Elite High Schools and Reproduction of Elites in the U.S.

By

Sohyun Kang

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This dissertation is approved by the following members of the Final Oral Committee:

Eric Grodsky, Professor, Sociology & Educational Policy Studies
Erica Turner, Associate Professor, Educational Policy Studies
Linn Posey-Maddox, Associate Professor, Educational Policy Studies
Ann Mullen, Associate Professor, Sociology, University of Toronto

Dedicated to Hongil, my parents, and my brother.

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Abstract

In this dissertation, I examine the role elite high schools[1] play in the perpetuation of privilege in America and how, if at all, that role has changed over time. I explore the characteristics of students who attend elite high schools and the relationships between attending those schools and entering elite colleges, earning a top 10% income, obtaining a professional job, and attending graduate/professional schools. I track the experiences of three cohorts of high school students those who were seniors in 1982, 2004, and 2013.

In Chapter 1, I show that even though it is important to study elites and elite educational institutions to understand the recent increase in inequality in the U.S., they have been understudied due to the limitation in the national data sets and the lack of attention from educational researchers when they try to understand social inequality (Gaztambide-Fernández & Howard, 2010, p. 2). I emphasize that this study can contribute to the field of the sociology of education by overcoming the limitation in the existing literature by defining elite high schools based on the Niche's 2018 best high schools ranking, and then by using that updated school type measure to examine the research questions. In Chapter 2, I show that between 1982 and 2013, White students and students from advantaged backgrounds were generally more likely to attend elite high schools rather than non-elite public high schools, compared to racial minority students and students from disadvantaged backgrounds. Also, I present that the number of Asian students in elite high schools substantially increased in the most recent cohort (2013). In Chapter 3, I show that between 1982 and 2013, elite high school students were consistently more likely to enter elite colleges compared to otherwise similar students from non-elite public high schools. The size of the association was remarkably increased compared to the early 1980s. I also

[1] I define elite high schools based on the Niche's 2018 best high schools ranking.

demonstrate that although a significant amount of the benefits gained from attending elite high schools on entering prestigious colleges could be explained by elite high school students' academic records, there is still a portion that could not be explained, meaning that there might be some other factors related to the type of high school that students attend. In Chapter 4, I first show that in 1982, elite high school students were less likely to earn a top 10% income compared to their non-elite public high school counterparts, but in 2004, they were more likely to earn a top 10% income. In the professional job analyses, I find that in 1982, there was no benefit of attending elite high schools on obtaining a professional job, but in 2004, elite high school students had higher chances of attaining a professional job compared to otherwise similar students from non-elite public high schools. Lastly, in the graduate/professional school analyses, I show that in 1982, students from elite high schools had a much higher possibility of attending graduate/professional schools compared to otherwise similar non-elite public high school students, but this benefit no longer existed in 2004. Potential explanations for this absence of elite high school advantages on graduate/professional school attendance are further discussed.

Overall, the results suggest that elite high schools had consistently been a place for upper class, mostly White students for three decades although there was some increase of Asian students in recent decades. Also, considering the continued benefits to elite high school students on elite college admission and the emergence of their advantages in income and professional occupations, it appears that the privilege of the U.S. elites has been reproduced by going through the elite educational institution. Also, the emergence of their advantages on later life outcomes such as income and occupation indicates that the duration of the time when a child's social origin can exert its influence has been extended. Limitations, future studies, and implication are discussed.

Chapter 1. Introduction

In his study of France's elite higher education system, Bourdieu (1996) introduced the notion of *school-mediated modes of reproduction*, where the transmission of privilege is carried out by educational institutions. He maintained that the elite school contributes to the distribution of power and privilege and to the legitimation of this distribution by the process of separation and aggregation, which in turn leads to the consecration (p. 116–117). Related to Bourdieu's argument, Khan (2012) emphasized the divergent role of educational institutions in that they can function both as engines of social mobility and social inequality. He argued that schools can be a medium for social mobility when they broaden access to resources to groups of people who have been previously excluded, but they can also be a mechanism for status reproduction, functioning as institutional barriers which favor only the privileged groups of people while excluding others (p. 371–372). In the line of status reproduction theory, the role of elite private schools in reproducing the privilege of elites is well documented in several studies (A. Reeves et al., 2017; Cookson & Persell, 1985b; Khan, 2010, 2011; Persell & Cookson, 1985).

Elite private schools in the U.S. were established from the late 18th to the early 20th century with the original intention of creating institutions where children of the old upper class could be educated in an environment separate from children of the nouveau riche and lower class immigrants (Levine, 1980). By the 1920s, these elite private schools were accepting children from parvenus families in expectation of their parents' financial contribution to the schools (Levine, 1980), and they became places where the new and the old upper classes could be naturally mixed (Mills, 2000). They selected and educated newer elites (i.e., those from parvenus families) in an upper class manner while maintaining their high standards for students from originally elite backgrounds (Mills, 2000). Around the 1950s, the elite private school was one of

the major educational sequences common to the upper classes in all leading cities in the U.S. (Mills, 2000).

Several studies have shown that the majority of elite private school students come from socially and economically advantaged backgrounds (Cookson & Persell, 1985b; Gaztambide-Fernández, 2009a; Lewis & Wanner, 1979; Powell, 1996; Zweigenhaft, 1993). Some other scholarly literature has documented a well-established pipeline between elite private high schools and elite colleges and elite private school graduates' excellent record of entering top colleges (Cookson & Persell, 1985b; Karen, 1990; Khan, 2010, 2011; Persell & Cookson, 1985). This "elite pathway," starting from entering an elite private school to entering an elite college, can be an example of what Turner (1960) termed *sponsored mobility*,[2] meaning that elite status is achieved through recruitment by the existing elite, not through open competition (i.e., *contest mobility*). Considering the fact that the doors to elite private schools are typically open only to students from upper class backgrounds and the fact that admitted students can enjoy special resume-building opportunities offered by the schools, which are favorably recognized and rewarded by elite college admission officers, it is reasonable to think of elite private schools as an example of sponsored mobility.

Many studies have indicated that attending an elite college provides educational (Brand & Halaby, 2006; Eide et al., 2016; Ford & Thompson, 2016), economic (Long, 2010; Witteveen & Attewell, 2017; Zimmerman, 2019), and occupational (Binder et al., 2016; Brand & Halaby, 2006; Rivera, 2011; Zimmerman, 2019) benefits to students. A few studies using the U.S. data have indicated that the length of the elite pathway might have extended by showing that elite

[2] However, it is debated whether elite private schools in the U.S. are indeed an example of sponsored mobility in that students in elite private schools usually compete so hard to become well-prepared applicants of elite colleges. Moreover, they tend to show superior academic achievement compared to students in other types of high schools. See Chapter 5 for further discussion.

private school graduates are better positioned at achieving superior lifetime outcomes such as income and occupation, compared to otherwise similar students from other types of high schools (Lewis & Wanner, 1979; Useem & Karabel, 1986). In this sense, if chances of entering elite colleges or having better later life outcomes are much higher for students from a specific type of high school, that school needs to be further investigated to see if it is functioning as a medium for status reproduction.

However, factors influencing attendance at elite private high schools as well as their students' performance in the elite college admission and later life outcomes have rarely been empirically tested for two reasons. First, what constitutes an *elite* private high school has rarely been clearly defined (Gaztambide-Fernández, 2009b).[3] National data sets collected from high school students do not use *elite private school* as an official category of the school type measure. None distinguished private schools that historically served the elite from other regular private schools, so elite private schools are usually included in the *other private school* category, which is also distinguished from Catholic schools. Because of the different characteristics of elite and non-elite private schools, researchers could not conduct empirical studies about elite private schools using large-scale data sets. Second, according to Gaztambide-Fernández and Howard (2010), educational researchers seldom paid attention to privileged groups such as elites when they tried to understand inequality (p. 2), and they cautioned that this can cause gaps in conceptual linkages when we try to understand social inequality. In a similar vein, Khan (2011) argued that we must know more about the wealthy and the institutions that are important for their reproduction and maintenance if we want to understand the recent increase in inequality in the U.S. (p. 5). He maintained that the role of social institutions such as schools in reproducing elites

[3] However, Gaztambide-Fernández (2009b) made a meaningful contribution to this.

is important because today's elites *cultivate*, rather than *inherit*, their privilege through credentialing in elite schools. Khan (2012) also claimed that elite educational institutions disguise their role of producing systematic inequality by emphasizing the talent, merit, and hard work of students attending elite schools, and rather fulfill a function of legitimation of the social hierarchy (p. 372).

Given the increased educational inequality in the U.S. for the past several decades (Chetty et al., 2017; Murnane & Reardon, 2018; R. V. Reeves, 2017) and considering the broader pushes for educational equity in the U.S., it is timely and imperative to investigate who gets access to elite schools and how those schools reproduce elites in the U.S. society. This dissertation contributes to the field of the sociology of education by examining the characteristics of students who attend elite high schools and the relationships between attending those schools and entering elite colleges, earning a top 10% income, obtaining a professional job, and attending graduate/professional schools using three national longitudinal data sets of education—the HS&B of 1980, the ELS of 2002, and the HSLS of 2009. Also, this study shows how those characteristics and relationships changed over time by comparing the results from high school students who were seniors in 1982, 2004, and 2013. More importantly, this dissertation seeks to overcome the limitation of the existing high school type measure in the three data sets by defining elite high schools based on the Niche's 2018 best high schools ranking and then uses this updated school type measure to examine the research questions. The result of this study will illuminate if elite high schools as an elite institution have been functioning as a medium for social mobility or social inequality.

In the following chapter (Chapter 2), I examine the relationship between students' background characteristics and the type of high schools they attended, and how the relationship

changed between 1982 and 2013. The result of this chapter will show if elite high schools have been continuously dominated by White, upper class students or have been the place where students from disadvantaged backgrounds can promote social mobility. In Chapter 3, I investigate how much more likely it is for elite high school students to enter elite colleges compared to otherwise similar students from non-elite public high schools, and how the difference (if any) changed between 1982 and 2013. Additionally, I examine how much of the relationship between attending elite high schools and entering elite colleges can be accounted for by students' academic performance in high school. The result of this chapter will show if the previously well-documented mutually beneficial relationship between elite private high schools and elite colleges and elite private school graduates' superior outcome in entering elite colleges also exist in the nationally representative sample. In Chapter 4, I demonstrate how much more likely it is for elite high school students to earn a top 10% income, obtain a professional occupation, and enter graduate/professional schools compared to otherwise similar students from non-elite public high schools, and how the difference (if any) changed between 1982 and 2004. The result of this chapter will demonstrate if attendance at elite high schools ensures better life chances for their alumni. In the last chapter, I provide the summary of findings, limitation, future studies, and implications of this dissertation.

Chapter 2. Who Goes to Elite High Schools?

Introduction

Traditionally, elite private schools have been dominated by students from White, affluent background. However, from time to time, they tried to diversify their student body to counter their image of elitism (Gaztambide-Fernández, 2009b). Generally, the entrance of African American students in these schools was permitted from the 1960s based on the civil rights movement (The JBHE Foundation, 2003). In the 1970s, elite private schools started to accept students from diverse background such as international students, other racial minority students, and low-income students, and they introduced co-education (Gaztambide-Fernández, 2009a). More recently, in an attempt to diversify further, elite private schools have increased their offers of financial aid. In the 2018–2019 school year, the number of students receiving financial aid ranges from 30% to 70%, depending on the school (Boarding School Review, n.d.). However, Khan (2012) argued that although elite private schools seem to be more open and fairer compared to the past, inequality is actually rising. He maintained that, on average, the student bodies at elite private schools are richer than they once were, and the elites have a greater and greater share of the national wealth (Khan, 2012). Murnane and Reardon (2018)'s study supports this argument by showing that the 90–50 income gap[4] among families of private nonsectarian elementary school students has grown substantially, and this increased gap was derived from the substantial increase in the enrollment rate of students from high-income families.

In this chapter, I investigate the characteristics of students who attend elite high schools and how, if at all, the pattern has changed over time using nationally representative samples of high school students who were seniors in 1982, 2004, and 2013. Given the public image of elite

[4] This denotes the gap in private school enrollment rates between families at the 90th and 50th income percentiles (Murnane & Reardon, 2018).

private schools as havens for White, upper class students (Carney, 2012) and the (seemingly) continuous efforts of schools to diversify the composition of the student body (Carney, 2012; Cookson & Persell, 1991; Gaztambide-Fernández, 2009a; Powell, 1996), it is necessary to examine the actual factors influencing attendance at elite high schools. This chapter will contribute to the existing literature by quantifying the extent to which elite schools are still places of privilege monopolized by White, upper class students or places where students from diverse backgrounds can enjoy social mobility.

Literature Review

Socioeconomic Composition of Elite Private Schools

Several studies have shown the socioeconomic characteristics of elite private school students compared to those of students from other types of schools. Lewis and Wanner (1979)[5] showed that elite private school students came from more advantaged backgrounds than their public school counterparts. They presented that the fathers' Socioeconomic Index (SEI) of elite private school students was 53.72, whereas that of public school students was 26.80. Cookson and Persell (1985b) showed that about 65% of boarding school families in their sample had annual incomes of more than $75,000 per year, whereas the U.S. median family income in 1981 was slightly less than $24,000 a year. Powell (1996) maintained that prep schools were a still unapproachable option for most Americans by showing that almost 60% of prep school students in 1988 came from families whose incomes were more than $75,000, whereas there were only 30% of such families in very affluent public schools and merely 6% of such families in all public schools. Regarding parental education, about two thirds of the boarding school fathers attended graduate/professional schools compared to less than one tenth of the national average fathers of

[5] The analytic sample was restricted to non-Black students because so few Black students in the original sample attended private schools.

high school seniors (Cookson & Persell, 1985b). In the study of Harvard graduates, Zweigenhaft (1993) presented that the years of education after high school was 4.6 for public school fathers, whereas it was 5.9–6.7 for elite prep school fathers. Using the sample of Harvard students, Michelman et al. (2021) showed that 14% of private feeder school students had a Harvard father, compared to only 5% for students from other types of schools. In addition, about 29% had a Harvard brother, while only 18% of students from other types of schools had a Harvard brother (p. 13).

Gaztambide-Fernández (2009a) maintained that elite boarding schools had tried to create economically diverse student bodies by raising funds to admit students with financial need. But he also claimed that elite boarding schools were still comprised of very wealthy students considering the fact that about two thirds of students were from the top 4% of the income distribution. Carney (2012) asserted that some elite boarding schools offer financial aid to students who cannot afford the cost of attendance, but the percentage of students on financial aid varies by school (Boarding School Review, n.d.). In the case of Philips Academy in 2010, 45% of the student body was on financial aid, with 12% receiving full scholarships (Carney, 2012). Lastly, Sullivan et al. (2014), using a 1970 British Cohort Study, showed that private school parents were more educated than parents in other types of schools. For example, 52% of private school students had at least one college educated parent, while only 8%–31% of students at grammar, comprehensive, and secondary modern schools did so.

Racial Composition of Elite Private Schools

Prior studies about elite private schools consistently have shown that the student body of elite prep schools is overwhelmingly White. Cookson and Persell (1985b) showed that 90% of boarding school students were White while 83% of the U.S. population was White. Moreover,

three of the nation's top 20 boarding schools did not graduate their first Black student until the 1970s. However, the number of Black students attending boarding schools has slowly increased since the tide of affirmative action began around the 1950s (Carney, 2012). Since then, elite boarding schools have made an effort to admit students from various racial backgrounds (Gaztambide-Fernández, 2009a).

The minority recruiting program *A Better Chance* (ABC) was founded in 1963 for the purpose of helping talented low-income minority students attend the most selective secondary schools (Cookson & Persell, 1991; Powell, 1996). Based on the success and popularity of this program, but due to the lack of participating boarding schools and shortage of funding, nearly 1,000 applicants had to be turned down in the mid-1960s (Walton, 2009). Following the success of this program, similar programs such as Prep for Prep Scholars, the Steppingstone Foundation, and the TEAK Fellowship were developed and executed to serve the similar purpose (Carney, 2012). Through these programs, elite prep schools could recruit academically qualified racial minority students who were considered "safe." Also, because those schools accepted only a small number of them, they could control the racial integration without creating problems with their traditional constituency (Powell, 1996).

Based on this effort on racial diversification, the percentage of integrated schools substantially increased from 33% to 84% between 1960 and 1969, and the percentage of Black students jumped up to 4.3% in 1975 (Powell, 1996).[6] However, Cookson and Persell (1985b) maintained that despite this effort, the percentage of Black students in elite prep schools remained very low. In 1982, only 1%–4% of prep schools students were Black compared to 19%

[6] There are several studies (Cookson & Persell, 1991; Datnow & Cooper, 1997; Fordham, 1991; Horvat & Antonio, 1999; Kramer, 2008; Kuriloff & Reichert, 2003; Zweigenhaft & Domhoff, 2003) that addressed how African American students did at elite private schools.

of public school students and 12% of the U.S. population (Cookson & Persell, 1985b). In addition, the Journal of Blacks in Higher Education (2003) showed that the percentage of Black students in elite boarding schools still hovered around 4%–12%, depending on the school.

Lastly, Powell (1996) showed that the racial diversification of prep schools was considerably increased based on the huge influx of Asian American students since the 1980s. Around the 1985, their headcount surpassed that of Black students, making Asian American students the largest racial minority group (about 9%) in elite prep schools by 1990. Somewhat different from Black students, Asian American students typically did not need financial aid to attend those elite prep schools. As a result, the total percentage of racial minority students in prep schools increased up to 21% by 1990. This was a remarkable number considering the previously White-dominant student body of those schools before the 1950s.

Gender in Elite Private Schools

There are two studies that slightly touched on the issue of gender in elite private schools. Powell (1996) maintained that before the 1960s, prep schools were dominated by boys, and the single-sex school was the major prep school tradition. In 1950, only 36% of prep school students were girls, and about 77% of prep schools were single-sex schools. Regarding the curriculum of elite private schools, Cookson and Persell (1985b) argued that male students were educated to attain a position of power based on the schools' strong academic curriculum and discipline. However, unlike the boys' schools, girls' schools aimed to educate their students for becoming a helpmate of men, not for a position of power. The characteristics of good breeding, gentleness, and nobles oblige were emphasized in girls' schools because at that time, expected future roles of girls were as wives and mothers, and most female students did not pursue higher education.

Powell (1996) explained that several factors contributed to the transition of prep schools into coeducational schools during the 1960s. Most importantly, the number of female students attending prep schools increased because more girl students chose to attend college, and families became more willing to pay for their girls' private schooling. The percentage of female students attending prep schools increased from 36% in 1950 to 48% in 1990, close to the percentages of females in the general population. Powell (1996) also asserted that due to the student unrest caused by economic pressures from the 1930s, prep school teachers were trying to be more acceptive of and sensitive to students' needs, and one of the major desires of students was coeducation (p. 103). He mentioned that there was an increased awareness that gender itself is the major kind of diversity. Based on this context, many prep schools quickly switched to become coeducational schools, merged with other single-sex schools, or sometimes closed (Powell, 1996). The 1968–1969 school year was when the majority of prep school students attended coeducational schools for the first time. Also, the fraction of single-sex prep schools was significantly decreased from 77% to 22% between 1950 and 1990.

Although existing literature provides information based on descriptive statistics about the characteristics of students attending elite private schools and how these characteristics may have changed, it provides only a snapshot of those characteristics and trends. Given broader pushes for equity in U.S. education, it is important to chart the temporal patterns during the past several decades to see if those elite schools followed the trend or remained insulated from it. In this chapter, I examine the relationship between student characteristics and elite high school attendance and how, if at all, the relationship changed over time, using a nationally representative sample of high school students who were seniors in 1982, 2004, and 2013.

Research Questions

1. What is the relationship between students' background characteristics and elite high school attendance?
2. How, if at all, have these relationships changed over time?

Methodology

Data

I draw on three national longitudinal data sets of education distributed by the National Center for Education Statistics (NCES): the High School and Beyond Study of 1980 (HS&B), the Education Longitudinal Study of 2002 (ELS), and the High School Longitudinal Study of 2009 (HSLS). These data sets allowed me to examine U.S. students' trajectories beginning from high school into postsecondary education, the labor market, and later life. Surveys were administered to students, parents, teachers, and school administrators. Additionally, students' math and verbal assessment scores in high school are available, and high school and postsecondary transcripts are provided to facilitate the analysis of course-taking.

Starting from 1980, the HS&B surveyed a nationally representative sample of about 27,000 high school students[7] who were sophomores (named "sophomore cohort") and seniors (named "senior cohort") in spring 1980. In this study, I excluded the senior cohort and used only the sophomore cohort because (a) appropriate later life outcomes such as income and occupation were not available for the senior cohort, and (b) it was difficult to combine the data from each cohort because several necessary measures such as high school GPA and math score were not exactly comparable to each other. The HS&B sophomore cohort was followed up five times after

[7] The original HS&B sample included 30,030 high school sophomores and 28,240 high school seniors (total of 58,270), but the HS&B applied a different sampling method to select the students who will be included in the follow-up studies.

the baseline survey. However, to make the timing of measuring outcome variables comparable to that of the ELS data, I excluded the fifth (the last) follow-up study of HS&B and used the data only up to the fourth follow-up study. The ELS surveyed a nationally representative sample of 15,360 high school students who were high school sophomores in spring 2002 and followed them up three times after the baseline survey. The HSLS, which is an ongoing study, surveyed a nationally representative sample of 24,660 high school students who were freshmen in fall 2009 and followed them up three times after the baseline survey. Table 1 shows the major characteristics of HS&B, ELS, and HSLS participants.

< Table 1 >

In fact, these three data sets are not ideal for this study because of the very small sample sizes of elite high schools. However, these data sets are among the best (and likely only) data available at a national level to support this study because they (a) enable me to identify elite high schools by linking with the Private School Universe Survey (PSS) or the Common Core of Data (CCD), (b) provide a nationally representative sample of U.S. high school students from birth cohorts spanning the 1960s to the 1990s, which enabled me to do cohort comparisons, and (c) provide rich sets of covariates such as demographics, background characteristics, secondary school achievement, and trajectories of postsecondary education. The three data sets include high school students who were seniors in 1982 (HS&B), 2004 (ELS), and 2013 (HSLS), respectively. I analyzed the restricted version of each data set in order to get necessary information for the analyses such as high school code, postsecondary institution code, level of postsecondary institution, college degree type, income, and occupation.

Defining Elite High Schools

How Prior Studies Defined.

As already mentioned in Chapter 1, the definition of elite high schools has never been clear. Prior literature on elite private schools varied in how it distinguished elite schools from other private schools. First, many studies relied on the historical reputations of schools that were usually included in Baltzell's (1964, 1979) list of the leading boarding schools or Domhoff's (1970, 1983) list of the schools that signaled membership in the upper social class when defining their elite private school samples. Zweigenhaft (1993), Useem and Karabel (1986), Karabel (2005), and Persell and Cookson (1985) are typical examples. Second, some studies used the regular private school category available in the data set they employed as their elite private school samples. For example, Lewis and Wanner (1979) used the other private school category in the OCG[8] data as their elite private school samples and Soares (2007) used the non-Catholic private school category in the NELS 1988[9] as their elite private school sample. Third, some considered all independent schools as elite private schools, including Wenglinsky and Jeong (2007) and Weis and Cipollone (2013). Fourth, a few studies define elite private high schools based on their relationship with elite private colleges. For example, Espenshade et al. (2005) used a list of schools that were considered to be the top U.S. secondary schools by veteran admission officers at Ivy League universities, while Michelman et al. (2021) identified elite private schools based on the number of students that those schools sent to Harvard. Lastly, Cookson and Persell (1985b) created their own list of elite boarding schools by including a variety of schools such as college preparatory schools, schools for deaf and blind children, military schools, schools for students gifted in science and mathematics, and some English, Cuban, and Israeli boarding schools.

[8] Occupational Changes in Generation data.

[9] National Education Longitudinal Study of 1988.

I define elite high schools as those that belong to Niche's top 75 best high schools in America, published in 2018.[10] The use of 75 as a cutoff was rather arbitrary. As far as I know, none of the previous studies used publicly available rankings to define elite schools. I chose Niche's ranking because it ranks schools based on multiple factors including average student test scores, college enrollment, student-teacher ratios, and student and parent surveys. Also, because this is a popular ranking among students and parents, it is highly possible that they would refer to this ranking when they need to get informed or make important educational decisions. There were some other rankings and review websites, but they had their own limitations. For example, the U.S. News ranking included only public high schools. The website "thebestschools.org" did not provide the formula that they used to create ranking and it seems like they no longer provide high school rankings. Finally, the website "greatschools.org", although popular among students and parents, did not provide ranking, but only reviews and ratings.

Measurement[11]

Dependent Variables.

High School Type.[12]

[10] Niche publishes K-12 school rankings yearly, considering factors including composite SAT/ACT scores (self-report), top colleges score (self-report), college enrollment (from the NCES), culture and diversity grade (self-report and from the U.S. Department of Education), parent and student surveys on overall experience (self-report), and student–teacher ratio (from the NCES). First, they assess the data for each factor to confirm that each datum provides a meaningful value for the ranking. In this stage, they logically give higher confidence to the aggregated data from schools with more responses and inspect for outliers and inaccurate values. Second, they calculate a standardized score for each factor at each school. Third, they assign weights to each factor to guarantee that no one factor has a dramatic influence on a particular school's final score and that the final score of each school represents the true performance of that school. Fourth, they calculate an overall score for each school by applying the assigned weights to each school's individual factor scores. Fifth, they evaluate the completeness of the data by dropping schools missing the data for 50% or more of the factors (by weight). Also, for the schools that have at least 50% of the factors (by weight) but lack one or more of the required factors, they only assign a grade and exclude them from the numerical ranking. Lastly, they create a numerical ranking and assign grades for each school (Niche, n.d.).

[11] Because I am using similar variables across three chapters (Chapter 2, 3, and 4), this section includes all variables appearing in this dissertation.

[12] This variable is used as an independent variable in Chapter 3 and 4.

In the HS&B, a high school type variable with nine categories was provided in the second follow-up data. I collapsed nine high school categories into four categories for comparability across the three data sets: (a) public (combined regular public, alternative public, Cuban Hispanic public, and other Hispanic public), (b) Catholic (combined regular Catholic, Black Catholic, and Cuban Hispanic Catholic), (c) other non-Catholic private, and (d) elite private. The last category, elite private, is defined by the HS&B as the 12 private high schools with the highest percentage of graduating seniors who were National Merit Scholarship semi-finalists, subject to the following condition: (a) the 1978 senior class had to graduate 40 or more students; and (b) no more than one school could be selected from a single state (Frankel et al., 1981, p. 3–17). However, because many elite private schools are located in states in the northeastern part of the U.S., the condition *no more than one school from a single state* can cause serious underrepresentation of prestigious elite private schools. Therefore, I supplemented the elite private school category by identifying schools that belong to Niche's top 75 best high schools in America, published in 2018. Among those Niche's top 75 schools, 65 were private schools and 10 were public schools. I identified the schools in the HS&B sample that belong to Niche's 75 high schools and included these schools to the elite private school category. In the process of doing this, some elite public schools (which 20 students attended[13]) were also added to the elite private school category. Thus, I changed the name of this category to *elite school*, not *elite private school*, because now it includes some elite public school students. Also, I changed the name of the public school category to *non-elite public school* in order to distinguish it from the elite school category which now included some elite public school students. As a result, I utilized a total of four high school categories in the HS&B: (a) non-elite public, (b) Catholic, (c) other

[13] This N is rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data.

private, and (d) elite. Although the elite school category now includes some students from elite public schools, I argue that this study still focuses on elite private schools because the majority of students in the elite school samples are from elite private schools that have historically served children of the upper class. Moreover, to the best to my knowledge, there is no historical record or study about elite public schools between the late 18th and the early 20th century, the period when elite private schools that traditionally served social elites boomed. Also, the inclusion of the elite public schools contributed to the enhanced statistical power without significantly changing the result. I accept this inclusion of elite public schools as a limitation of this study and mentioned it in the limitation section. Table 2 shows the sample size of the HS&B sophomore cohort by high school type.

< Table 2 >

The ELS provided a high school type variable with three categories (e.g., public, Catholic, and other private) in the base year data. In addition to these original categories, I added an elite school category by identifying those schools, again based on Niche's top 75 best high schools ranking. That is, I defined elite schools in the ELS as belonging to Niche's top 75 high schools in 2018 (65 private + 10 public). Using an NCES provided school identifier (NCES ID), I checked whether any students in the ELS attended one of those 75 schools. I was able to find some students who attended some of those 65 elite private high schools, but I could not find any students who attended any of those 10 elite public schools. That is, different from the HS&B (and also the HSLS, as explained in the next paragraph), the elite school category in the ELS does not contain any elite public schools. However, I just named it *elite*, rather than *elite private*, for comparability with the HS&B and the HSLS. Similarly, I changed the name of the public school category to non-elite public school for comparability with those two other data sets

although the elite school category of the ELS does not contain any elite public school students. As a result, I used a total of four categories of high school in the ELS: (a) non-elite public, (b) Catholic, (c) other private, and (d) elite. Table 3 shows the sample size of the ELS by high school type.

< Table 3 >

The HSLS provided a high school type variable with three categories (e.g., public, Catholic, and other private) in the base year data. Again, in addition to this original category, I added an elite school category by identifying those schools based on Niche's top 75 best high schools ranking. That is, I defined elite schools in the HSLS as belonging to Niche's top 75 ranking. Using the NCES ID, I checked whether any students in the HSLS attended one of those Niche's 75 schools. I was able to find 30 students who attended some of those elite private schools and 20 students who attended some of those elite public schools.[14] Just as I did with the HS&B, I combined these students from the two different types of elite schools into one and named it *elite school*. Also, I changed the name of the public school category to non-elite public school in order to distinguish it from the elite school category, which now included some elite public school students. As already mentioned earlier, I consider this inclusion of elite public school students as a limitation of this study and mentioned it in the limitation section. As a result, I employed a total of four categories of high school in the HSLS: (a) non-elite public, (b) Catholic, (c) other private, and (d) elite. Table 4 shows the sample size of the HSLS by high school type.

< Table 4 >

[14] All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data.

In order to check if the elite high school category in the three data sets has reasonable validity, I compared the distribution of math score and SAT composite score by each type of high school.[15] First, I compared the distribution of math score by each high school type. Results from all three data sets (Table 5, 6, and 7) clearly showed that elite high schools[16] had the highest percentages of students who fall into the top 3% of math score distribution (25%, 35%, and 15% in the HS&B, ELS, and HSLS, respectively). In contrast, non-elite public high schools had the lowest percentages of students who belong to the top 3% of math score distribution (< 5% in all three data sets[17]). Other private high schools ranked second following the elite high schools, but the gap with elite high schools was substantial. Put differently, elite high schools had the lowest percentages of students who fall into the lowest 10% of math score distribution (< 5%, 0%, and 0%, in the HS&B, ELS, and HSLS, respectively), whereas non-elite public high schools had the highest percentages of students who belong to the lowest 10% of math score distribution (10% in all three data sets). In sum, looking at the different distribution of math scores in each type of high school, the high school classification used in this study reasonably distinguishes *academically elite* high schools in the HS&B, ELS, and HSLS.

< Table 5, Table 6, Table 7 >

Second, I compared the distribution of the SAT composite score by each type of high school. Results from all three data sets (Table 8, 9, and 10) showed similar patterns with tables using math scores. Elite high schools had the highest percentages of students who fall into the top 3% of SAT score distribution (20%, 40%, and 20% in the HS&B, ELS, and HSLS,

[15] I followed what Davies & Guppy (1997) and Mullen et al. (2003) used to identify institutional selectivity.

[16] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

[17] Percentages of non-elite public high schools and Catholic high schools in all three data sets look the same because of the rounding, but considering total and individual Ns, non-elite public high schools have lower percentages of students who fall into the top 3% of the math score distribution.

respectively). On the contrary, Catholic high schools in the HS&B had the lowest percentages of students who belong to the highest 3% of SAT score distribution (< 5%) and non-elite public high schools in the ELS and HSLS had the lowest proportion of students who are in the highest 3% of SAT score distribution (< 5% in both data sets).[18] Again, other private high schools placed second following elite high schools, but the gap with elite high schools was sizable. Put differently, elite high schools had the smallest percentages of students who fall into the lowest SAT score distribution (0% in all three data sets), whereas the Catholic high schools (in the HS&B) or non-elite public high schools (in the ELS and HSLS) had the highest percentages of students in that category (15%, 15%, and 10%, respectively). Again, as can be seen in these different distributions of SAT scores in type of high school, the high school classification used in this study reasonably distinguishes *academically elite* high schools in the HS&B, ELS, and HSLS.

< Table 8, Table 9, Table 10 >

Elite College Attendance.[19]

To create an indicator of elite college attendance, I used information from multiple sources in each data set. For the HS&B, I used the attendance record from the second follow-up (1984), the third follow-up (1986), and the fourth follow-up (1992) data. For the ELS, I obtained the information from the second follow-up student–institution file, the third follow-up student–institution file, and the postsecondary transcript file. For the HSLS, I employed the information in the Update 2013 student file and the second follow-up student–institution file.

[18] Percentages of non-elite public high schools and Catholic high schools in all three data sets look the same because of the rounding, but considering total and individual Ns, their actual percentages are different.

[19] This variable is used as an independent variable in Chapter 4 graduate/professional school analysis.

If a student attended multiple institutions, I chose the institution with the highest selectivity index and then the higher level one. In defining elite colleges, I used *Barron's Admissions Competitiveness Index*. Barron's index is the selectivity rating of four-year accredited institutions in the U.S., and it is calculated based on the SAT/ACT scores, GPA, class rank, and percentage of applicants accepted (Schmitt, 2016). Barron's organizes four-year colleges into seven competitiveness categories: (1) most competitive, (2) highly competitive, (3) very competitive, (4) competitive, (5) less competitive, (6) noncompetitive, and (7) special.[20] I defined elite colleges as four-year institutions with Barron's Index 1 (*most competitive*) or 2 (*highly competitive*).

To assign the Barron's index, I first identified the FICE code[21] of a student's postsecondary institution and used this FICE code to merge with Barron's Index. I used the 1982 Barron's Index for students who were high school seniors in 1982 (HS&B), the 2004 Index for those who were high school seniors in 2004 (ELS), and the 2014 Index for those who were high school seniors in 2013 (HSLS) to appropriately reflect any decadal changes in institutional selectivity.

Earning Top 10% Income.

For the HS&B, I created a top 10% income indicator using two student-reported 1992 annual earning measures, collected about six years after students in the high school class of 1982 typically would have completed four-year degrees if they were going to do so. I first averaged

[20] Special category includes the following: (a) professional schools of art, music, nursing, other disciplines; (b) admission requirements are not based on academic criteria but are based on evidence of talent or special interest; and (c) schools oriented toward working adults (Schmitt, 2016, p. A-3, Table A-1).

[21] This is a six-digit identification code originally created by the Federal Interagency Committee on Education. The code was used to identify all schools doing business with the Office of Education during the early 1960s, but it is no longer used in the IPEDS; it has been replaced by the IPEDS unit ID (National Center for Education Statistics, 2006, p. G-3).

two 1992 annual earning measures, one from the 1992 Computer-Assisted Telephone Interview (CATI) section and the other from the 1992 labor force participation section. Then, using Current Population Survey (CPS) 1993 data,[22] I limited the sample to respondents in a similar age range with those in the HS&B (24–29 years old in 1992) and obtained a cutoff value of top 10% income. This was done to create a top 10% income indicator based on the U.S. population income distribution, rather than based on the income distribution of each data set, for each year the student income was collected. I included zero income and applied an appropriate individual-level weight. Then I created an indicator of earning a top 10% income using the HS&B 1992 earning measures by employing the cutoff point obtained from the CPS 1993 data.

I used a similar approach for the ELS. I created a top 10% income indicator using student-reported 2011 employment income, collected about three years after the typical baccalaureate recipient completed the degree. Using CPS 2012 data, I restricted the sample to respondents in a similar age range with those in the ELS (21–26 years old in 2011) and obtained a cutoff value of top 10% income by including zero income and applying the individual-level weight. Then I created an indicator of earning a top 10% income using the ELS 2011 income measure by employing the cutoff point obtained from the CPS 2012 data.

The HSLS was excluded from the income model (Chapter 4) because it did not have income measures collected at least three years after finishing bachelor's degrees. The HSLS is a currently ongoing study and in the most recent wave (the second follow-up study in 2016), students were juniors in college.

Professional Job Attainment.

[22] I used the CPS data one year after the target year (e.g., used CPS 1993 data to get 1992 income cutoff value) because CPS reports individual income from the previous calendar year.

In the HS&B, occupation was collected in 1991, about five years after the typical baccalaureate recipient completed the degree. In the ELS, it was collected in 2012, about four years after typical bachelor's degree recipient completed the degree. I excluded the HSLS data from the professional job model because at the time of the most recent survey (the second follow-up in 2016), students were still too young (college juniors) to ask their occupational outcomes.

To figure out whether a student obtained a professional job after finishing their schooling, I matched students' SOC (Standard Occupational Classification) code to the *job zone* in the Occupational Information Network (O*NET) data. The job zone was created by O*NET to indicate the level of education, experience, and training needed for work in particular occupation. There are five job zones: (1) need little or no preparation, (2) need some preparation, (3) need medium preparation, (4) need considerable preparation, and (5) need extensive preparation. I considered job zone 4 (*need considerable preparation*) and 5 (*need extensive preparation*) as professional occupations. Table 11 shows the selected characteristics of each job zone. Note that job zone 4 and 5 require incumbents to hold at least a bachelor's degree. To be specific, job zone 4 occupations require a bachelor's degree, and a considerable amount of work-related skill, knowledge, or experience is necessary for these occupations. Examples of job zone 4 occupations include accountants, actuaries, chemists, educational administrators, human resource managers, rehabilitation counselors, sales managers, social workers, and software developers. Job zone 5 occupations usually require a graduate school degree such as a master's degree, PhD, MD, or JD, and extensive work-related skill, knowledge, and experience are necessary for these occupations. Examples of job zone 5 occupations include astronomers, chief executives, dentists,

investment fund managers, lawyers, nurse practitioners, pharmacists, postsecondary teachers, and surgeons.

< Table 11 >

Graduate/Professional School Attendance.

In the HS&B, I created an indicator of whether a student attended any graduate/professional schools based on the information from several variables: highest education attained, ever attended MBA program, ever taken graduate or professional school courses, and graduate school attendance record from the third follow-up (1986) and the fourth follow-up (1992) data. Similarly, in the ELS, I utilized multiple variables to create a graduate/professional school attendance indicator: highest education attained and graduate school attendance record from the third follow-up student-level (2012) data and postsecondary transcript (2012) data. If students had multiple attendance records, I chose the record from the higher degree program (e.g., PhD rather than master's), higher levels of institution (e.g., four-year rather than two-year institution), and then the latest one attended. Also, I assumed that students who never attended any colleges did not attend graduate/professional schools. I excluded the HSLS data from the graduate/professional school model because again, at the time of the most recent survey (the second follow-up study in 2016), students were only college juniors.

Independent Variables.

Female.

Dichotomous indicator of whether student is female. For the HS&B, I used a composite measure provided in the second follow-up (1984) data. For the ELS, I used a composite measure in the first follow-up (2004) data. For the HSLS, I used a composite measure in the first follow-up (2011) data.

Race.

For the HS&B, I used a composite measure provided in the second follow-up (1984) data. For the ELS, I used a composite measure in the first follow-up (2004) data. For the HSLS, I used a composite measure in the first follow-up (2011) data. For crosstabs, I used the most detailed racial categories available in each data set. The HS&B has a total of five racial categories: White, Black, Hispanic, Asian/Pacific Islander, and American Indian. The ELS and HSLS have a total of seven racial categories: White, Black, Hispanic, Asian, American Indian/Alaskan Native, Pacific Islander/Native Hawaiian, and multi-racial. For descriptive tables and regression analyses, I used the following collapsed version of racial categories for comparability across three data sets: (a) White, (b) Black, (c) Hispanic, (d) Asian/Native Hawaiian /Pacific Islander, and (e) American Indian/Alaskan Native/multi-racial.

Parental Education.

In the HS&B, parental education was reported from three sources: the base year (1980) data (1980), the first follow-up (1982) data, and the parental survey (1980). I used the parental survey[23] response as a standard and filled in missing values using the reports from the first follow-up data. If it was still missing, I used the base year reports to fill in the remaining missing values. In the ELS, I used the information from a single measure in the first follow-up (2004) data. In the HSLS, I used the reports from the base year study (2009) and the first follow-up study (2012).

The HS&B and the ELS provided mother's and father's highest level of education separately, so I chose the higher attainment among those two. The HSLS provided the highest level of education that parents attained at two time points, so I chose the higher attainment

[23] But it should be noted that parent survey of the HS&B was given only to a subsample of base year students' parents, whereas in the ELS and the HSLS, it was collected from parents of all students.

between the two records. All these measures were collected as categorical variables using slightly different educational categories in each data set. Therefore, I recoded them so that they have comparable categories. For descriptive tables and regression analyses, I used the following collapsed version of educational categories to ease the interpretation of the results: (a) lower than bachelor's degree, (b) bachelor's degree, and (c) graduate degree.

Parental Income.

In the HS&B, I created three parental income measures using parental income reported at two time points: the base year study (in 1980 dollars) and the first follow-up study (in 1982 dollars). First, I recoded the ordinal measures of parental incomes into continuous measures by taking the midpoint of each income category.[24] Second, I transformed them to 2008 dollars for comparability with the ELS and HSLS. Third, I used the parental income from the first follow-up study (now transformed to 2008 dollars) as a standard and filled in the missing values using the measure from the base year study (now transformed to 2008 dollars). And I divided it by 1,000 and used it for the descriptive tables. Fourth, I log transformed[25] this parental income and used it for the regression analyses.

I also created a parental income quintile using cutoff points obtained from CPS data and used it for the crosstabs. This was done to create an income quintile based on the U.S. population income distribution, rather than based on the income distribution of each data set, for each year the parental income was collected. Using the CPS data one year after the target year (i.e., used CPS 1981 data to get 1980 income cutoff value),[26] I restricted the CPS samples to the households

[24] I used different coding scheme for recoding top income category in each data set. In the HS&B, I recoded the category "$38,000 or more" in the base year parental income measure to $48,000 and the category "$50,000 or more" in the first follow-up parental income measure to $60,000. In the ELS, I recoded the category "$200,001 or more" to $300,000. In the HSLS, I recoded the category "$235,000 or more" to $250,000.

[25] To keep zero incomes, I first added 500 to the income values and then log transformed them.

[26] This was done because CPS reports individual income from the previous calendar year.

with high school aged children (age 14–18), and then obtained cutoff values of income quintile. In doing so, I included zero income and applied an appropriate household-level weight. Before recoding the HS&B's continuous parental income into an income quintile distribution, I transformed the parental income from the first follow-up (in 1982 dollars) into 1980 dollars. Then, I used the parental income from the base year (in 1980 dollars) as a standard and filled in missing values using the first follow-up parental income (now transformed to 1980 dollars). Then, I recoded this parental income measure in 1980 dollars into income quintiles based on the cutoff points obtained from the CPS 1981 data.

I employed a similar approach for the ELS. I used a parental income measure from the base year study (in 2001 dollars). I transformed this ordinal measure of parental income into a continuous measure by taking the midpoint of each income category (see Footnote 17 for coding top income category) and transformed it to 2008 dollars for comparability across data sets. I divided this by 1,000 and used it for the descriptive tables. And I took the natural logarithm of this and used it for the regression analyses. I also created an income quintile measure for the crosstabs. I used CPS 2002 to get ELS 2001 quintile cutoffs. I restricted the CPS 2002 samples to the households with high school aged children, used the appropriate household weight, and included zero income. Then, I recoded the continuous measure of ELS parental income in 2001 dollars to the income quintile by employing cutoff values obtained from the CPS 2002 data.

In the HSLS, I used parental income variables reported at two time points: the base year (in 2008 dollars) and the first follow-up (in 2011 dollars) data. First, I recoded the ordinal measure of parental income into the midpoint to make it a continuous measure (see Footnote 18 for coding top income category). Second, I transformed the first follow-up income (originally in 2011 dollars) to 2008 dollars for comparability across data sets. Third, I used the parental income

from the first follow-up study (now in 2008 dollars) as a standard and filled in the missing values using the values from the base year study (already in 2008 dollars). I divided this by 1,000 and used it for descriptive tables. Fourth, I took the natural logarithm of this and used it for regression analyses. I also created a parental income quintile measure for the crosstabs using cutoff points obtained from the CPS 2009 data. I restricted the CPS 2009 samples to the households with high school aged children and applied the household weight. I then recoded a single measure of HSLS parental income in 2008 dollars to the income quintile using those cutoff values obtained from the CPS 2009 data.

High School GPA.

In the HS&B, I used an ordinal measure of the high school GPA taken from the high school transcript. I recoded the ordinal measure into the appropriate midpoints and used it as a continuous measure using the following criteria: (a) mostly A = 3.75, (b) half A and B = 3.5, (c) mostly B = 3.0, (d) half B and C = 2.5, (e) mostly C = 2.0, (f) half C and D = 1.5, and (g) mostly D = 1.0. In the ELS and HSLS, I used the continuous measure of the GPA for all courses, which was obtained from the high school transcript.

Math Score.

For the HS&B math score, I used the number right score of the math tests provided in the base year (1980) and the first follow-up (1982) data. First, I added Part 1 and Part 2 math scores in each wave, calculated the average of the base year and the first follow-up scores, and standardized it. For the ELS math score, I averaged the sophomore- and senior-year number right scores and standardized it. For the HSLS math score, I averaged the freshman- and junior-year number right scores and standardized it.

Advanced Math Course-Taking.

I considered the following courses as advanced math courses: statistics/probability, trigonometry, pre-calculus, calculus, and any Advanced Placement/International Baccalaureate math courses. In the HS&B, I created an indicator of whether a student took any advanced math course using information from multiple variables: credit record of math courses in the high school transcript, indicator of whether a student took each math course, and a measure showing the highest math course that students took. Similarly, in the ELS, I used information from multiple measures: credit record of math courses in the transcript, the number of math courses recorded in the transcript, unit of each math course, total years each math course was taken, and the highest math course that students took. In the HSLS, I used measures about the most advanced math course and the most challenging math course that students took.

Educational Expectation.

In all three data sets, students were asked in the base year study and the first follow-up study about their educational expectations. I prioritized the response from the first follow-up survey because it gave a more recent response and I filled in the missing values using the response from the base year survey. For comparability across the three data sets, I set the categories of the ELS measure as a standard and recoded the categories of the HS&B and the HSLS into the same category that the ELS has. For descriptive tables and regression analyses, I used the following collapsed version of educational categories to ease the interpretation of the results: (a) lower than bachelor's degree, (b) bachelor's degree, and (c) graduate degree.

Type of College Attended.[27]

To create a categorical measure of type of college that a student attended, I used information from multiple sources in each data set. For the HS&B, I used the attendance record

[27] This variable is a more detailed version of the "Elite College Attendance" variable.

from the second follow-up (1984), the third follow-up (1986), and the fourth follow-up (1992) data. For the ELS, I obtained the information from the second follow-up student–institution file, the third follow-up student–institution file, and the postsecondary transcript file. For the HSLS, I did not create this measure because this variable is used only in Chapter 4 and the HSLS dataset is not used in Chapter 4 analyses.

If a student attended multiple institutions, I chose the institution with the highest selectivity index and then the higher level one. I defined elite colleges as four-year institutions with Barron's Index 1 (*most competitive*) or 2 (*highly competitive*). I created the following categories by taking into account institution level and Barron's index: (a) two-year or less than two-year college, (b) non-elite four-year college, and (c) elite four-year college.

College GPA.

The HS&B provided three undergraduate GPAs based on two different sources: second follow-up data (1984) and postsecondary transcript (1993) data. I averaged three GPA measures to create one master college GPA. In the ELS, I used a measure of college GPA from all known institutions that students attended and then filled in missing values using the college GPA from the last known institutions that students attended. In the HSLS, the college GPA variable was not needed because this variable was used only for graduate/professional school analyses and the HSLS was not used for those analyses.

College Major.

In the HS&B, college major was provided by five measures from four different sources: second follow-up (1984) data, third follow-up (1986) data, fourth follow-up (1992) data, and postsecondary transcript (1993) data. The first two sources (the second and the third follow-ups) reported college majors using the 1985 and 1990 Classification of Instructional Programs (CIP)

code, whereas the latter two sources (the fourth follow-up and postsecondary transcript data) used their own three-digit major code. First, in each file, I identified the type of degree that students pursued and kept only the bachelor's or lower degrees because the purpose was to identify a college major, not a graduate/professional school major. If students pursued multiple degrees, I chose the higher degree and then the later one pursued. Second, I classified the majors attached to the pursued degree into eight categories based on the college major classification created by Goyette and Mullen (2006). Then I imposed an additional criterion—STEM majors—by combining some categories (e.g., science and math + engineering) or by taking out some majors from a particular category (e.g., taking out the public health major from the preprofessional category) and including them in the STEM category.[28] As a result, I used the following seven categories of college majors for the analyses: (a) humanities, (b) STEM, (c) social science, (d) business, (e) education, (f) preprofessional,[29] and (g) other occupationally-oriented.[30] Third, I merged all degree type and college major variables from the four different source files into one file and figured out if any student pursued multiple degrees. If the record indicated a student pursued multiple degrees, I chose the major from the higher degree and then the major from the most recently pursued degree.

In the ELS, college major was provided from three measures from three different sources using the 2010 CIP code: student file, student–institution file, and postsecondary transcript file. I followed the same procedure that I followed for the HS&B. First, in each file, I identified the type of degree that students completed and kept only the bachelor's or lower degrees. If students

[28] To categorize STEM majors, I referred to the *ACT-defined STEM Majors and Occupations by Area* available in www.act.org.

[29] This includes architecture, journalism, law, medicine, nursing, paralegal, public health, etc.

[30] This includes agriculture, communications, dental/medical technician, design, protective services, transportation, etc. See Appendix A in Goyette and Mullen (2006) for details.

attained multiple degrees, I chose the higher degree and then the later attained one. Second, I classified the majors attached to the attained degree into major categories created by Goyette and Mullen (2006) and further imposed a STEM major criterion. In the third stage, I combined all degree type and college major variables into one file and figured out which variable had the fewest missing values. Because the variable from the student file had the fewest missing values, I used this as a standard measure and used two other measures from the student–institution file and the college transcript file to fill in missing values. In the HSLS, the college major variable was not needed because it was used only for Chapter 4 analyses and the HSLS was not used in that chapter. Table 12 provides the definitions and codings of the HS&B, ELS, and HSLS variables used in the analyses.

< Table 12 >

Sample

The analytic sample of this chapter consists of students who (a) were sophomore cohort in 1980 (HS&B) or in 2002 (ELS), or junior cohort in 2009 (HSLS), (b) participated in the second follow-up study of the HS&B or the first follow-up study of the ELS or the HSLS, and (c) had non-missing values in the high school type variable. This restriction yielded the sample size of 13,680 for the HS&B, 14,760 for the ELS, and 20,590 for the HSLS.[31] Table 13 presents the sample restrictions and resulting sample sizes of the high school type analyses.

< Table 13 >

Table 14 shows the unweighted and weighted descriptive statistics of the variables used in the high school type analyses and the sample size of elite high schools in each data set.

[31] All Ns are rounded to nearest 10, following NCES rules for reporting of restricted-use data.

Among 13,680 students in the HS&B analytic sample, 80 students attended elite high schools,[32] comprising about 0.6% of the sample. In the analytic sample of the ELS with a total of 14,760 students, 40 students were in elite high schools, comprising about 0.3% of the sample. Among a total of 20,590 students in the HSLS analytic sample, 50 students were in elite high schools, comprising about 0.3% of the sample. Although the sample sizes of the elite high schools in all three data sets are exceptionally small relative to those of other types of high schools, I assume the homogeneity of those elite high schools and also assume my estimates throughout this dissertation are not overly impacted by the small sample size.

Looking at the weighted statistics, it is noticeable that the percentage of Catholic high schools decreased (6% to 4%), while that of public high schools (90% to 93%) and elite high schools (0.1% to 0.4%) increased between 1982 and 2013. The percentage of other private high schools (3%) did not change during the same period. It looks like parity in sex ratio had maintained for three decades (about 50% were female). The racial composition of high school seniors changed over three decades. While the percentage of White students decreased from 73% to 51% between 1982 and 2013, that of Black students (12% to 14%), Hispanic students (13% to 22%), Asian/Pacific Islander/Native Hawaiian students (1% to 4%), and American Indian/Alaskan Native/multi-racial students (1% to 8%) increased during the same period. The level of parental education remarkably increased for three decades. The percentage of parents with a bachelor's degree (12% to 22%) and that of parents with an advanced degree (12% to 15%) substantially increased, while that of parents with lower than a bachelor's degree (76% to 63%) decreased between 1982 and 2013. Lastly, parental income (in 2008 dollars) significantly increased between 1982 and 2004 ($58,700 to $78,300), but dropped for the next decade (from

[32] Remember that the elite school category in the HS&B and HSLS includes some elite public school students.

$78,300 to $68,500), possibly due to the impact of the 2008 recession.[33] Still, it showed an overall upward trend between 1982 and 2013 ($58,700 to $68,500).

< Table 14 >

Multiple Imputation

I used *multiple imputation with chained equations* (MICE) under the assumption of *missing at random* (MAR) to fill in missing values in independent variables (Enders, 2010). Also, because the ELS and the HSLS used the hot-deck imputation method to fill in missing values in major background variables (e.g., sex, race, parental education, parental income), I dropped all of these imputed-by-NCES values and filled in again using my multiple imputation. I used Stata/SE 16.0 for Windows and used *mi impute chained* command for the multiple imputation.

I used the Stage 2 sample in Table 13 for the multiple imputation. That is, I restricted my imputation sample to students who were sophomore cohort in 1980 (HS&B) or in 2002 (ELS), or junior cohort in 2009 (HSLS). Table 15 shows the missing rates of variables used in the high school type analyses. Most predictors have missing rates below 10% except for logged parental income in the ELS (25.7%) and parental education (26.5%) and logged parental income (29.2%) in the HSLS. Because White et al. (2010) suggested the number of imputations to be similar to the percentage of cases that are incomplete, I generated 25 imputed data sets by considering the missing rates of those parental education and logged parental income variables.

< Table 15 >

The predictors used in the imputation model included high school type, sex, race, parental education, logged parental income, students' educational expectation, math score, high school

[33] ELS parental income was measured in 2001 and HSLS parental income was measured in 2008 and 2011.

GPA, advanced math course-taking, type of college attended, earning a top 10% income (except for the HSLS), and professional job attainment (except for the HSLS). I did not have to impute values for the dependent variable (high school type) because it did not have any missing values. But I included it in the imputation model to get unbiased estimates (Johnson & Young, 2011). Aside from the variables used in the main analyses, I additionally included school-level variables as auxiliary variables to increase the plausibility of satisfying the missing at random assumption (Johnson & Young, 2011; White et al., 2010). In the HS&B, I included percentage of Black students, percentage of students from disadvantaged background, percentage of students who entered colleges, percentage of students who have a father with a bachelor's degree, and percentage of students who have a father with a professional occupation. In the ELS, I included percentage of minority students and percentage of students eligible for free/reduced price lunch. In the HSLS, I included percentage of Black students and percentage of students eligible for free/reduced price lunch. I chose the appropriate imputation model (e.g., *mlogit, ologit, logit, regress, pmm*) based on the type of imputed variables and added the *augment* option to address the issues of perfect prediction. Lastly, I reviewed the imputation results by examining frequency tables, descriptive statistics, *Monte Carlo Error, Relative Increase in Variance (RIV/RVI), Fraction of Missing Information (FMI)*, and trace plots.

Analysis

I used multinomial logistic regression to examine the relationship between student background characteristics and elite high school attendance. The dependent variable high school type has four response categories: (a) non-elite public, (b) Catholic, (c) other private, and (d) elite. Independent variables include sex, race, parental education, and logged parental income. I used the *mi estimate: svy* command to account for multiply imputed data and the complex

sampling structure of the three data sets. Then, I used *rrr* option for *mlogit* command to get relative risk ratios (RRR). RRR indicates how the risk of falling in one comparison group (e.g., elite high school) compared to the risk of falling in the reference group (e.g., non-elite public high school) changes when the variable in question (e.g., one of the predictors) changes. If RRR is greater than one, the comparison outcome (elite high school) is more likely, whereas if RRR is smaller than one, the reference group (non-elite public high school) is more likely. Appropriate panel weights were applied and all empirical estimates were generated using the 25 versions of imputed data sets.

Result

Descriptive result

Table 16 shows the numbers and percentages of female students in each type of high school in the HS&B, ELS, and HSLS. Mirroring the findings of previous literature, elite high schools were dominated by male students in 1982.[34] Only 30% of the elite high school student body was female, while about 50%–55% of the student body in other types of high schools were females. However, the results from the 2004 and 2013 cohorts show significant improvement in the sex ratio, which also reflects the findings from previous studies. In the 2004 cohort, females represented 45% of the elite high school student body. It is a fair amount of improvement compared to the percentage from two decades ago (30% in 1982). In the 2013 cohort, slightly over half of the elite high school student body (55%) were females. This is an even higher percentage compared to the percentage of girls in public, Catholic, and other private high schools (50%).

< Table 16 >

[34] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

Table 17, 18, and 19 present the racial composition conditional on high school type in the HS&B, ELS, and HSLS, respectively. The result from the 1982 cohort (Table 17) indicates that the percentage of White students were significantly high in other private high schools (80% vs. 50%–60% in other types of high schools). It is also noticeable that Black and Asian/Pacific Islander students were over-represented in elite high schools (25% and 10%, respectively) considering their proportions in the full HS&B sample (15% and < 5%, respectively). The high percentage of Asian students in elite high schools correctly reflects the previous findings (Powell, 1996). However, other results are deviated from the previous findings that elite schools were predominantly White, and Black students were seriously underrepresented in elite schools (Cookson & Persell, 1985b; Powell, 1996; The JBHE Foundation, 2003). These deviated patterns might be related to elite schools' continuous efforts to enhance the racial diversity of their student bodies, or they can be related to the small sample sizes of elite high schools. The result of the 2004 cohort (Table 18) presents a more familiar picture of racial composition in each type of high school. Generally, except for non-elite public high schools, all other types of high schools had high percentages of White students. About 75% of other private high school students and elite high school students, and 70% of Catholic high school students were White, whereas only 50% of non-elite public high school students were White. Also, it is evident that elite high schools had a much lower percentage of non-White students compared to non-elite public high schools. Elite high schools had only 0%–10% of non-White students, whereas non-elite public high schools had around < 5%–15% of non-White students. The result of the 2013 cohort (Table 19) presents a similar pattern to that of the 1982 cohort. White students were overrepresented in other private high schools (65%), and Asian students were overrepresented in elite high schools (30%) considering their proportions in the full HSLS sample (55% and 10%, respectively). It is

surprising to see that the percentage of White students in elite high schools (50%) is relatively lower than that of White students in other types of high schools (55%–65%). It is possible that this relatively modest percentage of Whites in elite high schools can be linked to the substantial increase of Asian students in those schools between 2004 and 2013 (from 5% to 30%).

< Table 17, Table 18, Table 19 >

Table 20, 21, and 22 show parental income quintile conditional on high school type in the HS&B, ELS, and HSLS, respectively. As indicated from the previous studies, results from all three cohorts consistently show that elite high school students are significantly more likely to come from affluent family backgrounds. The result from the 1982 cohort (Table 20) shows that 50% of elite high school parents were in the top income quintile, while only about 10% of non-elite public high school parents were in that category. On the other extreme, 25% of non-elite public high school parents were in the lowest income quintile, while only 10% of elite high school parents were in that category. The result of the 2004 cohort (Table 21) shows that 70% of elite high school parents were in the highest income quintile, while only about 10% of non-elite public high school parents were in that category. Also, around 25% of non-elite public high school parents were in the lowest income quintile, while none of the elite high school parents were in that category. Similar results were found in the 2013 cohort (Table 22). About 65% of elite high school parents were in the highest income quintile, whereas only about 15% of non-elite public high school parents were in that category. Also, while 30% of non-elite public high school parents were in the lowest income quintile, only 5% of elite high school parents were in that category.

< Table 20, Table 21, Table 22 >

Table 23, 24, and 25 show parental education conditional on high school type in the HS&B, ELS, and HSLS, respectively. As indicated from the previous studies, results from all three cohorts consistently show that elite high school students are significantly more likely to be come from highly-educated family backgrounds. The result from the 1982 cohort (Table 23) shows that 65% of elite high school parents obtained a graduate/professional degree, while only about 10% of non-elite public high school parents did so. On the other extreme, 20% of the non-elite public high school parents did not have a high school diploma, while less than 5% of the elite high school parents did not have a high school diploma. The result of the 2004 cohort (Table 24) shows that 75% of the elite high school parents had a graduate/professional degree, while only about 15% of the non-elite public high school parents did so. Also, around 10% of the non-elite public high school parents did not have a high school diploma, while all of the elite high school parents had a high school diploma. Similar results were found in the 2013 cohort (Table 25). About 70% of the elite high school parents had obtained a graduate/professional degree, whereas only about 15% of the non-elite public high school parents did so. Also, while 5% of the non-elite public high school parents did not have a high school diploma, all of the elite high school parents did.

< Table 23, Table 24, Table 25 >

Regression result

Table 26 shows the relative risk ratios and 95% confidence intervals from the multinomial logistic regression predicting elite high school attendance (see Appendix A for the Catholic high schools and other private high schools results). The result generally shows that the relative risk of attending elite high schools[35] significantly varies by students' background

[35] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

characteristics, net of other individual controls. In 1982, the relative risk of attending elite high schools instead of non-elite public high schools for students who have parents with a bachelor's degree was about 0.3 times ($p < .01$) that of students who have parents with lower than a bachelor's degree, given all other variables in the model are held constant. However, in 2004 and in 2013, the relative risk of attending elite high schools instead of non-elite public high schools for students who have parents with a bachelor's degree was about 13.9 times ($p < .001$) and 15.8 times ($p < .01$), respectively, that of students who have parents with lower than a bachelor's degree, all else equal.

The results from parents with a graduate degree show a much greater association. In 1982, the relative risk of attending elite high schools instead of non-elite public high schools for students who have parents with a graduate degree was about 4.6 times ($p < .01$) that of students who have parents with lower than a bachelor's degree, given all other variables in the model are held constant. This benefit of having highly educated parents continued through 2013 with a much greater amount of association. In 2004, the relative risk of attending elite high schools instead of non-elite public high schools for students with parents having a graduate degree was about 60.6 times ($p < .001$) that of students with parents having less than a college degree, net of other individual factors. Also, the corresponding value for the 2013 cohort was 39.4 ($p < .001$).

The result of parental income also suggests that coming from an affluent family background really helps students attend elite high schools instead of non-elite public high schools. In 1982, if logged parental income increases by one unit, the relative risk of attending elite high schools relative to non-elite public high schools increases by a factor of 3.1 ($p < .05$), given all other variables in the model are held constant. Put differently, if parental income increases by 10% in 1982, the relative risk of attending elite high schools instead of non-elite

public high schools increases by 11.4% ($p < .05$). The results from the 2004 and 2013 cohorts indicate that this advantage was consistently maintained at least until 2013. In 2004, if logged parental income increases by one unit, the relative risk of attending elite high schools instead of non-elite public high schools increases by a factor of 4.7 ($p < .001$), after holding all other variables in the model constant. In other words, if parental income increases by 10% in 2004, the relative risk of attending elite high schools instead of non-elite public high schools increases by 15.9% ($p < .001$). Similarly, in 2013, one unit increase in the logged parental income was associated with the increase in relative risk of attending elite high schools instead of non-elite public high schools by a factor of 3.6 ($p < .001$). This means that in 2013, 10% increase in parental income was associated with 13.1% ($p < .001$) increase in relative risk of attending elite high schools rather than non-elite public high schools, holding all other variables in the model constant.

The result also correctly reflects the fact that female students were underrepresented in elite high schools in the past, but their presence has significantly improved in more recent decades. In 1982, female students were less likely than male students to attend elite high schools instead of non-elite public high schools by a factor of 0.5 ($p < .001$), even after considering other individual characteristics. This sex disparity was not shown in 2004, but reappeared in the 2013 result in the reversed direction. In 2013, female students were more likely than male students to attend elite high schools rather than non-elite public high schools by a factor of 1.4 ($p < .001$), net of other individual characteristics.

The result shows that there was some Black student advantage over White students at attending elite high schools instead of non-elite public high schools in the early 1980s, but this disappeared after that. Specifically, in 1982, Black students were more likely than White students

to attend elite high schools relative to non-elite public high schools by a factor of 4.9 ($p < .001$), after holding all other variables in the model constant. However, there was no statistically significant difference both in 2004 and 2013. It is highly feasible that the 1982 result can be derived from the fact that elite private high schools had tried to increase the number of Black students since the 1960s. Moreover, it is notable that advantages to Asian/Pacific Islander/Native Hawaiian students at attending elite high schools instead of non-elite public high schools emerged in 2013. In other words, Asian/Pacific Islander/Native Hawaiian students were not in a superior position compared to White students at attending elite high schools in 1982 and 2004, but in 2013, they were more likely than White students to attend elite high schools instead of non-elite public high schools by a factor of 3.5 ($p < .001$), even after holding all other variables in the model constant. Contrary to this, Hispanic students were disadvantaged at entering elite high schools instead of non-elite public high schools in 2004 by a factor of 0.3 ($p < .05$) compared to their White counterparts, but this was not found in 1982 and 2013. Lastly, in 1982, American Indian/Alaskan Native/multi-racial students were somewhat disadvantaged compared to their White counterparts at attending elite high schools instead of non-elite public high schools by a factor of 0.07 ($p < .05$), after holding other variables in the model constant. Although this result was absent in 2004, it re-emerged in the 2013 result with the larger amount of association (by a factor of 0.46, $p < .05$).

< Table 26 >

Discussion

The result of the multinomial logistic regression predicting the type of high schools that students attended showed that the relative risk of attending elite high schools[36] significantly

[36] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

varies by students' background characteristics. First, it clearly showed that students raised by higher-income and more educated parents were more likely to attend elite high schools over non-elite public high schools compared to their otherwise similar less advantaged peers, and this pattern was maintained from 1982 to at least 2013. This result is compatible with the findings from Lewis and Wanner (1979)[37], Cookson and Persell (1985b), Zweigenhaft (1993), and Sullivan et al. (2014) that have shown that most elite private high school students were from economically and educationally advantaged backgrounds.

Second, it was somewhat surprising to see that in 1982, students who have parents with less than a college degree were more likely to attend elite high schools over non-elite public high schools compared to their counterparts who have parents with a college degree. Also, in the same year, it was found that Black students were more likely to attend elite high schools relative to non-elite public high schools compared to otherwise similar White students. Perhaps these deviated patterns reflect elite private high schools' prolonged efforts since the 1960s to diversify their student bodies by accepting more racial minority and low-income students (Gaztambide-Fernández, 2009a; Powell, 1996; The JBHE Foundation, 2003). However, it was notable that those benefits to students from lower educational backgrounds and Black students disappeared sometime after 1982. This change suggests that it became more conspicuous that students from disadvantaged backgrounds or racial minority students are less likely to attend elite high schools over non-elite public high schools compared to their counterparts.

Third, the result indicated that female students were less likely to attend elite high schools over non-elite public high schools in 1982, but it has shifted since then. In 2004, sex disparity in attending elite high schools did not exist, and it reappeared in 2013 in the reversed

[37] The analytic sample was restricted to non-Black students because so few Black students in the original sample attended private schools.

direction. That is, female students in 2013 were more likely to attend elite high schools over non-elite public high schools compared to otherwise similar male students. This result partially reflects what was presented by Powell (1996) that the percentage of female prep school students was increased from 36% to 48% between 1950 and 1990. Although this record does not cover the trend after 1990, it does point to the likelihood that the proportion of female students in elite private high schools would have increased more since 1990.

Lastly, the result presented that in 2013, Asian/Pacific Islander/Native Hawaiian students were more likely than otherwise similar White students to attend elite high schools relative to non-elite public high schools, whereas American Indian/Alaskan Native/multi-racial students were less likely to attend elite high schools rather than non-elite public high schools compared to their otherwise similar White counterparts. Among these, the result about Asian students can be corroborated by Powell (1996)'s study that has shown that racial diversification of prep schools was enhanced based on the huge influx of Asian American students since the 1980s. Also, the result of American Indian/Alaskan Native/multi-racial students indicates that attending elite high schools was still not a general option for racial minority students.

Chapter 3. Elite High Schools and Elite College Going

Introduction

Since their inception, elite private schools have relied in part on elite colleges to secure their legitimacy, and elite colleges considered those elite private schools as their stable feeder schools (Carney, 2012). Because top organizational purpose of elite private schools was to prepare their students for elite colleges, they maintained long-term mutually beneficial relationships with elite colleges since the late 19th century (Carney, 2012). Several scholarly works have well documented the relationship between those two, and how elite private school students gained a competitive edge in the process of elite college admission (Cookson & Persell, 1985b; Karen, 1990; Khan, 2010, 2011; Persell & Cookson, 1985).

In addition to the historical and institutional context, Bourdieu's (1984) concept of *habitus* helps explain why many students from elite private schools naturally choose elite colleges. Habitus, defined as "a set of disposition which generates meaningful practices and meaning-giving perceptions" (Bourdieu, 1984, p. 170), is embodied through the family upbringing and conditioned by one's particular position in the social structure (Edgerton & Roberts, 2014, p. 198). Thus, children who grew up in an advantaged family background can be unconsciously inculcated with their parents' high expectation about their education and can naturally come to consider “prestigious colleges as the norm” (Mullen, 2009, p. 25). A concept closely related to habitus is *field*, the “formal and informal norms governing a particular social sphere of activity” (Edgerton & Roberts, 2014, p. 195). The habitus-field congruence is critical in that if habitus aligns well with a particular field, the necessity of any changes in habitus will be minimal (Edgerton & Roberts, 2014). For example, if the habitus of an advantaged family background fits well with the elite private school climate (field), it is highly probable that the

student will get successful college admission outcomes and his habitus toward elite private schools will be maintained or enhanced (Edgerton & Roberts, 2014). Moreover, based on Bourdieu's habitus, Reay et al. (2001) explicated that institutional habitus is the habitus mediated through an organization and can be understood as "the impact of a cultural group or social class on an individual's behaviour" (p. 1). This indicates that students can be influenced by the type of educational institution they attend through their learning experiences there and through teachers' and classmates' perspectives and advice (Reay et al., 2001, p. 2). They also maintained that the influence can interact with familial habitus that students bring into their schools, and in some cases where institutional and familial habitus work in the same direction, it can create a "taken-for-granted disposition" (p. 4) on some educational choices (Reay et al., 2001). For instance, if students from advantaged family backgrounds attend such elite private schools, where the major focus is on sending the students to prestigious colleges, they can solidify their already structured norm that "going to college is synonymous with attending an Ivy League institution" (Mullen, 2009, p. 25).

Bourdieu's (1973, 1986) concept of *cultural capital* also helps explain why elite private school graduates are at an advantage on entering prestigious colleges. Bourdieu (1973) explained that the educational system reproduces the structure of the distribution of cultural capital among classes because the school rewards children who already possess certain familiarity with the dominant cultural capital (p. 265) and thereby "facilitates the conversion of dominant cultural capital into educational success" (Roksa & Robinson, 2017, p. 1230). Thus, children who already embodied upper class cultural capital from their affluent family background gain advantage in entering elite private schools and continuously maintain the lead when entering elite colleges based on the cultural capital accumulated during their high school years. Because elite colleges

do highly individualized and holistic review of each applicant (rather than focusing only on test scores), the acquired cultural capital of elite private school students can be recognized and rewarded by admission officers in the process of elite college admissions. The elite college's long history of favoring students from elite private high schools (presented in the next section) reasonably supports this argument.

Entering elite colleges has become more competitive since the 1970s (Hoxby, 2009), and existing literature has shown that graduating from an elite college offers educational (Brand & Halaby, 2006; Eide et al., 2016; Ford & Thompson, 2016), economic (Long, 2010; Witteveen & Attewell, 2017; Zimmerman, 2019), and occupational (Binder et al., 2016; Brand & Halaby, 2006; Rivera, 2011; Zimmerman, 2019) benefits to students. In this sense, if chances of entering an elite college are much higher for students from a specific type of high school, it needs to be further examined to see if that type of high school functions as a medium for status reproduction. Although existing (mostly qualitative) literature provides detailed information about elite private schools and mechanism of college admission negotiation between elite private high schools and elite colleges, it needs to be empirically tested to see if the pattern also exists in the nationally representative sample of high school seniors.

In this chapter, I examine whether elite high school students are more successful at entering elite colleges compared to otherwise similar students from non-elite public high schools and how, if at all, differences changed over time using a nationally representative sample of high school students who were seniors in 1982, 2004, and 2013. I also explore the extent to which those differences can be explained by students' academic performance. Given the widened income gaps and the close relationship between social origin and educational outcomes (Chetty et al., 2017; Murnane & Reardon, 2018; R. V. Reeves, 2017), it is timely and imperative to see if

and how privilege is transmitted and reproduced via educational institutions. This study will contribute to the existing literature by empirically testing the qualitative results of the previous studies about the role of elite private high schools in helping their students get into prestigious colleges and universities.

Literature Review

Some studies documented the elite college's history of favoring students from elite private high schools. In his study about the decision-making process of the Harvard admission office, Karen (1990) showed that the admission rate for students from Andover, Exeter, or 17 socially elite prep schools (including the *St. Grottlesex*[38] schools) was 28.3%, whereas that for public school students was 14.5%. He maintained that this advantage stemmed from four factors: a) elite prep schools' role as reliable sources of elite colleges, (b) upper class parents whose backgrounds matched well with those of the college admission officers, (c) elite prep schools' ability to attract the students from affluent background, and (d) their curriculum to prepare students in a way that matches with the admired culture of elite postsecondary institutions.

Moreover, in his historical review of Harvard's admission policies, Karabel (2005) explained that Harvard strongly preferred students from leading prep schools based on social, cultural, and financial reasons. Harvard believed that elite prep schools educated their students just like what Harvard most aspired to admit and those elite prep school graduates were the "paying guest" of Harvard (Karabel, 2005, p. 174). In 1940, among 77 applicants from St. Grottlesex schools, only one was rejected; among 137 applicants from Andover, Exeter, Choate, Hotchkiss, Hill, and Lawrenceville, only two were rejected (Karabel, 2005). In contrast, many public school students, even those from the nation's best public schools, were commonly

[38] A term for referring to six prestigious prep schools, considered as the most socially prominent prep schools in America: Groton, St. Paul's, St. George's, St. Mark's, Kent, and Middlesex (Zweigenhaft, 1993, p. 214).

rejected. In 1940, only 11 students from three elite public schools applied to Harvard and four were rejected. Likewise, Klitgaard (1985) revealed that particular private schools occupied the applicant docket of Harvard, indicating that those particular private schools were one of the major groups that Harvard wanted to admit to comprise its student body.

There are some studies that statistically tested if elite private school students have higher odds of being admitted to or graduating from elite colleges. Espenshade et al. (2005)[39] showed that private school graduates were 26% more likely to be admitted to an elite college compared to public school graduates. Also, they found that students who attended an elite high school (including both public and private schools) had 34% higher chances of admission to an elite college compared to otherwise similar students who attended a non-elite high school. Moreover, Soares (2007) found that being high school a senior at a private non-Catholic high school increased the odds of applying to elite colleges by a factor of 4.23 and it multiplied the odds of admission 2.36 times over public school seniors.

Studies conducted using British data showed similar results. Hemsley-Brown (2015) demonstrated that private school attendees were 1.5 times more likely to admitted to Russell Group universities[40] compared to state-funded school attendees. Boliver (2013) revealed that applicants from private schools and the higher professional/managerial class received more admission offers from Russell Group universities relative to applicants from state-schools and the manual class. Sullivan et al. (2014) found that private schooling was strongly related to

[39] The study sample was limited to students who were attending academically selective colleges and universities.

[40] According to Hemsley-Brown (2015), the Russell Group universities denote "24 leading UK universities (including Oxford University and University of Cambridge), which are committed to maintaining the very best research, an outstanding teaching and learning experience, and strong links with industry and the public sector." (p. 419, Notes 1)

getting an elite degree; students who were privately educated had over three times the odds of gaining an elite degree compared to otherwise similar students who attended non-private schools.

Several studies have documented how elite private high schools have helped their students get into elite colleges. Cookson and Persell (1985b), Khan (2010, 2011), and Persell and Cookson (1985) explained the way college counselors in elite boarding schools negotiate admission cases with admission officers in elite colleges based on their mutually beneficial relationship. By utilizing abundant economic resources, elite boarding schools create opportunities to their students to develop their own "interesting characters" through participating in a wide range of extracurricular activities and completing rigorous coursework (Khan, 2010, 2011; Persell & Cookson, 1985). Students compose their unique stories based on the activities done in high school, and college counselors use those individual stories to persuade admission officers that almost all of their students can be the best and even students at the bottom of the class are not actually at the bottom (Khan, 2010, p. 108–110). Moreover, college counselors try hard to do matchmaking by recommending each student to particular elite colleges where the probability of acceptance and enrollment are the highest.

Elite colleges also benefit from this process through increased yield and lowered acceptance rate (Khan, 2010). Sometimes this process of negotiation enabled elite boarding school students who were less academically qualified than students from public schools get into elite colleges (Khan, 2010). Karabel (2005) agreed that Harvard applicants from public schools had to pass through much higher academic standards than students from elite private schools. Thus, once those public school students are in Harvard, they outperformed students from elite private schools. Zweigehhaft (1993) had similar findings that, with few exceptions, Harvard students from public schools had higher grades than those from private schools. In addition,

Michelman et al. (2021) showed that Harvard students from private feeder schools were twice as likely as those from other types of schools to be in the bottom of the class rank group, and less than half as likely to be in the top of the class rank group (p. 13).

Stevens (2007) presented similar stories in his work on how a highly selective liberal arts college chooses its entrants. He showed that elite colleges do a highly individualized and holistic review of applicants (termed “evaluative storytelling” [p. 186]), rather than focusing only on academic abilities, to make a fine distinction between comparable applicants. He maintained that private school students enjoy better conditions where they can produce a variety of stories that can be delivered to admission officers to do evaluative storytelling compared to students without those necessary arrangement. For example, wealthy students attending private schools can get qualified assistance from their guidance counselors whose main duty is to help them get into selective colleges. These guidance counselors are usually responsible for only small caseloads so that they can focus on each student's characteristics and stories. Moreover, they have sufficient information and knowledge to prescreen their students for certain colleges and have enduring relationships with admission officers in prestigious colleges. He presented two contrasted examples where equally qualified students from public schools were disadvantaged in the admission process due to the absence of guidance counselors, whereas students from private schools had an advantage based on guidance counselors' strong support. He named this whole admission enterprise "organizational machinery" (p. 189), which enhances class privilege and exacerbates class inequality in the process of transition from high school to college.

In addition, Soares (2007) maintained that prep schools systematically prepare their students for the college entrance exam, whereas public schools usually do not.[41] He argued that

[41] However, Buchmann et al. (2010) showed that public high schools also provide test preparation courses.

the College Board exam functioned as a bridge between prep schools and private colleges while it functioned as a barrier between public schools and private colleges. Supporting this argument, some studies have shown that elite private school students are academically more competent than students from other types of high schools. Owings et al. (1995) presented that about 71.7% of the college-bound high school seniors attending schools belong to National Association of Independent Schools (NAIS)[42] scored 1,100 or higher on the SAT, whereas only about 20% of their peers at public and Catholic schools achieved the same level. Wenglinsky and Jeong (2007)[43] showed that students from independent private high schools had higher SAT scores than non-elite public high school students. They also showed that greatest academic growth was occurred in the independent private high schools, while the least growth was occurred in comprehensive public and Catholic high schools.

There are some studies emphasized the role of family backgrounds on entering elite colleges based on Bourdieu (1984)'s concept of habitus. Mullen (2009, 2010) maintained that habitus helps explain the connection between origins and academic destinations. She explained that habitus can be exerted through the expectation of parents about their children's education. For example, students who grow up in an upper class background naturally learn that college is a norm through their parents' expectation and support. Upper class parents send their children to elite boarding schools in the expectation that the school culture will prepare their children for elite college admission. Based on the intensive curriculum, variety of extracurricular activities, and supportive guidance counselors, elite boarding schools naturally develop students' strong predilections for elite institutions. As supporting evidence, Mullen (2009, 2010) showed that a

[42] National Association of Independent Schools (NAIS) is a nonprofit membership association that provides services to more than 1,800 schools and associations of schools in the United States and abroad, including more than 1,500 independent private K-12 schools in the U.S. (National Association of Independent Schools, n.d.).

[43] The study sample was limited to low-income students who were attending urban high schools.

majority of Yale students who only considered top colleges as their postsecondary institution were from elite private high schools.

Weis and Cipollone (2013) emphasized the role of parents in sending their children to elite colleges by identifying distinct class differences between parents of secular private schools and state schools in the way of preparing their children for elite colleges. Even though the backgrounds of the parents at those two schools were quite similar, parents of secular private schools actively micromanaged their children's preparation for elite colleges up until the end of the admission competition, whereas parents of state schools invested *up front* and then adopted a *lead from behind* approach once their children entered secondary school. The postsecondary results showed that secular private high school students had higher acceptance rates at the most prestigious institutions compared to state school students. Weis and Cipollone (2013) explained that these divergent class practices show how parents from different classes utilize their cultural, social, and economic capital to position their children for access to the prestigious colleges, and these different class-based normative practices can perpetuate social inequality.

Previous literature provides a detailed history of the mutually beneficial relationship between elite private schools and elite colleges and how elite private schools helped their students get into elite colleges. However, because the most studies are qualitative and narrative, existing literature should be corroborated by empirically testing whether a similar pattern exists in the nationally representative sample. In this chapter, I investigate whether students from elite high schools are more successful than otherwise similar students from non-elite public high schools at entering elite colleges, using three national longitudinal data sets of U.S. high school students.

Research Questions

1. How much more likely are elite high school students to attend elite colleges compared to students from non-elite public high schools net of the observable student characteristics? And to what extent can these differences be accounted for by academic performance?
2. How, if at all, have these differences changed over time?

Methodology

Sample

The analytic sample of this chapter consists of students who (a) were sophomore cohort in 1980 (HS&B) or in 2002 (ELS), or junior cohort in 2009 (HSLS), (b) completed high school, (c) participated the fourth follow-up study of the HS&B, the third follow-up study of the ELS, or the second follow-up study of the HSLS, and (d) had non-missing values in the elite college attendance indicator. This restriction yielded the sample size of 10,650 for the HS&B, 11,660 for the ELS, and 15,380 for the HSLS.[44] Table 27 presents the sample restrictions and resulting sample sizes of the elite college attendance analyses. And Table 28 shows the unweighted and weighted descriptive statistics of the variables used in the elite college attendance analyses, created by using the analytic sample limited to high school graduates. It also shows the sample size of elite high schools in each data set. Among the 10,650 students in the HS&B analytic sample, 70 students attended elite high schools,[45] comprising about 0.7% of the sample. In the analytic sample of the ELS with a total of 11,660 students, 50 students were in elite high schools, comprising about 0.4% of the sample. Among a total of 15,380 students in the HSLS analytic sample, 40 students were in elite high schools, comprising about 0.3% of the sample. Descriptive

[44] All Ns are rounded to nearest 10, following NCES rules for reporting of restricted-use data.

[45] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

statistics generally show patterns similar to those observed in the previous descriptive table for the high school type analyses (Table 14).

< Table 27, Table 28 >

Multiple Imputation

I used multiple imputation with chained equations under the assumption of missing at random to fill in missing values in independent variables (Enders, 2010). Also, because the ELS and the HSLS used the hot-deck imputation method to fill in missing values in major background variables (e.g., sex, race, parental education, parental income), I dropped all of these imputed-by-NCES values and filled in again using multiple imputation. I used Stata/SE 16.0 for Windows and used *mi impute chained* command for the multiple imputation.

I used the Stage 3 sample in Table 27 for the multiple imputation. That is, I restricted my imputation sample to students who (a) were sophomore cohort in 1980 (HS&B) or in 2002 (ELS), or junior cohort in 2009 (HSLS), and (b) completed high schools. Table 29 shows the missing rates of variables used in the elite college attendance analyses. Most predictors have missing rates below 10% except for logged parental income in the ELS (24.6%) and parental education (19.4%) and logged parental income (22.2%) in the HSLS. I generated 25 imputed data sets by considering the missing rates of those parental education and logged parental income variables. Although the dependent variable (elite college attendance) in the HSLS also has relatively high missing rate (17.9%), I did not impute this variable but just included it in the imputation model to get unbiased estimates (Johnson & Young, 2011).

< Table 29 >

The predictors used in the imputation model included high school type, sex, race, parental education, logged parental income, students' educational expectation, math score, high school

GPA, advanced math course-taking, elite college attendance, earning top 10% income (except for the HSLS), and professional job attainment (except for the HSLS). Aside from the variables used in the main analyses, I additionally included school-level variables as auxiliary variables to increase the plausibility of satisfying the missing at random assumption (Johnson & Young, 2011; White et al., 2010). In the HS&B, I included percentage of Black students, percentage of students from disadvantaged background, percentage of students who entered colleges, percentage of students who have a father with a bachelor's degree, and percentage of students who have a father with a professional occupation. In the ELS, I included percentage of minority students and percentage of students eligible for free/reduced price lunch. In the HSLS, I included percentage of Black students and percentage of students eligible for free/reduced price lunch. I chose the appropriate imputation model (e.g., *mlogit, ologit, logit, regress, pmm*) based on the type of imputed variables, and added the *augment* option to address the issues of perfect prediction. Lastly, I reviewed the imputation results by examining frequency tables, descriptive statistics, Monte Carlo Error, Relative Increase in Variance (RIV/RVI), Fraction of Missing Information (FMI), and trace plots.

Analysis

I used binary logistic regression to examine the relationship between high school type and elite college attendance conditional on high school completion. The dependent variable elite college attendance has two response categories: (a) never attended an elite college, and (b) attended an elite college. Independent variables are high school type and other control variables including sex, race, parental education, logged parental income, high school GPA, math score, advanced math course-taking, and students' educational expectation. Additionally, in order to examine the extent to which the relationship between elite high school attendance and elite

college attendance can be explained by academic performance, I compared the result from a baseline model, which includes only high school type as an independent variable, with a model that additionally includes high school academic performance variables as independent variables (e.g., high school GPA, math score, advanced math course-taking, and students' educational expectation).

I used the *mi estimate: svy* command to account for multiply imputed data and complex sampling structure of the HS&B, ELS, and HSLS. Then, I used the *mimrgns*, a Stata command for obtaining average marginal effects for multiply imputed data sets (Klein, 2016, 2020). Average marginal effects are easier and more intuitive to interpret compared to log-odds or odds ratios. It is interpreted as the predicted change in the probabilities of an outcome when there is one standard deviation change in the independent variable. Appropriate panel weights were applied and all empirical estimates were generated based on the 25 versions of imputed data sets.

Result

Table 30 shows the average marginal effects of attending each type of high school (instead of non-elite public high schools) on attending elite colleges conditional on high school completion (the results using odds ratios are in Appendix B). The results from the three cohorts indicate that between 1982 and 2013, attending an elite high school[46] was positively and consistently related to entering elite colleges. In 1982, students who attended elite high schools had about 7.6% ($p < .05$) higher probability of entering elite colleges compared with otherwise similar students who attended non-elite public high schools, net of individual characteristics. The result of the 2004 cohort presents a remarkable boost in the benefits of attending elite high schools. It shows that elite high school attendees' probability of entering elite colleges was

[46] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

higher by 38.3% ($p < .05$) compared to otherwise similar non-elite public high school counterparts. This is an almost five times larger amount of benefits compared to that of the 1982 cohort. The result of the 2013 cohort shows a somewhat decreased but still statistically significant amount of benefits of attending elite high schools. If students attended elite high schools instead of non-elite public high schools in 2013, their probability of getting into elite colleges increased by 23.3% ($p < .001$) even after controlling for individual characteristics. This is about a three times larger amount of benefits compared to that of the 1982 cohort.

Results from other types of high schools are also worth noting. Attendance at Catholic high schools instead of non-elite public high schools did not show a statistically significant relationship with elite college attendance for the 1982 cohort, net of individual characteristics. However, it showed a positive relationship for the 2004 and 2013 cohorts. For example, students who attended Catholic high schools in 2004 had about 2.9% ($p < .01$) higher chances of entering elite colleges compared to their non-elite public high school counterparts, net of individual factors. For the 2013 cohort, the amount of benefit increased up to 4.9% ($p < .001$). Attendance at other private high schools did not show any statistically meaningful advantages on entering elite colleges in 1982, but it presented a modest benefit in 2004 and 2013. Specifically, attending other private high schools instead of non-elite public high schools in 2004 and 2013 was related to 2.9% ($p < .05$) and 4.0% ($p < .05$) higher likelihood of entering elite college, respectively, all else equal. Although attendance at other types of high schools such as Catholic or other private high schools (instead of non-elite public high schools) contributed to the higher chances of getting into elite colleges in 2004 or 2013, the sizes of those associations were much smaller than that of attending elite high schools.

< Table 30 >

Table 31 presents the extent to which the relationship between elite high school attendance and elite college entrance can be explained by high school academic performance. The baseline model in 1982 (Model 1), which includes only the high school type, showed that elite high school students had about 35.7% ($p < .05$) higher chances of entering elite colleges compared to otherwise similar students who attended non-elite public high schools. However, after including high school academic variables into the model (Model 2), the size of the advantage of attending elite high schools was decreased by 75% (from 35.8% to 9.3%, $p < .01$). Similarly, although the baseline model in 2004 (Model 1) showed that elite high school students had about 83.5% ($p < .001$) higher chances of entering elite colleges compared to their counterparts from non-elite public high schools, the degree of association with attending elite high schools was decreased by 47% (from 83.5% to 46.3%, $p < .01$) after taking into account students' academic performance (Model 2). The 2013 result showed the comparable pattern. Although the baseline model in 2013 (Model 1) indicated that non-elite elite high school students had about 66.7% ($p < .001$) higher chances of entering elite colleges compared to their counterparts from non-elite public high schools, the size of the association was decreased by 58% (from 66.7% to 28.6%, $p < .001$) after including academic variables in the model (Model 2).

< Table 31 >

Discussion

The result of the binary logistic regression predicting elite college attendance showed that between 1982 and 2013, elite high school[47] students were consistently more likely to attend elite colleges compared to their non-elite public high school counterparts, net of observable student characteristics. To be specific, elite high school students had a higher probability of attending

[47] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

elite colleges compared to otherwise similar non-elite public high school students of 7.6% in 1982, 38.3% in 2004, and 23.3% in 2013. This finding of elite high schools' positive association with entering elite colleges is compatible with that of Espenshade et al. (2005)[48] that has shown that students who attended elite high schools (both public and private) had about 34% higher chances of entering elite colleges. The result also reflects what Soares (2007) found in his study that being a high school senior at a private non-Catholic school multiplied the chances of admission to elite colleges 2.36 times over being a senior at a public high school. Also, the result is consistent with the findings derived from U.K. data sets, which revealed that private schooling was strongly related to entering prestigious colleges (Hemsley-Brown, 2015). Furthermore, the result accurately mirrors the argument made in prior studies about how elite private schools helped their students get into elite colleges (Cookson & Persell, 1985b; Khan, 2010, 2011; Persell & Cookson, 1985) and the elite college's history of favoring elite private school students (Karabel, 2005; Karen, 1990; Klitgaard, 1985).

It is worth noting that the size of the association with attending elite high schools has substantially increased since 1982. Specifically, compared to the 1982 cohort, the 2004 cohort was about five times, and the 2013 cohort was about three times more likely to attend elite colleges. This might indicate that the role of elite high schools in reproducing elites and transmitting privilege has been intensified for several decades. Although there was some decrease in the size between 2004 and 2013, which might be driven by the increased competitiveness in elite college admission, the power of attending elite high schools was well maintained at least until 2013.

[48] The study sample was limited to students who were attending academically selective colleges and universities.

The magnitude of the elite high school attendance was much larger than that of any other predictors in the model. In the 2013 cohort, attending elite high schools instead of non-elite public high schools increased the probability of entering elite colleges by 23.3%, whereas attending Catholic high schools or other private high schools (instead of non-elite public high schools) increased the probability by only 4.9% and 4.0%, respectively. Moreover, the magnitude of it was much larger than that of high school GPA (7.4% increase), having parents with a graduate degree (5.2% increase), and logged parental income (1.4% increase). Put another way, in order to get into elite colleges, it might be more important to attend elite high schools than to have a good high school GPA, have parents with a graduate degree, or be raised by affluent parents.

It was interesting to see that the relationship between elite high school attendance and elite college entrance was still strong even after taking into account students' background characteristics and high school achievements. This indicates that although it is true that elite high schools attract students mostly from advantaged backgrounds (as shown in Chapter 2 results), superior college admission outcomes of their alumni cannot be solely explained by the composition of their student body. Rather, it suggests that there must be some unobserved and unique characteristics of elite high schools that could not be properly captured by the variables already included in the model. For example, these can include elite private high schools' mutually beneficial relationship with elite colleges, strong extracurricular activities of students, the role of college counselors, the college application behavior of students, and expectations and pressures from teachers and peers. These examples are what Bourdieu (1986) termed embodied cultural capital that students can obtain by attending an elite school, and the expectations and pressures from teachers and peers can be interpreted as examples of what Reay et al. (2001)

termed institutional habitus. This projection on the existence of unobserved elite private high school factors is well supported by previous studies on those schools' efforts to help their students get admission from elite colleges (Cookson & Persell; 1985, Khan, 2010, 2011; Persell & Cookson, 1985) and the distinct college application behavior of students from affluent backgrounds (Mullen & Goyette, 2019). Furthermore, Stevens (2007) explicated that students' acquired cultural capital can be recognized and rewarded by elite college admission officers through their holistic review processes.

Additionally, it was found that a significant amount of the benefits obtained from attending elite high schools on entering prestigious colleges could be explained by elite high school students' academic records. In all three cohorts, the size of the benefit coming from attending elite high schools was substantially decreased after including high school academic variables into the model. The reduction in the size of the benefit after including academic performance variables was the largest in 1982 (75% reduction), whereas it was smaller in 2004 and 2013 (47% and 58% reduction, respectively). This might indicate that the importance of having good high school records on entering prestigious colleges was less in 2004 and 2013 compared to the early 1980s. More importantly, it is worth noting that the benefit of attending elite high schools was still statistically significant even after taking into account students' academic performance. This denotes that getting good academic records in high school is not a sufficient condition for getting into elite colleges and there might be other factors related to the type of high school that students attend.

Lastly, the overall pattern of the result suggests that non-elite public high school seniors are increasingly (although slightly) disadvantaged at entering elite colleges compared to students from other types of high schools. This trend might be related to the fact that students from

affluent backgrounds are gathering more at non-public high schools, while those from disadvantaged backgrounds are gathering more at non-elite public high schools (as shown in Table 20, 21, and 22).

Chapter 4. Elite High Schools and Later Life Outcomes

Introduction

In the previous chapter, I examined the short-term outcome of attending an elite school—entering an elite college. But how about the long-term outcomes such as income, occupation, and graduate/professional school attendance? Historically, highly selective private schools in the U.S. have been tailored to children of elites by helping them become national elites who are equipped with aristocratic culture and manners (Baltzell, 1979; Lewis & Wanner, 1979; Mills, 2000). In his study of national elites, Baltzell (1979) showed that many graduates of New England elite private schools became leaders in business and financial community. He also claimed that the common experience in the total institution (i.e., elite private schools) helped them to forge a unified group of homogeneous national elites (p. 313). Armstrong (1974) and Levine (1980) also showed that substantially high number of elite private school graduates became owner of business or served as a business executive, vice president, or president.

Some scholars have theoretically explained how these superior outcomes of elite private school alumni could be possible. Bourdieu and Boltanski (1978) asserted that the advantages of attending elite higher education institutions are both material and symbolic because just by graduating from an elite institution, alumni are bestowed with credit-worthiness which enables them to get access to a variety of material and symbolic benefits (p. 207). Also, Bourdieu (1996) claimed that attending exclusive elite institutions provides extraordinarily concentrated current and potential symbolic capital, and the symbolic capital increases with the degree of restriction and exclusivity of those groups (Bourdieu, 1996, p. 79–81). In a similar vein, A. Reeves et al. (2017) claimed that going through elite secondary or tertiary educational institutions confers alumni with a status marker which signals possession of highly-valued dispositions, skills, and

knowledge instilled through the curriculum and extracurricular activities of those elite schools (p. 1141). This status marker is then recognized and rewarded by employers who approve alumni's entry into elite positions (A. Reeves et al., 2017; Bol & Weeden, 2015).

Supporting these arguments, several studies have shown that elite private school graduates enjoy several advantages compared to otherwise similar students who attended other types of schools. These advantages include academic competency (Wenglinsky & Jeong, 2007), college access and completion (Sullivan et al., 2014; Wenglinsky & Jeong, 2007), elite college admissions (Khan, 2010, 2011; Persell & Cookson, 1985; Soares, 2007; Sullivan et al., 2014), high income (Lewis & Wanner 1979; Zimmerman, 2019), professional job attainment (Macmillan et al., 2015; Zweigenhaft, 1992, 1993), promotion to the leadership positions (Useem & Karabel, 1986; Zimmerman, 2019), and becoming a national elite (A. Reeves et al., 2017).

However, it is less clear whether those superior lifetime outcomes are derived from the school's genuine ability to instruct their students or an artifact of their ability to attract students from affluent backgrounds who will be successful whichever schools they attend. There are several studies that attempted to address this issue by controlling for individual characteristics when examining the association between attending elite private schools and outcome variables. Boliver (2013), Espenshade et al. (2005)[49], Hemsley-Brown (2015), and Soares (2007) found that graduates of elite private high schools were more likely than those from public schools to attend elite colleges even after controlling for observable student characteristics. Sullivan et al. (2014) revealed that elite private school students had a higher probability of graduating from

[49] The study sample was limited to students who were attending academically selective colleges and universities.

elite colleges compared to their counterparts who attended other types of schools, net of individual characteristics.

However, there is only a handful of studies that attempted to address the same research questions the current chapter is trying to address—the conditional relationship between elite school attendance and later life outcomes. Among those small number of studies, some found that elite private school graduates are better positioned to achieve higher income and better occupational status relative to students from other types of schools (A. Reeves et al., 2017; Lewis & Wanner, 1979; Macmillan et al., 2015; Useem & Karabel, 1986; Zimmerman, 2019). However, other studies could not find any positive relationship between elite private school attendance and occupational outcomes such as SEI of occupation, becoming a CEO, and job satisfaction (Lewis & Wanner, 1979; Useem & Karabel, 1986; Wenglinsky & Jeong, 2007). Four other studies addressed similar research questions, but they are not directly applicable to this chapter due to methodological and definitional differences. Zweigenhaft (1992, 1993) showed that there is a difference in preferred educational pathways between elite prep school graduates and public school graduates, but his studies did not control for individual characteristics. Both Jerrim et al. (2016) and Neal (1997) found a positive relationship between private school attendance and income, but they did not deal with elite private schools, just regular private and Catholic schools, respectively.

In sum, the majority of previous studies indicated a positive association between attending those schools and outcome variables. Moreover, based on the prior studies showing the advantageous position of elite private school students in entering elite colleges (Karen, 1990; Khan, 2010, 2011; Persell & Cookson, 1985) and studies examining the positive returns of graduating from elite colleges (Binder et al., 2016; Ford & Thompson, 2016; Witteveen &

Attewell, 2017), it is reasonable to assume that elite private high school students would attain higher levels of income and occupational status and be more likely to attend graduate/professional schools compared to those from other types of high schools.

In this chapter, I add to the literature by investigating whether attending elite high schools has any relationship with earning a top 10% income, obtaining a professional job, and attending graduate/professional schools after controlling for the observable characteristics of the students who attend those schools. Also, I examine how the relationship (if at all) changed over time using a nationally representative sample of high school students who were seniors in 1982 and 2004. I seek to fill the void in the existing literature by (a) focusing on the outcomes of *elite private* high school attendees (not *regular private* or *Catholic* high school attendees although I included some elite public school attendees), (b) addressing different types of long-term outcomes (e.g., income, occupation, graduate/professional school attendance), (c) investigating the sole effect of attending elite high schools after considering elite college attendance, and (d) examining how the relationship (if any) changes over time. Given the worsened income disparity (Chetty et al., 2017; Murnane & Reardon, 2018; R. V. Reeves, 2017) and situation where debates on the function of schools in status attainment and status reproduction are still going on, it is timely to examine how the privilege of elites is transmitted to their offspring through educational institutions, and how the transmitted privilege is maintained throughout their lifetime. The result of this study will contribute to the literature by demonstrating if elite high schools really ensure better life chances for their alumni.

Literature Review

There are only a few studies that have addressed the relationship between attendance of elite private high schools and later life outcomes. Lewis and Wanner (1979)[50] found that private school attendance was positively related with earnings, but negatively related with years of schooling and occupational experience after accounting for students' background characteristics. Zweigenhaft (1993) showed that public high school graduates attending Harvard were much more likely than prep school graduates attending Harvard to attain doctoral degrees (31% vs. 8%–21% of prep school graduates), whereas elite prep school graduates were more likely to earn law degrees (40% vs. 22% of public school graduates). However, this study did not control for observable student characteristics.

Wenglinsky and Jeong (2007) investigated the relationship between attending different types of high schools and various outcome variables using the sample of low-income students from inner-city high schools. They found that there was no difference in job satisfaction between young adults from independent secular private high schools (which belong to NAIS[51]) and traditional public high schools after taking into account family background and prior achievement. However, they suspected that this result could be driven by the low quality of the job satisfaction measure. In their study of the positions within top corporations, Useem and Karabel (1986) demonstrated that attendance at one of the nation's exclusive preparatory schools was positively associated with the likelihood of joining the board of directors and participating in the leadership of a major business association even after controlling for educational credentials. However, they found that attendance of elite prep schools was not significantly related to

[50] The analytic sample was restricted to non-Black students because so few Black students in the original sample attended private schools.

[51] National Association of Independent Schools.

becoming a CEO. Using the sample of Harvard attendees in the 1920s and 1930s, Michelman et al. (2021) showed that high-status students from private feeder schools were much more likely to join exclusive campus clubs and this club membership premium was related to 32% higher earning, the higher probability of working in finance, and the higher probability of joining country clubs, compared to non-members. Even more, this membership premium persisted after controlling for high school, legacy status, and family backgrounds.

There are two U.K. studies that addressed similar research questions. Macmillan et al. (2015) demonstrated that privately educated graduates were a third more likely to obtain high-status occupations than state-educated graduates from similarly affluent background even after controlling for student characteristics. A. Reeves et al. (2017) examined whether Britain's private schools had remained pivotal to elite recruitment over time by employing data from the *Who's Who*[52] of the U.K. They revealed that alumni of the nine Clarendon schools (typical British elite schools) were about 94 times more likely to reach the ranks of British elite than alumni of other types of schools. Furthermore, they emphasized that although the power of British elite schools had declined notably over the past 120 years, still the elite schools remained remarkably powerful channels of elite recruitment and their power was not necessarily contingent on graduating from elite colleges or being affiliated to private members clubs. More recently, Zimmerman (2019) found that getting into the top undergraduate business program in Chile raised the number of leadership positions students held and the probability of being at a top income, but these gains were driven by male students from high-tuition private high schools, with zero effects for female students or students from other types of schools with similar admission test scores. He also revealed that students from private high schools who were

[52] In the Merriam-Webster dictionary, Who's Who is defined as "a compilation of brief biographical sketches of prominent persons in a particular field."

admitted to elite degree programs were more likely to lead firms with their same-background college peers and those peer ties formed in college were the main mechanism which enabled students' top attainment.

There are two more studies that dealt with similar research questions although they did not focus on elite private schools, but on regular private or Catholic schools. Jerrim et al. (2016) found a positive relationship between private school attendance and entry into a professional job even after taking into account family background and high school achievement. Neal (1997) revealed that urban minority men who attended Catholic schools were expected to get about 8% higher wages relative to their public school counterparts even after considering family background.

Although prior studies provide an indication that a relationship exists between attendance of elite private high schools and later life outcomes, most of them focused only on a single type of outcome and the U.S. based studies were conducted at least two to three decades ago. In this chapter, I investigate whether attending U.S. elite high schools has any relationship with earning a top 10% income, obtaining a professional job, and attending graduate/professional schools net of the observable characteristics of the students. Also, I examine whether the relationship (if at all) has changed over time between 1982 and 2004.

Research Questions

1. How much more likely are elite high school students to earn a top 10% income compared to students from non-elite public high schools, after controlling for the observable student characteristics?

2. How much more likely are elite high school students to obtain a professional job compared to students from non-elite public high schools, after controlling for the observable student characteristics?
3. How much more likely are elite high school students to attend graduate/professional schools compared to students from non-elite public high schools, after controlling for the observable student characteristics?
4. How, if at all, have these differences changed over time?

Methodology

Sample

The analytic sample of the top 10% income model (Research Question 1) consists of students who (a) were sophomore cohort in 1980 (HS&B) or in 2002 (ELS), (b) completed high school, (c) ever attended college, (d) participated the fourth follow-up study of the HS&B or the third follow-up study of the ELS, when the typical respondent would have been between 24 and 28 years of age, and (e) had non-missing values in the top 10% income indicator. This restriction yielded the sample size of 9,300 for the HS&B sand 10,830 for the ELS.[53] The analytic sample of the professional job attainment model (Research Question 2) consists of students who (a) were sophomore cohort in 1980 (HS&B) or in 2002 (ELS), (b) completed high school, (c) ever attended college, (d) participated the fourth follow-up study of HS&B or the third follow-up study of ELS (i.e., typical respondents in 24–28 years of age), and (e) had non-missing values in the professional job attainment indicator. This restriction yielded the sample size of 7,240 for the HS&B and 10,410 for the ELS. The analytic sample for the graduate/professional school attendance model (Research Question 3) consists of students who (a) were sophomore cohort in

[53] All Ns are rounded to nearest 10, following NCES rules for reporting of restricted-use data.

1980 (HS&B) or in 2002 (ELS), (b) completed high school, (c) ever attained a bachelor's degree, (d) participated the fourth follow-up study of the HS&B or the third follow-up study of the ELS (i.e., typical respondents in 24–28 years of age), and (e) had non-missing values in the graduate/professional school attendance indicator. This restriction yielded the sample size of 3,530 for the HS&B and 5,420 for the ELS. Table 32, 33, and 34 present the sample restrictions and resulting sample sizes of the top 10% income model, professional job model, and graduate/professional school model, respectively.

< Table 32, Table 33, Table 34 >

Table 35 and 36 show the unweighted and weighted descriptive statistics of the variables used in the top 10% income analyses and professional job analyses, respectively, and the sample sizes of elite high schools in each data set.[54] The table for the top 10% income analyses (Table 35) shows that among the 9,300 students in the HS&B analytic sample, 70 students attended elite high schools, comprising about 0.8% of the sample. In the analytic sample of the ELS with a total of 10,830 students, 50 students attended elite high schools, comprising about 0.5% of the sample. The table for the professional job analyses (Table 36) shows that among 7,240 students in the HS&B analytic sample, 60 students attended elite high schools, comprising about 0.8% of the sample. In the analytic sample of the ELS with a total of 10,410 students, 40 students attended elite high schools, comprising about 0.4% of the sample. Regarding descriptive statistics, both tables generally show patterns similar to those observed in the previous descriptive tables for the high school type analyses (Table 14) and elite college attendance analyses (Table 28).

< Table 35, Table 36 >

[54] Note that the elite school category in the HS&B includes some elite public school students.

Table 37 shows the unweighted and weighted descriptive statistics of the variables used in the graduate/professional school model, created by using the analytic sample limited to high school graduates and bachelor's degree attainers. It also shows the sample size of elite high schools in each data set. Among the 3,530 students in the HS&B analytic sample, 60 students attended elite high schools, comprising about 1.7% of the sample. In the analytic sample of the ELS with a total of 5,420 students, 40 students attended elite high schools, comprising about 0.7% of the sample. Because of the sample reduction (limited to high school graduates and bachelor's degree holders), characteristics in this table are generally distinguished from characteristics of the samples used in Table 14, 28, 35, and 36, where bachelor's degree holder restriction was not imposed. That is, after limiting the analytic sample to bachelor's degree recipients, the percentage of non-public high schools, White students, and Asian/Pacific Islander/Native Hawaiian students slightly increased, while the percentage of Black, Hispanic, and American Indian/Alaskan Native/multi-racial students decreased. Furthermore, it shows that four-year degree completers are from more advantaged backgrounds and have better high school and postsecondary achievements compared to students in samples used in Table 28, 35, and 36 (Table 14 does not have any academic variables).

According to the weighted statistics, the percentage of four-year college graduates entering the graduate/professional schools barely changed between 1982 and 2004 (29% to 30%). During the same period, the percentage of non-elite public high schools slightly increased from 82% to 86%, while that of Catholic high schools decreased from 12% to 8%. The percentage of other private high schools (6%) and elite high schools (0.2%) stayed the same for two decades. Regarding sex composition, the percentage of female students was 50% in 1982,

but it increased to 56% in 2004, mirroring the upward trend in the number of female students who pursue postsecondary education since the early 1970s.

It seems like high school seniors who attained a bachelor's degree became racially diverse between 1982 and 2004 based on the increase in the percentage of Black (6% to 9%), Hispanic (6% to 9%), Asian/Pacific Islander/Native Hawaiian (2% to 6%), and American Indian/Alaskan Native/multi-racial (0.4% to 4%) students. However, the percentage of White students decreased (85% to 72%) during the same period. The educational attainment of parents improved over the two decades. Between 1982 and 2004, the percentage of parents with lower than a bachelor's degree considerably decreased (51% to 42%), whereas that of parents with a bachelor's degree substantially increased (22% to 30%). The percentage of parents with a graduate degree barely changed (27% to 28%). Likewise, the amount of parental income (in 2008 dollars) significantly increased from $72,900 to $106,300 during the same period.

High school GPA increased from 3.0 to 3.3 and students taking advanced math course increased from 79% to 83% for two decades. However, standardized math score decreased from 0.9 to 0.6 during the same period. It is notable that students aspiring for a graduate degree substantially enhanced from 40% to 57%, whereas those aspiring to attain only a bachelor's degree decreased from 44% to 39% and those wanting to get less than a bachelor's degree substantially decreased from 16% to 4% between 1982 and 2004. The percentage of students attending elite colleges increased from 11% to 24% and college GPA increased from 2.9 to 3.1 between 1982 and 2004. The percentage of students majoring in humanities (10% to 16%), social science (14% to 17%), and preprofessional fields (4% to 6%) increased for two decades, while that of students majoring in STEM (30% to 25%) and business (26% to 21%) decreased. Lastly,

the percentage of students majoring in education (8% to 7%) and other occupationally-oriented major (8%) barely changed during the same period.

< Table 37 >

Multiple Imputation

I used multiple imputation with chained equations under the assumption of missing at random to fill in missing values in independent variables (Enders, 2010). Also, because the ELS used the hot-deck imputation method to fill in missing values in major background variables (e.g., sex, race, parental education, parental income), I dropped all of these imputed-by-NCES values and filled in again using multiple imputation. I used Stata/SE 16.0 for Windows and used *mi impute chained* command for the multiple imputation.

I used different imputation samples for each model. For the top 10% income model and professional job model, I used the Stage 4 sample in Table 32 and 33, respectively. That is, for both models, I restricted my imputation samples to students who (a) were sophomore cohort in 1980 (HS&B) or in 2002 (ELS), (b) completed high school, and (c) ever attended college. For the graduate/professional school model, I used the Stage 4 sample in Table 34. In other words, I limited my imputation sample to students who (a) were sophomore cohort in 1980 (HS&B) or in 2002 (ELS), (b) completed high school, and (c) attained a bachelor's degree.

Table 38, 39, and 40 show the missing rates of variables used in the top 10% income model, the professional job model, and the graduate/professional school model, respectively. Most predictors have missing rates of around 10% except for college major in the HS&B and ELS (31.9–35.5% in Table 38 and 39) and logged parental income in the ELS (21.3%–23.1% in all three tables). I generated 25 imputed data sets by considering the missing rates of these variables. Although one dependent variable—professional job attainment (missing rate 30.6% in

the HS&B, 16.8% in the ELS)—also have relatively high missing rates, I did not impute this but just included it in the imputation models to get unbiased estimates (Johnson & Young, 2011). I did the same thing for the top 10% income and graduate/professional school variables although these dependent variables did not have high missing rates in both data sets (Top 10% income was missing 10.8% in the HS&B, 13.5% in the ELS and graduate/professional school was missing 0.3% in the HS&B, 4.2% in the ELS).

< Table 38, Table 39, Table 40 >

The predictors used in the imputation model for the top 10% income model and the professional job model included high school type, sex, race, parental education, logged parental income, students' educational expectation, math score, high school GPA, advanced math course-taking, type of college attended, college GPA, college major, top 10% income indicator, and professional job indicator. For the graduate/professional school model, I included high school type, sex, race, parental education, logged parental income, students' educational expectation, math score, high school GPA, advanced math course-taking, elite college attendance, college GPA, college major, top 10% income indicator, professional job indicator, and graduate/professional school attendance indicator. For all three models, I additionally included school-level variables as auxiliary variables to increase the plausibility of satisfying the missing at random assumption (Johnson & Young, 2011; White et al., 2010). In the HS&B, I included percentage of Black students, percentage of students from disadvantaged background, percentage of students who entered colleges, percentage of students who have a father with a bachelor's degree, and percentage of students who have a father with a professional occupation. In the ELS, I included percentage of minority students and percentage of students eligible for free/reduced price lunch. I chose the appropriate imputation model (e.g., *mlogit, ologit, logit, regress, pmm*)

based on the type of imputed variables, and added the *augment* option to address the issues of perfect prediction. Lastly, I reviewed the imputation results by examining frequency tables, descriptive statistics, Monte Carlo Error, Relative Increase in Variance (RIV/RVI), Fraction of Missing Information (FMI), and trace plots.

Analysis

I conducted three sets of analyses to examine the relationship between high school type and three later life outcomes: first predicting top 10% income conditional on high school completion and college attendance, second predicting professional job attainment conditional on high school completion and college attendance, and third predicting graduate/professional school attendance conditional on high school completion and bachelor's degree completion. For all three models, I used binary logistic regressions because they all have binary outcomes.

For the top 10% income model, dependent variable has two response categories: (a) not earned a top 10% income, and (b) earned a top 10% income. Independent variables are high school type and other control variables including sex, race, parental education, logged parental income, high school GPA, math score, advanced math course-taking, students' educational expectation, type of college attended, college GPA, and college major. For the professional job model, dependent variable has two response categories: (a) not attained a professional job, and (b) attained a professional job. Independent variables are high school type and other control variables including the same variables used in the top 10% income model. For the graduate/professional school model, dependent variable has two response categories: (a) never attended a graduate/professional school, and (b) attended a graduate/professional school. Independent variables are high school type and other control variables including sex, race, parental education, logged parental income, high school GPA, math score, advanced math

course-taking, students' educational expectation, elite college attendance, college GPA, and college major.

I used the *mi estimate: svy* command to account for multiply imputed data and the complex sampling structure of the HS&B and the ELS. Then, I used the *mimrgns* command to get average marginal effects using multiply imputed data sets (Klein, 2016, 2020). Appropriate panel weights were applied, and all empirical estimates were generated based on the 25 versions of imputed data sets.

Result

Earning Top 10% Income

Table 41 shows the average marginal effects of attending each type of high school (instead of non-elite public high schools) on earning a top 10% income conditional on high school completion and college attendance (the results using odds ratios are in Appendix C). The result of the 1982 cohort indicates that elite high school[55] students were 3.4% ($p < .001$) less likely to earn a top 10% income compared to otherwise similar students who attended non-elite public high schools. However, this pattern was flipped after two decades. In 2004, elite high school students were 10.3% ($p < .001$) more likely to earn a top 10% income compared to otherwise similar non-elite public high school students. Although attending Catholic high schools instead of non-elite public high schools showed the increased probability of earning a top 10% income in 2004 (3.7%, $p < .01$) net of individual characteristics, the sizes of the associations were only about one third that of elite high schools. Students who attended other private high schools were somewhat disadvantaged in 1982 by 1.8% ($p < .05$) compared to otherwise similar

[55] Note that the elite school category in the HS&B includes some elite public school students.

non-elite public high school students, but in 2004, they were neither advantaged nor disadvantaged.

< Table 41 >

Professional Job Attainment

Table 42 shows the average marginal effects of attending each type of high school (instead of non-elite public high schools) on professional job attainment conditional on high school completion and college attendance (the results using odds ratios are in Appendix D). The result of the 1982 cohort shows that attending elite high schools did not have any significant benefit on getting a professional job compared to attending non-elite public high schools, net of individual characteristics. However, the result after two decades presents that the chance of getting a professional job was 14.8% ($p < .001$) higher for elite high school graduates compared to their otherwise similar non-elite public high school counterparts. Different from this pattern, attending Catholic high schools or other private high schools instead of non-elite public high schools did not make any statistically meaningful difference in getting a professional job in both 1982 and 2004.

< Table 42 >

Graduate/Professional School Attendance

Table 43 shows the average marginal effects of attending each type of high school (instead of non-elite public high schools) on graduate/professional school attendance conditional on high school completion and bachelor's degree attainment (the results using odds ratios are in Appendix E). The results from the two cohorts indicate that the advantages of attending elite high schools instead of non-elite public high schools disappeared sometime between 1982 and 2004. In 1982, students who attended elite high schools were 49.8% ($p < .001$) more likely to

attend graduate/professional schools compared to their non-elite public high school counterparts, net of background characteristics and high school achievement. However, this positive relationship no longer existed in 2004. Lastly, attending Catholic high schools or other private high schools instead of non-elite public high schools did not make any statistically meaningful difference in attending graduate/professional school in both 1982 and 2004.

< Table 43 >

Discussion

Earning Top 10% Income

The result of the top 10% income model showed that in 1982, elite high school[56] students were 3.4% less likely to earn a top 10% income relative to their non-elite public high school counterparts, net of individual characteristics. After two decades, however, they were 10.3% more likely to earn a top 10% income compared to non-elite public high school students after controlling for observable student characteristics. This positive relationship between attending elite high schools and earning a high income in 2004 is consistent with prior literature by Lewis and Wanner (1979)[57] and Zimmerman (2019) that have shown the positive relationship between attending private high schools and earning high income. Although the size of the benefit (10.3%) seems modest, it is worth noting that the disadvantage of being in elite high schools in 1982 (–3.4%) was reversed to an advantage in 2004 (10.3%). This might indicate that elite high schools are increasingly functioning as a medium for elite reproduction in American society.

Moreover, the small amount of benefit gained from attending elite high schools instead of non-elite public high schools (10.3%) is larger compared to that of the benefit gained from

[56] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

[57] The analytic sample was restricted to non-Black students because so few Black students in the original sample attended private schools.

attending Catholic high schools instead of non-elite public high schools (3.7%). Also, it was about two times larger than that of getting a good high school GPA (5.3%) and about 3.5 times larger than having high-income parents (2.8%) or getting a good college GPA (2.7%). In sum, in order to become a top 10% income earner, it might be more critical to attend elite high schools than to attend Catholic high schools, get a good GPA in high school, be raised by high-income parents, or get a good GPA in college.

The about 3.4% disadvantage coming from attending elite high schools in 1982 might be related to the result in the graduate/professional school attendance model (Table 43). In other words, it may be that attending graduate/professional schools was the popular option for elite high school graduates in 1982, and this might have contributed to the reduced possibility of being in the top 10% income category because graduate students are usually captured as a low-income population.

Moreover, it was interesting that the relationship between attending elite high schools and earning a top 10% income was still valid even after controlling for students' ascriptive characteristics and high school achievement. This indicates that even though it is true that elite high schools attract students who already possess enough resources to be academically successful (as shown in Chapter 2 results), it is not the sole reason for the superior outcomes of their graduates. There must be some other contributing factors related to elite high schools that could not be captured by the measures already included in the model. For example, it may be that students obtained qualified information from their social networks created from their high school lives and utilized that information to get high-paying jobs. It is also conceivable that some students led the company based on their peer relationships formed from their high school lives (Zimmerman, 2019). All these invisible resources of elite high school students are what

Bourdieu (1973, 1986) referred to as cultural capital and social capital. Moreover, all these can be the example of the conversion of cultural capital and social capital into economic capital (Bourdieu, 1986).

Lastly, it is worth emphasizing that the relationship between attending elite high schools and earning a top 10% income was still statistically significant even after considering the type of college attended (which took into account college selectivity). This denotes that the relationship between attending elite high schools and earning a top 10% income is not necessarily contingent on attending elite colleges. Rather, it has an independent impact to smooth their alumni's ways into the top 10% income bracket without additional help from elite colleges. This finding resonates with what A. Reeves et al. (2017) found in their study using the U.K. data that private school graduates could exert their power to get into elite positions without additional help from attending prestigious colleges.

Professional Job Attainment

The result of the professional occupation model showed that there was no advantage of attending elite high schools on getting a professional job in 1982, but in 2004, students who attended elite high schools instead of non-elite public high schools were about 14.8% more likely to attain a professional job, net of observable student characteristics. This finding mirrors what Macmillan et al. (2015) found in their study using the U.K. data that privately educated students were about a third more likely to obtain high-status occupations compared to state-educated students. Although the size of association (14.8%) seems modest, it is meaningful in that it might indicate elite high schools are somewhat functioning as a medium for reproducing elites in the U.S. Also, it was the largest magnitude compared to those of any other predictors in the model. Its magnitude was even larger than that of attending elite colleges (8.6%), and about six times

larger than those of math test score (2.4%) and logged parental income (2.3%). In other words, to get a professional job, it might be more important to attend elite high schools than to attend elite colleges, get a good high school math score, or have high-income parents.

In addition, it should be noted that the impact of attending elite high schools was still valid even after taking into account student background characteristics, high school academic record, and type of college attended. This means that the elite high school's ability to assemble students from advantaged backgrounds (as shown in Chapter 2 results) is not the only reason for the superior performance of their alumni. There must be some unobserved factor unique-to-elite high schools that could not be explained by the predictors already included in the model. To illustrate, it is possible that elite high school students had more peers who thought pursuing for professional jobs are the norm, and this peer effect could have motivated students to naturally think about preparing for getting professional jobs. It is also imaginable that elite high school students had more social networks through their parents, classmates, or teachers who can help them be more informed about getting professional jobs compared to their counterparts who attended non-elite public high schools. Again, all these invisible resources of elite high school students can be what Bourdieu (1973, 1986) referred to as cultural capital and social capital, and the effects from peers and teachers can be understood as an example of what Reay et al. (2001) referred to as institutional habitus.

Lastly, it is quite impressive to see the relationship between attending elite high schools and getting a professional job was still valid even after considering type of college attended (that is, eliteness of college). This indicates that getting the benefits of attending elite high schools in obtaining a professional job is not necessarily dependent on elite college attendance. Rather, it denotes that attending elite high schools has a unique impact on their alumni's professional job

attainment without getting help from prestigious colleges. This mirrors the findings of A. Reeves et al. (2017) that private schools endowed their graduates with the power to get into elite positions without any help from attending elite colleges.

Graduate/Professional School Attendance

The result of the graduate/professional school model showed that in 1982, elite high school students had about 49.8% higher probability of attending graduate/professional schools compared to their non-elite public high school counterparts, net of observable student characteristics. However, this advantage no longer existed in 2004. This dramatic shift contradicts findings from other studies that have shown that students from advantaged backgrounds are more likely to enter graduate schools (Goyette & Mullen, 2006; Mullen et al., 2003; Posselt & Grodsky, 2017). However, at the same time, it resonates with the finding of the study that has shown that students from high-income backgrounds are about 4–5 percentage points less likely to intend to enter graduate schools than their lower income counterparts (Schapiro et al., 1991).

There are several possible explanations for the non-existence of benefits of attending elite high schools on attending graduate/professional schools. First, it looks like the advantages of attending elite high schools are already embedded in the college academic measures such as elite college attendance, college GPA, and college major. I checked that before adding a group of college academic variables into the model, attending elite high schools (instead of non-elite public high schools) increased the chances of entering graduate/professional schools by 12.1%, after controlling for high school achievements. However, the statistical significance disappeared after including college academic measures in the model. This suggests that the benefit of attending elite high schools (instead of non-elite public high schools) on entering

graduate/professional schools was fully contingent upon the impact of college academic variables and there was no independent relationship between attending elite high schools and the outcome.

Second, it might be related to the constraint on graduate/professional school attendance measure that I used in this chapter. Zweigenhaft (1992) presented that students from public high schools were more likely to attain a doctoral degree, whereas elite prep school graduates were more likely to get law degrees. This denotes that although it might be true that many elite high school students entered graduate/professional schools, it might be also the case that students from other types of high schools entered graduate schools at a similar rate but with a different major, degree type, or selectivity. Then, it is highly probable that the use of a simple graduate attendance indicator, which does not reflect major, degree type, and prestige of the graduate program, might have failed to capture more fine-grained differences in choices between elite high school students and non-elite high school students. This limitation of the graduate/professional school measure is further discussed in Chapter 5.

Third, the result might be related to the small sample sizes of elite high schools in the ELS and the sample reductions. We have very small samples sizes of elite high schools in both data sets, but the size in the ELS was smaller. Also, I restricted the analytic sample to high school graduates and a bachelor's degree recipients and dropped students who had missing values in the graduate/professional school attendance indicator. This process of reducing the already small sample sizes of elite high schools might have interfered with the ability to find statistical significance.

Lastly, it is possible that the result of this graduate/professional school analysis might be connected to the results of the top 10% income and professional job analyses. Reflecting the fact

that elite high school students were advantaged in 2004 at earning a top 10% income and obtaining a professional job compared to their non-elite public high school counterparts, it may be the case that entering graduate/professional schools right after finishing college was not an attractive option for elite high school graduates. In this scenario, it is possible that I could not capture students who will choose to enter graduate/professional schools later than three to six years after finishing college. Also, considering the fact that a large number of professional occupations (which are usually preferred by elite high school graduates) require graduate-level study, I might get a different result if the graduate school related response obtained from students' mid-age becomes available. This limitation regarding the timing of the measurement of the occupational variable is further discussed in Chapter 5.

Chapter 5. Conclusion

In this dissertation, I examined the role elite high schools play in the perpetuation of privilege in America and how, if at all, that role has changed over time. I examined the characteristics of students who attend elite high schools and the relationship between attending those schools and entering elite colleges, earning a top 10% income, obtaining a professional job, and attending graduate/professional schools. I track the experiences of three cohorts of high school students who were seniors in 1982, 2004, and 2013.

Although there are several (mostly qualitative) studies that have addressed the characteristic of elite private high schools' student body, their way of preparing the students for elite colleges, and admission outcomes of those students, studies using large-scale longitudinal data sets to examine similar research questions have not been actively undertaken. The potential reasons for this lack of systematic quantitative studies are mainly related to the shortage of data sets that provide elite private high school as an official category of their high school type measure. Also, it is related to the fact that educational researchers have rarely been focused on privileged groups or institutions such as elites or elite schools when they try to understand inequality in the U.S. society (Gaztambide-Fernández & Howard, 2010, p. 2).

In this study, I aimed to fill the void in the prior literature first by defining elite high schools based on Niche's high school ranking, and then by using that updated school type measure to empirically test the characteristics of students who attend elite high schools and the relationship between attending those schools and postsecondary and later life outcomes after controlling for observable student characteristics. In addition, I examined how those characteristics or the relationships changed over time by comparing the results from three national longitudinal samples of high school students who were seniors in 1982, 2004, and 2013.

Summary of Findings

In Chapter 1, I show that even though it is important to study elites and elite educational institutions to understand the recent increase in inequality in the U.S., they have been understudied due to the limitation in the national data sets and the lack of attention from educational researchers when they try to understand social inequality (Gaztambide-Fernández & Howard, 2010, p. 2). I emphasized that this study can contribute to the field of the sociology of education by overcoming the limitation in the existing literature by defining elite high schools based on Niche's high schools ranking, and then by using that updated school type measure to examine the research questions of this dissertation.

In Chapter 2, I examined the relationship between students' background characteristics and elite high school attendance net of other observable individual characteristics, and how those relationships changed over time between three high school senior cohorts (the 1982, 2004, and 2013 cohorts). I used multinomial logistic regressions predicting high school type with four categories (non-elite public, Catholic, other private, and elite[58]) and presented relative risk ratios and 95% confidence intervals. The result clearly suggested that between 1982 and 2013, students from higher-income and more educated parents were consistently more likely to attend elite high schools instead of non-elite public high schools compared to otherwise similar students from lower-income and less educated parents. Although there was some deviated pattern in 1982, it no longer existed in the next two cohorts. To be specific, in 1982, students from less educated parents and Black students were more likely to attend elite high schools over non-elite public high schools compared to their counterparts, possibly reflecting elite private high schools' efforts to diversify their student bodies since the 1960s. However, their advantages were gone in 2004

[58] Note that the elite school category in the HS&B and HSLS includes some elite public school students.

and 2013. The result also indicated that female students in 1982 were underrepresented in elite high schools, but this sex disparity disappeared in 2004, and then re-emerged in 2013 with reverse direction. Female students in 2013 were more likely to attend elite high schools instead of non-elite public high schools compared to otherwise similar male students. Lastly, the result from the most recent cohort (2013) suggested that Asian/Pacific Islander/Native Hawaiian students were much more likely than White students to attend elite high schools instead of non-elite public high schools, which possibly reflects the huge influx of Asian American students to elite private high schools since the 1980s. On the contrary, American Indian/Alaskan Native/multi-racial students were still less likely than White students to attend elite high schools over non-elite public high schools.

In Chapter 3, I investigated the relationship between attending elite high schools and attending prestigious colleges net of observable student characteristics, and how the relationship (if any) shifted over time between three high school senior cohorts (the 1982, 2004, and 2013 cohorts). I also examined how much of the relationship between elite high school attendance and elite college entrance can be explained by students' high school academic performance. I used binary logistic regression for predicting whether a student ever attended an elite college and presented average marginal effects. The result of the analysis suggested that for three decades, elite high school students were consistently more likely to enter elite colleges compared to otherwise similar students from non-elite public high schools. Also, it was notable that the size of the benefit that comes from attending elite high schools was remarkably increased since the early 1980s. Compared to the 1982 cohort, the 2004 cohort was about five times and the 2013 cohort was about three times more likely to attend elite colleges. Even though there was some decline in the size between 2004 and 2013, possibly driven by the increased competitiveness in

elite college admission, the power of elite high schools was maintained at least until 2013. Furthermore, it was interesting to see that the size of the association between attending elite high schools and elite college entrance was larger than that of having a good high school GPA, having parents with a graduate degree, or growing up in an affluent family. The fact that the relationship between elite high school attendance and elite college entrance was still valid even after controlling for individual characteristics signifies that there must be some other unique-to-elite high school characteristics that could not be properly captured by already included predictors in the model such as relationship with elite colleges, strong extracurricular activities of students, role of college counselors, college application behavior of students, and expectations and pressures from teachers and peers. Also, it was found that a significant amount of the advantages coming from attending elite high schools on entering selective universities could be explained by students' academic performance in high school. However, the result also showed that there is still a portion that could not be accounted for by high school academic performance, indicating that there might be some other factors related to the type of high school that students attend. Lastly, the overall pattern from the result suggests that non-elite public high school students are increasingly (although modestly) disadvantaged at entering prestigious colleges perhaps because students from affluent backgrounds are gathering more at high schools other than non-elite public high schools, whereas those from lower-income backgrounds are gathering more at non-elite public high schools (as shown in Table 20, 21, and 22).

In Chapter 4, I examined the relationship between attending elite high schools and earning a top 10% income, attaining a professional job, and entering graduate/professional schools, respectively, net of observable student characteristics. Also, I explored how those relationships (if any) changed over time between two high school senior cohorts (the 1982 and

2004 cohorts). I used binary logistic regression for all three outcomes and presented average marginal effects. The result of the income model showed that in 1982, elite high school students were less likely to earn a top 10% income compared to their non-elite public high school counterparts, but in 2004, they were more likely to do so. Although the size of the benefit in 2004 was modest, the shift from minus to plus value might denote that elite high schools are increasingly functioning as a mode of status reproduction in the U.S. society. Also, it was interesting to see that to become a top 10% income earner, it is more important to attend elite high schools than to attend Catholic high schools, get a decent high school GPA, be raised by high-income parents, or get a good college GPA when considering the relative effect sizes of the predictors included in the model. Moreover, it was worth noting that the relationship between attending elite high schools and becoming a top 10% income earner was still significant even after controlling for other individual characteristics in the model. This suggests that there might be some other factors related to elite high schools which contribute to explain the different probability of being in the top 10% income category such as social networks and peer relationships formed in the elite high school lives. Additionally, it was noticeable that the relationship between elite high school attendance and earning a top 10% income was still statistically significant even after considering type of college attended. This indicates that attending elite high schools has an independent relationship with becoming a top 10% income earner without any help from prestigious postsecondary institutions.

The result of the professional job model presented that in 1982, there was no benefit of attending elite high schools (instead of non-elite public high schools) on obtaining a professional job, but in 2004, elite high school students had higher chances of attaining a professional job compared to otherwise similar non-elite public high school students. Also, the size of its

association with getting a professional job was larger than that of any other predictors in the model, meaning that it is more important to attend elite high schools than to attend elite colleges, get a good high school record, and have high-income parents to attain a professional occupation. Moreover, it was noticeable that the relationship between elite high school attendance and getting a professional job was still statistically valid even after taking into account other observable student characteristics. Again, this implies the existence of unobserved traits of elite high schools that could not be properly captured by predictors already included in the model. Potential examples might include peer effect and its influence on students' motivation, social networks formed in elite high schools, and quality information coming from those networks. Furthermore, it was quite impressive to see that the relationship with the outcome variable was maintained even after considering type of college attended, meaning that elite high schools can exert their power to help their alumni to obtain high-status jobs without additional help from prestigious colleges.

The result of the graduate/professional school model showed that in 1982, students from elite high schools had a much higher possibility of attending graduate/professional schools compared to otherwise similar students from non-elite public high schools. However, this benefit no longer existed in 2004. There are several potential explanations for this absence of elite high school advantages on graduate/professional school outcome. Foremost, it looks like the relationship between elite high school attendance and graduate/professional attendance was fully explained by college academic measures such as elite college attendance, college GPA, and college major. I checked that the statistically significant relationship between elite high school attendance and graduate/professional school attendance disappeared after including college academic variables in the model. This also denotes that there is no independent impact of elite

high school attendance on predicting graduate/professional school attendance and only the indirect impact of it through college academic variables exists. Also, the limitation comes from using a simplified version of a graduate/professional school indicator and very small sample sizes of elite high school students who completed a four-year degree and also attended graduate/professional school might have contributed to the result. Additionally, considering the benefits to elite high school students regarding earning a top 10% income and obtaining a professional job in 2004, it is also feasible that entering graduate school right after completing college was not a popular option of elite high school graduates at that time. If this was the case, it is highly possible that I missed most students who chose to enter graduate schools later in their life. Considering the fact that a large proportion of high-status occupations (which are usually preferred by elite high school graduates) require graduate-level studies, it is highly probable that I might get a different result if I could use the graduate/professional school information collected when students were at their mid-age.

Overall, the results from Chapter 2, 3, and 4 indicate that elite high schools had consistently been a place for upper class, mostly White students for three decades, although there was some increase of Asian students in recent decades. Looking at the continued benefits to elite high school students on elite college admission and the emergence of their advantages in economic and occupational outcomes even after considering individual characteristics, it appears that the privilege of the U.S. elites has been reproduced by going through elite high schools. Also, the advent of their edges on later life outcomes (i.e., income, occupation) implies that the duration of the time when a child's social origin can exert its influence has been extended, indicating the interference with the movement towards "socioeconomic liberation" (Stolzenberg, 1994, p. 1068). Although this study could not take the whole picture of students' later lives, it is

highly expected that attendance at elite high schools would ensure better later life outcomes of their alumni.

Limitation

Although this study tried to contribute to the existing literature by demonstrating characteristics of students who attend elite high schools and the short-term and longer-term outcomes of attending those schools using the updated school type measure, it is still subject to several limitations.

First, due to the small sample size of students from elite private high schools, I had no choice but to include some elite public high schools to the elite private high school category in the HS&B and HSLS to increase the sample size. This interfered with my ability to separate out the sole effect of attending elite private high schools. Also, the inclusion of elite public high schools may have underestimated the true conditional effect of attending elite private high schools because higher academic and non-academic achievements are generally expected from elite private high school students than elite public high school students.[59] The lack of longitudinal data sets with enough elite private high school samples is a major stumbling block for conducting quantitative research on those schools and it needs to be addressed in future data collection of national longitudinal data sets.

Second, although I tried to increase the sample sizes of elite high school category, they are still exceptionally small compared to the sample sizes of other types of high schools and this small sample size issue might cause insufficient statistical power of the analysis. It can also

[59] It should be also noted that there is variation even among elite public schools. For example, specialized high schools and exam schools function like private schools serving students from advantaged backgrounds (see Cocoran & Baker-Smith, 2015; Dobbie & Fryer Jr., 2014; Finn & Hockett, 2012), whereas some elite public boarding schools and SEED schools are serving an increasing number of underrepresented minority students or economically disadvantaged students (see Curto & Fryer Jr., 2014; Shi, 2020).

cause substantial sampling variance for the coefficients for elite high schools because elite high schools can vary in their specific types (e.g., day or boarding), percentages of students from disadvantaged or racially diverse background, admission policies, instructional practices, and cultures, and therefore may not be substitutable. For instance, lives at day and boarding schools are expected to be quite different. While boarding schools are more like a "total institution" (Goffman, 1961, p. xiii) where children can be naturally developed with an elite culture in a geographically isolated and socially exclusive environment, day schools are known to be less socially exclusive and not an appropriate place to naturally instill elite characters and manners compared to boarding schools (Levine, 1980, p. 73). Other several studies have indicated that elite school students' experiences and outcomes may vary even within schools by showing how low-income racial minority students did at elite private schools (Cookson & Persell, 1991; Datnow & Cooper, 1997; Fordham, 1991; Horvat & Antonio, 1999; Kramer, 2008; Kuriloff & Reichert, 2003; Zweigenhaft & Domhoff, 2003).

Third, even though previous literature on elite private schools emphasized that those are socially elite schools, this study could not check if the schools in the Niche's ranking are also all socially elite. Rather, this study is based more on academically elite schools because Niche mainly used test scores to calculate its ranking and I checked the validity of the school type measure by reviewing the distribution of the math score and the SAT score by school type. However, as I looked into the schools in the Niche's ranking, socially elite schools are tended to also academically elite. Therefore, I believe not drawing a fine distinction between socially elite and academically elite schools would not cause seriously biased results. But I also believe that if we can make a fine distinction between those two types of schools (socially elite vs.

academically elite), it would be interesting to see (even at the postsecondary level) how or if alumni outcomes or trajectories differ between those two types of schools, in the long run.

Fourth, although I tried to control for observable student characteristics as much as possible, this study does not reveal causation but only conditional association. Also, it is possible that there can be unobserved differences such as psychosocial factors or personal disposition between elite high school attendees and non-elite high school attendees which could not be fully captured using already included predictors in the three data sets.

Fifth, for the descriptive analyses, I tried to use the most detailed racial categories available in each of the three data sets.[60] However, for the regression analyses, I had to combine the Asian and Pacific Islander/Native Hawaiian categories into one and the American Indian/Alaskan Native and multi-racial categories into one in the ELS and HSLS because some regression analyses failed to run due to the too small sample sizes of those racial categories. Also, this integration was needed to enable the result comparisons between the three data sets. I accept this collapsing of racial categories as a limitation of this study because those combined racial categories are not at all the same, meaning that there must be a wide range of variability between those categories.

Sixth, three later life outcomes—income, occupation, and graduate/professional school attendance—were measured in a relatively short timeframe, about three to six years after the typical baccalaureate recipient completed the degree (i.e., typical respondents in 24–28 years of age in the HS&B and ELS). Especially regarding income, this can cause *lifecycle bias* that can arise when using current income as a proxy for lifetime income (Bhuller et al., 2011; Gouskova

[60] In the HS&B, I used five racial categories: White, Black, Hispanic, Asian/Pacific Islander, and American Indian. In the ELS and HSLS, I used seven racial categories: White, Black, Hispanic, Asian, American Indian/Alaskan Native, Pacific Islander/Native Hawaiian, and Multi-racial.

et al., 2010). Several studies have shown that relying on snapshots of income can result in a biased result of mobility estimates because the association between current and lifetime income varies systematically over the lifecycle (Bhuller et al., 2011; Haider & Solon, 2006). Some studies have suggested that earnings measured at particular age ranges[61] can minimize the lifecycle bias, but I could not get incomes measured at those age ranges. Regarding occupation, people usually get paid more or promoted to higher positions as they build their careers. But the degree of these changes can be substantially different between individuals and occupations. Therefore, if occupational attainment was measured in participants' midlife or after that, the differences in occupational outcomes could be more dramatic. Moreover, it is plausible that some students were still attending graduate/professional schools at the time of measuring income and occupation. If this was the case, students who will eventually get a high-paying, high-status job after getting their graduate/professional degrees could not be appropriately reflected in the result of the analyses. In a similar vein, graduate/professional school attendance was measured somewhat early to capture the full pictures of the advanced-level schooling. Although Nevill and Chen (2007) showed that most 1992−1993 bachelor's degree recipients waited about two to three years to enter a graduate degree program (meaning that the measurement timing of the variables used in this study is reasonable), it is still possible that this study could not capture students who returned to graduate schools later after having work experience.

Seventh, I could not utilize more fine-grained graduate/professional school attendance measures due to the small sample size of students who attended elite high schools and also attended graduate/professional schools. For example, I did not use the graduate/professional school *completion* indicator but instead used the *attendance* indicator in order to avoid losing

[61] Bhuller et al. (2011) suggested early 30s, Haider and Solon (2006) indicated 30–45, Gouscova et al. (2010) recommended 35–44, and Nybom and Stuhler (2016) suggested midlife.

more cases. Because I could not observe every graduation record of all graduate/professional school attendees, relying on the completion record would have made the already small sample smaller. However, considering the fact that the doctoral degree completion rate is not high (about 57%–77%, varies by areas of study)[62], focusing only on the attendance record can slightly overestimate the impact of attending elite high schools. In addition, I could not take into account major of graduate degree (e.g., business, law, medicine, etc.), types of graduate degree (e.g., master's, doctoral, and professional), and selectivity of graduate schools due to the limitation in the data sets. But it should be noted that several previous studies indicated or emphasized the importance of considering more detailed categorization of graduate programs (Brint et al., 2020; Brint & Yoshikawa, 2017; Cappelli et al., 2014; Ott, 2011; Posselt & Grodsky, 2017; Rivera, 2015; Useem & Karabel, 1986; Wai, 2013).

Eighth, I used the elite college *attendance* measure, not *completion* measure, as one of the predictors in the analyses of three later outcomes, just like what I did for the graduate/professional school attendance indicator. I made this choice because I could not get every graduation record of all students who attended colleges and I did not want to lose more cases from the already small group of students who entered elite colleges. However, considering the fact that the completion rate of elite colleges is significantly high (93% for the 1995 entering cohort of Ivy League Universities[63]), it is unlikely that this choice would significantly bias the result.

Lastly, when studying elites, it is very important to consider wealth as well as income. However, all three data sets that I used in this dissertation did not contain appropriate wealth

[62] Check following studies for more about doctoral degree completion rates: Bair & Haworth (2004), Baum & Steele (2017), Cassuto (2013), Most (2008), The Council of Graduate Schools (2004), and The Council of Graduate Schools (2008).

[63] Bowen et al. (2009), Figure 10.6.

measures. In the HS&B and the HSLS, there was a variable indicating whether parents own a home, but it was not available in the ELS. Although income includes only wages, dividends, or interest that people get every year, wealth is more related to marketable assets such as real estate, bank accounts, stocks, bonds, insurance, and cashable possessions minus any debts such as mortgage and loans (Domhoff, 2014; Fischer & Hout, 2008). Killeward et al. (2017) showed that wealth remains distinct from long-term measures of income and associated with variety of outcomes such as educational and occupational achievement. Fischer and Hout (2008) explained that about 40% of wealth accumulation is the result of inheritance or inter vivo gifts (p. 148), and Ford and Thompson (2016) showed that students with abundant family wealth can benefit from the transferability of wealth across generations. For instance, based on parents' wealth, students can choose prestigious private colleges without caring about tuition, prepare exams to apply for first-professional schools, choose to continue their study at graduate/professional schools, have enough job-seeking period, or take the risk of a career transition. So, focusing only on income will make researchers lose true pictures of financial security. Capturing the former group as in the lowest income quintile while capturing the latter group as in the highest income quintile can bias the results of studies, which can lead to incorrect policy implications.

Future Study

Based on results and limitations of this study, I suggest several directions for future research on elite high schools. First, in order to make meaningful progress in understanding the role elite private high schools play in social stratification, comprehensive data on a larger sample of the elite private high school population should be collected. That is, data collection protocol of national educational longitudinal data sets should include plans for oversampling the elite private high schools. The results of this study, which have shown that there is a huge gap between elite

private schools and other private schools, strongly indicate that distinguishing between elite and non-elite private schools is very important, which in turn supports the necessity of increasing the sample sizes of elite private high schools. In addition, the lack of a comprehensive database of American elites is another problem. There are two data sources of social elites—Who's Who and the Social Register—but the criteria for inclusion are not clear-cut and they do not contain background characteristics of listees, which is a very important factor when studying elites. Several studies about national elites (Brint et al., 2020; Brint & Yoshikawa, 2017; Cappelli & Hamori, 2004; Wai, 2013) constructed their own data set of elites by searching through a variety of online resources based on their own definition of elites. To establish the database of elites, we should first define the criteria of being elite in different social fields. We also need to think about type and scope of information on elites that should be collected. As Khan (2011) asserted, we must know more about elites if we want to understand the inequality in the American society. If we can get a larger sample size of elite private schools and gain access to a database of national elites, conducting a more comprehensive elite study such as investigating the routes of becoming a national elite in the U.S. society will become feasible.

Second, it is critical to supplement current national educational surveys with wealth measures. To obtain more reliable wealth measures, linking data with state administrative records or tax records can be another option to consider. If accurate wealth measures become available in the future, researchers can try to investigate more detailed and accurate circumstances of students' life-time trajectories. As already mentioned in the limitation section, students raised by parents with abundant wealth can benefit from it at every stage in their life. They can invest more resources to be better prepared for the labor market and even afford unpaid internships until they can get a job that they want. They can have average-paying jobs but still

belong to the group of economic elites based on the inheritance from their parents. Considering these, it would be interesting to study how wealth affects the choice of students from different types of high schools and their later life.

Third, when I was reviewing related literature of this study, I could not find any study about the detailed admission process of exclusive elite private schools.[64] To the best of my knowledge, it is a remarkably understudied area. To get a sense of the population of particular institutions, we have to first examine the admission policy and process of those institutions. Some studies have revealed detailed gatekeeping and screening procedures used in the elite college admission (Stevens, 2007; Toor, 2002) and top corporate job interviews (Rivera, 2011). It would be useful to conduct similar studies which focus on the admission process of exclusively elite private schools. In this way, we can get more information about how students' cultural capitals accumulated through the upbringing helps them get into the elite pathway.

Fourth, it would be worthwhile to study the intergenerational transmission of elite high school attendance if data on the types of high schools students' parents and grandparents attended become available. I suspect that many students in our elite high school samples were raised by parents who also attended elite schools, but there was no way to prove this using currently available data. It is important to pay attention to the intergenerational transmission of education because transmission of cultural capital through upbringing is known to be the central way to reproduce the social status of parents (Bourdieu, 1996; Soares, 2007). In their study of intergenerational transmission of college selectivity, Ford and Thompson (2016) found that children of parents with an elite college degree were more likely to attend elite colleges even after considering family background and academic ability. Similarly, Zweigenhaft and Domhoff

[64] Only Cookson & Persell (1985) and Levine (1980) briefly mentioned about elite private school's admission criteria.

(2003) found that offspring of ABC program participants were academically competent and they also successfully entered elite colleges, indicating the potential existence of intergenerational transmission of privilege. If we can check if different generations of family members attended the same types of secondary schools, we can get an indication of whether the status reproduction through secondary educational institutions is actually happening in the real setting.

Fifth, as emphasized in some previous studies (A. Reeves et al., 2017; Brint et al., 2020) and partially shown in this study, it would be important to examine the combined effect of passing through multiple elite institutions or groups (e.g., secondary schools, colleges, graduate/professional schools, top corporate firms, elite social groups, etc.) rather than just focusing on the single institution.[65] In a real-life setting, people want to get into elite institutions as preparation for getting into the next level of elite institutions. People rarely want to just stop at a single elite institution but rather want to join the "elite channels." But it is also true that very few people complete the whole elite course; many people deviate from it in the middle of it. Therefore, it would be interesting to see the combined impact of successfully passing through multiple elite institutions compared to going through only a single elite institution. In this way, we can see the actual situation of elite trajectories and their impact on people's lives.

Sixth, it would be important to re-survey respondents in their middle age (in the age range of 40–60 years old) to see their lifetime earnings and late careers.[66] As mentioned in the limitation section, finishing up the survey three to six years after completion of a bachelor's degree will not capture later life outcomes of those who attend graduate/professional schools later in their life to get advanced degrees. Moreover, as people get older, they get more work

[65] Levine (1980) also indicated that having just an Ivy League degree was not enough to be accepted in upper class circles. Rather, one should also have attended the right boarding schools to be considered as an upper class.

[66] This has been done in the fourth follow-up study of the HS&B senior cohort and the fifth follow-up study of the HS&B sophomore cohort.

experience and this will lead to higher earnings and higher positions. Some people even can become social elites. If we can get students' later life outcomes in their mid-age, we can investigate whether attending elite high schools contributes to maintaining the privilege of their alumni throughout their lifetime.

Seventh, it might be interesting to consider the major, degree type, and selectivity of graduate programs that students enter. Because of the growing popularity of graduate/professional schools, the phenomenon of differentiation and stratification in graduate programs and schools has become more conspicuous (Posselt & Grodsky, 2017). The use of more detailed classification of graduate schools when conducting stratification research is becoming more important because each category carries different market value in the society. Several studies have shown that the selectivity of the graduate program matters for getting elite positions in corporate firms (Cappelli et al., 2014; Ott, 2011; Rivera, 2015; Useem & Karabel, 1986) and other studies demonstrated that there is a close relationship between getting elite professional degrees and becoming a social elite (Brint et al., 2020; Brint & Yoshikawa, 2017; Wai, 2013). If we can get larger sample sizes of elite private high schools, it would be interesting to see how students from different types of high schools make their graduate/professional school choices.

Lastly, it would be noteworthy to see how the college application preference of elite high school seniors differs from that of non-elite high school seniors. Several studies have indicated that even academically underprepared elite private high school students had been accepted to elite colleges based on their schools' unique application strategies (Karabel, 2005; Khan, 2010; Zweigenhaft, 1993). More importantly, Mullen and Goyette (2019) demonstrated that private school students were more likely to apply for and get into elite colleges regardless of their

academic and non-academic abilities. They also found that students from a high-SES background had a tendency to apply to institutions with a somewhat higher level of selectivity relative to their actual academic competency based on the belief that their rich experience in extracurricular activities will increase the possibility of acceptance. In sum, it would be important to investigate whether this unique application behavior of high-SES students also can be found in elite high school seniors.

Implication and Conclusion

The result of this dissertation provides an overview of how privileges of elites in the U.S. have been reproduced via educational institutions over the past several decades. Also, it offers a chance to consider the validity of the theories that are frequently used when trying to explain the ways that elites are reproduced in the society. Even though this study did not examine the detailed processes happening inside of elite high schools, I applied Bourdieu (1973, 1984, 1986)'s theory of habitus, cultural capital, and social capital when explaining the potential existence of unique-to-elite high school characteristics that contribute to superior outcomes of their alumni. In fact, several previous studies on elite schools (A. Reeves et al., 2017; Mullen, 2009, 2010; Soares, 2007; Zweigenhaft, 1992) have already validated the application of Bourdieu's theories in explaining the reproduction function of elite educational institutions. Using Bourdieu's theory, we further need to understand how elites and institutions that serve them maintain or improve their social status through distinction and the myth of meritocracy. As Khan explained in his work (2011, 2012), elites frequently use the words "talent, merit, and hard work (rather than appeals to their ties or to other powerful institutions such as families and firms)" (Khan, 2012, p. 372) to conceal the condition or underlying system that generates inequality in students' outcomes. In this sense, it would also be meaningful to further explore the

top 10% income and professional job outcomes of this study and see how Bourdieu's theories can be played out on explaining those results. That is, delving more into the detailed process by which elite high school graduates achieve high-income and professional jobs would illuminate how well Bourdieu's theories can be applied in the U.S. context and how elite status is attained in the U.S. society.[67]

We should also contemplate whether U.S. elite private high schools are still a typical example of sponsored mobility, whereas the U.S. educational system itself is generally considered an example of contest mobility. Although it is hard to deny that the majority of students attending elite private high schools are from an economically advantaged background (as shown in Table 20, 21, and 22) and that they benefit from the mutually beneficial relationships between their schools and elite colleges in the college admission process, the fact that they are generally more academically competent than students from other types of high schools provides the point of reservation to consider elite private high schools as an example of sponsored mobility. It looks like elite private high school students compete so hard at the same time they are sponsored by existing elites (e.g., parents, teachers, college counselors, and college admission officers) to win the college admission game. In this case, we can say that elite private high schools are positioned somewhere between contest mobility and sponsored mobility. However, it is still questionable if those students who participate in the competition are all on an equal footing in the beginning of the competition, which is the prerequisite of achieving valid contest mobility (Turner, 1960). Also, if we also think about the equally competent students attending elite public high schools who were disadvantaged in elite college admissions only because they are from public schools, we can still think of elite private high schools as an

[67] In doing this, the works by Rivera (2011, 2012, 2015) about the hiring process of top-tier consulting and law firms can serve as a good milestone.

example of sponsored mobility. The key point is that the reality is more complicated than we think, and researchers should carefully consider details of the situation or the changes made in it as time goes by.

Some scholars may raise some questions about similarities and differences between English and American elite schools because it is generally known that most U.S. elite boarding schools imitated English elite boarding school models (Cookson & Persell, 1985a). To the best of my knowledge, only a few studies tried to compare the two. Cookson and Persell (1985a) explained that while those elite schools in Britain and the U.S. are very similar in that they educate and socialize children from elite backgrounds, some differences exist regarding the commonality of single-sex schools, the openness of knowledge that students learn at school, and the relationship between students and teachers. Additionally, Cookson and Persell (1985b) emphasized that while English elite school students are taught to show their eliteness publicly, American elite school students are trained to be hide their eliteness (p. 29). Although it is easy to find studies about elite higher education in the U.K. (e.g., Chevalier, 2014), it is relatively rare to find studies on U.K. elite secondary schools that historically served children of upper class families.[68] Only A. Reeves et al. (2017) addressed the relationship between attending historically elite British secondary schools and outcome variables, while many other studies (Boliver, 2013; Hemsley-Brown, 2015; Jerrim et al., 2016; Macmillan et al., 2015; Sullivan et al., 2014) did not distinguish between historically elite schools from regular private schools. However, regardless of the detailed categorization of those U.K. elite schools, most U.K. based studies showed that privately educated students generally achieved superior academic and non-academic outcomes

[68] These two books are about English elite secondary schools: Wakeford (1969) and Weinberg (1967).

compared to the state-educated students (A. Reeves et al., 2017; Boliver, 2013; Hemsley-Brown, 2015; Jerrim et al., 2016; Macmillan et al., 2015; Sullivan et al., 2014).

Debates on whether elite private high schools can function as places promoting social mobility or as mediums for consolidating status reproduction can be addressed differently based on the socioeconomic status of the attendees. Considering the superior outcomes of elite private high school graduates net of other observable student characteristics, it is highly probable that even students from disadvantaged backgrounds can benefit from attending elite private high schools—it can either promote social mobility or prevent downward mobility. The social mobility function of elite private high schools is well documented in several prior studies that have shown that study participants and even their offspring could benefit from elite college entrance and upgraded economic and social status (Horvat & Antonio, 1999; Jack, 2016; Persell & Cookson, 1985; Zweigenhaft & Domhoff, 2003). However, considering the rich family background of most elite private high school attendees, it is more realistic to say that those schools have been majorly functioning as mediums for status reproduction. In other words, they have been mostly serving an already advantaged population in the U.S. society.

Lastly, this study provides some insights into how the U.S. educational system should deal with the increased degree of inequality in American society. The results of this study generally indicate that elite high schools attract students from more advantaged backgrounds than non-elite public high schools do (as shown in the Chapter 2 result) and they are better equipped to prepare their students for elite college admission (Cookson & Persell, 1985b; Khan, 2010, 2011; Persell & Cookson, 1985). Therefore, we should accurately examine major gaps between elite high schools and non-elite public high schools regarding available resources and programs for preparing students for college admission. And we should consider the ways to

improve the quality of non-elite public school programs and resources particularly regarding the provision of extracurricular activities, the role of college counselors, and the offering of advanced courses, which are emphasized as important factors influencing elite college admission outcomes (Cookson & Persell, 1985b; Khan, 2010, 2011; Persell & Cookson, 1985; Stevens, 2007). Moreover, based on the success stories from the programs geared towards students from disadvantaged backgrounds (Zweigenhaft & Domhoff, 2003), we should keep running and extending those types of programs to give an opportunity for social mobility to academically competent but socioeconomically disadvantaged students. We also need to remember that "opening the door and doing nothing more is insufficient" (Fordham, 1991, p. 481). Rather, we need to carefully keep track of how those students are doing in elite schools and think about the ways to support them in a more realistic sense to help them finish their journey of social mobility. As Grodsky and Riegle-Crumb (2010) demonstrated, the high college-going habitus in elite schools will almost equally benefit those students from disadvantaged backgrounds.

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Table 1. Major Characteristics of HS&B, ELS, and HSLS Participants

Major characteristic	HS&B sophomore (1980)	ELS (2002)	HSLS (2009)
Grade in the base year	10th grade	10th grade	9th grade
Year born	1963–1964	1986–1987	1994–1995
Year when high school seniors	1982	2004	2013
Age when measuring later life outcomes	26–28	24–26	–

Note. Dash sign (–) = Data not available.

Table 2. Sample Size of HS&B Sophomore Cohort by High School Type

High school type		BY–1980		1FU–1982		2FU–1984		3FU–1986		4FU–1992	
		n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)
Non-elite public		10,770	(78.3)	11,090	(78.6)	10,770	(78.8)	10,550	(78.6)	9,940	(78.7)
Catholic		2,600	(18.9)	2,620	(18.6)	2,530	(18.5)	2,500	(18.6)	2,330	(18.5)
Other private		300	(2.2)	320	(2.3)	300	(2.2)	300	(2.2)	290	(2.3)
Elite	Elite private	60	(2.2)	60	(2.3)	60	(2.2)	60	(2.2)	60	(2.3)
	Elite public	20	(2.2)	20	(2.3)	20	(2.2)	20	(2.2)	10	(2.3)
Total		13,750	(100)	14,100	(100)	13,680	(100)	13,430	(100)	12,640	(100)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns may not be added to the total because of rounding. BY = Base year; FU = Follow-up.

Table 3. Sample Size of ELS by High School Type

High school type		BY–2002		1FU–2004		2FU–2006		3FU–2012	
		n	(%)	*n*	(%)	*n*	(%)	*n*	(%)
Non-elite public		11,970	(78.5)	11,540	(78.2)	10,940	(78.1)	10,180	(77.5)
Catholic		1,900	(12.5)	1,890	(12.8)	1,810	(12.9)	1,730	(13.2)
Other private		1,330	(8.7)	1,290	(8.7)	1,220	(8.7)	1,180	(9.0)
Elite	Elite private	40	(0.3)	40	(0.3)	40	(0.3)	50	(0.3)
	Elite public	0	(0)	0	(0)	0	(0)	0	(0)
Total		15,240	(100)	14,760	(100)	14,010	(100)	13,130	(100)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns may not be added to the total because of rounding. BY = Base year; FU = Follow-up.

Table 4. Sample Size of HSLS by High School Type

High school type		BY–2009		1FU–2012		2013 Update		2FU–2016	
		n	(%)	*n*	(%)	*n*	(%)	*n*	(%)
Non-elite public		17,490	(81.6)	16,820	(81.7)	15,020	(80.9)	14,090	(81.3)
Catholic		2,440	(11.4)	2,390	(11.6)	2,210	(11.9)	2,030	(11.7)
Other private		1,460	(6.8)	1,330	(6.4)	1,280	(6.9)	1,180	(6.8)
Elite	Elite private	30	(0.2)	30	(0.2)	30	(0.2)	30	(0.2)
	Elite public	20	(0.1)	20	(0.1)	20	(0.1)	20	(0.1)
Total		21,440	(100)	20,590	(100)	18,560	(100)	17,340	(100)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns may not be added to the total because of rounding. BY = Base year; FU = Follow-up.

Table 5. Math Score Percentile Rank Conditional on High School Type–HS&B

High school type	Math score percentile rank–1982 (HS&B)						
	LT 10%	10%–50%	50%–75%	75%–90%	90%–97%	HT 97%	Total
	n	*n*	*n*	*n*	*n*	*n*	*N*
Non-elite public	1,200	4,800	2,640	1,520	800	240	11,200
	(10)	(45)	(25)	(15)	(5)	(< 5)	(100)
Catholic	90	870	800	530	290	80	2,640
	(< 5)	(35)	(30)	(20)	(10)	(< 5)	(100)
Other private	10	90	80	70	40	30	320
	(< 5)	(25)	(25)	(25)	(15)	(10)	(100)
Elite	0	10	10	30	20	20	80
	(< 5)	(5)	(10)	(30)	(25)	(25)	(100)
Total	1,300	5,760	3,520	2,150	1,150	360	14,240
	(10)	(40)	(25)	(15)	(10)	(< 5)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools. LT = Less than; HT = Higher than.

Table 6. Math Score Percentile Rank Conditional on High School Type–ELS

High school type	Math score percentile rank–2004 (ELS)						
	LT 10%	10%–50%	50%–75%	75%–90%	90%–97%	HT 97%	Total
	n	*n*	*n*	*n*	*n*	*n*	*N*
Non-elite public	1,350	5,520	2,960	1,630	820	300	12,570
	(10)	(45)	(25)	(15)	(5)	(< 5)	(100)
Catholic	40	520	640	460	250	70	1,970
	(< 5)	(25)	(30)	(25)	(15)	(< 5)	(100)
Other private	50	350	410	320	190	80	1,390
	(< 5)	(25)	(30)	(25)	(15)	(5)	(100)
Elite	0	0	10	0	20	20	50
	(0)	(< 5)	(15)	(5)	(40)	(35)	(100)
Total	1,440	6,390	4,010	2,400	1,280	470	15,980
	(10)	(40)	(25)	(15)	(10)	(< 5)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. LT = Less than; HT = Higher than.

Table 7. Math Score Percentile Rank Conditional on High School Type–HSLS

High school type	Math score percentile rank–2013 (HSLS)						
	LT 10%	10%–50%	50%–75%	75%–90%	90%–97%	HT 97%	Total
	n	*n*	*n*	*n*	*n*	*n*	*N*
Non-elite public	1,930	7,880	4,520	2,570	1,330	520	18,740
	(10)	(40)	(25)	(15)	(5)	(< 5)	(100)
Catholic	70	780	780	550	320	100	2,580
	(< 5)	(30)	(30)	(20)	(10)	(< 5)	(100)
Other private	70	510	420	310	170	70	1,550
	(< 5)	(35)	(25)	(20)	(10)	(< 5)	(100)
Elite	0	0	10	20	20	10	60
	(0)	(< 5)	(20)	(30)	(30)	(15)	(100)
Total	2,060	9,170	5,730	3,440	1,840	690	22,930
	(10)	(40)	(25)	(15)	(10)	(< 5)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools. LT = Less than; HT = Higher than.

Table 8. SAT Composite Score Percentile Rank Conditional on High School Type–HS&B

High school type	SAT score percentile rank–1982 (HS&B)						
	LT 10%	10%–50%	50%–75%	75%–90%	90%–97%	HT 97%	Total
	n	*n*	*n*	*n*	*n*	*n*	*N*
Non-elite public	350	1,680	670	500	290	100	3,580
	(10)	(45)	(20)	(15)	(10)	(< 5)	(100)
Catholic	200	760	330	190	110	30	1,620
	(15)	(45)	(20)	(10)	(5)	(< 5)	(100)
Other private	10	70	30	40	20	20	190
	(5)	(35)	(15)	(20)	(10)	(10)	(100)
Elite	0	0	10	10	10	10	50
	(0)	(10)	(25)	(20)	(25)	(20)	(100)
Total	560	2,510	1,040	740	440	160	5,440
	(10)	(45)	(20)	(15)	(10)	(< 5)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools. LT = Less than; HT = Higher than.

Table 9. SAT Composite Score Percentile Rank Conditional on High School Type–ELS

High school type	SAT composite score percentile rank–2004 (ELS)						
	LT 10%	10%–50%	50%–75%	75%–90%	90%–97%	HT 97%	Total
	n	*n*	*n*	*n*	*n*	*n*	*N*
Non-elite public	950	2,850	1,690	780	440	160	6,860
	(15)	(40)	(25)	(10)	(5)	(< 5)	(100)
Catholic	120	600	520	330	140	50	1,750
	(5)	(35)	(30)	(20)	(10)	(< 5)	(100)
Other private	60	320	320	200	150	60	1,120
	(5)	(30)	(30)	(20)	(15)	(5)	(100)
Elite	0	0	0	10	20	20	40
	(0)	(0)	(5)	(15)	(40)	(40)	(100)
Total	1,130	3,770	2,530	1,310	740	280	9,760
	(10)	(40)	(25)	(15)	(10)	(< 5)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. LT = Less than; HT = Higher than.

Table 10. SAT Composite Score Percentile Rank Conditional on High School Type–HSLS

High school type	SAT composite score percentile rank–2013 (HSLS)						
	LT 10%	10%–50%	50%–75%	75%–90%	90%–97%	HT 97%	Total
	n	*n*	*n*	*n*	*n*	*n*	*N*
Non-elite public	1,440	5,030	2,960	1,580	750	290	12,050
	(10)	(40)	(25)	(15)	(5)	(< 5)	(100)
Catholic	110	770	680	440	250	80	2,330
	(< 5)	(35)	(30)	(20)	(10)	(< 5)	(100)
Other private	40	380	370	260	140	60	1,250
	(< 5)	(30)	(30)	(20)	(10)	(< 5)	(100)
Elite	0	0	10	20	10	10	50
	(0)	(5)	(20)	(30)	(25)	(20)	(100)
Total	1,590	6,180	4,020	2,310	1,150	440	15,690
	(10)	(40)	(25)	(15)	(5)	(< 5)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools. LT = Less than; HT = Higher than.

Table 11. Characteristics of Job Zone

Job zone	Preparation needed	Level of education needed	Example
1	Little or no prep	May require HS diploma or GED	Baristas, dishwashers, fast food cooks, fishers, hunters, laundry workers, meat trimmers, models, painting workers
2	Some prep	Usually require HS diploma	Bus drivers, cashiers, childcare workers, farmworkers, hotel desk clerks, library assistants, mail carriers, retail salespersons, telemarketers
3	Medium prep	Most require training, on-the-job experience, or AA degree	Administrative service managers, chefs, dental hygienists, electricians, flight attendants, legal secretaries, pharmacy technicians, registered nurses, travel guides
4	Considerable prep	Most require bachelor's degree	Accountants, actuaries, chemists, educational administrators, human resources managers, rehabilitation counselors, sales managers, social workers, software developers
5	Extensive prep	Most require graduate degree	Astronomers, chief executives, dentists, investment fund managers, lawyers, nurse practitioners, pharmacists, postsecondary teachers, surgeons

Note. From O*NET's website (https://www.onetonline.org/help/online/zones).

Table 12. Definitions and Codings of Variables Used in the HS&B, ELS, and HSLS

Variable	Definition and coding
Dependent variable	
High school type	Categorical measure of high school type R attended: (a) non-elite public, (b) Catholic, (c) other private, and (d) elite. This variable is used as a dependent variable in Chapter 2 and as an independent variable in Chapter 3 and 4. • HS&B: Used a school type variable in the 2FU data. Originally had nine high school categories including elite private high school but collapsed into four and supplemented the elite private high school category by identifying additional elite high schools based on Niche's ranking. Because the HS&B included some elite public high school attendees, I changed the name of this category to elite school. • ELS, HSLS: Used a school type variable in the base year data. Originally had three high school categories but added an additional elite high school category by identifying those based on Niche's ranking. The HSLS included some elite public high school attendees, while ELS had none. But I also named the category in the ELS as elite school, not elite private school, for comparability across the three data sets.
Elite college attendance	Dichotomous indicator of whether R attended elite colleges. Defined elite colleges as 4-year institutions with Barron's Index 1 (*most competitive*) or 2 (*highly competitive*). This variable is used as a dependent variable in Chapter 3 and as an independent variable in Chapter 4 graduate/professional school analysis. If attended multiple institutions, chose the institution with the highest selectivity index and then the higher level one. Figured out the FICE code of students' institution first and merged with Barron's Index file using the FICE code. • HS&B: Used records from 2FU, 3FU, and 4FU data. • ELS: Used records from 2FU student–institution, 3FU student–institution, and postsecondary transcript file. • HSLS: Used records from Update 2013 student and 2FU student–institution data.
Earning top 10% income	Dichotomous indicator of whether R earned a top 10% income. • HS&B: Used two student-reported 1992 annual earnings, collected about six years after completing 4-year degrees. Averaged two 1992 annual earnings and created an indicator using the cutoff value of the top 10% income obtained from CPS 1993 data. • ELS: Used student-reported 2011 employment income, collected about three years after completing 4-year degrees. Created an indicator using the cutoff value obtained from CPS 2012 data.
Professional job attainment	Dichotomous indicator of whether R attained a professional job. Used O*NET's Job Zone to figure out professional occupations. Among five Job Zones, considered 4 (*need considerable preparation*) and 5 (*need extensive preparation*) as professional occupations. • HS&B: Measure collected in 1991, about five years after completing 4-year degrees. • ELS: Measure collected in 2012, about four years after completing 4-year degrees.

Table 12. (CONT.)

Variable	Definition and coding
Grad/prof school attendance	Dichotomous indicator of whether R attended graduate/professional schools. • HS&B: Used information from multiple variables–Highest education attained, ever attended MBA program, ever taken graduate/professional school courses, and graduate school attendance record from the 3FU and 4FU data. • ELS: Used information from multiple variables from multiple sources–Highest education attained, graduate school attendance record from the 3FU student-level data and postsecondary transcript data. If multiple attendance records, chose the higher degree program, higher levels of institution, and then the latest attended one. Assumed students who never attended colleges did not attend graduate/professional schools.
Independent variable	
Female	Dichotomous indicator of whether R is female. • HS&B: Used a composite measure in the 2FU data. • ELS, HSLS: Used a composite measure in the 1FU data.
Race	Categorical measure of R's race: (a) White, (b) Black, (c) Hispanic, (d) Asian/Native Hawaiian /Pacific Islander, and (e) American Indian/Alaskan Native/multi-racial. • HS&B: Used a composite measure in the 2FU data. • ELS, HSLS: Used a composite measure in the 1FU data. Five racial categories shown above were used for descriptive tables and regression analyses. For crosstabs, the most detailed racial categories available in each data set were used: • HS&B: 5 categories - White, Black, Hispanic, Asian/Pacific Islander, and American Indian. • ELS, HSLS: 7 categories - White, Black, Hispanic, Asian, American Indian/Alaskan Native, Pacific Islander/Native Hawaiian, and multi-racial.
Parental education	Categorical measure of parent's highest level of education attained: (a) lower than bachelor's degree, (b) bachelor's degree, and (c) graduate degree. • HS&B: Used information from BY, 1FU, and parental data. Used parental data as a standard and filled in missing values using 1FU, and then BY data. Provided mother's and father's highest level of education separately, so chose the higher attainment among the parents. • ELS: Used information from 1FU data. Provided mother's and father's highest level of education separately, so chose the higher attainment among the parents. • HSLS: Provided parents' highest level of education at two time points–BY and 1FU data. Used the higher attainment record between two. Measures were collected as a categorical variable using slightly different educational categories in each data set, so recoded them to have the comparable categories.

Table 12. (CONT.)

Variable	Definition and coding
Parental income	Continuous measure of logged parental income in 2008 dollars. • HS&B: Created three parental income measures using parental income reported at two time points–BY and 1FU data. Recoded the ordinal measure into a continuous measure by taking the midpoint and transformed to 2008 dollars. Then, used the measure in the 1FU data as a standard and filled in missing values using the measure from the BY data. Divided this by 1,000 and used it for the descriptive tables. Log transformed version was used for the regression analyses. For crosstabs, created an income quintile using cutoff points obtained from CPS 1981 data. First transformed the 1FU parental income into 1980 dollars. Second, used the BY measure as a standard and filled in missing values using the 1FU measure. Lastly, recoded into income quintiles: (a) 1st quintile (Lowest), (b) 2nd quintile, (c) 3rd quintile, (d) 4th quintile, and (e) 5th quintile (Highest). • ELS: Used a single BY parental income. Transformed the ordinal measure into a continuous measure by taking the midpoint and transformed to 2008 dollars. Then, divided this by 1,000 and used it for the descriptive tables. Log transformed version was used for the regression analyses. Created an income quintile for the crosstabs using the same procedure used for the HS&B. Used CPS 2002 data. • HSLS: Used measures reported at two time points–BY and 1FU data. Recoded the ordinal measure into the midpoint and transformed to 2008 dollars. Used the 1FU measure as a standard and filled in missing values using the BY values. Divided this by 1,000 and used it for descriptive tables. Took the natural logarithm and used it for regression analyses. Created an income quintile for the crosstabs using the same procedure used for the HS&B and the ELS. Used CPS 2009 data.
High school GPA	Continuous measure of R's high school GPA for all courses. • HS&B: Recoded the ordinal measure taken from the high school transcript into the midpoints and used it as a continuous measure: (a) mostly A = 3.75, (b) half A and B = 3.5, (c) mostly B = 3.0, (d) half B and C = 2.5, (e) mostly C = 2.0, (f) half C and D = 1.5, and (g) mostly D = 1.0. • ELS, HSLS: Used the continuous measure of the GPA for all courses, which was taken from the high school transcript.
Math score	Continuous measure of R's standardized high school math test score. • HS&B: Used the number right score provided in BY and 1FU data. Added Part 1 and 2 number right score in each wave, averaged BY and 1FU scores, and standardized it. • ELS: Averaged the sophomore- and senior-year number right scores and standardized it. • HSLS: Averaged the freshman- and junior-year number right scores and standardized it.
Advanced math course-taking	Dichotomous indicator of whether R took any advanced math course. Considered the following as advanced math courses: Statistics/probability, trigonometry, pre-calculus, calculus, and any AP/IB math courses. • HS&B: Used information from multiple sources–Credit record in the transcript, indicator of whether a student took each math course, and a measure showing the highest math course that students took. • ELS: Used information from multiple sources–Credit record in the transcript, the number of math courses recorded in the transcript, unit of each math course, total years each math course was taken, and the highest math course that students took. • HSLS: Used information from multiple sources–Measures about the most advanced math course taken and the most challenging math course that students took.

Table 12. (CONT.)

Variable	Definition and coding
Educational expectation	Categorical measure of R's educational expectation in high school: (a) lower than bachelor's degree, (b) bachelor's degree, and (c) graduate degree. In all three data sets, students were asked in the BY survey and the 1FU survey about their educational expectations. Prioritized the response in the 1FU, and then filled in missing values using the BY response. For comparability across the data sets, set the categories of the ELS measure as a standard and recoded the categories of the HS&B and the HSLS. Then, collapsed the categories into three to ease the interpretation of the descriptive and regression results.
Type of college attended	Categorical measure of type of college that R attended: (a) 2-year or less than 2-year college, (b) non-elite 4-year college, and (c) elite 4-year college. Defined elite colleges as 4-year institutions with Barron's Index 1 (most competitive) or 2 (highly competitive). This is a more detailed version of the "Elite College Attendance" variable. If attended multiple institutions, chose the institution with the highest selectivity index and then the higher level one. Figured out the FICE code of students' institution first and merged with Barron's Index file using the FICE code. • HS&B: Used records from 2FU, 3FU, and 4FU data. • ELS: Used records from 2FU student–institution, 3FU student–institution, and postsecondary transcript file.
College GPA	Continuous measure of R's college GPA. • HS&B: Used three undergraduate GPAs from two sources–2FU and postsecondary transcript data. Averaged three GPA measures to create a master GPA. • ELS: Used a college GPA from all known institutions that students attended, and then filled in missing values using the college GPA from the last known institutions.
College major	Categorical measure of R's college major: (a) humanities, (b) STEM, (c) social science, (d) business, (e) education, (f) preprofessional, and (g) other occupationally-oriented major. • HS&B: Used information from 2FU, 3FU, 4FU, and the postsecondary transcript data. If multiple degrees, chose the higher degree and then the later attained degree. Classified the majors attached to the attained degree into categories created by Goyette and Mullen (2006) and added a STEM category. • ELS: Used information from student, student–institution, and postsecondary transcript data. Followed the same procedure used for the HS&B. One difference is that, after combining all college majors from multiple sources into one file, figured out the measure with the fewest missing values. Because the measure from the student file had the fewest missing values, used this as a standard measure and filled in missing values using the two remaining measures.

Note. BY = Base year; FU = Follow-up; R = Respondent.

Table 13. Sample Restrictions and Resulting Sample Sizes of High School Type Analyses

Restriction	HS&B	ELS	HSLS
1. None	14,830	16,200	25,210
2. Sophomore cohort in 1980 (HS&B), 2002 (ELS), junior cohort in 2009 (HSLS)	14,830	16,020	25,210
3. Participated in the 2nd (HS&B), the 1st (ELS, HSLS) follow-up study	13,680	14,760	20,590
4. No missing data on high school type variable	13,680	14,760	20,590
Analytic sample size	13,680	14,760	20,590

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data.

Table 14. Descriptive Statistics of Variables Used in High School Type Analyses

Variable	1982 (HS&B, *N*=13,680)		2004 (ELS, *N*=14,760)		2013 (HSLS, *N*=20,590)	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
	M	*M*	*M*	*M*	*M*	*M*
Dependent variable						
High school type						
Non-elite public (*n*=10,770 / *n*=11,540 / *n*=16,820)	.79	.90	.78	.92	.82	.93
Catholic (*n*=2,530 / *n*=1,890 / *n*=2,390)	.18	.06	.13	.04	.12	.04
Other private (*n*=300 / *n*=1,290 / *n*=1,330)	.02	.03	.09	.03	.06	.03
Elite (*n*=80 / *n*=40 / *n*=50)	.006	.001	.003	.001	.003	.004
Independent variable						
Female	.51	.50	.50	.50	.50	.50
Race						
White	.60	.73	.57	.60	.56	.51
Black	.14	.12	.13	.14	.10	.14
Hispanic	.22	.13	.15	.16	.16	.22
Asian/PI/NH	.03	.01	.10	.04	.09	.04
AI/AN/multi-racial	.02	.01	.05	.05	.09	.08
Parental education						
Lower than BA	.75	.76	.60	.64	.56	.63
BA degree	.12	.12	.22	.21	.25	.22
Graduate degree	.12	.12	.18	.15	.20	.15
Parental income (1000s, 2008 $)	58.3 (34.6)	58.7 (33.9)	83.8 (74.9)	78.3 (68.1)	77.4 (60.5)	68.5 (56.3)

Note. Standard deviations are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B and HSLS includes some elite public schools. Weighted descriptives were generated using appropriate panel weights. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native.

Table 15. Missing Rates of Variables Used in High School Type Analyses

Variable	HS&B (*N*=14,830)			ELS (*N*=16,020)			HSLS (*N*=25,210)		
	Valid *n*	Missing *n*	% Missing	Valid *n*	Missing *n*	% Missing	Valid *n*	Missing *n*	% Missing
Dependent variable									
High school type	14,830	0	0.0	16,020	0	0.0	25,210	0	0.0
Independent variable									
Female	14,830	0	0.0	16,010	10	0.1	25,140	60	0.2
Race	14,630	190	1.3	16,020	0	0.03	24,100	1,110	4.4
Parental education	14,070	760	5.1	15,520	500	3.1	18,520	6,690	26.5
Parental income (log)	13,390	1,430	9.7	11,900	4,120	25.7	17,850	7,360	29.2

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Rows may not be added to the total because of rounding.

Table 16. Female Student by High School Type in the HS&B, ELS, and HSLS

High school type	Female student		
	1982 (HS&B)	2004 (ELS)	2013 (HSLS)
	n	*n*	*n*
Non-elite public (*n*=10,770 / *n*=11,530 / *n*=16,820)	5,440	5,820	8,280
	(50)	(50)	(50)
Catholic (*n*=2,530 / *n*=1,890 / *n*=2,390)	1,420	910	1,230
	(55)	(50)	(50)
Other private (*n*=300 / *n*=1,290 / *n*=1,330)	150	650	680
	(50)	(50)	(50)
Elite (*n*=80 / *n*=40 / *n*=50)	20	20	30
	(30)	(45)	(55)
Total (*n*=13,680 / *n*=14,750 / *n*=20,590)	7,030	7,400	10,210
	(50)	(50)	(50)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns may not be added to the total because of rounding. The elite school category of the HS&B and HSLS includes some elite public schools.

Table 17. Racial Composition Conditional on High School Type–HS&B

High school type	Race–1982 (HS&B)					
	White	Black	Hispanic	Asian/PI	AI	Total
	n	*n*	*n*	*n*	*n*	*N*
Non-elite public	6,290	1,450	2,390	350	240	10,710
	(60)	(15)	(20)	(< 5)	(< 5)	(100)
Catholic	1,540	390	550	40	10	2,520
	(60)	(15)	(20)	(< 5)	(< 5)	(100)
Other private	240	10	40	0	0	300
	(80)	(< 5)	(10)	(< 5)	(< 5)	(100)
Elite	40	20	10	10	0	80
	(50)	(25)	(15)	(10)	(< 5)	(100)
Total	8,110	1,860	2,980	390	260	13,610
	(60)	(15)	(20)	(< 5)	(< 5)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools. PI = Pacific Islander; AI = American Indian.

Table 18. Racial Composition Conditional on High School Type–ELS

High school type	Race–2004 (ELS)							
	White	Black	Hispanic	Asian	AI/AN	PI/NH	Multi-racial	Total
	n	*n*	*n*	*n*	*n*	*n*	*n*	*N*
Non-elite public	5,990	1,740	1,850	1,290	110	30	520	11,540
	(50)	(15)	(15)	(10)	(< 5)	(< 5)	(< 5)	(100)
Catholic	1,340	150	240	70	0	10	80	1,890
	(70)	(10)	(15)	(< 5)	(< 5)	(< 5)	(< 5)	(100)
Other private	990	70	70	70	10	20	70	1,290
	(75)	(5)	(5)	(5)	(< 5)	(< 5)	(5)	(100)
Elite	30	0	0	0	0	0	0	40
	(75)	(10)	(< 5)	(5)	(0)	(0)	(< 5)	(100)
Total	8,360	1,960	2,160	1,430	120	60	670	14,760
	(55)	(15)	(15)	(10)	(< 5)	(< 5)	(< 5)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. AI = American Indian; AN = Alaskan Native; PI = Pacific Islander; NH = Native Hawaiian.

Table 19. Racial Composition Conditional on High School Type–HSLS

High school type	Race–2013 (HSLS)							
	White	Black	Hispanic	Asian	AI/AN	PI/NH	Multi-racial	Total
	n	*n*	*n*	*n*	*n*	*n*	*n*	*N*
Non-elite public	9,240	1,760	2,740	1,380	110	90	1,500	16,820
	(55)	(10)	(15)	(10)	(< 5)	(< 5)	(10)	(100)
Catholic	1,400	260	360	180	20	10	180	2,390
	(60)	(10)	(15)	(10)	(< 5)	(< 5)	(10)	(100)
Other private	870	100	170	100	10	0	70	1,330
	(65)	(5)	(15)	(10)	(< 5)	(< 5)	(5)	(100)
Elite	30	0	10	20	0	0	0	50
	(50)	(5)	(10)	(30)	(0)	(0)	(< 5)	(100)
Total	11,530	2,120	3,270	1,680	140	100	1,760	20,580
	(55)	(10)	(15)	(10)	(< 5)	(< 5)	(10)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools. AI = American Indian; AN = Alaskan Native; PI = Pacific Islander; NH = Native Hawaiian.

Table 20. Parental Income Quintile Conditional on High School Type–HS&B

High school type	Parental income quintile–1982 (HS&B)					
	1st quintile (Lowest)	2nd quintile	3rd quintile	4th quintile	5th quintile (Highest)	Total
	n	*n*	*n*	*n*	*n*	*N*
Non-elite public	2,670	2,990	1,430	1,910	800	9,800
	(25)	(30)	(15)	(20)	(10)	(100)
Catholic	380	590	400	650	380	2,390
	(15)	(25)	(15)	(25)	(15)	(100)
Other private	30	70	40	60	80	280
	(10)	(25)	(15)	(20)	(30)	(100)
Elite	10	10	0	10	40	70
	(10)	(15)	(< 5)	(20)	(50)	(100)
Total	3,080	3,660	1,870	2,630	1,300	12,530
	(25)	(30)	(15)	(20)	(10)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools.

Table 21. Parental Income Quintile Conditional on High School Type–ELS

High school type	Parental income quintile–2004 (ELS)					
	1st quintile (Lowest)	2nd quintile	3rd quintile	4th quintile	5th quintile (Highest)	Total
	n	*n*	*n*	*n*	*n*	*N*
Non-elite public	2,030	2,860	1,800	1,030	900	8,620
	(25)	(35)	(20)	(10)	(10)	(100)
Catholic	90	270	310	360	490	1,510
	(5)	(20)	(20)	(25)	(30)	(100)
Other private	70	200	210	160	340	990
	(5)	(20)	(20)	(15)	(35)	(100)
Elite	0	0	0	10	20	30
	(0)	(< 5)	(< 5)	(20)	(70)	(100)
Total	2,190	3,330	2,330	1,550	1,750	11,150
	(20)	(30)	(20)	(15)	(15)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding.

Table 22. Parental Income Quintile Conditional on High School Type–HSLS

High school type	Parental income quintile–2013 (HSLS)					
	1st quintile (Lowest)	2nd quintile	3rd quintile	4th quintile	5th quintile (Highest)	Total
	n	*n*	*n*	*n*	*n*	*N*
Non-elite public	4,030	2,380	1,980	2,840	1,820	13,050
	(30)	(20)	(15)	(20)	(15)	(100)
Catholic	240	200	250	540	770	2,000
	(10)	(10)	(15)	(25)	(40)	(100)
Other private	110	110	160	280	410	1,060
	(10)	(10)	(15)	(25)	(40)	(100)
Elite	0	0	0	10	30	40
	(5)	(0)	(5)	(20)	(65)	(100)
Total	4,390	2,690	2,390	3,660	3,020	16,150
	(25)	(15)	(15)	(25)	(20)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools.

Table 23. Parental Education Conditional on High School Type–HS&B

High school type	Parental education–1982 (HS&B)					
	LT HS	HS	Some coll	BA	Grad/prof	Total
	n	*n*	*n*	*n*	*n*	*N*
Non-elite public	1,820	3,240	3,120	1,110	1,010	10,300
	(20)	(30)	(30)	(10)	(10)	(100)
Catholic	200	610	750	440	470	2,460
	(10)	(25)	(30)	(20)	(20)	(100)
Other private	20	40	80	60	100	290
	(5)	(15)	(25)	(20)	(35)	(100)
Elite	0	0	10	10	50	80
	(< 5)	(< 5)	(15)	(15)	(65)	(100)
Total	2,040	3,890	3,960	1,620	1,620	13,130
	(15)	(30)	(30)	(10)	(10)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools. LT = Less than.

Table 24. Parental Education Conditional on High School Type–ELS

High school type	Parental education–2004 (ELS)					
	LT HS	HS	Some coll	BA	Grad/prof	Total
	n	*n*	*n*	*n*	*n*	*N*
Non-elite public	1,020	2,600	3,810	2,210	1,550	11,190
	(10)	(25)	(35)	(20)	(15)	(100)
Catholic	20	210	530	560	550	1,860
	(< 5)	(10)	(30)	(30)	(30)	(100)
Other private	10	110	280	370	500	1,260
	(< 5)	(10)	(20)	(30)	(40)	(100)
Elite	0	0	0	10	30	40
	(0)	(0)	(< 5)	(20)	(75)	(100)
Total	1,050	2,910	4,610	3,150	2,630	14,360
	(5)	(20)	(30)	(20)	(20)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. LT = Less than.

Table 25. Parental Education Conditional on High School Type–HSLS

High school type	Parental education–2013 (HSLS)					
	LT HS	HS	Some coll	BA	Grad/prof	Total
	n	*n*	*n*	*n*	*n*	*N*
Non-elite public	920	4,850	2,620	2,950	2,120	13,470
	(5)	(35)	(20)	(20)	(15)	(100)
Catholic	20	350	260	760	690	2,080
	(< 5)	(15)	(15)	(35)	(35)	(100)
Other private	10	180	120	390	420	1,110
	(< 5)	(15)	(10)	(35)	(40)	(100)
Elite	0	0	0	10	30	40
	(0)	(0)	(< 5)	(30)	(70)	(100)
Total	940	5,380	3,010	4,110	3,270	16,700
	(5)	(30)	(20)	(25)	(20)	(100)

Note. Percentages are in parentheses. All percentages are rounded to the nearest 5% and all Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Columns and rows may not be added to the total because of rounding. The elite school category includes some elite public schools. LT = Less than.

Table 26. Relative Risk Ratios and 95% Confidence Intervals from the Multinomial Logistic Regression Predicting Elite High School Attendance

Variable	Attending elite high school (Reference category=Non-elite public)					
	1982 (HS&B, *N*=13,680)		2004 (ELS, *N*=14,760)		2013 (HSLS, *N*=20,590)	
	RRR	95% CI	RRR	95% CI	RRR	95% CI
Parental education (ref.=Lower than BA)						
Bachelor's degree	0.34**	(0.15–0.76)	13.88***	(3.06–63.03)	15.83**	(1.92–130.51)
Graduate degree	4.64**	(1.82–11.81)	60.55***	(22.95–159.81)	39.35***	(4.53–341.73)
Parent income (log, 2008 $)	3.10*	(1.29–7.41)	4.68***	(2.62–8.38)	3.64***	(2.09–6.34)
Female	0.46***	(0.31–0.69)	0.92	(0.75–1.14)	1.38***	(1.24–1.53)
Race (ref.=White)						
Black	4.88***	(3.34–7.13)	1.20	(0.77–1.87)	0.97	(0.58–1.64)
Hispanic	0.80	(0.52–1.22)	0.29*	(0.09–0.97)	1.96	(0.91–4.23)
Asian/PI/NH	0.27	(0.05–1.56)	1.11	(0.70–1.74)	3.50***	(2.46–4.98)
AI/AN/multi-racial	0.07*	(0.01–0.90)	1.30	(0.67–2.54)	0.46*	(0.24–0.88)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Elite high school sample of the HS&B and HSLS includes some elite public schools. RRR = Relative Risk Ratio; CI = Confidence Interval; PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who participated in the second follow-up (HS&B) or the first follow-up (ELS, HSLS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 27. Sample Restrictions and Resulting Sample Sizes of Elite College Attendance Analyses

Restriction	HS&B	ELS	HSLS
1. None	14,830	16,200	25,210
2. Sophomore cohort in 1980 (HS&B), 2002 (ELS), junior cohort in 2009 (HSLS)	14,830	16,020	25,210
3. High school graduate	13,170	15,020	20,900
4. Participated in the 4th (HS&B), the 3rd (ELS), the 2nd (HSLS) follow-up study	11,530	12,690	16,550
5. No missing data on elite college attendance variable	10,650	11,660	15,380
Analytic sample size	10,650	11,660	15,380

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data.

Table 28. Descriptive Statistics of Variables Used in Elite College Attendance Analyses, HS Graduates

Variable	1982 (HS&B, *N*=10,650)		2004 (ELS, *N*=11,660)		2013 (HSLS, *N*=15,380)	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
	M	*M*	*M*	*M*	*M*	*M*
Dependent variable						
Elite college attendance	.04	.04	.14	.11	.12	.09
Independent variable						
High school type						
Non-elite public (*n*=8,170 / *n*=8,880 / *n*=12,330)	.77	.90	.76	.92	.80	.92
Catholic (*n*=2,130 / *n*=1,650 / *n*=1,940)	.20	.07	.14	.05	.13	.04
Other private (*n*=270 / *n*=1,090/ *n*=1,070)	.02	.04	.09	.03	.07	.03
Elite (*n*=70 / *n*=50 / *n*=40)	.007	.001	.004	.001	.003	.004
Female	.52	.51	.53	.51	.51	.50
Race						
White	.63	.75	.59	.62	.57	.53
Black	.12	.11	.12	.14	.10	.13
Hispanic	.20	.12	.13	.15	.15	.21
Asian/PI/NH	.03	.01	.10	.04	.09	.04
AI/AN/multi-racial	.02	.01	.05	.05	.09	.09
Parental education						
Lower than BA	.72	.74	.57	.62	.52	.61
Bachelor's degree	.14	.13	.23	.22	.26	.23
Graduate degree	.14	.13	.21	.17	.22	.16
Parental income (1000s, 2008 $)	60.9 (34.8)	60.4 (34.0)	88.6 (77.5)	80.5 (69.2)	80.8 (61.3)	70.6 (56.4)
High school GPA	2.6 (0.6)	2.6 (0.6)	2.8 (0.7)	2.8 (0.8)	2.9 (0.8)	2.8 (0.8)
Math score (standardized)	0.2 (1.0)	0.1 (1.0)	0.2 (1.0)	0.05 (1.0)	0.2 (1.0)	0.04 (0.9)
Advanced math course-taking	.52	.50	.59	.54	.71	.66
Educational expectation						
Lower than BA	.52	.58	.22	.27	.25	.30
Bachelor's degree	.25	.24	.36	.36	.29	.29
Graduate degree	.23	.19	.42	.38	.46	.41

Note. Standard deviations are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B and HSLS includes some elite public schools. Weighted descriptives were generated using appropriate panel weights. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native.

Table 29. Missing Rates of Variables Used in Elite College Attendance Analyses, HS Graduates

Variable	HS&B (*N*=13,170)			ELS (*N*=15,020)			HSLS (*N*=20,900)		
	Valid *n*	Missing *n*	% Missing	Valid *n*	Missing *n*	% Missing	Valid *n*	Missing *n*	% Missing
Dependent variable									
Elite college attendance	12,060	1,120	8.49	13,290	1,730	11.5	17,170	3,740	17.9
Independent variable									
High school type	13,170	0	0.0	15,020	0	0.0	20,900	0	0.0
Female	13,170	0	0.0	15,010	10	0.1	20,900	0	0.0
Race	13,070	100	0.8	15,020	0	0.02	20,880	20	0.1
Parental education	12,660	520	3.9	14,620	400	2.7	16,840	4,060	19.4
Parental income (log)	12,280	890	6.8	11,330	3,690	24.6	16,260	4,640	22.2
High school GPA	13,130	50	0.4	13,870	1,150	7.7	19,910	990	4.7
Math score	12,780	400	3.0	14,990	30	0.2	20,510	380	1.8
Advanced math course-taking	13,140	30	0.2	14,950	70	0.5	20,690	200	1.0
Educational expectation	12,940	240	1.8	14,510	510	3.4	19,480	1,420	6.8

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Rows may not be added to the total because of rounding.

Table 30. Average Marginal Effects: Probability of Attending Elite College Conditional on HS Completion

Variable	Elite college attendance		
	1982 (HS&B, *N*=10,650)	2004 (ELS, *N*=11,660)	2013 (HSLS, *N*=15,380)
High school type (ref.=Non-elite public)			
Catholic	0.003	0.029**	0.049***
	(0.006)	(0.010)	(0.012)
Other private	0.040	0.029*	0.040*
	(0.022)	(0.014)	(0.018)
Elite	0.076*	0.383*	0.233***
	(0.036)	(0.162)	(0.024)
High school GPA	0.013*	0.060***	0.074***
	(0.005)	(0.008)	(0.010)
Math score (standardized)	0.037***	0.057***	0.054***
	(0.005)	(0.005)	(0.005)
Advanced math course-taking	0.016*	0.056***	0.032**
	(0.007)	(0.009)	(0.010)
Edu expectation (ref.=Lower than BA)			
Bachelor's degree	0.006	0.031**	0.016
	(0.006)	(0.012)	(0.010)
Graduate degree	0.036***	0.067***	0.049***
	(0.007)	(0.012)	(0.011)
Parent education (ref.=Lower than BA)			
Bachelor's degree	0.011	0.041***	0.014
	(0.006)	(0.008)	(0.009)
Graduate degree	0.018**	0.063***	0.052***
	(0.006)	(0.008)	(0.009)
Parent income (log, 2008 $)	0.012*	0.018***	0.014*
	(0.006)	(0.005)	(0.006)
Female	0.001	-0.001	-0.010
	(0.005)	(0.007)	(0.008)
Race (ref.=White)			
Black	0.036**	0.015	0.009
	(0.013)	(0.012)	(0.016)
Hispanic	0.013	0.033*	0.040**
	(0.009)	(0.013)	(0.015)
Asian/PI/NH	0.021*	0.076***	0.042**
	(0.010)	(0.012)	(0.013)
AI/AN/multi-racial	-0.007	0.026	0.002
	(0.017)	(0.015)	(0.011)

Note. Standard errors are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B and HSLS includes some elite public schools. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who completed high schools, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) or the second follow-up (HSLS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 31. Average Marginal Effects: Comparing Models to Show the Explanatory Power of Academic Performance on Elite College Attendance Conditional on HS Completion

Variable	Elite college attendance					
	1982 (HS&B, *N*=10,650)		2004 (ELS, *N*=11,660)		2013 (HSLS, *N*=15,380)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
High school type (ref.=Non-elite public)						
Catholic	0.028**	0.005	0.133***	0.043***	0.163***	0.065***
	(0.010)	(0.006)	(0.023)	(0.011)	(0.030)	(0.014)
Other private	0.140*	0.049	0.156***	0.050**	0.151***	0.056**
	(0.063)	(0.027)	(0.034)	(0.016)	(0.041)	(0.021)
Elite	0.357*	0.093**	0.835***	0.463**	0.667***	0.286***
	(0.149)	(0.031)	(0.063)	(0.164)	(0.039)	(0.033)
High school GPA		0.013*		0.060***		0.072***
		(0.005)		(0.008)		(0.009)
Math score (standardized)		0.038***		0.069***		0.066***
		(0.004)		(0.005)		(0.005)
Advanced math course-taking		0.018**		0.062***		0.038***
		(0.007)		(0.009)		(0.010)
Edu expectation (ref.=Lower than BA)						
Bachelor's degree		0.008		0.036***		0.020*
		(0.005)		(0.010)		(0.009)
Graduate degree		0.047***		0.085***		0.060***
		(0.007)		(0.011)		(0.010)

Note. Standard errors are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B and HSLS includes some elite public schools. All samples were restricted to respondents who completed high schools, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) or the second follow-up (HSLS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 32. Sample Restrictions and Resulting Sample Sizes of Top 10% Income Analyses

Restriction	HS&B	ELS
1. None	14,830	16,200
2. Sophomore cohort in 1980 (HS&B), 2002 (ELS)	14,830	16,020
3. High school graduate	13,170	15,020
4. Ever attended college	10,430	12,510
5. Participated in the 4th (HS&B), the 3rd (ELS) follow-up study	9,450	11,320
6. No missing data on top 10% income variable	9,300	10,830
Analytic sample size	9,300	10,830

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data.

Table 33. Sample Restrictions and Resulting Sample Sizes of Professional Job Analyses

Restriction	HS&B	ELS
1. None	14,830	16,200
2. Sophomore cohort in 1980 (HS&B), 2002 (ELS)	14,830	16,020
3. High school graduate	13,170	15,020
4. Ever attended college	10,430	12,510
5. Participated in the 4th (HS&B), the 3rd (ELS) follow-up study	9,450	11,320
6. No missing data on professional job attainment variable	7,240	10,410
Analytic sample size	7,240	10,410

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data.

Table 34. Sample Restrictions and Resulting Sample Sizes of Graduate/Professional School Analyses

Restriction	HS&B	ELS
1. None	14,830	16,200
2. Sophomore cohort in 1980 (HS&B), 2002 (ELS)	14,830	16,020
3. High school graduate	13,170	15,020
4. Ever attained bachelor's degree	3,640	5,670
5. Participated in the 4th (HS&B), the 3rd (ELS) follow-up study	3,530	5,430
6. No missing data on grad/prof school attendance variable	3,530	5,420
Analytic sample size	3,530	5,420

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data.

Table 35. Descriptive Statistics of Variables Used in Top 10% Income Analyses, HS Graduates and College Attenders

	1982 (HS&B, *N*=9,300)		2004 (ELS, *N*=10,830)	
	Unweighted	Weighted	Unweighted	Weighted
	M	*M*	*M*	*M*
Dependent variable				
Earning top 10% income	.04	.03	.16	.15
Independent variable				
High school type				
Non-elite public (*n*=6,860 / *n*=8,070)	.74	.88	.74	.91
Catholic (*n*=2,120 / *n*=1,640)	.23	.08	.15	.05
Other private (*n*=250 / *n*=1,080)	.03	.04	.10	.04
Elite (*n*=70 / *n*=50)	.008	.001	.004	.001
Female	.53	.52	.55	.53
Race				
White	.62	.75	.60	.63
Black	.13	.12	.12	.14
Hispanic	.20	.11	.13	.15
Asian/PI/NH	.03	.01	.10	.05
AI/AN/multi-racial	.02	.01	.05	.05
Parental education				
Lower than BA	.69	.70	.54	.59
Bachelor's degree	.15	.15	.24	.23
Graduate degree	.16	.15	.22	.18
Parental income (1000s, 2008 $)	62.5 (35.0)	62.6 (34.2)	91.4 (78.1)	83.2 (69.9)
High school GPA	2.7 (0.6)	2.7 (0.6)	2.9 (0.7)	2.8 (0.7)
Math score (standardized)	0.3 (1.0)	0.28 (1.0)	0.2 (0.9)	0.1 (0.9)
Advanced math course-taking	.56	.54	.62	.57
Educational expectation				
Lower than BA	.45	.50	.18	.22
Bachelor's degree	.29	.28	.37	.38
Graduate degree	.26	.22	.45	.41
Type of college attended				
2-year/LT 2-year college	.37	.40	.28	.32
Non-elite 4-year college	.58	.55	.57	.55
Elite 4-year college	.06	.05	.16	.13
College GPA	2.7 (0.7)	2.7 (0.7)	2.8 (0.9)	2.7 (0.9)
College major				
Humanities	.09	.08	.15	.15
STEM	.31	.32	.32	.31
Social science	.09	.08	.13	.12
Business	.21	.21	.17	.17
Education	.05	.05	.05	.05
Preprofessional	.03	.03	.05	.04
Other occupationally-oriented	.21	.23	.14	.15

Note. Standard deviations are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. Weighted descriptives were generated using appropriate panel weights. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native.

Table 36. Descriptive Statistics of Variables Used in Professional Job Analyses, HS Graduates and College Attenders

Variable	1982 (HS&B, *N*=7,240)		2004 (ELS, *N*=10,410)	
	Unweighted	Weighted	Unweighted	Weighted
	M	*M*	*M*	*M*
Dependent variable				
Professional job attainment	.38	.38	.44	.42
Independent variable				
High school type				
Non-elite public (*n*=5,300 / *n*=7,760)	.73	.88	.75	.91
Catholic (*n*=1,700 / *n*=1,580)	.23	.08	.15	.05
Other private (*n*=180 / *n*=1,040)	.03	.04	.10	.04
Elite (*n*=60 / *n*=40)	.008	.001	.004	.001
Female	.53	.53	.55	.54
Race				
White	.63	.76	.60	.63
Black	.12	.11	.12	.14
Hispanic	.20	.11	.13	.14
Asian/PI/NH	.03	.01	.10	.04
AI/AN/multi-racial	.02	.01	.05	.05
Parental education				
Lower than BA	.70	.70	.54	.59
Bachelor's degree	.15	.15	.24	.23
Graduate degree	.15	.15	.21	.17
Parental income (1000s, 2008 $)	62.6 (34.6)	62.7 (33.9)	91.1 (78.1)	83.1 (70.4)
High school GPA	2.7 (0.6)	2.7 (0.6)	2.9 (0.7)	2.8 (0.7)
Math score (standardized)	0.3 (1.0)	0.3 (1.0)	0.2 (0.9)	0.1 (0.9)
Advanced math course-taking	.56	.55	.62	.57
Educational expectation				
Lower than BA	.45	.50	.18	.21
Bachelor's degree	.29	.28	.37	.38
Graduate degree	.26	.22	.45	.41
Type of college attended				
2-year/LT 2-year college	.37	.40	.28	.33
Non-elite 4-year college	.58	.55	.57	.55
Elite 4-year college	.05	.04	.15	.12
College GPA	2.7 (0.7)	2.7 (0.7)	2.8 (0.9)	2.7 (0.9)
College major				
Humanities	.08	.08	.15	.15
STEM	.31	.32	.32	.32
Social science	.09	.08	.12	.11
Business	.22	.22	.17	.17
Education	.04	.04	.05	.06
Preprofessional	.04	.03	.05	.04
Other occupationally-oriented	.22	.24	.14	.16

Note. Standard deviations are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. Weighted descriptives were generated using appropriate panel weights. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native.

Table 37. Descriptive Statistics of Variables Used in Graduate/Professional School Analyses, HS Graduates and Bachelor's Degree Attainers

Variable	1982 (HS&B, *N*=3,530)		2004 (ELS, *N*=5,420)	
	Unweighted	Weighted	Unweighted	Weighted
	M	*M*	*M*	*M*
Dependent variable				
Grad/prof school attendance	.31	.29	.30	.30
Independent variable				
High school type				
Non-elite public (*n*=2,240 / *n*=3,500)	.64	.82	.65	.86
Catholic (*n*=1,070 / *n*=1,140)	.30	.12	.21	.08
Other private (*n*=150 / *n*=740)	.04	.06	.14	.06
Elite (*n*=60 / *n*=40)	.017	.002	.008	.002
Female	.52	.50	.57	.56
Race				
White	.71	.85	.66	.72
Black	.10	.06	.08	.09
Hispanic	.14	.06	.08	.09
Asian/PI/NH	.05	.02	.14	.06
AI/AN/multi-racial	.008	.004	.043	.040
Parental education				
Lower than BA	.51	.51	.37	.42
Bachelor's degree	.22	.22	.30	.30
Graduate degree	.27	.27	.33	.28
Parental income (1000s, 2008 $)	73.2 (36.2)	72.9 (35.3)	113.9 (89.3)	106.3 (82.5)
High school GPA	3.0 (0.5)	3.0 (0.5)	3.3 (0.5)	3.3 (0.5)
Math score (standardized)	0.9 (0.8)	0.9 (0.8)	0.7 (0.8)	0.6 (0.8)
Advanced math course-taking	.79	.79	.85	.83
Educational expectation				
Lower than BA	.15	.16	.03	.04
Bachelor's degree	.41	.44	.37	.39
Graduate degree	.44	.40	.60	.57
Elite college attendance	.12	.11	.27	.24
College GPA	2.9 (0.5)	2.9 (0.5)	3.1 (0.5)	3.1 (0.5)
College major				
Humanities	.10	.10	.16	.16
STEM	.29	.30	.26	.25
Social science	.16	.14	.18	.17
Business	.26	.26	.20	.21
Education	.07	.08	.06	.07
Preprofessional	.04	.04	.06	.06
Other occupationally-oriented	.08	.08	.08	.08

Note. Standard deviations are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. Weighted descriptives were generated using appropriate panel weights. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native.

Table 38. Missing Rates of Variables Used in Top 10% Income Analyses, HS Graduates and College Attenders

Variable	HS&B (*N*=10,430)			ELS (*N*=12,510)		
	Valid *n*	Missing *n*	% Missing	Valid *n*	Missing *n*	% Missing
Dependent variable						
Earning top 10% income	9,300	1,120	10.8	10,830	1,680	13.5
Independent variable						
High school type	10,430	0	0.0	12,510	0	0.0
Female	10,430	0	0.0	12,510	0	0.03
Race	10,370	60	0.6	12,510	0	0.01
Parental education	10,110	310	3.0	12,230	290	2.3
Parental income (log)	9,830	600	5.7	9,620	2,890	23.1
High school GPA	10,390	30	0.3	11,570	940	7.5
Math score	10,170	260	2.5	12,500	10	0.1
Advanced math course-taking	10,410	10	0.1	12,480	30	0.2
Educational expectation	10,280	150	1.4	12,200	320	2.5
Type of college attended	9,430	1,000	9.6	11,330	1,180	9.4
College GPA	9,110	1,320	12.6	11,220	1,290	10.3
College major	7,100	3,320	31.9	8,060	4,420	35.3

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Rows may not be added to the total because of rounding.

Table 39. Missing Rates of Variables Used in Professional Job Analyses, HS Graduates and College Attenders

Variable	HS&B (*N*=10,430)			ELS (*N*=12,510)		
	Valid *n*	Missing *n*	% Missing	Valid *n*	Missing *n*	% Missing
Dependent variable						
Professional job attainment	7,240	3,190	30.6	10,410	2,110	16.8
Independent variable						
High school type	10,430	0	0.0	12,510	0	0.0
Female	10,430	0	0.0	12,510	0	0.03
Race	10,370	60	0.6	12,510	0	0.01
Parental education	10,110	310	3.0	12,230	290	2.3
Parental income (log)	9,830	600	5.7	9,620	2,890	23.1
High school GPA	10,390	30	0.3	11,570	940	7.5
Math score	10,170	260	2.5	12,500	10	0.1
Advanced math course-taking	10,410	10	0.1	12,480	30	0.2
Educational expectation	10,280	150	1.4	12,200	320	2.5
Type of college attended	9,430	1,000	9.6	11,330	1,180	9.4
College GPA	9,110	1,320	12.6	11,220	1,290	10.3
College major	7,100	3,320	31.9	8,100	4,420	35.3

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Rows may not be added to the total because of rounding.

Table 40. Missing Rates of Variables Used in Graduate/Professional School Analyses, HS Graduates and Bachelor's Degree Attainers

Variable	HS&B (*N*=3,640)			ELS (*N*=5,670)		
	Valid *n*	Missing *n*	% Missing	Valid *n*	Missing *n*	% Missing
Dependent variable						
Grad/prof school attendance	3,630	10	0.3	5,430	240	4.2
Independent variable						
High school type	3,640	0	0.0	5,670	0	0.0
Female	3,640	0	0.0	5,670	0	0.02
Race	3,630	10	0.3	5,670	0	0.02
Parental education	3,600	40	1.1	5,590	80	1.4
Parental income (log)	3,510	130	3.5	4,460	1,210	21.3
High school GPA	3,640	0	0.03	5,280	390	6.9
Math score	3,580	60	1.6	5,670	0	0.04
Advanced math course-taking	3,640	0	0.0	5,670	0	0.04
Educational expectation	3,630	20	0.4	5,620	50	0.9
Elite college attendance	3,520	120	3.4	5,500	170	2.9
College GPA	3,610	30	0.9	5,530	130	2.4
College major	3,640	0	0.0	5,670	0	0.0

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. Rows may not be added to the total because of rounding.

Table 41. Average Marginal Effects: Probability of Earning Top 10% Income Conditional on HS Completion and College Attendance

Variable	Earning top 10% income	
	1982 (HS&B, *N*=9,300)	2004 (ELS, *N*=10,830)
High school type (ref.=Non-elite public)		
Catholic	0.011	0.037**
	(0.005)	(0.012)
Other private	-0.018*	-0.020
	(0.007)	(0.012)
Elite	-0.034***	0.103***
	(0.003)	(0.020)
High school GPA	0.010	0.053***
	(0.005)	(0.010)
Math score (standardized)	-0.001	0.016*
	(0.004)	(0.006)
Advanced math course-taking	-0.002	0.003
	(0.007)	(0.011)
Edu expectation (ref.=Lower than BA)		
Bachelor's degree	0.005	-0.022
	(0.007)	(0.015)
Graduate degree	0.008	0.008
	(0.008)	(0.016)
Type of college attended (ref.=Elite 4-year college)		
2-year/LT 2-year college	-0.034*	-0.045**
	(0.015)	(0.017)
Non-elite 4-year college	-0.010	-0.031*
	(0.014)	(0.013)
College GPA	0.005	0.027***
	(0.006)	(0.007)
College major (ref.=STEM)		
Humanities	-0.025**	-0.107***
	(0.009)	(0.013)
Social science	-0.007	-0.068***
	(0.011)	(0.014)
Business	-0.010	0.054**
	(0.008)	(0.017)
Education	-0.033***	-0.094***
	(0.010)	(0.019)
Preprofessional	-0.022	-0.057**
	(0.013)	(0.020)
Other occupationally-oriented	-0.017	-0.023
	(0.009)	(0.018)

Table 41. (CONT.)

Variable	Earning top 10% income	
	1982 (HS&B, *N*=9,300)	2004 (ELS, *N*=10,830)
Parent education (ref.=Lower than BA)		
Bachelor's degree	0.001	0.024*
	(0.007)	(0.010)
Graduate degree	-0.003	0.004
	(0.007)	(0.011)
Parent income (log, 2008 $)	0.015*	0.028***
	(0.006)	(0.007)
Female	-0.022***	-0.085***
	(0.006)	(0.009)
Race (ref.=White)		
Black	0.002	-0.009
	(0.010)	(0.014)
Hispanic	0.031**	-0.010
	(0.011)	(0.014)
Asian/PI/NH	-0.002	0.001
	(0.010)	(0.014)
AI/AN/multi-racial	-0.001	-0.017
	(0.016)	(0.018)

Note. Standard errors are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who completed high schools, attended colleges, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 42. Average Marginal Effects: Probability of Attaining Professional Job Conditional on HS Completion and College Attendance

Variable	Professional job attainment	
	1982 (HS&B, *N*=7,240)	2004 (ELS, *N*=10,410)
High school type (ref.=Non-elite public)		
Catholic	0.017	0.013
	(0.017)	(0.013)
Other private	0.053	-0.01
	(0.041)	(0.016)
Elite	0.092	0.148***
	(0.070)	(0.017)
High school GPA	0.035*	0.018
	(0.016)	(0.012)
Math score (standardized)	0.047***	0.024**
	(0.011)	(0.008)
Advanced math course-taking	0.009	0.044**
	(0.017)	(0.014)
Edu expectation (ref.=Lower than BA)		
Bachelor's degree	0.076***	0.064***
	(0.020)	(0.019)
Graduate degree	0.088***	0.112***
	(0.022)	(0.020)
Type of college attended (ref.=Elite 4-year college)		
2-year/LT 2-year college	-0.292***	-0.239***
	(0.047)	(0.029)
Non-elite 4-year college	-0.118**	-0.086***
	(0.043)	(0.022)
College GPA	0.040**	0.059***
	(0.014)	(0.008)
College major (ref.=STEM)		
Humanities	-0.120***	-0.067***
	(0.031)	(0.020)
Social science	-0.025	-0.001
	(0.036)	(0.024)
Business	-0.022	-0.002
	(0.025)	(0.020)
Education	-0.016	0.097**
	(0.044)	(0.030)
Preprofessional	-0.045	-0.040
	(0.045)	(0.032)
Other occupationally-oriented	-0.135***	-0.136***
	(0.025)	(0.021)

Table 42. (CONT.)

Variable	Professional job attainment	
	1982 (HS&B, *N*=7,240)	2004 (ELS, *N*=10,410)
Parent education (ref.=Lower than BA)		
Bachelor's degree	0.019	0.020
	(0.021)	(0.014)
Graduate degree	0.009	0.053**
	(0.021)	(0.017)
Parent income (log, 2008 $)	0.052***	0.023**
	(0.015)	(0.008)
Female	-0.027	-0.018
	(0.015)	(0.011)
Race (ref.=White)		
Black	0.012	-0.002
	(0.027)	(0.019)
Hispanic	-0.009	0.013
	(0.022)	(0.018)
Asian/PI/NH	0.007	-0.003
	(0.034)	(0.017)
AI/AN/multi-racial	-0.091*	-0.065**
	(0.045)	(0.023)

Note. Standard errors are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who completed high schools, attended colleges, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the mi estimate: svy command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 43. Average Marginal Effects: Probability of Attending Graduate/Professional School Conditional on HS Completion and Bachelor's Degree Completion

Variable	Grad/prof school attendance	
	1982 (HS&B, *N*=3,530)	2004 (ELS, *N*=5,420)
High school type (ref.=Non-elite public)		
Catholic	0.041	-0.0004
	(0.022)	(0.016)
Other private	0.054	-0.003
	(0.048)	(0.023)
Elite	0.498***	-0.008
	(0.114)	(0.029)
High school GPA	-0.043	0.016
	(0.026)	(0.019)
Math score (standardized)	0.025	0.005
	(0.016)	(0.013)
Advanced math course-taking	0.017	0.015
	(0.028)	(0.024)
Edu expectation (ref.=Lower than BA)		
Bachelor's degree	0.058	0.094*
	(0.031)	(0.044)
Graduate degree	0.146***	0.179***
	(0.034)	(0.043)
Elite college attendance	0.108**	0.077***
	(0.036)	(0.016)
College GPA	0.211***	0.247***
	(0.024)	(0.017)
College major (ref.=STEM)		
Humanities	-0.038	-0.044
	(0.036)	(0.023)
Social science	-0.001	0.074**
	(0.032)	(0.023)
Business	-0.119***	-0.117***
	(0.027)	(0.020)
Education	0.030	-0.033
	(0.041)	(0.031)
Preprofessional	0.009	-0.165***
	(0.051)	(0.030)
Other occupationally-oriented	-0.215***	-0.002
	(0.033)	(0.031)

Table 43. (CONT.)

Variable	Grad/Prof school attendance	
	1982 (HS&B, *N*=3,530)	2004 (ELS, *N*=5,420)
Parent education (ref.=BA)		
Lower than BA	0.012	0.027
	(0.024)	(0.020)
Graduate degree	0.058*	0.034
	(0.026)	(0.021)
Parent income (log, 2008 $)	0.0001	0.004
	(0.019)	(0.011)
Female	-0.026	0.015
	(0.022)	(0.015)
Race (ref.=White)		
Black	0.038	0.153***
	(0.045)	(0.030)
Hispanic	0.039	0.002
	(0.038)	(0.028)
Asian/PI/NH	0.122*	-0.008
	(0.048)	(0.020)
AI/AN/multi-racial	-0.009	0.009
	(0.102)	(0.038)

Note. Standard errors are in parentheses. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who completed high schools, attained a bachelor's degree, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Appendices

Appendix A. Relative Risk Ratios and 95% Confidence Intervals From the Multinomial Logistic Regression Predicting Catholic/Other Private High School Attendance

Variable	High school type (Reference category=Non-elite public)											
	1982 (HS&B, *N*=13,680)				2004 (ELS, *N*=14,760)				2013 (HSLS, *N*=20,590)			
	Catholic		Other private		Catholic		Other private		Catholic		Other private	
	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Parental education (ref.=Lower than BA)												
Bachelor's degree	1.87***	(1.47–2.37)	2.38**	(1.39–4.07)	1.68***	(1.40–2.03)	1.98***	(1.60–2.45)	2.13***	(1.72–2.63)	2.89***	(2.15–3.90)
Graduate degree	1.82***	(1.41–2.36)	3.28***	(1.88–5.75)	1.79***	(1.35–2.38)	3.02***	(2.24–4.07)	2.65***	(2.04–3.45)	3.68***	(2.62–5.17)
Parent income (log, 2008 $)	1.90***	(1.63–2.23)	1.92***	(1.43–2.57)	2.38***	(2.07–2.74)	1.94***	(1.57–2.39)	2.30***	(1.96–2.71)	1.86***	(1.40–2.48)
Female	1.25	(0.85–1.83)	1.06	(0.84–1.34)	0.89	(0.64–1.22)	1.04	(0.88–1.24)	1.22	(0.92–1.62)	1.13*	(1.01–1.28)
Race (ref.=White)												
Black	0.57**	(0.38–0.86)	0.18***	(0.07–0.46)	0.55**	(0.37–0.81)	0.40***	(0.27–0.58)	0.80	(0.51–1.28)	0.45**	(0.28–0.74)
Hispanic	0.83	(0.62–1.12)	0.70	(0.24–2.09)	0.93	(0.67–1.28)	0.46**	(0.28–0.77)	0.98	(0.70–1.39)	0.53**	(0.36–0.77)
Asian/PI/NH	0.81	(0.50–1.33)	0.41	(0.15–1.16)	0.86	(0.47–1.57)	1.22	(0.76–1.94)	0.49**	(0.30–0.82)	0.64	(0.37–1.10)
AI/AN/multi-racial	0.25**	(0.10–0.59)	0.93	(0.24–3.69)	0.88	(0.63–1.25)	1.16	(0.75–1.79)	0.83	(0.62–1.10)	0.83	(0.46–1.51)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. RRR = Relative Risk Ratio; CI = Confidence Interval; PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who participated in the second follow-up (HS&B) or the first follow-up (ELS, HSLS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Appendix B. Odds Ratios and 95% Confidence Intervals From the Binary Logistic Regression Predicting Elite College Attendance Conditional on HS Completion

Variable	Elite college attendance					
	1982 (HS&B, *N*=10,650)		2004 (ELS, *N*=11,660)		2013 (HSLS, *N*=15,380)	
	OR	95% CI	OR	95% CI	OR	95% CI
High school type (ref.=Non-elite public)						
Catholic	1.11	(0.74–1.68)	1.46**	(1.13–1.89)	2.05***	(1.50–2.80)
Other private	2.92*	(1.18–7.22)	1.47*	(1.06–2.04)	1.83*	(1.14–2.96)
Elite	5.55**	(1.85–16.69)	30.21**	(2.80–325.58)	11.93***	(8.23–17.28)
High school GPA	1.61*	(1.10–2.35)	2.35***	(1.88–2.93)	3.48***	(2.53–4.80)
Math score (standardized)	3.82***	(2.79–5.24)	2.23***	(1.91–2.59)	2.48***	(2.11–2.92)
Advanced math course-taking	1.97*	(1.06–3.68)	2.50***	(1.76–3.54)	1.83**	(1.19–2.81)
Edu expectation (ref.=Lower than BA)						
Bachelor's degree	1.36	(0.70–2.62)	1.78*	(1.09–2.89)	1.40	(0.89–2.22)
Graduate degree	3.66***	(1.94–6.90)	2.93***	(1.80–4.77)	2.44***	(1.53–3.88)
Parent education (ref.=Lower than BA)						
Bachelor's degree	1.52	(0.99–2.35)	1.83***	(1.48–2.26)	1.29	(0.93–1.77)
Graduate degree	1.87**	(1.26–2.78)	2.34***	(1.91–2.87)	2.23***	(1.69–2.95)
Parent income (log, 2008 $)	1.55*	(1.04–2.30)	1.29***	(1.11–1.49)	1.26*	(1.03–1.54)
Female	1.06	(0.75–1.49)	0.98	(0.81–1.19)	0.84	(0.65–1.09)
Race (ref.=White)						
Black	2.74**	(1.52–4.95)	1.24	(0.88–1.73)	1.18	(0.68–2.02)
Hispanic	1.54	(0.92–2.56)	1.56**	(1.12–2.16)	1.87**	(1.25–2.80)
Asian/PI/NH	1.90*	(1.12–3.21)	2.54***	(1.96–3.29)	1.92***	(1.35–2.72)
AI/AN/multi-racial	0.74	(0.16–3.32)	1.43	(0.97–2.12)	1.03	(0.71–1.51)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B and HSLS includes some elite public schools. OR = Odds Ratio; CI = Confidence Interval; PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who completed high schools, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) or the second follow-up (HSLS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Appendix C. Odds Ratios and 95% Confidence Intervals From the Binary Logistic Regression Predicting Top 10% Income Conditional on HS Completion and College Attendance

Variable	Earning top 10% income			
	1982 (HS&B, *N*=9,300)		2004 (ELS, *N*=10,830)	
	OR	95% CI	OR	95% CI
High school type (ref.=Non-elite public)				
Catholic	1.33*	(1.00–1.76)	1.36**	(1.12–1.64)
Other private	0.46	(0.20–1.05)	0.83	(0.65–1.06)
Elite	0.02***	(0.003–0.18)	2.13***	(1.66–2.73)
High school GPA	1.36	(0.99–1.87)	1.61***	(1.35–1.91)
Math score (standardized)	0.96	(0.77–1.19)	1.15*	(1.03–1.29)
Advanced math course-taking	0.95	(0.64–1.41)	1.03	(0.85–1.25)
Edu expectation (ref.=Lower than BA)				
Bachelor's degree	1.18	(0.75–1.84)	0.82	(0.63–1.06)
Graduate degree	1.27	(0.77–2.08)	1.07	(0.82–1.40)
Type of college attended (ref.=Elite 4-year college)				
2-year/LT 2-year college	2.33**	(1.39–3.91)	1.14	(0.91–1.42)
Non-elite 4-year college	2.94**	(1.40–6.18)	1.47**	(1.10–1.96)
College GPA	1.18	(0.84–1.66)	1.27***	(1.12–1.45)
College major (ref.=STEM)				
Humanities	0.42*	(0.20–0.89)	0.31***	(0.22–0.43)
Social science	0.83	(0.47–1.47)	0.53***	(0.40–0.71)
Business	0.77	(0.51–1.18)	1.46**	(1.16–1.82)
Education	0.26*	(0.07–0.92)	0.38***	(0.23–0.62)
Preprofessional	0.49	(0.16–1.47)	0.60*	(0.40–0.89)
Other occupationally-oriented	0.61	(0.34–1.07)	0.83	(0.62–1.11)
Parent education (ref.=Lower than BA)				
Bachelor's degree	1.04	(0.71–1.53)	1.23*	(1.04–1.46)
Graduate degree	0.90	(0.58–1.42)	1.04	(0.85–1.27)
Parent income (log, 2008 $)	1.60*	(1.11–2.31)	1.29***	(1.14–1.45)
Female	0.50***	(0.35–0.71)	0.47***	(0.40–0.55)
Race (ref.=White)				
Black	1.08	(0.58–2.03)	0.92	(0.71–1.19)
Hispanic	2.07**	(1.35–3.18)	0.91	(0.71–1.18)
Asian/PI/NH	0.92	(0.46–1.82)	1.01	(0.80–1.27)
AI/AN/multi-racial	0.96	(0.33–2.77)	0.85	(0.60–1.20)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. OR = Odds Ratio; CI = Confidence Interval; PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who completed high schools, attended colleges, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Appendix D. Odds Ratios and 95% Confidence Intervals From the Binary Logistic Regression Predicting Professional Job Attainment Conditional on HS Completion and College Attendance

Variable	Professional job attainment			
	1982 (HS&B, *N*=7,240)		2004 (ELS, *N*=10,410)	
	OR	95% CI	OR	95% CI
High school type (ref.=Non-elite public)				
Catholic	1.09	(0.92–1.30)	1.07	(0.94–1.21)
Other private	1.32	(0.88–1.99)	0.95	(0.81–1.12)
Elite	1.60	(0.80–3.20)	2.10***	(1.78–2.49)
High school GPA	1.20*	(1.02–1.42)	1.10	(0.97–1.24)
Math score (standardized)	1.28***	(1.15–1.43)	1.13**	(1.04–1.23)
Advanced math course-taking	1.05	(0.89–1.25)	1.25**	(1.09–1.42)
Edu expectation (ref.=Lower than BA)				
Bachelor's degree	1.48***	(1.22–1.80)	1.38***	(1.15–1.67)
Graduate degree	1.56***	(1.27–1.93)	1.74***	(1.43–2.12)
Type of college attended (ref.=Elite 4-year college)				
2-year/LT 2-year college	2.38***	(1.93–2.94)	2.09***	(1.77–2.47)
Non-elite 4-year college	4.08***	(2.67–6.25)	3.09***	(2.39–4.00)
College GPA	1.24**	(1.07–1.43)	1.35***	(1.24–1.46)
College major (ref.=STEM)				
Humanities	0.54***	(0.38–0.75)	0.72***	(0.59–0.87)
Social science	0.88	(0.62–1.26)	1.00	(0.79–1.26)
Business	0.90	(0.70–1.15)	0.99	(0.82–1.20)
Education	0.92	(0.60–1.42)	1.60**	(1.20–2.13)
Preprofessional	0.80	(0.51–1.25)	0.82	(0.60–1.12)
Other occupationally-oriented	0.49***	(0.38–0.64)	0.50***	(0.40–0.62)
Parent education (ref.=Lower than BA)				
Bachelor's degree	1.11	(0.89–1.37)	1.10	(0.96–1.27)
Graduate degree	1.05	(0.84–1.31)	1.30**	(1.11–1.53)
Parent income (log, 2008 $)	1.32***	(1.13–1.53)	1.12**	(1.04–1.22)
Female	0.87	(0.74–1.02)	0.91	(0.82–1.02)
Race (ref.=White)				
Black	1.07	(0.81–1.41)	0.99	(0.82–1.19)
Hispanic	0.95	(0.76–1.20)	1.07	(0.89–1.28)
Asian/PI/NH	1.04	(0.73–1.48)	0.98	(0.83–1.16)
AI/AN/multi-racial	0.60	(0.35–1.02)	0.71**	(0.56–0.91)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. OR = Odds Ratio; CI = Confidence Interval; PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who completed high schools, attended colleges, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.

Appendix E. Odds Ratios and 95% Confidence Intervals From the Binary Logistic Regression Predicting Graduate/Professional School Attendance Conditional on HS Completion and Bachelor's Degree Completion

Variable	Grad/prof school attendance			
	1982 (HS&B, *N*=3,530)		2004 (ELS, *N*=5,420)	
	OR	95% CI	OR	95% CI
High school type (ref.=Non-elite public)				
Catholic	1.26	(0.99–1.60)	1.00	(0.83–1.20)
Other private	1.34	(0.81–2.22)	0.98	(0.75–1.28)
Elite	13.73***	(3.03–62.35)	0.96	(0.69–1.33)
High school GPA	0.78	(0.59–1.04)	1.10	(0.88–1.36)
Math score (standardized)	1.16	(0.96–1.39)	1.03	(0.89–1.20)
Advanced math course-taking	1.10	(0.80–1.52)	1.09	(0.83–1.44)
Edu expectation (ref.=Lower than BA)				
Bachelor's degree	1.44	(0.97–2.15)	1.94	(0.95–3.96)
Graduate degree	2.32***	(1.53–3.51)	3.12**	(1.56–6.27)
Elite college attendance	1.76**	(1.24–2.50)	1.52***	(1.28–1.79)
College GPA	3.33***	(2.53–4.37)	4.07***	(3.28–5.05)
College major (ref.=STEM)				
Humanities	0.82	(0.57–1.19)	0.79	(0.61–1.01)
Social science	1.00	(0.72–1.38)	1.45**	(1.16–1.82)
Business	0.51***	(0.37–0.69)	0.50***	(0.39–0.64)
Education	1.16	(0.78–1.73)	0.84	(0.60–1.17)
Preprofessional	1.05	(0.63–1.74)	0.35***	(0.22–0.56)
Other occupationally-oriented	0.24***	(0.14–0.41)	0.99	(0.72–1.36)
Parent education (ref.=Lower than BA)				
Bachelor's degree	1.07	(0.81–1.40)	1.17	(0.94–1.45)
Graduate degree	1.38*	(1.05–1.82)	1.21	(0.97–1.52)
Parent income (log, 2008 $)	1.00	(0.81–1.24)	1.02	(0.90–1.16)
Female	0.86	(0.68–1.10)	1.09	(0.92–1.29)
Race (ref.=White)				
Black	1.24	(0.77–2.00)	2.25***	(1.65–3.06)
Hispanic	1.25	(0.83–1.87)	1.01	(0.73–1.40)
Asian/PI/NH	1.91**	(1.19–3.07)	0.95	(0.75–1.20)
AI/AN/multi-racial	0.95	(0.29–3.08)	1.05	(0.69–1.62)

Note. All Ns are rounded to the nearest 10 to follow NCES requirements for reporting of restricted-use data. The elite school category of the HS&B includes some elite public schools. OR = Odds Ratio; CI = Confidence Interval; PI = Pacific Islander; NH = Native Hawaiian; AI = American Indian; AN = Alaskan Native. All samples were restricted to respondents who completed high schools, attained a bachelor's degree, participated in the fourth follow-up (HS&B) or the third follow-up (ELS) study, and had non-missing values on the outcome variable. Other missing values in the predictors were imputed using multiple imputation with chained equations. All analyses were conducted using the *mi estimate: svy* command in Stata to account for the multiply-imputed data set and complex survey structure. Appropriate panel weights were applied.
*$p < .05$. **$p < .01$. ***$p < .001$.