ANNENBERG
BROWN UNIVERSITY

EdWorkingPaper No. 22-535

From Interest to Entry: The Teacher Pipeline From College Application to Initial Employment

Brendan Bartanen
University of Virginia

Andrew Kwok
Texas A&M University

Strengthening teacher supply is a key policy objective for K–12 public education, but understanding of the early teacher pipeline remains limited. We leverage the universe of applications to a large public university in Texas from 2009–2020 to examine the pipeline into teacher education and employment as a K–12 public school teacher. A unique feature of Texas's centralized higher education application is it solicits potential interest in teacher certification. We document sharply declining interest in teaching over the period. Further, we show that nonwhite, male, and high-achieving students are substantially underrepresented in teacher education. Particularly for race/ethnicity, these disparities are only partially explained by differences in interest at application.

VERSION: February 2022

Suggested citation: Bartanen, Brendan, and Andrew Kwok. (2022). From Interest to Entry: The Teacher Pipeline From College Application to Initial Employment. (EdWorkingPaper: 22-535). Retrieved from Annenberg Institute at Brown University: https://doi.org/10.26300/hqn6-k452

From Interest to Entry: The Teacher Pipeline From College Application to Initial Employment

Brendan Bartanen[1] and Andrew Kwok[2]

[1]University of Virginia

[2]Texas A&M University

February 2022

Abstract

Strengthening teacher supply is a key policy objective for K–12 public education, but understanding of the early teacher pipeline remains limited. We leverage the universe of applications to a large public university in Texas from 2009–2020 to examine the pipeline into teacher education and employment as a K–12 public school teacher. A unique feature of Texas's centralized higher education application is it solicits potential interest in teacher certification. We document sharply declining interest in teaching over the period. Further, we show that nonwhite, male, and high-achieving students are substantially underrepresented in teacher education. Particularly for race/ethnicity, these disparities are only partially explained by differences in interest at application.

From Interest to Entry: The Teacher Pipeline From College Application to Initial Employment

Introduction

Spurred by long-standing concerns about the quality of the K–12 public school teacher workforce, strengthening the teacher pipeline is a top priority for United States education policy. Robust findings from two bodies of research demonstrate the key role of teachers. The first is that there is wide variation in teacher quality, which contributes to large differences in outcomes between students with the most and least effective teachers (Chetty, Friedman, & Rockoff, 2014a; Hanushek & Rivkin, 2012). The second is that students—particularly those from historically marginalized backgrounds—benefit from a demographically diverse educator workforce (e.g., Grissom, Kern, & Rodriguez, 2015; Redding, 2019). Despite clear evidence of their importance, the K–12 public education system struggles to attract high-achieving and ethnoracially diverse teachers (Partelow, Spong, Brown, & Johnson, 2017). For instance, college students pursuing teacher certification tend to have lower academic achievement than those pursuing other careers, though there is some evidence of recent improvement (e.g., Gitomer, 2007; Lankford, Loeb, McEachin, Miller, & Wyckoff, 2014; Master, Sun, & Loeb, 2018). Perhaps more concerning are the stubborn persistence of racial/ethnic representation gaps between the teacher workforce and the K–12 student population (Brown & Boser, 2017; Ingersoll, Merrill, Stuckey, Collins, & Harrison, 2021). Students of color now comprise a majority in K–12 public schools, but the teacher workforce remains roughly 80% White (Taie & Goldring, 2020).

Improving the teacher workforce almost certainly requires strengthening the supply of new teachers. Recent evidence, however, shows limited progress on this front. Coupled with falling enrollments in teacher education (Partelow, 2019), survey data suggests that interest in teaching declined in recent years, even prior to the COVID-19 pandemic (Croft, Guffy, & Vitale, 2018). Further, the composition of individuals in university-based teacher

education programs (TEPs)—which supply roughly 75% of newly certified teachers—largely mirrors the existing teaching workforce (Putman & Walsh, 2021). While the rise of alternative certification programs creates an additional potential lever for strengthening the pipeline, it is critical to understand why traditional TEPs struggle to recruit talented and diverse individuals. Are these groups simply not interested in becoming teachers, or could TEPs do more to reach them? Unfortunately, the answer to this question remains unclear, as there is little work focused on this critical early juncture of the teacher pipeline.

In this study, we contribute to filling this gap by examining who is potentially interested in teaching when applying to college and, subsequently, whether these same individuals actually enter teacher education and become employed as full-time K–12 public school teachers. To do this, we analyze the universe of applications for first-year and transfer admissions to a large public university in Texas from 2009–2020. A unique feature of Texas's centralized common application for higher education admissions is that it solicits students' potential interest in becoming a teacher. We link these applications with institutional data from the TEP, allowing us to observe subsequent teacher pipeline outcomes, including enrolling in teacher education and becoming employed after graduation as a K–12 public school teacher in Texas. Together, these data allow us to provide a fairly comprehensive examination of the early teacher pipeline, with a particular focus on understanding selection into teacher education. To be specific, we answer the following research questions:

1. Who is interested in becoming a teacher when applying to college?
2. To what extent does interest in teaching explain representation gaps—by demographics and academic achievement—in teacher education and the supply of newly certified teachers?

We make two main contributions to a relatively sparse literature examining the

early teacher pipeline. First, we provide important descriptive insight concerning potential interest in teaching among high school and college students. While most studies of teacher supply focus either on variation among subsets of individuals who have already committed to teaching (e.g., Bartanen & Kwok, 2021; Goldhaber, Krieg, & Theobald, 2014; Goldhaber, Krieg, Theobald, & Goggins, 2020; Vagi, Pivovarova, & Barnard, 2019) or comparing teachers to non-teachers (Henke, Chen, & Geis, 2000; Redding & Baker, 2019), this provides limited insight about what leads individuals to choose teaching in the first place. The few existing studies that examine interest in teaching, while helpful, are either dated (Hanushek & Pace, 1995) or focused on international contexts (Han, Borgonovi, & Guerriero, 2018; Savage, Ayaita, Hübner, & Biewen, 2021), which may have limited generalizability to the current challenges faced by U.S. public education. Second, the richness of our data—in particular, our ability to track individuals from application to employment—allows us to more closely pinpoint "leaks" that undermine efforts to create a high-quality and diverse teacher pipeline. In terms of scope, our study is most similar to Hanushek and Pace (1995), who use data from the High School and Beyond survey to examine potential interest in teaching and subsequent career choices among a group of high school seniors from 1980.

Consistent with declines in teacher education enrollment nationally, we document sharply declining interest in teaching among applicants to the university over the study period. This decline is not driven systematically by particular groups (e.g., applicants of color). Mirroring the current composition of the teacher workforce, men and applicants with stronger academic achievement are substantially less likely to be interested in teaching. By contrast, interest in teaching is slightly *greater* among Black and Hispanic/Latino applicants, as well as applicants from lower-income families.

Turning from potential interest to concrete steps towards becoming a teacher, we find substantial underrepresentation of nonwhite, male, and high-achieving students. Among the full applicant pool, for instance, Black applicants are roughly 75% less likely

than observably similar White applicants to enter the university's TEP. Men are 93% less likely than women to enter teacher education, and applicants from the upper tail of the SAT score distribution (1300–1600) are 29% less likely than those from the middle (1000–1290). Importantly, racial/ethnic and gender representation gaps in teacher education are substantially larger than gaps in potential interest in teaching, suggesting that the lack of diversity in teacher education is not purely driven by a lack of potential students from underrepresented backgrounds. High-achieving students, by contrast, end up slightly overrepresented in teacher education relative to initial interest among applicants. Because most preservice teachers that we observe subsequently become employed as K–12 teachers, differential enrollment in teacher education translates closely to representation gaps among new teachers supplied by the university.

What are the leaks in the pipeline that explain these differences between interest and entry? For underrepresentation by race/ethnicity, differential rates of admission and enrollment both contribute to a narrowing of the pool of potential students for teacher education. Many potentially interested students from underrepresented backgrounds never step foot on (this) campus. However, even among matriculants, students of color are substantially less likely to enter teacher education and these gaps are only partially explained by differences in potential interest. Interest differences by school level play some role. Potential teachers of color tend to be more interested in high school, where the path to certification is less direct and the TEP is smaller. One promising finding is that among students who express strong interest in teaching—as measured by their initial major choice at application—we find no subsequent evidence of disparities in teacher education representation. Overall, our results provide evidence that efforts to recruit a more representative group of students into TEPs could help to strengthen teacher supply.

Background

Policymakers have consistently sought ways to raise the caliber of the teaching workforce. There is abundant evidence that teachers are a key input to student success and are perhaps the most important *in-school* factor. Students assigned to higher-quality teachers learn more and have better life outcomes, on average (Chetty, Friedman, & Rockoff, 2014b; Kane, McCaffrey, Miller, & Staiger, 2013). Students also benefit from a more diverse teacher workforce, particularly those from historically marginalized backgrounds (e.g., Dee, 2005; Gershenson, Hart, Hyman, Lindsay, & Papageorge, 2022; Grissom & Redding, 2016; Lindsay & Hart, 2017).

Coupled with evidence on the importance of teachers are claims that the composition of the U.S. teacher workforce is sub-optimal with respect to both quality and diversity (e.g., Partelow et al., 2017). The latter claim is straightforward; there is a widening diversity gap between K–12 public school students and their teachers. While the absolute share of teachers of color has steadily increased in recent decades (Ingersoll & Merrill, 2017), it has not kept up with changes in the K–12 student population, where students of color are now a majority. Further, teacher diversity is also worsening over time in reference to the population of college-educated workers from which it draws (Hansen & Quintero, 2019). By contrast, claims about the average quality of the teacher workforce are often indirect and suggestive. For instance, some analyses note U.S. students' middling academic performance relative to other developed countries, such as on the Program for International Student Assessment (Auguste, Kihn, & Miller, 2010; Hanushek, Piopiunik, & Wiederhold, 2019). Concurrently, higher-performing countries tend to have more stringent standards for teacher selection and entry, which contributes to a higher-quality teacher workforce and ultimately improves student learning. A second line of argument is that U.S. teachers tend to come from the middle and bottom of the distribution of college graduates (e.g., Ballou & Podgursky, 1995; Hanushek & Pace, 1995). Despite inconsistent evidence relating measures of academic achievement (e.g., SAT scores) to teachers' classroom

effectiveness, there is continued concern that teaching attracts too few talented individuals.

The Role of Teacher Education Programs

Even with considerable interest and effort towards strengthening the teacher workforce, making tangible and consistent progress has proved challenging. While not the only lever, it is difficult to imagine a solution that does not include increasing the quality and diversity of new teachers. And while alternative paths to teaching are growing more common, the vast majority of new teachers still enter the profession through traditional, university-based teacher education programs (National Center for Education Statistics, 2018). Thus, TEPs are a critical juncture in the teacher pipeline and have accordingly received considerable attention in terms of their content, practices, and structure (see Goldhaber, 2019). Broadly speaking, this body of existing work treats teacher education as the beginning of the teacher pipeline, taking as given the set of college students who choose to pursue certification. An underexplored aspect, then, of how TEPs may contribute to workforce quality and diversity is their potential influence over who becomes a teacher.

Descriptively, the composition of PSTs largely mirrors the representational disparities in existing teacher workforce. For instance, the National Council of Teacher Quality reviewed the demographic composition of a nationally representative sample of teacher preparation programs and identified that only a fifth of programs have enrollment compositions that are at or above the state and local demographics, with the majority of these diverse programs housed within minority-serving institutions (Putman & Walsh, 2021). Further, few programs have stringent academic requirements (e.g., minimum GPA) for entry, suggesting that neither diversity nor quality are prioritized within many TEPs.

The extent to which TEPs can actually influence composition is unclear. One on hand, representation gaps in teacher education may reflect pre-existing disparities in openness to a teaching career. Low salaries and perceived lack of professionalization likely discourages many individuals from even considering teaching (Auguste et al., 2010; Farkas,

Johnson, & Foleno, 2000). Even among high-achieving and ethnoracially diverse students who are potentially interested, there is substantial competition from other sectors that can offer better pay, as well as other public service careers where individuals feel they can make a stronger impact (Putman, Hansen, Walsh, & Quintero, 2016). Relatedly, students may receive strong negative signals from peers or family about the appropriateness or value of pursuing a teaching career (Mancenido, 2021).

Despite clear pre-existing challenges faced by TEPs in recruiting high-achieving and diverse students, their own policies and practices may exacerbate or ameliorate these dynamics. In a review, Goe and Roth (2019) note ten strategies for TEPs to attract students from underrepresented groups, but few were backed by more than a handful of studies. Among those with the strongest support are developing university/school district partnerships and grow-your-own programs. Perhaps the most obvious and potentially low-cost strategy for TEPs is to increase efforts to recruit students from within the college or university (Bustos Flores, Clark, Claeys, & Villarreal, 2007). Yet such initiatives may fall flat without parallel efforts to make TEPs more welcoming to students of color (e.g., Carter Andrews et al., 2019). In reviewing efforts in teacher education to increase racial/ethnic diversity, for instance, Sleeter and Milner (2011) note that successful programs tended to make specific efforts to build interest among students of color in a teaching career, including connecting them with mentor teachers from the same background and engaging students in culturally relevant projects. Though noting that the evidence base is thin, Gist, Bristol, Bianco, and Goings (2021) further suggest that recruitment of students of color into teacher education is more likely to succeed when programs take concrete steps to show commitment to diversity, including individualized mentoring and employing culturally relevant curricula.

Who is Interested in Teacher Education?

Empirically, we know relatively little about the mechanisms that shape the composition of TEPs, particularly once students are enrolled in college. As described above, there is ample evidence showing that the composition of TEPs tends to mirror the existing composition of the teacher workforce. These high-level patterns are important, but provide little insight about the role of TEPs in contributing to shaping the composition of newly certified teachers. Could they do more to recruit talented and diverse individuals?

An important step towards answering this question requires understanding who is potentially interested in teaching and whether they follow through. Unfortunately, there is limited work in this area. Some prior studies examine K-12 students' intentions about becoming a teacher, though primarily in international contexts (Dastidar & Sikdar, 2015; Kyriacou & Coulthard, 2000). For instance, Han et al. (2018) analyzed PISA data to identify job aspects and working conditions that are important for high school students when considering the teaching profession. The authors identified that 10% of individuals in total aspired for a career in teaching, with those interested in teaching again often having lower achievement scores. While there were differences in gender by country, this was often a result of national professionalization, complementing other findings utilizing PISA data (Park & Byun, 2015). In related work, Savage et al. (2021) examines predictors of entry into a teacher education among German high school students, finding that parental influences were strongest—having a parent who was a teacher or who wanted the student to become a teacher were both positively associated with entry into teacher education. Unconditionally, women and lower-achieving students were more likely to enter teacher education, though these relationships were attenuated in a multiple regression framework.

A major limitation of work in this area is the inability to measure both potential interest in teaching and subsequent teacher pipeline outcomes. The only exception, to our knowledge, is Hanushek and Pace (1995), who examine a cohort of high school seniors from 1980 using the High School and Beyond survey. In fact, their analysis demonstrates the

utility of longitudinal measurements of teaching pipeline outcomes, as they document substantial shuffling in and out of the pipeline both among those who express interest in teaching as a high school student and those who do not. They find that only 22% of high school students who aspired to teaching had completed a teacher preparation program six years later. Equally important, only about 40% of those who completed teacher preparation thought they would become teachers when they were in high school. Concerning composition, they find that white women and lower-achieving students are overrepresented among those who become teachers.

Our study improves upon existing work in several ways. First, we are able to measure potential interest in teaching among a very large sample ($\approx$ 500,000) of high school and early college students across twelve years. This allows us to document with substantial precision interest gaps in teaching and their change over the past decade. We can then subsequently measure various junctures on the path to becoming a teacher. This allows us to speak more directly to the potential dynamics that shape the composition of TEPs, going beyond simply comparing differences between teachers and non-teachers. More specifically, we can start to disentangle the potential explanations for the stubborn persistence of diversity and achievement gaps in TEPs.

Data and Context

Our data come from a public university in Texas—one of the largest universities in the country and a major supplier of new teachers in the state. From the perspective of understanding issues related to teacher supply, Texas is an important context to study. The state is experiencing rapid demographic shifts and has a student and teacher population that is substantially more racially/ethnically diverse than the country as a whole. In 2019–2020, students of color constituted 73% of statewide K–12 enrollment. Consistent with nationwide patterns, however, the percentage of teachers of color lags significantly

behind at 43%, or 46% among newly certified teachers.[1] Texas is also notable for the large presence of alternative certification programs, which are overwhelmingly for-profit and supply roughly the same number of newly certified teachers as traditional undergraduate programs (Yin & Partelow, 2020). Undergraduate and alternative certification programs differ in their typical demographic served, though, with alternative programs producing older teachers (mean age of 33.6 vs. 25.4 for undergraduate). Additionally, Black teachers comprise a substantially greater share of newly certified teachers from alternative programs (16% vs. 5%), while Hispanic/Latino teachers comprise less (28% vs. 39%).

The university houses an undergraduate TEP offering certification in the following areas: early childhood–6th grade core subjects, 4–8th grade math/science, and 4–8th grade English language arts/social studies. Students pursuing certification in these areas earn an bachelor's degree through the college of education in interdisciplinary studies, which serves as a de facto education major. Formal entry into teacher education typically occurs at the beginning of a student's junior year. There is also a pathway to secondary certification (grades 7–12) where students pursue a major in a content area (e.g., chemistry) alongside completing the requirements for teacher certification. Fifty percent of teacher education students earn certification in grades 4–8, 40% in grades EC–6, and 10% in grades 7–12.

Our study combines various data sources from the university, which are described in more detail below. Appendix Table A1 shows descriptive statistics for the full sample and across various subsamples we examine throughout the analysis.

Admissions Data

Our first key data source is the universe of applications for first-year and transfer admissions from 2009–2020. Texas has a centralized common application system, ApplyTexas, through which students can apply to public colleges and universities.[2] The

[1] See https://tea.texas.gov/reports-and-data/educator-data/educator-reports-and-data

[2] ApplyTexas also serves a smaller number of private institutions.

application is largely standardized and remained consistent across the study period. For each applicant, we observe demographic information (e.g., race/ethnicity, gender), family background characteristics (e.g., income, parental education, household size), and educational background information, including SAT composite scores and high school GPA. Additionally, we have indicators for whether an applicant was offered admission, whether they enrolled, and whether they graduated as of 2020. In total, we observe approximately 520,000 applications submitted over the 12-year period. The university grew rapidly during this time, with applications nearly doubling and enrollment increasing by more than 40%.

In addition to the standard demographic, family background, and educational background information, the application includes two questions that solicit students' career interests, including teaching. The primary question we leverage asks applicants: "Will you seek teacher certification?" A response of yes or no is required. If applicants respond with yes, they are then required to indicate one of four levels: Elementary Level (Early Childhood–Grade 4), Middle School/Junior High Level (Grades 4–8), High School Level (Grades 8–12), or All Levels (Early Childhood–Grade 12).[3]

The inclusion of this question stems from the state's attempt to identify talented and diverse individuals to enter the teaching profession. Towards this end, the legislature passed a bill in 1995 to promote workforce diversity and excellence, which included language prompting the Texas Higher Education Coordinating Board to implement programs for identifying students interested in teaching.[4] These state efforts have since

[3] In conversations with university admissions officials, we confirmed that the question is fundamentally low stakes—the institution does not use this information for admissions purposes and it is never passed on, for instance, to the TEP.

[4] Sec. 21.004. TEACHER RECRUITMENT PROGRAM. (a) To the extent that funds are available, the agency, the State Board for Educator Certification, and the Texas Higher Education Coordinating Board shall develop and implement programs to identify talented students and recruit those students and persons, including high school and undergraduate students, mid-career and retired professionals, honorably discharged and retired military personnel, and members of underrepresented gender and ethnic groups, into the teaching profession. (b) From available funds, the agency, the State Board for Educator Certification, and the Texas Higher Education Coordinating Board shall develop and distribute materials that emphasize the importance of the teaching profession and inform individuals about state-funded loan forgiveness and tuition assistance programs. (c) The commissioner, in cooperation with the commissioner of higher education and the executive director of the State Board for Educator Certification, shall annually identify

waned, but the corresponding application item has remained.

We use applicants' responses to this question as measure of *potential interest in teaching*. Several things support this measure in terms of validity and reliability, the first of which is the context. The question is part of students' college applications, where they are providing mostly fact-based information like senior coursework, residency information, and test scores. There is a strong expectation to complete the application with care and provide truthful responses. The specific teacher certification question is located in the middle of the application form, immediately following a question about interest in preprofessional programs and preceding a section where students provide information about senior coursework. The two-part format also supports the reliability of this question. As noted above, applicants who indicate interest in teacher certification must then choose one of four grade bands, effectively creating a double-check mechanism.

Additionally, as we will show in our analysis, several empirical facts support our use of this measure. First, the question has strong predictive validity with respect to other observed outcomes such as initially choosing a teacher certification major (we describe this measure below), entering the TEP, and employment as a K–12 teacher. For example, 93% of applicants who choose the teacher certification major indicate interest in teacher certification, compared to 7% of those who choose other majors. Further, among those who did not initially major in teacher certification but eventually enrolled in teacher education, nearly half had indicated interest in teaching in their application, compared to only 8% of

---

the need for teachers in specific subject areas and geographic regions and among underrepresented groups. The commissioner shall give priority to developing and implementing recruitment programs to address those needs from the agency's discretionary funds. (d) The agency, the State Board for Educator Certification, and the Texas Higher Education Coordinating Board shall encourage the business community to cooperate with local schools to develop recruiting programs designed to attract and retain capable teachers, including programs to provide summer employment opportunities for teachers. (e) The agency, the State Board for Educator Certification, and the Texas Higher Education Coordinating Board shall encourage major education associations to cooperate in developing a long-range program promoting teaching as a career and to assist in identifying local activities and resources that may be used to promote the teaching profession. (f) Funds received for teacher recruitment programs may be used only to publicize and implement the programs. Added by Acts 1995, 74th Leg., ch. 260, Sec. 1, eff. May 30, 1995. Amended by Acts 1999, 76th Leg., ch. 1590, Sec. 7, eff. June 19, 1999.

those who did not enter teacher education. Second, our descriptive findings showing changes in interest over time and differences by gender and high school achievement replicate patterns from prior work using survey-based interest measures (Croft et al., 2018; Hanushek & Pace, 1995).

The application also asks students to indicate their potential interest in preprofessional programs. Different from the teacher certification question, the preprofessional question does not require a response. Applicants choosing to respond can select one of the following programs: pre-law, medicine, nursing, veterinary, physical therapy, pharmacy. They may also select "no" or "others" (i.e., a program not listed).

The final piece of information we use from the admissions data is the applicant's initial major choice. Whereas we interpret the teacher certification question as measuring potential interest in teaching, an applicant's initial major choice provides a stronger signal of intent to enter teacher education at the time of application. Applicants to the university must indicate a preferred college and major, but this information is not used to make admissions decisions. It is also not a binding choice—students may change majors after they enroll. Accordingly, we find that among teacher education students, only 55% initially chose the teacher certification major. This is consistent with Hanushek and Pace (1995), who document substantial shuffling in and out of teacher training over time, including among those who expressed intent in high school to become a teacher. Nonetheless, initial major is a stronger predictor of entering teacher education than potential interest—among matriculants, 62% of those initially majoring in teacher certification actually enter teacher education, compared to 23% who indicated potential interest in teacher certification.

Teacher Education Data

We link these admissions data with records from the university's TEP to identify who actually pursues teacher certification and who becomes employed as a K–12 public school teacher in Texas. Due to the lagged nature of these outcomes with respect to the

admissions data, our teacher education and employment outcomes cover applicants from 2009–2015. Over this period, roughly 2,800 students entered teacher education, among whom 78% were employed for at least one year as a full-time K–12 public school teacher in Texas. To obtain this measure of employment, the college of education provides a list of graduates to the Texas Education Agency, which then provides a matched list with information that includes school placement and job title.[5]

There are two main limitations of our outcomes data. First, our employment outcomes only capture graduates who went through the TEP at the university. While this likely constitutes the strong majority of university graduates who enter teaching, it is not the complete set. The first group we cannot identify are graduates who became teachers through alternative certification programs. As noted above, alternative certification is a major supply of new teachers in Texas, but these programs are serving a substantially different type of prospective teacher, on average (e.g., Kwok & Cain, 2021).

The second group are graduates earning teacher certification outside of core academic subjects, including agricultural, health, physical, and special education. Here, we can identify transfer students who entered these programs, but not first-year students. However, as a group these programs produce far fewer newly certified teachers than the TEP. Based on our own tabulations and cross-checks with publicly available reports from the Texas Education Agency, we estimate the share of students entering through these other programs to be roughly 20% of the total, compared to 80% certified through the TEP. Ultimately, then, we believe our outcomes data paints a fairly complete picture of the composition of the university's graduating students who become newly certified public school teachers, though we acknowledge some level of uncertainty, particularly concerning alternative certification programs. We return to this issue in our discussion of limitations and avenues for future research.

[5] Importantly, the full list of graduates is provided each year, not just new graduates. This allows us to observe delayed entries.

Methods

Consistent with the nature of our research questions, our analysis is descriptive. Primarily, we are interested in documenting changes in the representation of groups at different points along the early teacher pipeline. For example, to what extent does the representation of students of color in teacher education align with their representation among individuals who express interest in teaching? Here, we simply tabulate group composition at each juncture. While these tabulations are informative, it is difficult to discern from them the underlying dynamics driving the disparities. Therefore, we also use a multiple regression approach, which allows us to examine, for instance, racial/ethnic disparities in teaching interest among applicants with otherwise equivalent backgrounds.

We estimate log-binomial models of the following form:

$$Y_i = \beta_0 + \beta_1 Demog_i + \beta_2 Family_i + \beta_3 Acad_i + \delta(Transfer \times Year)_i + \epsilon_i \quad (1)$$

where Y_{it} is a binary indicator of the outcome for applicant i. As with our simple tabulations, we examine a set of successive teacher pipeline outcomes, from initial interest to employment as a full-time K–12 teacher. We predict Y_i as a function of applicant demographic characteristics (race/ethnicity and gender), family background characteristics (a categorical measure of income level, binary indicators for whether each parent has a bachelor's degree), and measures of academic achievement in high school (categorical measures of SAT composite score and GPA standardized within high schools). To account for differences in the composition of applicants across years and between the transfer versus first-year pools, we include fixed effects for transfer-by-year.

The key advantage of using a log-binomial model rather than other models for dichotomous outcomes, such as logistic regression or ordinary least squares (i.e., linear probability model), is that the log-binomial model produces direct estimates of the risk ratio, which are our parameters of interest. Different from odds ratios, risk ratios are both

easy to understand and maintain a clear interpretation across models with different baseline probabilities. Consider, for example, two models that predict initial interest and entry into teacher education, respectively. The marginal probabilities of these outcomes are 9.4% and 1.1%. If we want to understand whether the representation of Black teachers in teacher education is greater or less than their representation among those who are initially interested in teacher certification, we can compare the risk ratios for Black teachers between these two models.

Results

Interest in Teacher Certification Over Time

We begin by presenting descriptive information about potential interest in teacher certification from 2009 to 2020. Figure 1 shows the percentage of applicants indicating interest in teacher certification by year. For comparison, we show results for applicants' expressed interest in preprofessional programs, such as law or medicine. Note that while the preprofessional programs are mutually exclusive (i.e., applicants could not indicate interest in multiple programs), interest in teacher certification is a standalone question that is not dependent on an applicant's choice of whether to indicate interest in a preprofessional program. Thus, while it is informative to compare changes over time, we should be cautious about making direct comparisons in the *levels* of interest in teacher certification versus other careers.

Overall, interest in teaching declined steadily and substantially across the twelve-year period, from 13.0% in 2009 to 6.7% in 2020. This decline is consistent with national evidence over the same period showing drops in interest in teaching among high school students (Croft et al., 2018) and in enrollments of teacher preparation programs (Partelow, 2019). This pattern is particularly stark when contrasted with applicants' interest in other professions, such as medicine and law, where we observe no such decline.

Figure 2 shows disaggregation by applicant demographics (gender and race/ethnicity

in panel A) and academic achievement (SAT composite score and high school GPA in panel B). While there are substantial differences in interest in teaching across demographic groups, the interest decline is not systematically driven by a particular group. Mirroring the current composition of the K–12 teacher workforce, women are substantially more likely than men to express interest in teacher certification. As a percentage of the 2009 level, interest in teaching has declined by 45% and 51% for male and female applicants, respectively. Perhaps surprisingly, given the stark under-representation of teachers of color in K–12 schools, we find that interest in teaching is slightly *greater* among Black and Hispanic/Latino applicants in comparison to White applicants. In 2020, for example, 7.4% and 8.7% of Black and Hispanic/Latino applicants, respectively, expressed interest in teacher certification, compared to 6.2% of White applicants. By contrast, Asian applicants are substantially less interested in teaching, on average, at 4.5% in 2020.

Turning to high school achievement in panel B, we again find that the decline in interest in teaching is not systematically driven by high or low-performers. However, we do observe that high-performing applicants are substantially less likely to indicate interest in a teaching career. This relationship is particularly strong for SAT scores, where the highest scorers (>= 1300) are less than one-third as likely as the lowest scorers (< 1000) to indicate interest. We observe a similar pattern by high school GPA (standardized within high schools), though in this case the difference is driven by higher-achieving students only.

Examining the Early Teacher Pipeline

We now turn to the main part of our analysis by examining the teacher pipeline from initial application to employment as a K–12 teacher in Texas. Our overarching goal is to shed light on the potential mechanisms behind the stubborn persistence of representation gaps in the supply of new teachers. To begin, we show the composition of the potential teacher pipeline over successive junctures—from initial application, to matriculation and graduation, to eventual employment as a K–12 public school teacher in

Texas. To maintain a common sample for whom we can observe the full set of outcomes, we focus on applicants from 2015 or earlier.

Figure 3 demonstrates the gradual shaping of the teacher pipeline in terms of race/ethnicity and SAT composite score. In panel A, the first bar shows the racial/ethnic composition of the full pool of applicants. 55% of applicants over this period were White, 24% were Hispanic/Latino, 12% were Asian, and 6.7% were Black.[6] By contrast, the final bar shows that graduates who completed teacher certification and were employed as a K–12 public school teacher in Texas are substantially more likely to be White (80%), mirroring the existing composition of the teacher workforce in the United States. What explains the shift? Examining various junctures between college application and employment, we find that the racial/ethnic diversity of the pipeline drops both between application and matriculation, and between matriculation and entry into teacher education. Students of color comprise 46% of total applications but only 34% of matriculants and 21% of teacher education students. Notably, the share of Black and Hispanic/Latino matriculants who express interest in teacher certification remains slightly above their shares of all matriculants. Finally, the composition of K–12 teachers closely mirrors the composition of the TEP, further suggesting that a salient juncture from the perspective of increasing racial diversity is the pathway *into* teacher education.

Panel B of Figure 3 shows results by SAT composite score. Comparing the applicant pool to those graduating from teacher education and teaching in a K–12 public school in Texas, we find a shrinking of the upper tail; high-scoring students are less likely to become teachers. The gap appears to be completely driven by interest expressed at the time of college application. Students with SAT scores of 1400 or above constitute 16% of applicants but only 6.7% of applicants indicating interest in teacher certification. This latter percentage is very similar to the share of high-scorers who end up teaching in a K–12

[6] 1.8% of applicants did not identify with one of the aforementioned race/ethnicity groups and includes American Indian, Alaska Native, Native Hawaiian, and Other Pacific Islander

public school (6.4%). By contrast, low-scoring applicants, matriculants, and graduates are substantially more likely to be interested in teaching, but their share among those entering teacher education is tempered by the admissions screening process.

Next, we move to a multiple regression framework to examine the partial correlations between teacher pipeline outcomes and students' personal demographics, family background characteristics, and academic achievement. Table 1 shows results from a series of log-binomial regression models for successive pipeline outcomes. In each column, coefficients are expressed as risk ratios, with the base rate (the predicted probability when coefficients are fixed at their indicated base values) shown at the bottom. For example, the base rate in column 1 indicates that among white female applicants from middle-income families where neither parent has a bachelor's degree, and with SAT scores and GPAs in the middle of the distribution, the predicted probability of potential interest in teaching is 16.3%. The first three columns, which are completely based on admissions data, include applicants across all years, while columns 4 and 5 restrict to 2015 and earlier due to the time lag in observing entry into teacher education K–12 teaching.[7]

Table 1 column 1 shows results for interest in teacher certification at the time of application. Different from the unadjusted patterns in 3 where Black and Hispanic/Latino applicants were more likely than White applicants to express interest in teaching, column 1 shows that these groups are slightly *underrepresented* once we adjust for gender, family background, and high school achievement.[8] However, the pattern of narrowing of racial/ethnic diversity in moving from interest at application to enrollment in teacher education remains consistent. For instance, Black applicants are 86% as likely as White applicants to be interested in teacher certification (column 1) but are only 23% as likely to

[7] Appendix Table A2 shows results for columns 1–3 for the sample restriction used in columns 4–5. We find essentially identical patterns, though the estimated base rates are slightly larger because of the declining interest in teacher certification in more recent years.

[8] Appendix Table A3 reproduces the results in Table 1 with each of the applicant characteristics entered individually. Controlling for either family income or SAT composite score on its own produces risk ratios similar to those in column 1.

enter the TEP (column 4). We find similar patterns of disparities for Asian and Hispanic/Latino applicants.

Columns 2 and 3 show that both differential rates of admittance and matriculation among underrepresented applicants contribute to the disconnect between interest in teacher certification and the composition of the TEP. The decrease in the risk ratios between columns 1 and 2 shows that, among those interested in teacher certification, Black and Asian applicants are less likely than White applicants to be admitted. Further, the decrease from columns 2 to 3 shows that, among those admitted, nonwhite students are less likely to enroll at the university. Comparing columns 3 and 4, however, we still find that the representation of students of color in teacher education is well below the share of enrolled students at the university who indicate potential interest in teaching, even adjusting for any differences in family background or academic achievement.

Turning to gender, men are roughly half as likely as women to express potential interest in teacher certification, even after accounting for the wide set of other characteristics. While perhaps unsurprising, this large interest gap underscores the challenge of recruiting men to teacher education programs, given that men are already less likely to enroll in higher education (Reeves & Smith, 2021; Rich, 2014). Looking at downstream outcomes, the gender gap grows slightly larger due to differential rates of admittance and matriculation, but there is a substantial drop in male representation comparing potentially interested students to those who enter teacher education. Column 3 shows that relative to the complete applicant pool, men are 35% as likely as women to express interest in teacher certification and enroll at the university, but only 7% as likely to enter teacher education (column 4).

In terms of family background, middle-income applicants (i.e., those from families earning between $80k and $150k per year) are the most likely to enroll in teacher education and become full-time K–12 teachers. While lower-income applicants and admitted students are initially more likely to express potential interest in teacher certification, their

representation drops at each subsequent pipeline juncture, particularly between enrollment in the university and entering teacher education. Applicants from high-income families are roughly 11% less likely than those from middle-income families to be interested in teaching—a gap that remains consistent in magnitude across each column. Conditional on the other applicant characteristics in the model, there is little to no association between teacher pipeline outcomes and parental education level.

As shown previously, one of the most consistent predictors of interest in teacher certification is an applicant's academic background—particularly their SAT composite score. For low-scorers, there is a large drop-off in representation comparing all applicants to those enrolled in teacher education, which is mostly explained by their substantially lower admission rate. High-scoring (1300–1600) applicants follow a different pattern—they are 59% as likely (relative to the 1000–1290 group) to be interested in teaching at the time of application but have nearly comparable representation (91%) among those offered admission. From there, the share of high-performers drops at each subsequent juncture, from matriculation to teacher education to full-time teacher. Patterns based on applicant high school GPA (standardized within high schools) are similar, such that the pool of newly certified teachers draws heavily from students in the middle of the achievement distribution.

Overall, Table 1 helps to illustrate the gradual shaping of the teaching pipeline from an applicant pool diverse across many dimensions to a TEP—and, by consequence, a supply of new teachers—that is substantially more homogeneous. Particularly notable is that the composition of the TEP is very different from the pool of applicants who indicate potential interest in teaching, providing some suggestive evidence that there is opportunity to increase the share of students from underrepresented group in teacher education. In that vein, we next examine more closely the selection into teacher education among enrolled students.

Examining the Choice to Enter Teacher Education

Table 2 aims to understand the large disconnect between the composition of the TEP and the broader potential pool composed of enrolled students who express interest in teacher certification. First, we examine students' initial major choice. Over the study period, the typical path to certification was through an interdisciplinary studies major offered by the TEP, as Texas prohibited institutions of higher education from offering an undergraduate major in education. As part of the college application process, students select a first-choice school and major. While not a binding choice, initial major choice provides a strong signal of intent to pursue teacher certification; roughly half of these students end up in the TEP. Accordingly, we view initial major as a stronger signal of intent or commitment to become a teacher, as opposed to the weaker signal of potential interest.

Columns 1 and 2 predict, among enrolled students, interest in teacher certification and initial major in teacher certification, respectively. Comparing interest in teacher certification versus initial major choice is informative, as these outcomes are measured at the same point in time. Column 1 replicates the pattern from Table 1 for interest in teacher certification, showing that interest gaps by race/ethnicity are relatively modest even among enrolled students. By contrast, the gaps in initial major choice are substantial, more closely reflecting the representation disparities in downstream outcomes like teacher education and employment as a K–12 public school teacher. The gender gap follows a similar pattern—it is much larger for initial major choice than for potential interest in teaching. Interestingly, this dynamic does not exist for the disparities by academic achievement. Here, there is a close correspondence of the odds ratios in columns 1 and 2, demonstrating that the share of students by SAT score or GPA group with an initial major in teacher certification matches the share of such students who expressed interest in teacher certification.

The remaining columns model entry into the TEP. This is a critical juncture for the teacher pipeline, as high rates of graduation and entry into the public K–12 teacher workforce (at least for this institution) conditional on enrolling in the TEP mean that

compositional changes beyond this point are only marginal. We examine teacher education entry among four subgroups of enrolled students defined by potential interest in teacher certification (yes/no) and initial teacher certification major (yes/no). Across predictors, the risk ratios in columns 3 and 4 are similar, and confirm the patterns in Table 1 showing underrepresentation of students of color, men, and those with high SAT scores. Patterns by initial major, however, show substantial differences. Most notably, column 5 shows that among students who initially chose teacher certification as a major, rates of subsequent entry into teacher education are fairly comparable across racial/ethnic groups. Men and high-SAT students also enter teacher education at more comparable rates among those initially choosing the teacher certification major.

Table 2 shows that for underrepresented groups—namely, men and people of color—there is a large disconnect between potential interest in teaching and more concrete steps towards certification. Once on a path towards certification, we do not find evidence that these groups disproportionately leave teacher education or the teaching profession. This suggests that efforts by the TEP to recruit a more diverse group of teacher candidates could be fruitful in terms of increasing representation among new teachers. That said, we must be cautious in extrapolating the results in column 5 to a broader set of individuals who are perhaps less committed to a teaching career. Relatedly, we cannot pinpoint the exact mechanism driving the gaps between potential interest and major choice. For example, this gap could stem from informational disparities in how to enter teacher education, but could also reflect a desire to keep one's options open. At a minimum, these results suggest that underrepresented groups are not actively pushed out of the teacher education track, but rather that initial recruitment into teacher education is a major challenge.

Why, then, don't underrepresented groups join teacher education at rates in line with their potential interest? One additional avenue we can investigate through our data is applicants' interest in a particular certification level. As a follow-up to indicating interest

in earning teacher certification, applicants are asked to choose one of four levels: elementary school, middle school, high school, or all grades. We can observe this response for first-year applicants (not transfer students). This response is informative because the TEP primarily serves students earning certification at the elementary (grades EC–6) and middle school (grades 4–8) levels. While there are paths to secondary certification (grades 7–12), these individuals comprise less than ten percent of the TEP's enrollment.

Table 3 shows results (relative risk ratios) from a multinomial logistic regression model predicting the intended level of teacher certification relative to the base category of not interested in teacher certification. We find that students of color are roughly equally as likely as White students to be interested in high school or all grades certification, but substantially less likely to be interested in elementary or middle school. Similarly, men are only slightly less likely than women to express interest in high school, but almost never express interest in elementary or middle school. Among the roughly 59,000 men enrolled in the university across the 12-year study period, only 30 and 55 indicated interest in elementary and middle school, respectively. We also find that the negative relationship between SAT scores and interest is somewhat smaller in magnitude for high school certification.

The results in Table 3 suggest one potential mechanism for the disconnect between expressed interest in teacher certification and the actual choice to enter teacher education. Because the university's TEP primarily serves those pursuing teacher certification for elementary and middle school grades, we would anticipate that those interested in high school or all-grades certification—which have relatively greater shares of students of color, men, and high-achieving students—would be less likely to enter. Table 4 tests this hypothesis. Specifically, we predict both the likelihood of initially majoring in teacher certification and of entering teacher education, with and without controlling for intended certification level. This framework allows us to examine the extent to which differential rates of interest by certification level explain the observed gaps in these teacher pipeline

outcomes.

Table 4 shows that among enrolled students who express interest in teacher certification, those interested in high school are substantially less likely both to choose an initial major in teacher certification and to ultimately enter teacher education. The disparity is larger for the teacher certification major, reflecting the fact that those pursuing grades 7–12 certification through teacher education will major in a content area (e.g., English) rather than interdisciplinary studies. This is also supported by Appendix Table A5, which shows the correspondence between intended certification level and actual certification area in teacher education. A comparison of columns 1–2 and 3–4 shows that accounting for the differences in intended level of certification only slightly reduces the magnitude of racial/ethnic gaps in teacher pipeline outcomes. For instance, the risk ratio for Black (relative to White) moves from 0.56 in column 3 to 0.63 in column 4. There is a larger reduction in the magnitude of the risk ratios for men, but both race and gender disparities in teacher education remains substantial even after accounting for differences in intended certification level.[9]

Discussion and Conclusions

In this paper, we leverage admissions records from a large public university in Texas linked to teacher education program data to descriptively document the teacher pipeline from college application to employment as a K–12 public school teacher. A key feature of our analysis is linking interest to entry. Who is interested in becoming a teacher? Who actually becomes one?

Perhaps our most important finding is that racial/ethnic gaps in teacher education are substantially larger than gaps in potential interest in teaching. Put another way, far fewer students of color pass through teacher education than would be predicted based on

[9] Appendix Table A6 shows an alternative version of this analysis that predicts entering teacher education restricting to subgroups defined by intended certification level. Consistent with the results in Table 4, we find that racial/ethnic and gender disparities exist within these subgroups, though in some cases the estimates are fairly imprecise due to small sample sizes (middle school, in particular).

who expresses interest in teaching when applying to college. Why is this the case? There is no single "leak" in the pipeline of diverse teachers. Instead, the representation of potential teachers of color declines at every juncture from college application to teacher education. While applicants of color are interested in teaching at rates equal to or even greater than white applicants, they are less likely to be admitted, to matriculate and, conditional on enrollment, to enter teacher education. These representational disparities in teacher education are important, as they directly contribute to the growing gaps between the racial/ethnic composition of the K–12 public school teacher workforce and the students whom they serve.

While we cannot speak definitively to the specific mechanisms that drive these patterns, we uncover two important clues. The first is that while applicants of color signal potential interest in teaching at rates similar to white applicants, they are substantially less likely to choose an initial major that leads directly to teacher certification. While this initial choice is not binding and many college students switch majors (Leu, 2017), we observe that the majority of students who start in the major end up in teacher education. We also find no evidence of representational disparities among this group in terms of entering teacher education, suggesting that bridging the gap from potential interest to concrete steps towards certification is a key challenge for increasing the supply of diverse teachers.

A second clue is that potential teachers of color express greater interest in high school certification than elementary or middle school. This is relevant because paths to high school certification in many states, including Texas, are less direct than for elementary or middle school. Rather than an pursuing an education major, potential high school teachers major in a content area and concurrently complete the certification requirements. This structure, while sensible for ensuring adequate content-area knowledge in advanced subjects, means less time and contact with teacher education and opens up the possibility of being lured into more lucrative careers. In fact, those interested in high school

certification were less likely to enter teacher education, but this explains only little of the racial/ethnic disparities we observe in teacher education. Nonetheless, the difference in interest by certification level is, to our knowledge, a novel finding that deserves additional attention.

Our findings also speak to the underrepresentation of high-achieving individuals and men. Higher-achieving students—measured by SAT scores or high school GPA—are substantially less likely to be interested in teaching, which translates to their underrepresentation in teacher education and among K–12 public school teachers. While less often a policy focus, men are severely underrepresented in teacher education and K–12 public schools—a pattern that we replicate here. Similar to potential teachers of color, men enter teacher education at substantially lower rates than would be implied by their initial interest. Somewhat differently, however, the interest gap is also large, underscoring long-standing gender dynamics that have shaped the teacher workforce, particularly in elementary and middle schools (Drudy, 2008).

We believe these findings have important implications for policy and practice, though we also stress consideration of our limitations and the need for additional research. Foremost, this study reinforces the continued need for policies that remove potential barriers keeping diverse and talented individuals out of teacher education and K–12 classrooms. Concerning the recruitment of teachers of color, in particular, the gap between interest and entry suggests that substantial improvement is possible. While we are unable to identify the specific mechanisms at play, it is worth noting that the measure of potential interest in teaching, which comes from Texas's centralized application for higher education admission, is not utilized by the university or TEP. Obviously, this is just one institution, but we suggest that it may represent a broader phenomenon whereby teacher education insufficiently invests in identifying, recruiting, and graduating teachers beyond their typical demographic. At a minimum, our results suggest a need for additional research examining the recruitment practices of TEPs.

Concerning external validity, more broadly, we reiterate that this study's data come from a single university in a state with distinctive characteristics relating to teacher supply. While our high-level descriptive findings about interest in teaching—including changes over time and differences by gender, race/ethnicity, and academic achievement—are directly in line with national evidence (Croft et al., 2018; Hanushek & Pace, 1995), threats to generalizability are potentially greater when we examine entry into teacher education and K–12 public schools. For example, this institution has a relatively small high school certification program and Texas has a large alternative certification sector, meaning that some students whom we do not observe in teacher education may nonetheless become certified K–12 teachers. Relatedly, we cannot observe the outcomes of applicants who were not admitted or did not enroll at this institution. Future work that follows college students across institutions and in both traditional and alternative certification sectors could help to address this limitation and provide a more comprehensive picture of the teacher pipeline.

Finally, we must reiterate that we are fundamentally limited by what we can measure using quantitative data. Our measure of potential interest in teaching, in particular, is dichotomous and measured at a single point in time. This is helpful in documenting large-scale patterns, but students' considerations to become a teacher are undoubtedly dynamic and multi-faceted—nuances we cannot capture here. Relatedly, we cannot observe the specific processes that drive our results, highlighting the need for qualitative or mixed-methods research that can help inform effective policies for promoting a stronger teacher workforce.

As a concluding note, we underscore the sharp decline over the 12-year period of our study in high school students' interest in becoming a teacher, which was consistent across race/ethnicity, gender, and academic achievement. This mirrors the enrollment drop in teacher preparation programs nationally, which have rightfully received considerable attention (e.g., Goldberg, 2021; Partelow, 2019). To the extent that these declines serve as a barometer for the health of the teaching profession and the challenges ahead, it is critical

for researchers to continue expanding our understanding of the early teacher pipeline and the important role played by teacher education programs.

References

Auguste, B., Kihn, P., & Miller, M. (2010). *Closing the talent gap: Attracting and retaining top-third graduates to careers in teaching* (Tech. Rep.). McKinsey & Company.

Ballou, D., & Podgursky, M. (1995). Recruiting Smarter Teachers. *The Journal of Human Resources*, *30*(2), 326.

Bartanen, B., & Kwok, A. (2021). Examining Clinical Teaching Observation Scores as a Measure of Preservice Teacher Quality. *American Educational Research Journal*, *58*(5), 1–33.

Brown, C., & Boser, U. (2017). *Revisiting the Persistent Teacher Diversity Problem* (Tech. Rep.). The Center for American Progress.

Bustos Flores, B., Clark, E. R., Claeys, L., & Villarreal, A. (2007). Academy for Teacher Excellence: Recruting, Preparing, and Retaining Latino Teachers through Learning Communities. *Teacher Education Quarterly*, *34*(4), 53–69.

Carter Andrews, D. J., Castro, E., Cho, C. L., Petchauer, E., Richmond, G., & Floden, R. (2019). Changing the Narrative on Diversifying the Teaching Workforce: A Look at Historical and Contemporary Factors That Inform Recruitment and Retention of Teachers of Color. *Journal of Teacher Education*, *70*(1), 6–12.

Chetty, R., Friedman, J., & Rockoff, J. (2014a). Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates. *American Economic Review*, *104*(9), 2633–2679.

Chetty, R., Friedman, J. E., & Rockoff, J. N. (2014b). Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood. *American Economic Review*, *104*(9), 2633–2679.

Croft, M., Guffy, G., & Vitale, D. (2018). Encouraging More High School Students to Consider Teaching.

Dastidar, A. G., & Sikdar, S. (2015). Occupation choices of high school and college students with special reference to teaching and research. *Policy Futures in Education*, *13*(3), 375–394.

Dee, T. S. (2005). A Teacher Like Me: Does Race, Ethnicity, or Gender Matter? *The American Economic Review*, *95*(2), 158–165.

Drudy, S. (2008). Gender balance/gender bias: The teaching profession and the impact of feminisation. *Gender and Education*, *20*(4), 309–323.

Farkas, S., Johnson, J., & Foleno, T. (2000). *A Sense of Calling: Who Teacher and Why* (Tech. Rep.). New York, NY: Public Agenda.

Gershenson, S., Hart, C. M., Hyman, J., Lindsay, C. A., & Papageorge, N. W. (2022). The Long-Run Impacts of Same Race Teachers. *American Economic Journal: Economic Policy*.

Gist, C. D., Bristol, T. J., Bianco, M., & Goings, R. B. (2021). Finding strategies to bring Teachers of Color and Indigenous Teachers into the profession. In *Building a more ethnoracially diverse teaching force: New directions in research, policy, and practice* (pp. 8–11). Phi Delta Kappan.

Gitomer, D. H. (2007). *Teacher Quality in a Changing Policy Landscape: Improvements in the Teacher Pool* (Tech. Rep.). Princeton, NJ: Educational Testing Service.

Goe, L., & Roth, A. (2019). *Strategies for Supporting Educator Preparation Programs'*

Efforts to Attract, Admit, Support, and Graduate Teacher Candidates From Underrepresented Groups (Tech. Rep. No. March). Princeton, NJ: Educational Testing Service.

Goldberg, E. (2021, apr). *As Pandemic Upends Teaching, Fewer Students Want to Pursue It.* Retrieved from https://www.nytimes.com/2021/03/27/us/covid-school-teaching.html

Goldhaber, D. (2019). Evidence-based teacher preparation: Policy context and what we know. *Journal of Teacher Education*, *70*(2), 90–101.

Goldhaber, D., Krieg, J., & Theobald, R. (2014). Knocking on the door to the teaching profession? Modeling the entry of prospective teachers into the workforce. *Economics of Education Review*, *43*, 106–124.

Goldhaber, D., Krieg, J. M., Theobald, R., & Goggins, M. (2020). *Front End to Back End: Teacher Preparation, Workforce Entry, and Attrition* (No. December).

Grissom, J. A., Kern, E. C., & Rodriguez, L. A. (2015). The "Representative Bureaucracy" in Education: Educator Workforce Diversity, Policy Outputs, and Outcomes for Disadvantaged Students. *Educational Researcher*, *44*(3), 185–192.

Grissom, J. A., & Redding, C. (2016). Discretion and Disproportionality: Explaining the Underrepresentation of High-Achieving Students of Color in Gifted Programs. *AERA Open*, *2*(1), 1–25.

Han, S. W., Borgonovi, F., & Guerriero, S. (2018). What Motivates High School Students to Want to Be Teachers? The Role of Salary, Working Conditions, and Societal Evaluations About Occupations in a Comparative Perspective. *American Educational Research Journal*, *55*(1), 3–39.

Hansen, M., & Quintero, D. (2019). The diversity gap for public school teachers is actually growing across generations. *Brown Center Chalkboard, Brookings Institution*.

Hanushek, E. A., & Pace, R. R. (1995). Who chooses to teach (and why)? *Economics of Education Review*, *14*(2), 101–117.

Hanushek, E. A., Piopiunik, M., & Wiederhold, S. (2019, oct). The Value of Smarter Teachers. *Journal of Human Resources*, *54*(4), 857–899.

Hanushek, E. A., & Rivkin, S. (2012). The Distribution of Teacher Quality and Implications for Policy. *Annual Review of Economics*, *4*(1), 131–157.

Henke, R. R., Chen, X., & Geis, S. (2000). Progress through the teacher pipeline: 1992-93 college graduates and elementary/secondary school teaching as of 1997. statistical analysis report. Postsecondary education descriptive analysis reports. (January), 209.

Ingersoll, R., Merrill, E., Stuckey, D., Collins, G., & Harrison, B. (2021). The demographic transformation of the teaching force in the united states. *Education Sciences*, *11*(5).

Ingersoll, R., & Merrill, L. (2017). *A Quarter Century of Changes in the Elementary and Secondary Teaching Force: From 1987 to 2012* (Tech. Rep.). Washington D.C.: National Center for Education Statistics.

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* (Tech. Rep.).

Kwok, A., & Cain, C. (2021, feb). Alternatively certified teachers' perceptions of new teacher induction. *Professional Development in Education*, 1–13.

Kyriacou, C., & Coulthard, M. (2000). Undergraduates' Views of Teaching as a Career

Choice. *Journal of Education for Teaching*, *26*(2), 117–126.
Lankford, H., Loeb, S., McEachin, A., Miller, L. C., & Wyckoff, J. (2014). Who Enters Teaching? Encouraging Evidence That the Status of Teaching Is Improving. *Educational Researcher*, *43*(9), 444–453.
Leu, K. (2017). *Beginning college students who change their majors within 3 years of enrollment* (Tech. Rep.). Washington, DC: National Center for Education Statistics.
Lindsay, C. A., & Hart, C. M. D. (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.
Mancenido, Z. (2021). How High Achievers Learn That They Should Not Become Teachers. *Harvard Educational Review*, *91*(4), 433–456.
Master, B., Sun, M., & Loeb, S. (2018). Teacher workforce developments: Recent changes in academic competitiveness and job satisfaction of new teachers. *Education Finance and Policy*, *13*(3), 310–332.
National Center for Education Statistics. (2018). *Characteristics of Public School Teachers Who Completed Alternative Route to Certification Programs* (Tech. Rep.).
Park, H., & Byun, S. Y. (2015). Why some countries attract more high-ability young students to teaching: Cross-national comparisons of students' expectation of becoming a teacher. *Comparative Education Review*, *59*(3), 523–549.
Partelow, L. (2019). *What To Make of Declining Enrollment in Teacher Preparation Programs* (Tech. Rep.). Washington, D.C.: Center for American Progress.
Partelow, L., Spong, A., Brown, C., & Johnson, S. (2017). *America Needs More Teachers of Color and a More Selective Teaching Profession* (Tech. Rep.). Washington, D.C.: Center for American Progress.
Putman, H., Hansen, M., Walsh, K., & Quintero, D. (2016). The real challenges to building a diverse workforce. *Brookings Institution*(August), 1–22.
Putman, H., & Walsh, K. (2021). *Driven by Data: Using Licensure Tests to Build a Strong, Diverse Teacher Workforce* (Tech. Rep.). National Council on Teacher Quality.
Redding, C. (2019). A Teacher Like Me: A Review of the Effect of Student–Teacher Racial/Ethnic Matching on Teacher Perceptions of Students and Student Academic and Behavioral Outcomes. *Review of Educational Research*, *89*(4), 499–535.
Redding, C., & Baker, D. J. (2019, apr). Understanding Racial/Ethnic Diversity Gaps Among Early Career Teachers. *AERA Open*, *5*(2), 1–17.
Reeves, R., & Smith, E. (2021). The male college crisis is not just in enrollment, but completion. *Brookings Institution*.
Rich, M. (2014). Why don't more men go into teaching. *New York Times*. Retrieved from https://www.nytimes.com/2014/09/07/sunday-review/why-dont-more-men-go-into-teaching.html
Savage, C., Ayaita, A., Hübner, N., & Biewen, M. (2021). Who Chooses Teacher Education and Why? Evidence From Germany. *Educational Researcher*, *50*(7), 483–487.
Sleeter, C. E., & Milner, H. R. (2011). Researching successful efforts in teacher education to diversity teachers. In *Studying diversity in teacher education* (pp. 81–103).
Taie, S., & Goldring, R. (2020). *Characteristics of Public and Private Elementary and Secondary School Teachers in the United States: Results From the 2017–18 National Teacher and Principal Survey* (Tech. Rep.). Washington, DC: National Center for

Education Statistics.

Vagi, R., Pivovarova, M., & Barnard, W. (2019). Keeping Our Best? A Survival Analysis Examining a Measure of Preservice Teacher Quality and Teacher Attrition. *Journal of Teacher Education*, *70*(2), 115–127.

Yin, J., & Partelow, L. (2020). *An Overview of the Teacher Alternative Certification Sector Outside of Higher Education* (Tech. Rep.). Center for American Progress.

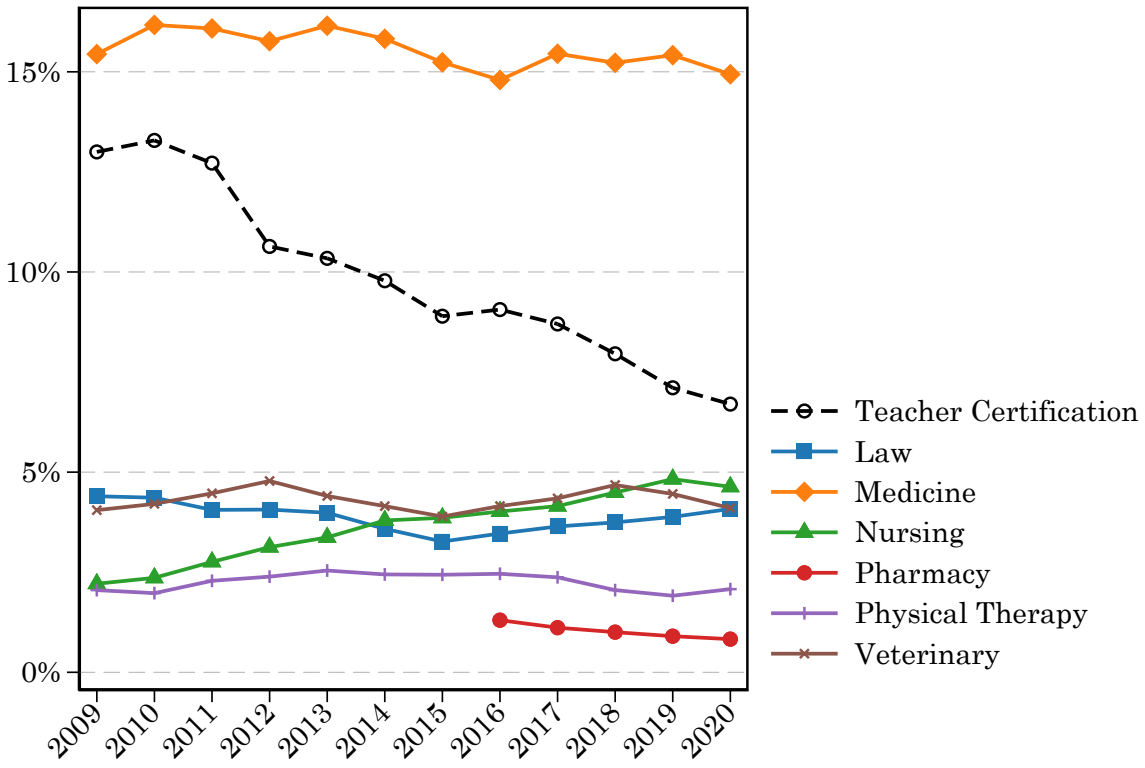
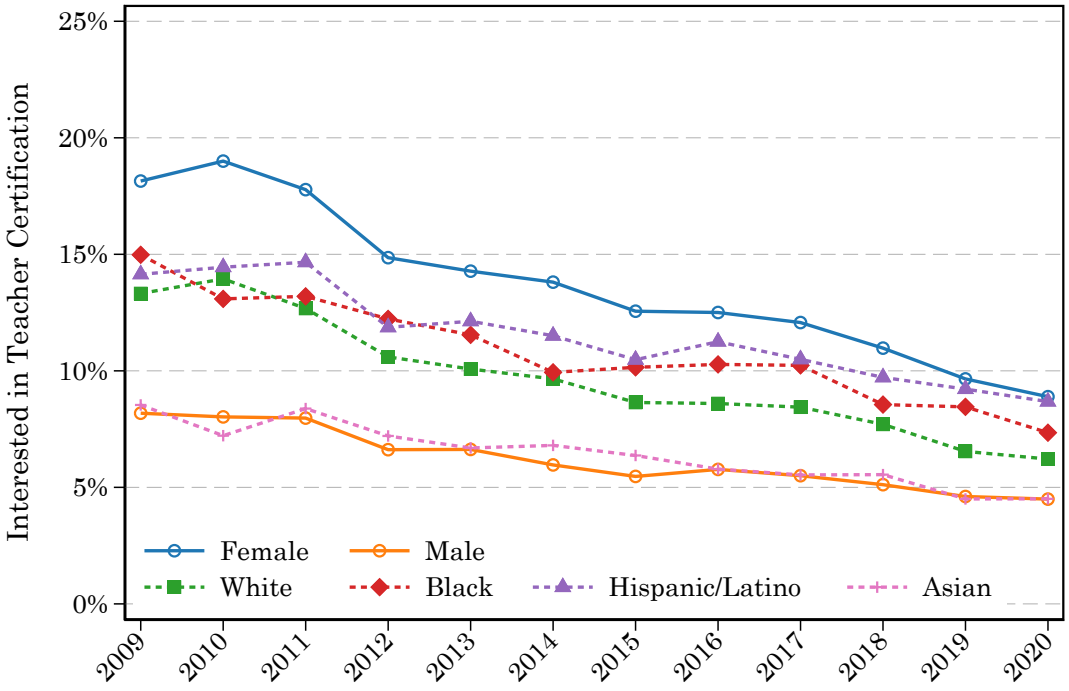


Figure 1

Interest in Teaching and Preprofessional Programs

Notes: For teacher certification, the lines shows the percentage of applicants who responded yes to the following question: "Will you seek teacher certification?" A yes/no response was required. The remaining lines comes from a single item: "If you plan to pursue a preprofessional program, please specify which one." A response was not required and applicants could choose one (mutually exclusive) of the six listed programs, "no", or "others." Pharmacy was not an available option until 2016.

(a) *Demographics*



(b) *Academic Achievement*

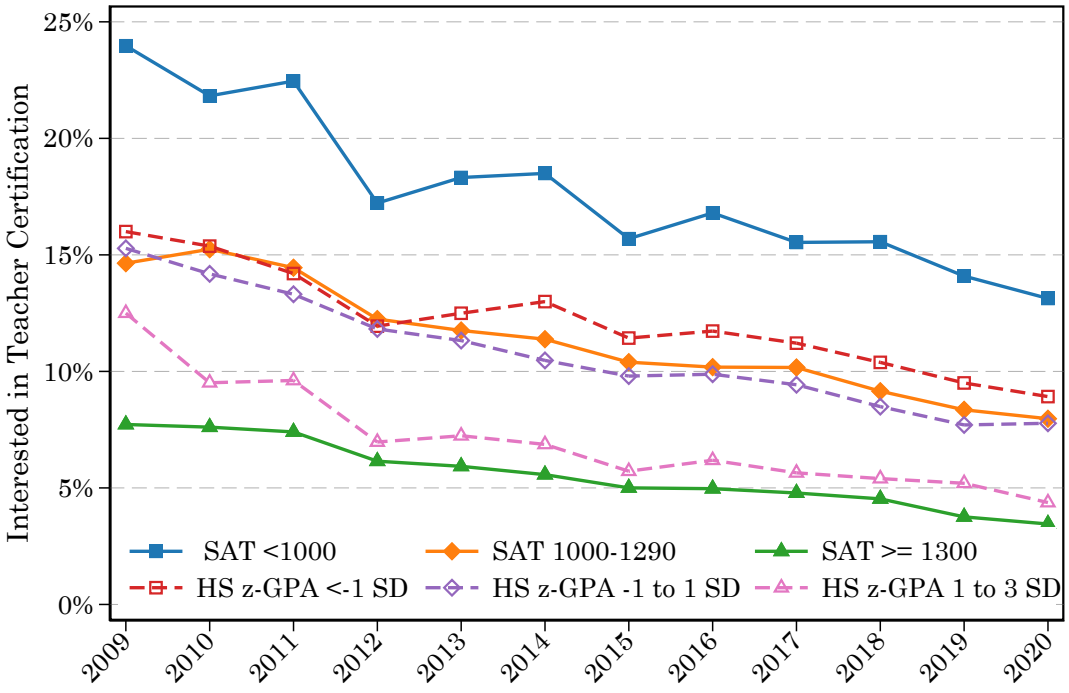
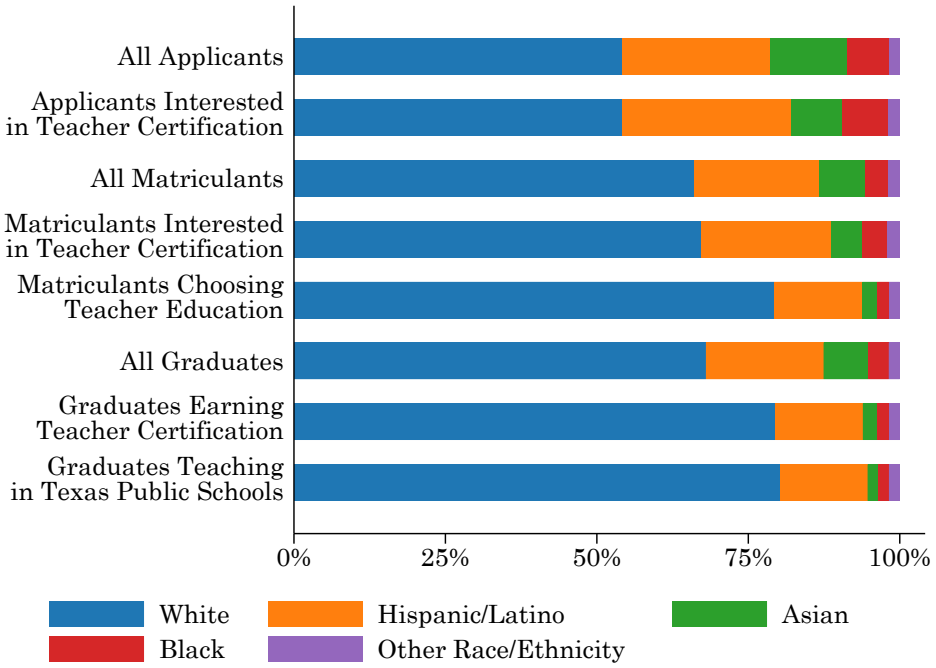


Figure 2

Interest in Teaching by Applicant Characteristics

Notes: Lines show the percentage of applicants within the defined subgroups who responded yes to the following question: "Will you seek teacher certification?" A yes/no response was required.

(a) *Race/Ethnicity*



(b) *SAT Composite Score*

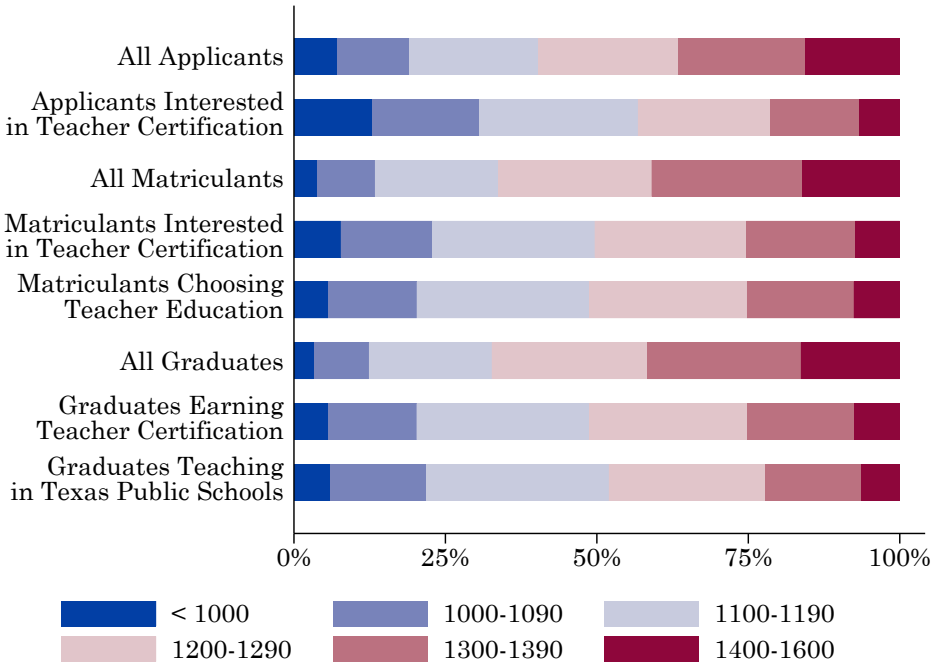


Figure 3

Composition of the Potential Teacher Pipeline

Notes: Bars show the composition of individuals defined by each label. Due to the lagged nature of outcomes, the plots are restricted to a common sample of those who applied in 2015 or earlier.

Table 1

Predicting Interest in Teaching and Teacher Pipeline Outcomes

Outcome =	Interest	Interest + Admit	Interest + Enroll	Teacher Ed	Employ K-12 Tch
	(1)	(2)	(3)	(4)	(5)
Personal Demographics					
White (base)					
Black	0.86**	0.63**	0.50**	0.23**	0.20**
	(0.015)	(0.020)	(0.021)	(0.032)	(0.034)
Hispanic/Latino	0.95**	0.91**	0.70**	0.46**	0.46**
	(0.010)	(0.015)	(0.015)	(0.026)	(0.030)
Asian	0.76**	0.64**	0.42**	0.18**	0.15**
	(0.012)	(0.015)	(0.015)	(0.023)	(0.023)
Other Race/Ethnicity	1.01	0.94	0.89	0.74*	0.72*
	(0.033)	(0.047)	(0.053)	(0.103)	(0.114)
Male (base = Female)	0.49**	0.40**	0.35**	0.07**	0.05**
	(0.005)	(0.006)	(0.007)	(0.005)	(0.005)
Family Background					
Income less than $80k	1.12**	1.13**	1.01	0.76**	0.70**
	(0.013)	(0.020)	(0.022)	(0.039)	(0.041)
Income $80k–$150k (base)					
Income more than $150k	0.89**	0.82**	0.82**	0.86**	0.86**
	(0.012)	(0.016)	(0.019)	(0.043)	(0.048)
Father has BA (base = no)	0.94**	0.92**	0.95**	1.02	0.98
	(0.010)	(0.014)	(0.018)	(0.046)	(0.049)
Mother has BA (base = no)	0.99	0.99	1.00	1.07	1.07
	(0.010)	(0.015)	(0.019)	(0.046)	(0.052)
Academic Achievement					
SAT <1000	1.41**	0.94*	0.92*	0.84*	0.87
	(0.019)	(0.025)	(0.032)	(0.075)	(0.086)
SAT 1000–1290 (base)					
SAT 1300–1600	0.59**	0.91**	0.78**	0.71**	0.62**
	(0.007)	(0.015)	(0.017)	(0.035)	(0.036)
HS z-GPA -3 to -1 SD	1.08**	0.37**	0.47**	0.39**	0.39**
	(0.016)	(0.013)	(0.019)	(0.044)	(0.048)
HS z-GPA -1 to 1 SD (base)					
HS z-GPA 1 to 3 SD	0.76**	0.91**	0.83**	0.89	0.77**
	(0.015)	(0.021)	(0.025)	(0.060)	(0.063)
Base Rate (%)	16.3	10.8	8.9	4.9	4.3
N	517857	517857	517857	254789	254789

Notes: Estimates are from log-binomial regression models, with coefficients expressed as risk ratios. Heteroskedasticity-robust standard errors shown in parentheses. Outcomes are listed in the model header, with the base rate (predicted probability when coefficients are fixed at their indicated base values) expressed as a percentage in the model footer. "Interest" indicates whether an applicant responded "yes" to the following application question: "Will You Seek Teacher Certification?" For teacher education and entry, we restrict the sample to applicants applying in 2015 or earlier. Models include binary indicators for the application year-by-transfer status. Appendix Table A2 shows results for the common sample defined by columns 4 and 5, which are very similar.

* $p < 0.05$; ** $p < 0.01$

Table 2
Who Enrolls in Teacher Education?

Outcome =	Interest in Cert	Initial Cert Major	Teacher Education			
Subgroup =			Interest in Cert?		Initial Major?	
			Yes	No	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)
Personal Demographics						
White (base)						
Black	0.87**	0.43**	0.51**	0.38**	0.98	0.43**
	(0.035)	(0.049)	(0.079)	(0.101)	(0.144)	(0.083)
Hispanic/Latino	0.89**	0.64**	0.70**	0.73**	0.92	0.65**
	(0.018)	(0.027)	(0.043)	(0.074)	(0.049)	(0.052)
Asian	0.76**	0.26**	0.51**	0.43**	1.02	0.43**
	(0.026)	(0.030)	(0.074)	(0.087)	(0.119)	(0.068)
Other Race/Ethnicity	1.00	0.82	0.87	0.79	1.10	0.68
	(0.057)	(0.091)	(0.114)	(0.238)	(0.103)	(0.164)
Male (base = Female)	0.37**	0.05**	0.15**	0.14**	0.84	0.12**
	(0.007)	(0.004)	(0.016)	(0.015)	(0.079)	(0.011)
Family Background						
Income less than $80k	1.09**	0.88**	0.82**	0.84	0.93	0.82*
	(0.023)	(0.036)	(0.041)	(0.088)	(0.039)	(0.065)
Income $80k–$150k (base)						
Income more than $150k	0.88**	0.96	1.06	0.86	0.93	0.90
	(0.020)	(0.038)	(0.048)	(0.088)	(0.036)	(0.069)
Father has BA (base = no)	0.98	1.09*	1.06	1.05	0.96	1.11
	(0.018)	(0.038)	(0.045)	(0.096)	(0.034)	(0.076)
Mother has BA (base = no)	0.98	1.03	1.06	0.92	1.05	0.97
	(0.018)	(0.034)	(0.043)	(0.079)	(0.036)	(0.063)
Academic Achievement						
SAT <1000	1.42**	1.53**	0.89	1.19	0.88	1.04
	(0.045)	(0.091)	(0.076)	(0.239)	(0.065)	(0.164)
SAT 1000–1290 (base)						
SAT 1300–1600	0.64**	0.61**	0.84**	0.74**	1.01	0.61**
	(0.014)	(0.028)	(0.043)	(0.062)	(0.045)	(0.040)
HS z-GPA -3 to -1 SD	1.13**	1.06	0.82	1.04	0.82*	1.03
	(0.043)	(0.076)	(0.087)	(0.245)	(0.081)	(0.177)
HS z-GPA -1 to 1 SD (base)						
HS z-GPA 1 to 3 SD	0.76**	0.76**	1.04	0.87	1.12*	0.72**
	(0.022)	(0.042)	(0.068)	(0.109)	(0.053)	(0.074)
Base Rate (%)	17.4	7.1	33.1	2.7	66.6	4.3
N	159986	159986	9139	75630	2540	82229

Notes: Estimates are from log-binomial regression models, with coefficients expressed as risk ratios. Heteroskedasticity-robust standard errors shown in parentheses. Outcomes and subgroups (all models have a baseline restriction of only including enrolled students) are listed in the model header, with the base rate (predicted probability when coefficients are fixed at their indicated base values) expressed as a percentage in the model footer. "Interest in Cert" indicates whether an applicant responded "yes" to the following application question: "Will You Seek Teacher Certification?" "Initial Cert Major" indicates whether an applicant's preferred major (at the time of application) is associated with the teacher education program. "Teacher Education" indicates whether the applicant is observed in the teacher education program. Models include binary indicators for the application year-by-transfer status.
* $p < 0.05$; ** $p < 0.01$

Table 3
Predicting Intended Teacher Certification Level

	Intended Certification Level (Base = Not Interested)			
	Elementary	Middle	High	All Grades
Personal Demographics				
White (base)				
Black	0.54**	0.58*	1.12	1.07
	(0.072)	(0.154)	(0.082)	(0.094)
Hispanic/Latino	0.69**	0.59**	1.05	1.08
	(0.043)	(0.077)	(0.042)	(0.051)
Asian	0.34**	0.62*	1.15**	0.88
	(0.047)	(0.128)	(0.063)	(0.070)
Other Race/Ethnicity	0.84	0.25*	0.98	1.15
	(0.161)	(0.176)	(0.128)	(0.174)
Male (base = Female)	0.02**	0.14**	0.86**	0.27**
	(0.003)	(0.021)	(0.028)	(0.013)
Family Background				
Income less than $80k	0.96	0.99	1.27**	1.23**
	(0.065)	(0.128)	(0.056)	(0.067)
Income $80k–$150k (base)				
Income more than $150k	0.98	0.80	0.85**	0.94
	(0.063)	(0.107)	(0.041)	(0.055)
Father has BA (base = no)	1.14*	1.21	0.86**	0.99
	(0.065)	(0.140)	(0.034)	(0.047)
Mother has BA (base = no)	1.19**	1.16	0.89**	0.96
	(0.065)	(0.129)	(0.033)	(0.045)
Academic Achievement				
SAT <1000	2.17**	2.20**	1.33**	1.53**
	(0.225)	(0.490)	(0.108)	(0.137)
SAT 1000–1290 (base)				
SAT 1300–1600	0.50**	0.55**	0.75**	0.54**
	(0.028)	(0.062)	(0.027)	(0.025)
HS z-GPA -3 to -1 SD	1.16	1.24	1.30**	1.31*
	(0.164)	(0.349)	(0.112)	(0.149)
HS z-GPA -1 to 1 SD (base)				
HS z-GPA 1 to 3 SD	0.54**	0.92	0.79**	0.81**
	(0.048)	(0.141)	(0.044)	(0.055)
Base Rate (%)	4.6	0.9	4.6	4.3
N	117682			

Notes: Estimates are from a multinomial logistic regression model, with coefficients expressed as relative risk ratios. Heteroskedasticity-robust standard errors shown in parentheses. Outcomes are listed in the model header, with the base rate (predicted probability when coefficients are fixed at their indicated base values) expressed as a percentage in the model footer. The sample is restricted to applicants for first-year undergraduate admissions who subsequently enrolled at the university Appendix Table A4 shows results for all first-year admissions applicants.
* $p < 0.05$; ** $p < 0.01$

Table 4

Predicting Teacher Education Entry by Intended Certification Level

Outcome =	Initial Cert Major		Teacher Education	
	(1)	(2)	(3)	(4)
Interest in Cert Level = Elem (base)				
Interest in Cert Level = Middle		0.86*		0.84*
		(0.056)		(0.070)
Interest in Cert Level = High		0.12**		0.28**
		(0.011)		(0.022)
Interest in Cert Level = All Grades		0.47**		0.49**
		(0.023)		(0.029)
Personal Demographics				
White (base)				
Black	0.69**	0.82	0.56**	0.63**
	(0.092)	(0.105)	(0.098)	(0.108)
Hispanic/Latino	0.73**	0.78**	0.65**	0.70**
	(0.048)	(0.048)	(0.053)	(0.055)
Asian	0.34**	0.44**	0.40**	0.46**
	(0.058)	(0.072)	(0.080)	(0.090)
Other Race/Ethnicity	0.71	0.76	0.59*	0.62
	(0.143)	(0.142)	(0.157)	(0.159)
Male (base = Female)	0.08**	0.19**	0.13**	0.22**
	(0.012)	(0.029)	(0.019)	(0.033)
Academic Achievement				
SAT <1000	1.11	0.94	0.92	0.82
	(0.123)	(0.098)	(0.134)	(0.117)
SAT 1000–1290 (base)				
SAT 1300–1600	1.00	1.16**	0.87*	0.97
	(0.048)	(0.049)	(0.050)	(0.052)
HS z-GPA -3 to -1 SD	0.64*	0.63**	0.60**	0.59**
	(0.111)	(0.103)	(0.118)	(0.114)
HS z-GPA -1 to 1 SD (base)				
HS z-GPA 1 to 3 SD	1.02	1.15*	1.01	1.10
	(0.076)	(0.076)	(0.089)	(0.091)
Base Rate (%)	23.9	43.8	27.6	45.6
N	9636	9636	6374	6374

Notes: Estimates are from log-binomial regression models, with coefficients expressed as risk ratios. Heteroskedasticity-robust standard errors shown in parentheses. Outcomes are listed in the model header, with the base rate (predicted probability when coefficients are fixed at their indicated base values) expressed as a percentage in the model footer. In columns 1–2, the sample includes applicants for first-year admissions that indicated interest in teacher certification and subsequently enrolled in the university. Columns 3–4 are the same but additionally restricted to those who applied in 2015 or earlier.

* $p < 0.05$; ** $p < 0.01$

Appendix
Supplementary Figures and Tables

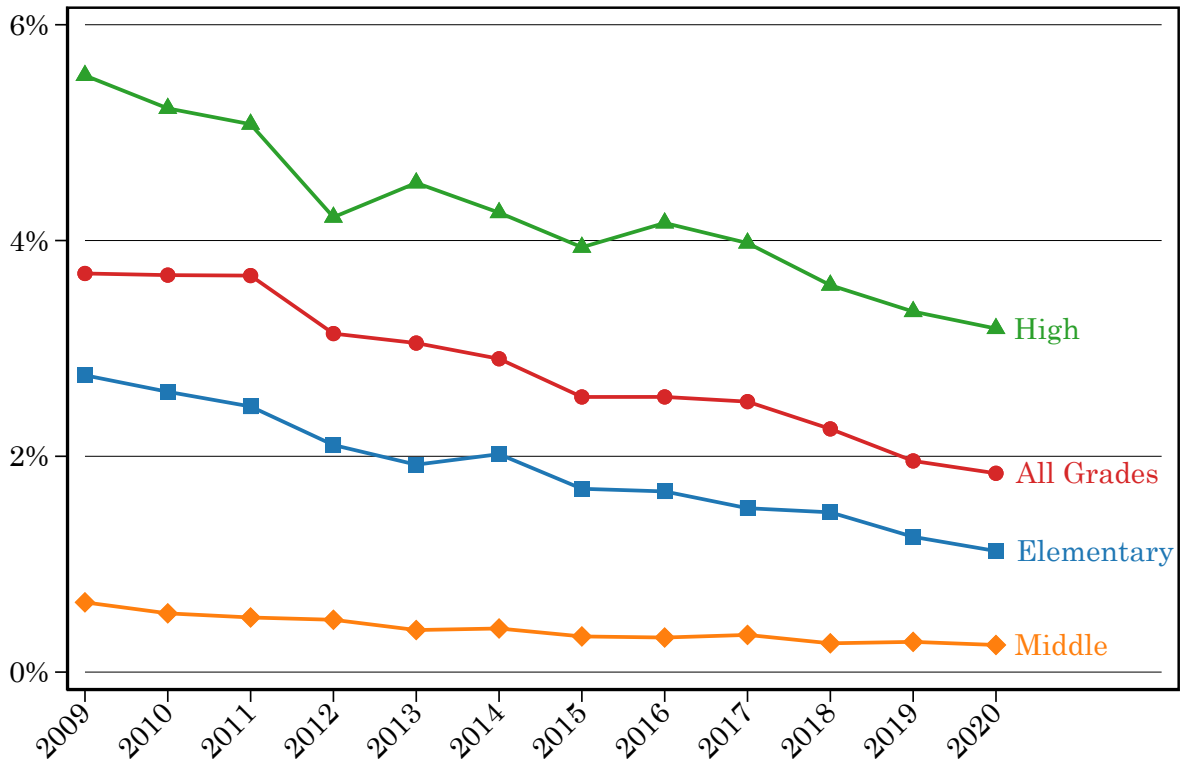


Figure A1
Interest in Teacher Certification by Level

Notes: Lines show the percentage of applicants who responded yes to the following question: "Will you seek teacher certification?" and then chose one of the four certification levels shown. These were the only choices and applicants who responded yes to the certification interest question were required to choose one. The responses for certification level are only available for first-year undergraduate applicants.

Table A1

Descriptive Statistics

	All	2009–15 Apps	First-year Apps	Transfer Apps	Enroll	Enter Tch Ed
Personal Demographics						
Asian	0.14	0.12	0.16	0.09	0.09	0.02
Black	0.07	0.07	0.07	0.06	0.04	0.02
Hispanic/Latinx	0.26	0.24	0.27	0.22	0.22	0.14
Other Race/Ethnicity	0.02	0.02	0.01	0.02	0.02	0.02
White	0.51	0.55	0.49	0.61	0.63	0.80
Male	0.51	0.51	0.50	0.55	0.50	0.07
Family Background						
Family Income < $80k	0.33	0.36	0.32	0.39	0.30	0.27
Family Income $80k–$150k	0.24	0.25	0.23	0.27	0.27	0.34
Family Income > $150k	0.23	0.21	0.23	0.19	0.25	0.24
Family Income > $80k, 2009 only	0.03	0.05	0.03	0.02	0.04	0.07
Family Income Unknown	0.03	0.02	0.03	0.04	0.03	0.02
Family Income No Response	0.14	0.10	0.15	0.08	0.11	0.06
Father has BA	0.57	0.55	0.58	0.51	0.61	0.60
Mother has BA	0.51	0.52	0.53	0.45	0.56	0.58
Parental Education Missing	0.08	0.08	0.08	0.07	0.05	0.03
Academic Characteristics						
Transfer Applicant	0.19	0.19	0.00	1.00	0.26	0.35
SAT Composite Missing	0.09	0.08	0.00	0.46	0.09	0.10
SAT Composite < 1000	0.06	0.07	0.07	0.06	0.03	0.05
SAT Composite 1000–1290	0.52	0.53	0.54	0.40	0.49	0.63
SAT Composite >= 1300	0.33	0.32	0.39	0.08	0.38	0.22
HS z-GPA -3 to -1 SD	0.08	0.08	0.09	0.05	0.04	0.03
HS z-GPA -1 to 1 SD	0.35	0.34	0.38	0.23	0.44	0.44
HS z-GPA 1 to 3 SD	0.08	0.08	0.09	0.05	0.12	0.09
HS z-GPA not tabulated	0.48	0.51	0.44	0.67	0.41	0.43
Outcome Measures						
Interested in Teacher Certification	0.09	0.11	0.09	0.11	0.09	0.74
Initial Major in Teacher Certification	0.02	0.03	0.02	0.04	0.03	0.55
Offered Admission	0.51	0.55	0.52	0.48	0.99	0.99
Enrolled	0.31	0.33	0.28	0.43	1.00	1.00
Entered Teacher Education		0.01	0.01	0.02	0.03	1.00
Employed as K–12 Teacher		0.01	0.01	0.02	0.03	0.78

Notes: Apps = Applicants. In 2009 only, family income responses were top-coded at $80k. Students with untabulated high school z-GPA were those from high schools that had insufficient numbers of observed applicants. A very small number of enrolled students are recorded as not being offered admission. Due to extremely high collinearity between missingness of mother and father education level, we construct a single indicator for missing either measure (parental education missing) and impute the binary indicators (father/mother has BA) as zero. Other race/ethnicity includes American Indian, Alaska Native, Native Hawaiian, and other Pacific Islander.

Table A2

Predicting Teacher Pipeline Outcomes (Restricted to common sample of applicants from 2015 and earlier)

Outcome =	Interest	Interest + Admit	Interest + Enroll	Teacher Ed	Employ K-12 Tch
	(1)	(2)	(3)	(4)	(5)
Personal Demographics					
White (base)					
Black	0.83**	0.62**	0.50**	0.23**	0.20**
	(0.019)	(0.025)	(0.027)	(0.032)	(0.034)
Hispanic/Latino	0.92**	0.88**	0.69**	0.46**	0.46**
	(0.013)	(0.018)	(0.019)	(0.026)	(0.030)
Asian	0.73**	0.63**	0.41**	0.18**	0.15**
	(0.016)	(0.020)	(0.019)	(0.023)	(0.023)
Other Race/Ethnicity	1.04	0.94	0.94	0.74*	0.72*
	(0.042)	(0.057)	(0.067)	(0.103)	(0.114)
Male (base = Female)	0.47**	0.38**	0.35**	0.07**	0.05**
	(0.006)	(0.007)	(0.008)	(0.005)	(0.005)
Family Background					
Income less than $80k	1.10**	1.11**	1.03	0.76**	0.70**
	(0.017)	(0.024)	(0.028)	(0.039)	(0.041)
Income $80k–$150k (base)					
Income more than $150k	0.90**	0.83**	0.81**	0.86**	0.86**
	(0.016)	(0.021)	(0.025)	(0.043)	(0.048)
Father has BA (base = no)	0.95**	0.93**	0.92**	1.02	0.98
	(0.013)	(0.019)	(0.023)	(0.046)	(0.049)
Mother has BA (base = no)	0.99	1.02	1.02	1.07	1.07
	(0.013)	(0.020)	(0.024)	(0.046)	(0.052)
Academic Achievement					
SAT <1000	1.40**	0.95	0.94	0.84*	0.87
	(0.025)	(0.032)	(0.041)	(0.075)	(0.086)
SAT 1000–1290 (base)					
SAT 1300–1600	0.59**	0.90**	0.75**	0.71**	0.62**
	(0.010)	(0.018)	(0.020)	(0.035)	(0.036)
HS z-GPA -3 to -1 SD	1.06**	0.37**	0.46**	0.39**	0.39**
	(0.022)	(0.017)	(0.025)	(0.044)	(0.048)
HS z-GPA -1 to 1 SD (base)					
HS z-GPA 1 to 3 SD	0.77**	0.90**	0.85**	0.89	0.77**
	(0.020)	(0.027)	(0.034)	(0.060)	(0.063)
Base Rate (%)	19.3	13.1	10.8	4.9	4.3
N	254789	254789	254789	254789	254789

Notes: Estimates are from log-binomial regression models, with coefficients expressed as risk ratios. Heteroskedasticity-robust standard errors shown in parentheses. Outcomes are listed in the model header, with the base rate (predicted probability when coefficients are fixed at their indicated base values) expressed as a percentage in the model footer.

* $p < 0.05$; ** $p < 0.01$

Table A3

Predicting Teacher Pipeline Outcomes (Bivariate Models)

Outcome =	Interest	Interest + Admit	Interest + Enroll	Teacher Ed	Employ K-12 Tch
White (base)					
Black	1.14**	0.67**	0.50**	0.20**	0.17**
	(0.019)	(0.020)	(0.021)	(0.027)	(0.029)
Hispanic/Latino	1.23**	1.04*	0.77**	0.44**	0.43**
	(0.012)	(0.015)	(0.015)	(0.023)	(0.026)
Asian	0.68**	0.61**	0.37**	0.14**	0.11**
	(0.011)	(0.014)	(0.013)	(0.018)	(0.018)
Other Race/Ethnicity	1.06	0.92	0.87*	0.69**	0.67*
	(0.035)	(0.046)	(0.052)	(0.096)	(0.106)
Male (base = Female)	0.45**	0.38**	0.33**	0.07**	0.05**
	(0.004)	(0.005)	(0.006)	(0.005)	(0.005)
Income less than $80k	1.27**	1.10**	0.89**	0.57**	0.53**
	(0.014)	(0.018)	(0.018)	(0.028)	(0.030)
Income $80k–$150k (base)					
Income more than $150k	0.82**	0.82**	0.84**	0.93	0.92
	(0.011)	(0.016)	(0.020)	(0.046)	(0.051)
Father has BA (base = no)	0.77**	0.83**	0.91**	1.08	1.03
	(0.008)	(0.013)	(0.017)	(0.048)	(0.051)
Mother has BA (base = no)	0.86**	0.95**	1.00	1.21**	1.22**
	(0.009)	(0.014)	(0.019)	(0.052)	(0.060)
SAT <1000	1.57**	0.90**	0.81**	0.59**	0.61**
	(0.021)	(0.024)	(0.028)	(0.052)	(0.059)
SAT 1000–1290 (base)					
SAT 1300–1600	0.49**	0.78**	0.68**	0.65**	0.56**
	(0.006)	(0.012)	(0.014)	(0.031)	(0.031)
HS z-GPA -3 to -1 SD	1.15**	0.34**	0.42**	0.30**	0.29**
	(0.017)	(0.012)	(0.017)	(0.033)	(0.036)
HS z-GPA -1 to 1 SD (base)					
HS z-GPA 1 to 3 SD	0.63**	0.90**	0.81**	0.91	0.76**
	(0.013)	(0.020)	(0.024)	(0.061)	(0.060)

Notes: Estimates are from log-binomial regression models, with coefficients expressed as risk ratios. Heteroskedasticity-robust standard errors shown in parentheses. Outcomes are listed in the model header. Each set of characteristics (race/ethnicity, gender, family income, parental education, SAT score, HS z-GPA) is estimated in a separate regression.

* $p < 0.05$; ** $p < 0.01$

Table A4

Multinomial Logistic Regression Results for Intended Teacher Certification Level (base=will not seek teacher certification), All Applicants

	Elementary	Middle	High	All Grades
Personal Demographics				
White (base)				
Black	0.40**	0.73**	1.11**	1.00
	(0.023)	(0.069)	(0.033)	(0.037)
Hispanic/Latino	0.71**	0.70**	1.10**	1.15**
	(0.021)	(0.045)	(0.022)	(0.027)
Asian	0.36**	0.58**	1.02	0.86**
	(0.019)	(0.055)	(0.026)	(0.029)
Other Race/Ethnicity	0.96	0.71	0.97	1.10
	(0.089)	(0.164)	(0.067)	(0.088)
Male (base = Female)	0.03**	0.23**	1.06**	0.36**
	(0.002)	(0.015)	(0.017)	(0.008)
Family Background				
Income less than $80k	1.01	1.15	1.23**	1.26**
	(0.035)	(0.082)	(0.027)	(0.035)
Income $80k–$150k (base)				
Income more than $150k	1.12**	0.90	0.79**	0.93*
	(0.040)	(0.072)	(0.021)	(0.029)
Father has BA (base = no)	1.04	1.15*	0.87**	0.96
	(0.030)	(0.071)	(0.017)	(0.023)
Mother has BA (base = no)	1.09**	1.13*	0.92**	0.98
	(0.031)	(0.069)	(0.018)	(0.023)
Academic Achievement				
SAT <1000	2.02**	2.20**	1.43**	1.39**
	(0.075)	(0.169)	(0.038)	(0.044)
SAT 1000–1290 (base)				
SAT 1300–1600	0.41**	0.46**	0.67**	0.54**
	(0.014)	(0.032)	(0.013)	(0.014)
HS z-GPA -3 to -1 SD	1.09*	1.08	1.10**	1.12**
	(0.045)	(0.094)	(0.030)	(0.037)
HS z-GPA -1 to 1 SD (base)				
HS z-GPA 1 to 3 SD	0.57**	0.68**	0.80**	0.78**
	(0.033)	(0.080)	(0.027)	(0.033)
Base Rate (%)	5.1	0.8	4.5	4.4
N		420162		

Notes: Coefficients are expressed as relative risk ratios, with robust standard errors shown in parentheses. Outcomes are listed in the model header, with the base rate (predicted probability when coefficients are fixed at their indicated base values) expressed as a percentage in the model footer.

* $p < 0.05$; ** $p < 0.01$

Table A5

Multinomial Logistic Regression Results for Teacher Education Certification Area (base=not in teacher ed)

	Certification Area in Teacher Education		
	EC–6	4–8	7–12
Interest in Cert Level = Elem (base)			
Interest in Cert Level = Middle	0.25**	1.76**	6.11*
	(0.064)	(0.307)	(5.552)
Interest in Cert Level = High	0.03**	0.35**	10.89**
	(0.008)	(0.050)	(7.945)
Interest in Cert Level = All Grades	0.17**	0.64**	7.05**
	(0.023)	(0.081)	(5.219)
Personal Demographics			
White (base)			
Black	0.53	0.52*	0.00**
	(0.185)	(0.162)	(0.000)
Hispanic/Latino	0.41**	0.47**	0.45*
	(0.083)	(0.076)	(0.176)
Asian	0.21**	0.32**	0.49
	(0.108)	(0.112)	(0.264)
Other Race/Ethnicity	0.45	0.42	0.49
	(0.235)	(0.223)	(0.505)
Male (base = Female)	0.05**	0.23**	0.35**
	(0.036)	(0.049)	(0.106)
Academic Achievement			
SAT <1000	0.68	0.74	0.00**
	(0.209)	(0.210)	(0.000)
SAT 1000–1290 (base)			
SAT 1300–1600	0.76*	0.91	2.49**
	(0.101)	(0.107)	(0.621)
HS z-GPA -3 to -1 SD	0.40*	0.52	0.62
	(0.171)	(0.197)	(0.632)
HS z-GPA -1 to 1 SD (base)			
HS z-GPA 1 to 3 SD	1.22	1.12	1.53
	(0.255)	(0.210)	(0.564)
Base Rate (%)	8.0	11.8	1.0
N		6172	

Notes: Coefficients are expressed as relative risk ratios, with robust standard errors shown in parentheses. Outcomes are listed in the model header, with the base rate (predicted probability when coefficients are fixed at their indicated base values) expressed as a percentage in the model footer. The sample is restricted to applicants for first-year admissions who indicated interest in teacher certification, enrolled, and then entered teacher education.

* $p < 0.05$; ** $p < 0.01$

Table A6

Who Enrolls in Teacher Education? (Results by Subgroup for Intended Certification Level)

Subgroup =	Elementary (1)	Middle (2)	High (3)	All Grades (4)
Personal Demographics				
White (base)				
Black	0.70	1.11	0.34*	0.62
	(0.156)	(0.743)	(0.173)	(0.199)
Hispanic/Latino	0.76**	0.75	0.45**	0.79
	(0.079)	(0.267)	(0.101)	(0.115)
Asian	0.55*	0.81	0.30**	0.44*
	(0.162)	(0.429)	(0.133)	(0.161)
Other Race/Ethnicity	0.63		0.48	0.77
	(0.219)		(0.332)	(0.351)
Male (base = Female)	0.49	0.33*	0.21**	0.17**
	(0.221)	(0.161)	(0.043)	(0.052)
Family Background				
Income less than $80k	0.94	0.67	1.05	0.87
	(0.087)	(0.202)	(0.199)	(0.133)
Income $80k–$150k (base)				
Income more than $150k	1.05	1.11	0.98	1.15
	(0.086)	(0.233)	(0.196)	(0.161)
Father has BA (base = no)	0.93	1.05	1.35	1.08
	(0.073)	(0.247)	(0.230)	(0.138)
Mother has BA (base = no)	1.09	1.10	0.97	0.92
	(0.085)	(0.210)	(0.158)	(0.106)
ed_level_miss	1.08	1.33	0.82	0.41
	(0.203)	(1.279)	(0.339)	(0.203)
Academic Achievement				
SAT <1000	0.85	0.23	0.76	0.85
	(0.150)	(0.226)	(0.388)	(0.244)
SAT 1000–1290 (base)				
SAT 1300–1600	0.91	1.18	0.95	1.03
	(0.068)	(0.203)	(0.137)	(0.118)
HS z-GPA -3 to -1 SD	0.64	0.32	0.58	0.61
	(0.150)	(0.309)	(0.329)	(0.260)
HS z-GPA -1 to 1 SD (base)				
HS z-GPA 1 to 3 SD	1.15	1.37	1.17	0.88
	(0.124)	(0.362)	(0.260)	(0.162)
Base Rate (%)	47.1	31.7	11.5	22.5
N	1379	307	2737	1911

Notes: Estimates are from log-binomial regression models, with coefficients expressed as risk ratios. Heteroskedasticity-robust standard errors shown in parentheses. Outcomes are listed in the model header, with the base rate (predicted probability when coefficients are fixed at their indicated base values) expressed as a percentage in the model footer. The sample is restricted to applicants for first-year admissions who indicated interest in teacher certification and enrolled in the university.

* $p < 0.05$; ** $p < 0.01$