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Can you leave high school behind?

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ABSTRACT

In recent years, many states, including California, Texas, and Oregon, have changed admissions policies to increase access to public universities for students from lower socioeconomic backgrounds. A key concern, however, is how these students will perform. This paper examines the relationship between high school quality and student success in college. Using administrative data from the University of Texas at Austin, we take advantage of the unique policy environment provided by Texas's Top 10% automatic admissions law, which has not only increased the diversity of high schools in the state that send students to the university, but also provides an admission criteria based on a sole observable characteristic: high school class rank. We find that high school characteristics do affect student performance, and these effects seem more pronounced for women and low-income students. In addition, there is little evidence that the effects of high school characteristics decay over students' time in college.

1. Introduction

In recent years, many states, including California, Texas, and Oregon, have changed admissions policies to increase access to public universities for students from lower socioeconomic backgrounds. As a result, students from lower-performing public high schools are now more likely to enter a selective public university. A key concern, however, is how these students will perform. Is their preparation sufficient to enable them to succeed? Importantly, how can under-resourced public high schools facilitate student success in college?

Despite the obvious policy relevance, there is surprisingly little consensus in the literature on the characteristics of a high-quality school, particularly at the high school level. Recent advancements in data collection now enable us to examine the link between high school characteristics and performance in college to determine which dimensions of high school quality influence the future success of students. While there are a few recent studies attempting to address this issue, none has addressed the inherent issues of selection of students into a university.

This study examines the influence of high schools and high school characteristics on early college achievement using administrative data from the University of Texas at Austin. Importantly, we make significant efforts to control for selection into the university. The policy environment in Texas presents an opportunity to make a unique contribution to the school quality literature. The Top 10% Rule, passed in 1997, grants automatic admission to UT Austin to all students who graduate from a Texas public high school ranked in the top 10% of their class. This suggests that, regardless of school quality, the best students from each high school in Texas can enroll at the state's flagship university. Given that our outcome of interest—early college achievement—is conditional on admission to the university, the law not only increases the diversity of high schools represented in our analysis, but moderates selection problems common in most school

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quality studies. In this study, the majority of admissions decisions at UT are based on a single observable characteristic that we can control for: the student's high school class rank. As a result, we focus on those students who were admitted based on the Top 10% Rule.

In addition to selection based on admission, there is also selection based on who chooses to enroll conditional on admission. To attempt to mitigate this likely non-random selection, we exploit numerous types of variation. In addition to controlling for an extensive list of observable student characteristics, we also look within high schools at changes in school quality over time. As long as student enrollment decisions (conditional on observable characteristics and school fixed effects) are unrelated to changes in high school quality, our estimates will be unbiased. While this is ultimately untestable, we present evidence to suggest that this may not be an unreasonable assumption.

We find that high school quality affects student performance in college, regardless of the estimation strategy. High school variables measuring campus socio-economic status (SES), academic preparation for college, and school resources all are related to college performance, as measured by freshman year GPA. The effects of campus SES are also significant in models including school fixed effects, suggesting that even changes within high schools and not just differences across high schools influence college performance over time. Importantly, we find evidence that these effects persist over time spent in college, with continued significant effects of high school characteristics on student GPAs in sophomore and junior years.

The paper unfolds as follows. The second section describes the relevant literature. Section 3 discusses the Texas policy environment, and Section 4 discusses the empirical strategy. Section 5 describes the data, and Section 6 presents our results. Section 7 considers heterogeneous effects and decay, and Section 8 concludes.

2. Related literature

There is a substantial literature relating school inputs to student performance on standardized tests or longer-run outcomes such as earnings. (See Hanushek (2006) for a review of this literature.) Despite the obvious policy relevance, less is known about the relationship between school inputs and performance in college. Recent studies suggest that high school factors are predictive of early college outcomes (Cyrenne & Chen, 2012; Bettinger, Evans, & Pope, 2011; Massey, 2006; Wolniak & Engberg, 2010; Cohn, Cohn, Balch, & Bradley, 2004; Pike & Saupe, 2002; Adelman, 1999).

Betts and Morell (1999) use individual-level data to model college grade point average (GPA) as a function of high school characteristics and family background. Like the present study, Betts and Morell analyze student data from a single elite public university. They find that individual family background and characteristics of the high school neighborhood are significantly related to college GPA. They also find that teacher experience has a significant and positive relationship with college GPA but that, like previous literature, other high school characteristics such as the pupil–teacher ratio and the level of teacher education do not. A key limitation of this work, however, is that it does not fully address non-random selection of students into the university. Admission and then enrollment are both non-random, and controlling for observed individual characteristics is unlikely to sufficiently account for this selection. As a result, it is difficult to draw inference from these results.

In related work, Fletcher and Tienda (2010) examine racial gaps in college achievement at UT Austin, Texas A&M University, UT San Antonio, and Texas Tech University. Basic OLS models identified a racial disadvantage in achievement across the four institutions. However, after controlling for high school fixed effects, they note that the racial gap disappeared and, at some institutions, minority students actually achieved higher average first semester grade point averages than white students from the same high schools. In a subsequent paper, Fletcher and Tienda (2012) used a similar methodology to examine whether racial gaps in college achievement varied with the economic disadvantage of sending high schools, measured as the share of students who ever received a school lunch subsidy. Their findings suggest that racial achievement gaps for minority students relative to white students from the same high schools did not exist in first semester grade point averages, but appeared between the first and sixth semesters of college for all strata of high school economic advantage. In contrast to our own work, their work primarily focuses on racial differences in performance and, similar to the paper by Betts and Morell, the authors do not address potential problems introduced by non-random selection of students into college.

Finally, recent work by Deming, Hastings, Kane, and Staiger (2011) addresses the issue of selection into high school but without detailed data at the university level. The authors find that students who attend high schools with better observed dimensions of quality are 6% more likely to earn a bachelor's degree. The study exploits a lottery-based school choice program using a value-added approach, which provides the best estimated counterfactual of all the aforementioned studies. Students who move from low-quality neighborhood schools to higher quality choice schools experience meaningful gains in academic preparation that lead to degree completion as opposed to increased information about the college-going process or decreased the costs of applying. While we are not able to mitigate selection in as convincing a way, the Deming et al. study relies on data from the National Student Clearinghouse, and unlike the present study, does not benefit from data about college experiences.[1]

3. Texas policy environment

Prior to 1997, admission to UT Austin was based on a combination of SAT/ACT scores and high school class rank, with discretion to increase minority enrollment. In 1996, the Supreme Court's ruling in Hopwood v. Texas outlawed the use of race in admissions to public universities. To maintain racial diversity without targeting race directly, the Texas

[1] Using data from the Tennessee STAR experiment, Dynarski, Hyman, and Schanzenbach (2013) are able to analyze the effects of random assignment to class size in primary school on long-term college outcomes. They find significant effects of smaller class sizes at a young age on the probability of college graduation and on choice of major. Unfortunately, we are unable to look at major choice in our data.