−0.000
	(0.001)	(0.000)	(0.000)
Two or more dependents	−0.002	−0.001	0.001
	(0.001)	(0.001)	(0.000)
Less than bachelor's degree	−0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.001)
Bachelor's degree	0.000	0.000	−0.000
	(0.001)	(0.001)	(0.000)
Master's degree or higher	−0.000	0.000	−0.000
	(0.000)	(0.001)	(0.000)
Institution characteristics (total)	−0.010***	−0.003	−0.002
	(0.002)	(0.002)	(0.002)
Public college/university	−0.000	0.000	−0.000
	(0.000)	(0.000)	(0.000)
Selective admissions	0.000	0.000	−0.001
	(0.000)	(0.000)	(0.002)
Institution in state of legal residence	−0.001	0.000	−0.000
	(0.000)	(0.001)	(0.000)
Ever formally changed major	−0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.000)
Southeast	−0.002	−0.003	−0.001
	(0.001)	(0.001)	(0.001)
Midwest	−0.009**	0.001	−0.002**
	(0.003)	(0.000)	(0.001)
West	0.001	−0.002	−0.001
	(0.001)	(0.002)	(0.001)
Undergraduate education	0.043***	0.037***	0.044***
	(0.004)	(0.002)	(0.001)
Bachelor's in education	0.034***	0.030***	0.041***
	(0.001)	(0.001)	(0.001)
Part-time	0.003**	0.002**	0.002**
	(0.001)	(0.001)	(0.001)
Full-time	0.001	0.000	−0.000
	(0.001)	(0.001)	(0.000)
$1–$27,999 student loans	0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.000)
$28,000+ student loans	−0.002	−0.000	0.001
	(0.001)	(0.000)	(0.001)
College entrance exam (standardized)	0.007+	0.004+	0.000
	(0.004)	(0.002)	(0.000)
Observations	10,920	10,780	11,030

Notes. Heteroskedastic-robust standard errors in parentheses. Sample size rounded to the nearest 10 in accordance with National Center for Education Statistics guidelines.
$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

other race compared to White graduates. This finding builds on evidence previously described showing a strong relationship between gender and entry into teaching, including its relationship with race/ethnicity.

Examining the background characteristics of recent college graduates as well as characteristics of their undergraduate education yields important insights in understanding the nature of racial/ethnic differences in college major and entry into teaching. First, the large racial/ethnic gaps in majoring in education cannot be accounted for by observable characteristics in the model. Second, when predicting entry into teaching, controlling for majoring in education is strongly associated with becoming a teacher and explains a large portion of the Black-White gap and completely explains the Latinx-White gap. Yet, when examining racial/ethnic and gender differences, we find that Black men, Latinos, and other race men enter teaching at lower rates than White women, even when controlling for majoring in education.

Factors Shaping Entry Into Teaching

Evidence that majoring in education largely explains the observed racial/ethnic gaps in entry into teaching among recent college graduates points to the need to understand what factors may be driving this finding (third research question). The next series of analyses examines the extent to which these preparation activities may partially mediate the process of studying education during college and becoming a teacher in the subsequent years. We view this analysis as suggestive given that respondents to this portion of the survey indicated that they had an interest in working as a teacher. Notably, there are cases in which respondents either completed the survey and later did not become a teacher or did not complete the survey and still entered teaching.[3]

In Table 6, we estimate a series of linear probability models predicting participation becoming a teacher, conditional on different preparation activities. If the direction or significance of the estimate on the variable for bachelor's in education changes when these additional covariates are added to the model, it would suggest that the relationship between studying education during college and becoming a teacher is partially mediated through that preparation activity (or set of preparation activities). To model the intertemporal process, we sequentially add these preparation activities to the model in the order in which they would have most likely occurred.

Overall, we find evidence for this "partial mediator" hypothesis. Even when controlling for earning a bachelor's in education, entering a teacher preparation program is associated with a 16.3 percentage point increase in the probability of entering teaching, holding all else constant. When completion of student teaching is added to the model (Columns 4 and 5), the estimate on entering a teacher preparation program shrinks by roughly half and is only marginally significant (p = .07). Instead, completion of student teaching is associated with a 16.2 percentage point increase in the probability of entering teaching. We find no evidence that taking a teacher exam is associated with entering teaching, holding all else constant, and the relationship between entering a teacher preparation program and completing student teaching remains consistent as well. Finally, as the magnitude of the coefficient for a bachelor's in education decreases when the preparation activities are added to the model, it suggests that participation entering a teacher preparation program or completing student teaching as part of an undergraduate education degree facilitates the process of being hired for a teaching position after graduation.

Separate from these activities linked to a traditional undergraduate teacher preparation program is application to a nontraditional K–12 teacher program (Table 6, Columns 8 and 9). We do not include other preparation activities in these models as alternative certification programs typically enable entry into teaching without entering a student teaching program or completing student teaching. Application to a nontraditional teacher program is associated with an 11.7 percentage point increase in the probability of entering teaching, but only when controlling for a bachelor's in education. With no evidence of racial/ethnic differences in the application rates to nontraditional teacher programs in Table 2 but some evidence of a relationship between application to a nontraditional teacher program in Table 6, it could differentially predict entry into teaching for Black or Latinx graduates. In supplementary analysis, we find no evidence of differences in the relationship between applying to a nontraditional teacher program and entering teaching for White or Latinx graduates. For Black graduates, however, the predicted probability of entering teaching is more than triple when the graduates report having applied to a nontraditional teacher program. Among this subset of respondents who expressed an interest in teaching, Black respondents who had not applied to a nontraditional teacher program had a 22% predicted probability of entering teaching compared to 71% for those who had applied.

Discussion and Conclusion

We show a significant gap in who majors in education based on gender and race/ethnicity. Similar to prior literature, these differences extend to employment as a teacher within four years after graduation. Conditional on graduating from college, 13% of graduates who identify as White worked as a teacher after graduation compared to 8% of graduates identifying as Black, 11% of graduates identifying as Latinx, and 6% of graduates of another race/ethnicity. Controlling for student demographics and institutional characteristics only widens these racial/ethnic gaps in college major and teaching between White and Black and Latinx graduates, respectively. However, once we control for graduating with a bachelor's in education, the gap in teaching

TABLE 6
Predicting Employment as a Teacher Within Four Years of College Graduation, Preparation Activities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Black	−0.050	−0.077	−0.031	−0.080+	−0.037	−0.079	−0.038	−0.171**	−0.045
	(0.048)	(0.051)	(0.048)	(0.048)	(0.046)	(0.048)	(0.046)	(0.053)	(0.047)
Latinx	−0.055	−0.079+	−0.047	−0.077+	−0.049	−0.075+	−0.051	−0.134**	−0.061
	(0.043)	(0.046)	(0.042)	(0.044)	(0.042)	(0.044)	(0.042)	(0.049)	(0.043)
Other race	−0.095*	−0.093+	−0.080+	−0.088+	−0.078+	−0.086+	−0.080+	−0.151**	−0.100*
	(0.048)	(0.050)	(0.047)	(0.049)	(0.047)	(0.049)	(0.047)	(0.053)	(0.047)
Bachelor's of education	0.477***		0.378***		0.337***		0.344***		0.488***
	(0.030)		(0.038)		(0.039)		(0.039)		(0.030)
Entered teacher education program		0.348***	0.163***	0.184***	0.079+	0.177***	0.086+		
		(0.031)	(0.036)	(0.044)	(0.044)	(0.046)	(0.044)		
Completed K–12 student teaching assignment				0.254***	0.162***	0.243***	0.177***		
				(0.044)	(0.045)	(0.048)	(0.048)		
Had taken PRAXIS/ teaching certification exam						0.028	−0.040		
						(0.045)	(0.044)		
Had applied to nontraditional K–12 teacher program								0.036	0.117**
								(0.047)	(0.044)
Constant	0.315**	0.273*	0.268*	0.279*	0.272*	0.277*	0.274*	0.422**	0.314**
	(0.116)	(0.136)	(0.124)	(0.124)	(0.119)	(0.125)	(0.119)	(0.126)	(0.116)
Observations	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250

Note. Heteroskedastic robust standard errors in parentheses. Sample size rounded to the nearest 10 in accordance with National Center for Education Statistics guidelines.
$^{+}p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

between White graduates and Black, Latinx, and multiracial graduates, respectively, is no longer distinguishable from zero, though a marginally significant difference persists for other Asian and other graduates of color (i.e., American Indian, Native Hawaiian, and other racial identities). This finding appears to be driven by differential majoring in education, which is supported by the decomposition results. The finding regarding majoring in education aligns with the prior research that finds that White women are more likely than their peers to major in education or a field that requires a significant number of education courses (e.g., Ma, 2009; Speer, 2017).

When we examine the interplay between racial and gender identity and the discriminatory barriers to becoming a teacher, a couple of distinct patterns emerge. White female graduates are consistently more likely to have graduated with a bachelor's in education than any other identity group we examine, even when conditioning on a rich set of control variables and state fixed effects. In some instances, these differences are strikingly large. Black male and Latino graduates are more than 12 percentage points less likely to earn a bachelor's in education than White female graduates. Not surprisingly, we find similar gaps in who becomes a teacher following graduation. For White, Black, and other male graduates of color, these differences even persist after accounting for differences in graduating with a bachelor's in education.

By focusing our analysis on a nationally representative sample of college graduates and tracking their pathway into the teaching profession, our findings have clear implications for policy. That the teacher racial/ethnic diversity gaps persist even among college graduates suggests that the underrepresentation of people of color in the teacher workforce is not solely attributable to inequitable educational opportunities for students from historically underserved racial/ethnic groups that result in lower rates of high school and college graduation. This provides an opportunity for policymakers and practitioners to create interventions, potentially focused on who chooses to major in education, to increase the number of teachers of color in the United States. Our analysis shows that majoring in education signals a person's intention to work as a teacher but also provides graduates with a

support system that is helpful in attaining their first teaching position. By being less likely to major in education, graduates of color were also less likely to participate in preparation activities, such as entering a teacher preparation program or student teaching, that facilitated being hired as a teacher. These findings suggest that enrollment in a traditional teacher education program provided access to supports and networking opportunities that aided in being hired following graduation. As completion of student teaching had the strongest association with becoming a teacher, this practice seemed to play a particularly important role in becoming a teacher, a finding that has emerged from other recent work (Goldhaber, Krieg, & Theobald, 2014).

The importance of these activities in being hired as a teacher further underscores the need for teacher preparation programs to adopt more active strategies in the recruitment and retention of students of color. One approach is to use scholarships to recruit teachers of color. One such example is the Florida Fund for Minority Teachers, which recruits advanced undergraduate and graduate students who have not previously studied education and awards them up to $12,000 in scholarships over the course of three academic years (Florida Fund for Minority Teachers, n.d.). In exchange, scholarship recipients are required to teach in a Florida public school for the number of years in which they received a scholarship. In addition, teacher preparation programs may need to alter the curriculum in ways that make them geared less toward White female teachers and more toward the unique needs of preservice teachers of color (Sleeter & Milner, 2011).

Another approach for which we find evidence is the expansion of alternative certification programs, particularly those with the specific goal of recruiting a racially and ethnically diverse pool of prospective teachers (Gist, 2017; Okezie, 2018). A recent review of Grow Your Own programs highlights their promise in achieving this goal by providing access to teaching for nontraditional students from the school and geographic community (Gist, Bianco, & Lynn, 2019). Given evidence from this study of the extremely low rates with which Black male graduates major in education and become a teacher in the years following graduation, alternative certification programs geared specifically toward recruiting Black male teachers may be particularly promising (Jones & Jenkins, 2012; Pabon, Anderson, & Kharem, 2011).

In the decomposition analysis, we find evidence that even among this sample of recent college graduates, a higher college entrance exam is associated with a reduced gap in entry into teaching between White, Black, and Latinx graduates, respectively. To the degree to which college entrance exams are correlated with performance on licensure exams, these differences point to the potential role of licensure exams in screening out people of color from teaching. Yet, we find no evidence of a relationship between taking a certification exam and entry into teaching following graduation. That being said, given evidence from prior research of certification exams as a structural barrier to accessing teaching for many people of color (Angrist & Guryan, 2008; Goldhaber & Hansen, 2010; Petchauer, 2012; Tyler, 2011), the lack of evidence in our study may be linked to the wording of the question or features of the subsample that responded to the teacher survey.

Although our study highlights the importance of majoring in education as explaining significant portions of the observed racial/ethnic gaps in entry to teaching, there are important factors that shape the self-selection into a major that were beyond the scope of the current study. Our results do not make clear the extent to which the decision to major in a subject other than education is driven by the availability of more desirable or higher paying occupations other than teaching and how this process may differ by race/ethnicity. Future research could more closely examine the ways in which the decision to major in education interacts with local labor market conditions as well as the availability of alternative certification programs.

Ongoing research on this topic can also focus more thoroughly on the role of teacher licensure exams in screening out teachers of color (Carter Andrews et al., 2019; Petchauer, 2012). In particular, richer data on the passage of licensure exams and how passage rates vary across teachers in traditional and alternative preparation programs will yield important insights on the role that preparation programs play in passage of preparation exams. Finally, future research can study individuals' pathway into teaching not only at graduation—as we did in this study—but during college as well. Such an approach would allow researchers to identify the extent to which differences in graduating with a bachelor's in education were attributable to differential entry into education programs or differential persistence after entry. A clearer understanding of the relative influence of these different factors on racial/ethnic differences in majoring in education as well as how these differences vary across institutions will yield important insight into recruiting and retaining aspiring teachers of color.

Notes

1. In the current study, people of color, students of color, and teachers of color all refer to individuals who identify with either Black, Latinx, Asian, American Indian/Alaskan Native, Hawaiian/Pacific Islander, or multiple races.

2. While we recognize that the intersectionality of race and gender can and likely does shape the experiences of who majors in education and who becomes a teacher (Crenshaw, 1993), the full research project does not formally model or concretely discuss the social norms or power structures that create this specific intersectionality. For these reasons, we do not refer to any of our analyses as tests of intersectionality.

3. Two thousand, six hundred and sixty respondents completed the supplemental teacher survey. Among those who completed

the survey, 870 graduated with a bachelor's in education (33%). Among the 1,400 who graduated with a bachelor's in education, 870 completed the survey (62%). Among the 1,760 who became teachers, 1,020 completed the survey (58%).

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