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Leaving Home State for College: Differences by Race/Ethnicity and Parental Education

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Abstract   Using the College Board SAT registration and questionnaire data of 2010 high school graduating seniors, we found clear patterns by race/ethnicity and parental education on two outcomes: out-of-state score-sending and out-of-state college attendance. White students had the highest rates and Hispanic students had the lowest rates, and there was a clear gradient by parental education with the students with college-educated parents having the highest rates of out-of-state score sending and college attendance. Substantial differences by race/ethnicity and parental education still persist after considering students' family income, academic preparation, high school characteristics and state of residence. State-specific estimates show that Hispanic and Asian students' low likelihood of out-of-state college-going based on all SAT takers are largely driven by students' choices in a few states where they are highly concentrated or their presence are substantial. In contrast, the concentration of Black students and presence of HBCUs in a state seem irrelevant to whether Black students stay or leave home states for college. It seems that high performing Black and Hispanic students and those with parents lacking a Bachelor's degree gained much in their access to a private and selective college by leaving their home states.

Keywords   College enrollment · Out-of-state college-going · Race/ethnicity · Parental education

Introduction

Each year, a substantial number of students move across the state border for college. The National Center for Education Statistics reported that over 250,000 high school graduates left their home states in 2009. Hoxby (1997, 2009) demonstrated that the declining cost of

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air travel and telecommunications, along with the rise of standardized college admissions testing and the subsequent decline in colleges' informational cost, has made the undergraduate market more competitive. Students have been increasingly willing to consider schools outside of their immediate geographic area or state (Postsecondary Education Opportunity 1996a).

There are pros and cons in leaving home states for college. Although some states have tuition reciprocity agreements with neighboring states, attending an out-of-state institution in general is more costly. Non-resident students often pay higher tuition to attend public institutions, although private institutions do not differentiate between in-state or out-of-state students in tuition costs. Going out-of-state may be associated with higher transportation costs, as well as room and board expenses. Non-resident students likely face more competition at admissions as they are often required to meet higher standards (Blume and Roza 2012), though public institutions have a financial incentive to favor out-of-state over in-state students because out-of-state students pay higher tuition (Groen 2004). However, students have more choices if searching for colleges across the country, and attending out-of-state colleges can facilitate a fast transition to independence and provide students with opportunities to explore new areas and to establish new networks for future job opportunities (Mulder and Clark 2002).

Arguably, students from advantaged families can afford the higher costs to attend an out-of-state college with potentially better academic and social fit, possibly gaining richer educational experience and expanding future job prospects. Sapra (2013) found that higher academic ability students (based on standardized composite test scores) were more likely to leave their home states to attend out-of-state colleges among 2004 high school graduates. Other descriptive studies found that the distance traveled for college was positively correlated with Students' test score, high school GPA, as well as family income and parental education, White and Black students tend to travel further than Asian and Hispanic students (Postsecondary Education Opportunity 1996a; Mattern and Wyatt 2009). However, students from families with higher socioeconomic status tend to perform better in school, as do White and Asian students compared to Black and Hispanic students. Therefore, it is not clear whether family income, parental education and race/ethnicity might play roles in shaping students' college location choices independent of their academic achievement. In this study we address this question focusing on out-of-state college going.

Literature Review and Research Questions

Chapman (1981) laid the conceptual foundations for the "stage" models of college choice, which were synthesized by Hossler and Gallagher (1987) into three stages of decision-making: (1) "predisposition to attend college;" (2) "search for a choice set;" and (3) "matriculation." The second stage concludes when students apply to one or more institutions. During the search stage, students presumably test their aspirations against realistic options based on their calculated probability of admission (Fuller et al. 1982; Manski and Wise 1983), which typically results in lowered expectations about plausible options. Early analysts of college choice acknowledged the enormity of the matching problem, and Manski and Wise (1983) were among the first to illustrate the power of choice models for studying college preferences (Mare 1985).

The constellation of individual and institutional characteristics influence students' preferences and enrollment decisions (Chapman 1981; Hossler and Gallagher 1987; Hossler et al. 1989; McDonough 1997). Studies on college choices have paid particular attention to choices between 2-year and 4-year institutions, quality and selectivity of the institution attended, and how application and attendance patterns differ for students from different demographic and socio-economic backgrounds. Researchers found that high-achieving students and those from high SES families applied to more schools, to more selective schools, and to more costly schools (McDonough and Antonio 1996; Hurtado et al. 1997). Underrepresented minorities, first generation college-goers and students from low income families applied to fewer postsecondary institutions, attended community colleges at higher rates, and had significantly lower chances to make it to selective colleges and universities (Hurtado et al. 1997; Reardon et al. 2012). Many of these students were not academically prepared for college and they attended high schools with fewer students going to college, which contributed to but did not fully account for the lower chances these students had in applying to and attending selective institutions (Hearn 1991; Davies and Guppy 1997; Bowen et al. 2005; Pallais and Turner 2006; Roderick et al. 2006; Hill and Winston 2010). As Zemsky and Oedel (1983) stated, "… the patterns of college choice are stitched deeply into the social and economic fabric of the nation."

It is understandable that the selectivity and quality of institution have been the focus of studies on college choices, because attending a selective institution has important implications on students' performance, persistence, graduation, labor market and life outcomes (e.g. Bowen and Bok 1998; Brewer et al. 1999; Hoxby 2001). Yet college location is also an important aspect in students' college choice decision, and increasingly so. Our results reported later suggest students may have better prospects in attending more selective colleges by leaving their home states. Furthermore, attending college out-of-state also has direct implications on students' labor market opportunities as past migration (especially when attending college) leads to future migration (Kodrzycki 2001).

However, how individual characteristics influence students' choices of out-of-state institutions is not very well understood. Toutkoushian (2001) examined students' SAT score-sending to a few out-of-state institutions among 1996 high school graduating seniors in New Hampshire. He found that parental education and family income did not appear to restrict student choices, and that students were most interested in institutions where their ability more closely matched the average ability of enrolled students. Yet, the author himself also pointed out that the experiences in New Hampshire were probably not representative of the nation because the strong presence of private sector in New England and the state had a low poverty rate and few minority students. One recent study (Sapra 2013) examined the impact of academic ability/achievement on students' out-of-state college attendance and found that higher academic ability students (based on composite test scores) were more likely to leave their home states for college. In addition to test scores, parental education, family income, immigrant status, college major plans, type of high school (private/public), race, and students' home state were all strong predictors of out-of-state college attendance. Yet this study utilizes Educational Longitudinal Study (ELS: 2002) examining a cohort of students almost a decade ago.

Relevant to out-of-state college-going, several studies examined distance to nearby college and leaving home for college, and how the choices differed by students' socio-economic background. The likelihood of leaving home for college was found to be positively affected by the father's education and the parental income (Mulder and Clark 2002). Compared with other students, those having parents with a college or higher degree or in top income categories traveled farthest to attend college; compared with other race/

ethnicity groups, Asian and Mexican Americans traveled the least to attend college (Mattern and Wyatt 2009; Postsecondary Education Opportunity, 1996a). Some parents were locally oriented, preferring that their children stay home for college. Compared with college-anywhere parents, these parents were significantly more likely to be Asian American, Black, or Hispanic, and less likely to have a college degree. More importantly, the location preferences of most students corresponded with those of their parents because parents' preferences directly and indirectly influenced students' college applications (Turley 2006). Compared with other race/ethnicity groups, Hispanics were the most likely to report that it was important to live at home during college, even among those with college-educated parents. The preference to stay home fully explained the Hispanic-White gap in applying to selective institutions (Desmond and Turley 2009).

However, these studies on how students' college location preference are related to college applications are generally descriptive. They provide limited insights on how students' social and economic backgrounds might independently shape their college choices with regard to college locations. In addition, the in-state or out-of-state location choice is qualitatively distinct as the choice goes beyond simple distance and on or off campus residence. Out-of-state college going has implications on how students are treated at admissions and at enrollment, and how students might migrate in the future (Kodrzycki 2001).

Therefore, in this study we extend the current literature on college choices to examine both in-state/out-of state college intentions and actual attendance among 2010 graduating seniors, and how these choices of students differ by race/ethnicity group status and parental education. Specifically, we ask the following three research questions. First, how do students differ in their in-state versus out-of-state college intentions and actual attendance? How do students differ in translating their intended choices into actual attendance? Second, do the differences by race/ethnicity and parental education persist when we take into consideration students' academic preparation? Would we find the same pattern in out-of-state college-going as in selective college applications and attendance? That is, even after considering their weaker academic preparation and their attendance in high schools with fewer peers going to selective colleges, students are still constrained in their choice by their race/ethnicity group status and family socioeconomic status. We also pay particular attention to state residency because students' out-of-state college choices are influenced by state differences in their public postsecondary education choices, pricing and quality, private institution enrollment capacity and other geographic characteristics (Mak and Moncur 2003; Cooke and Boyle 2011; Sapra 2013). Lastly, we ask whether students in fact leave home states to attend better institutions.

The following section discusses data elements and analysis strategies. After reporting descriptive and multivariate analyses, we conclude with a summary and implications.

Data and Methods

Several data elements are used in this study. We use the College Board SAT registration and questionnaire data of the 2010 high school graduating seniors.[1] The SAT questionnaire

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[1] We restrict to students attending high schools in the U.S.

asks students about their demographics and academic performance. All SAT takers can request to send their test scores to four postsecondary institutions for free[2] and to additional institutions for a fee.[3]

The first postsecondary attendance of SAT takers by the summer of 2011 was tracked using National Student Clearinghouse (NSC) data. We restrict to college attendance one year post high school graduation to limit measurement error in in-state and out-of-state status because students may migrate from their home states (where they attended high school) to other states during this time. Although regulations vary from state to state, most require 12 months of continuous residence for students to be considered in-state. Given that we allow 1 year for students to enroll in a post-secondary institution, this is one of the most recent cohorts we can examine in both college intention and actual enrollment within 1 year of high school graduation.

To student data, we append high school characteristics data and post-secondary institutional characteristics obtained from NCES. In addition, we also append Barron's college selectivity index, which classifies colleges and universities according to the competitiveness of their admissions.

Key Variables

Two outcomes are examined in this study: in-state/out-of-state college intention and actual attendance. Following other studies (e.g. Pallais and Turner 2006), we use score-sending as a proxy for student intention to attend 4-year colleges. Based on the state location of institutions that students request to send scores, we classify students into five mutually exclusive groups: students who

- Do not send scores to any institutions (no score-sending)[4];
- Send scores to in-state institutions only (in-state only);
- Send scores to out-of-state institutions only (out-of-state only);
- Send scores to both in-state and out-of-state institutions (both in- and out-of-state)[5];
- Send scores to institutions abroad or in U.S. territory only (abroad and U.S. territory).

Based on the state location of institutions that students first attended within 1 year from high school graduation, we classify students into four mutually exclusive groups, students who

- Do not attend any colleges/universities or missing attendance outcome (no college/missing)[6];

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[2] Students receiving an SAT fee waiver for the test can send scores to up to 8 institutions at no cost to them. http://sat.collegeboard.org/register/sat-fee-waivers.

[3] Students can take SAT multiple times, we capture all score-sending requests in this study; however, the SAT scores used in multivariate analyses were the most recent test scores.

[4] Because students do not have to send SAT scores to colleges (they can send ACT scores, and they can apply and attend a test-optional colleges including those that do not require test scores) using SAT score-sending likely understates students' college intentions. Some students might perform better on the ACT, and therefore opt to send ACT scores only. However, the number of SAT takers sending no SAT scores but other test scores to postsecondary institutions is likely to be small.

[5] Few students sent scores to in-state institutions and institutions abroad/in U.S. territory. To simplify grouping, we classified these students into the category of "both in- and out-of-state."

[6] This group of students includes both students who indeed did not attend any colleges/universities and a small number of students who attended an institution not in NSC data, including those abroad and in U.S. territories.

- Attend an in-state institution (in-state);
- Attend an out-of-state institution (out-of-state);
- Attend an institution in U.S. territories.

We focus on two independent variables in studying students' in-state/out-of-state college choice. The first is race/ethnicity group status and the second is parental education.[7] Students are classified into White, Black, Hispanic, Asian, and other/missing race/ethnicity categories. Based on parental education reported on the SAT questionnaire, students are classified into four categories, having a parent with at least a Bachelor's degree, having a parent with an Associate's degree or some college education, having a parent with high school diploma, or having a parent with some high school or lower education (i.e., lacking high school diploma). Because a substantial number of students fail to report their parental education, and their individual and academic profiles are different from students from other categories, we classify these students into a separate "no response" category.

Analytical Strategies

In multivariate analyses, we examine students who sent scores and students who attended postsecondary institutions to focus on in-state and out-of-state choices, and we omit a very small number of students only sending scores to or attending institutions abroad or in U.S. territories. We apply logit models to estimate the likelihood that students from different race/ethnicity and parental education backgrounds would intend to attend and actually attend out-of-state institutions. For score-sending, we collapse "both in- and out-of-state" and "out-of-state only" categories together into an "out-of-state" category. This operation allows us to focus on out-of-state college-going intention. In addition, as we will discuss later, students in the "both in- and out-of-state" category are more similar to students in the "out-of-state only" category than to students in "in-state only" category. Finally, this operation also enables an easier comparison and presentation of the multivariate analysis results on out-of-state score-sending and actual attendance. Formally,

$$y = \beta Z + \gamma T + \varepsilon$$

where y indicates whether a student intends to or actually attends (0/1) an out-of-state institution. Z is a vector of individual race/ethnicity and parental education. T is vector of gender, family income (captured using whether a student attended a private high school, number of institutions a student sent scores to, and student-reported family income categories), academic preparation (captured using SAT scores, GPA, class rank and self-rated math ability), high school characteristics (for public high schools only, including percent of students receiving free or reduced-price lunch, urbanicity and race/ethnicity composition) and state residency. And ε is an error term.

We first estimate a baseline model only including vector Z to quantify how students from different race/ethnicity groups and parental education backgrounds differ in out-of-state college intention and attendance. We subsequently include variables capturing students' family income, academic preparation, and state resided to investigate whether the differences by race/ethnicity and parental education persist. Because high school

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[7] Family income is an important component of socioeconomic status, and it is also a deciding factor of college location choice (Postsecondary Education Opportunity 1996a). However, over one-third of SAT takers did not answer the question on family income, and it is questionable how well high school students know about their parents' income; therefore in this paper, we choose to focus on parental education, a strong correlate of family income, and use student reported family income as a covariate.

characteristics variables are available for public schools, we estimate the same models for public school students only and further add high school characteristics variables to the expanded models.

In studying out-of-state college going, state residency is a very important factor to consider. The migration of high school graduates to college has been researched at the state level mostly using aggregate data at the state level (Cooke and Boyle 2011; Mak and Moncur 2003; Postsecondary Education Opportunity 1996a, b, 2003).[8] These studies concluded that the differences in migration reflect differences in the relative attractiveness of postsecondary opportunities among states (Postsecondary Education Opportunity 1996b). States providing more choices and higher quality services, charging lower tuition, having broad-based merit scholarship programs and lower income levels tended to retain a higher percentage of college-bound freshmen at home (Mak and Moncur 2003). One recent study (Sapra 2013) using the Educational Longitudinal Study (ELS: 2002) individual level data reported consistent findings on state-level financial aids and quality of higher education system. Spatial arrangements of origin states and destination states also significantly influenced the migration between states. Small, densely settled states on the east coast and large, generally populous states saw many of their high school graduates leaving home states for college, and often attended college in nearby states that were less densely settled. Students were attracted to more rural and high amenity states with younger populations; they were also attracted to states with higher private enrollment (Cooke and Boyle 2011). However, Kodrzycki (2001) noted that which college graduates migrate out-of-state was explained more by individual characteristics than by the overall employment rates of the state where they graduated. It is conceivable that individual characteristics contribute substantially to students' out-of-state college going choices in additional to state variations in postsecondary education opportunities. In this study, we therefore focus on student characteristics and use state fixed effects to capture these state differences that migration research has already investigated in detail (see review in Cooke and Boyle 2011).

Regarding the race/ethnicity focus of this paper, several states, such as California, have a significant Hispanic and Asian presence, and Historically Black Colleges and Universities are mostly located in former states of the Confederacy. We estimate the models separately for a number of states to investigate how students from different states would choose between in-state and out-of-state institutions.

Data Limitations

We use the College Board SAT registration and questionnaire data in this study. However, in a number of states more students take the ACT than the SAT. The students in ACT-dominant states who do take an SAT test tend to have a higher academic profile with higher score on the SAT. As a sensitivity analysis, we re-estimate the models including only students from 24 SAT dominant states and Washington, D.C. (i.e., states with at least 40 % of high school graduating seniors taking the SAT). Results are very similar to those reported in this paper, which is not surprising as over two-thirds of SAT takers are from these 24 states and D.C. areas.[9]

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[8] Out-of-state migration is considered to have long-lasting implications for local and state economies regarding higher education revenues and spending and the availability of highly skilled labor forces (Cooke and Boyle 2011).

[9] Results are available upon request.

Still, there might be concerns as to whether the findings are generally applicable to students from states where most students take the ACT. Empirically, the states with the largest Hispanic and Asian populations are also SAT-dominant states. Later we show that, though the odds ratio estimates for Blacks vary to a certain extent across states, they are consistent in direction. The odds ratio estimates for parental education categories are fairly stable across states, indicating that parental education similarly shapes students' out-of-state college-going across states. Yet it remains possible that students from ACT states have different college choice behaviors, and we do not have data on students only taking ACT. Therefore, our findings may not apply to these ACT students.

Descriptive Analyses

Several findings emerge from the descriptive analyses. First, among the 2010 graduating seniors taking the SAT and sending scores, sending to in-state institutions only (41 %) and to both in-state and out-of-state institutions (48 %) were the dominant choices (reported in the top panel of Table 1). Only 11 % of students sent scores to out-of-state institutions only; and a very few (0.05 %) sent scores to institutions abroad only, which is consistent with the findings that participation in study abroad is negligible (Salisbury et al. 2009). Over one-quarter of students sent scores nowhere, which capture students with no college intention, students intending to attend a local community college, or students choosing to only send an ACT score or planning to attend a test optional institution.

Second, White students had the lowest rate of sending scores to in-state institutions only, and the highest rate of sending scores to out-of-state institutions; the opposite held true for Hispanic students.[10] Reported in the middle panel of Table 1, about 36 % of White and 41 % of Black students, and 44 % of Asian students sent scores to in-state institutions only; in comparison, 60 % of Hispanic students did so. About 12 % of White students sent scores to out-of-state institutions only, and another 52 % sent scores to both in-state and out-of-state institutions, the highest rates among all race/ethnicity groups. Hispanic students had the lowest rates, 6 and 34 %, respectively.

Third, sending scores to out-of-state institutions presented a clear gradient by parental education. Reported in the bottom panel of Table 1, about 20 % of students with college-educated parents sent scores nowhere; and among those sending scores, 31 % sent to in-state institutions only, 13 % sent to out-of-state institutions only and 56 % sent to both in-state and out-of-state institutions. These students had the lowest rate of sending scores to in-state institutions only and the highest rates of sending scores to out-of-state institutions. The opposite held true for students with parents lacking a high school diploma. Over one-third of these students sent scores nowhere, and among those sending scores, nearly half sent to in-state institutions only.

Fourth, regarding the number of institutions to which students sent scores, students sending scores to out-of-state institutions only had a slight edge over those sending scores to in-state institutions only; yet students sending scores to both in-state and out-of-state institutions sent the most, 7 in total and nearly twice as many as other categories of students. The top panel of Table 2 reports the average number of institutions to which students sent scores. Students sending scores to in-state institutions only on average sent

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[10] When we calculate the percentages considering all five score-sending categories, the major patterns in out-of-state score-sending and college attendance by race/ethnicity and by parental education are consistent with those reported here.

Table 1 Out-of-state score-sending, row percent

2010 SAT Takers, N = 1,454,198	Sending no scores (n = 412,916) (%)	Students sending scores (n = 1,041,282)			
		In-state only (%)	Out-of-state only (%)	Both in and out (%)	Abroad & U.S. territory only (%)
All	28	41	11	48	0.05
By race/ethnicity					
White (N = 836,250)	27	36	12	52	0.03
Black (N = 193,377)	33	41	11	48	0.01
Hispanic (N = 217,499)	35	60	6	34	0.05
Asian (N = 135,425)	19	44	7	48	0.19
Other/missing (N = 71,647)	34	44	11	45	0.10
By parental education					
BA or higher (N = 719,660)	20	31	13	56	0.07
AA or some college (N = 355,188)	35	50	9	41	0.04
High school (N = 177,507)	39	57	7	36	0.01
Below high school (N = 71,408)	37	69	4	27	0.02
No response/missing (130,435)	37	48	11	40	0.09

Source: 2010 SAT data, the College Board

Table 2 Number of institutions students sent scores

2010 SAT Takers, N = 1,454,198[a]

	Counts		
	In-state	Out-of-state	Abroad & U.S. territory
Total	3.0	2.2	0.01
Score-sending			
All			
In-state Only	3.5	–	–
Out-of-state only	–	3.9	0.02
Both in and out	3.2	3.7	0.02
Abroad & U.S. territory only	–	–	2.29
By race/ethnicity			
White			
In-state only	3.2	–	–
Out-of-state only	–	4.0	0.02
Both in and out	3.0	3.7	0.02
Abroad only	–	–	2.43
Black			
In-state only	3.5	–	–
Out-of-state only	–	3.3	0.01
Both in and out	3.2	3.2	0.01
Abroad only	–	–	2.64
Hispanic			
In-state only	3.6	–	–
Out-of-state only	–	3.3	0.02
Both in and out	3.6	3.1	0.02
Abroad only	–	–	1.78
Asian			
In-state only	4.3	–	–
Out-of-state only	–	5.6	0.04
Both in and out	3.8	4.9	0.04
Abroad only	–	–	2.42
By parental education			
BA or higher			
In-state only	3.5	–	–
Out-of-state only	–	4.4	0.03
Both in and out	3.1	4.1	0.02
Abroad only	–	–	2.33
AA or some college			
In-state only	3.3	–	–
Out-of-state only	–	3.0	0.01
Both in and out	3.2	2.8	0.01
Abroad only	–	–	2.20
High school			
In-state only	3.4	–	–

Table 2 continued

2010 SAT Takers, N = 1,454,198[a]

	Counts		
	In-state	Out-of-state	Abroad & U.S. territory
Out-of-state only	–	2.8	0.01
Both in and out	3.3	2.7	0.01
Abroad only	–	–	1.52
Below high school			
In-state only	3.8	–	–
Out-of-state only	–	3.1	0.01
Both in and out	4.0	2.7	0.02
Abroad only	–	–	1.88

Source: 2010 SAT data, the College Board

[a] Students who did not send scores anywhere are not presented in the table

scores to 3.5 institutions, students sending scores to out-of-state institutions only on average sent to 3.9 institutions, and students sending scores to both in-state and out-of-state institutions on average sent to 3.2 in-state institutions and 3.7 out-of-state institutions. Students sending scores to institutions abroad only on average sent to 2.3 institutions.[11] As shown in the bottom two panels, this pattern holds true when we examine students by race/ethnicity group status and parental education. The exception is that, for Black and Hispanic students and those with parents lacking a college degree, the number of institutions students sent scores to was slightly lower for those sending scores to out-of-state institutions only than for those sending scores to in-state institutions only.

Fifth, among those attending college, most students attended an in-state institution and about one-quarter of SAT takers left their home states for college. Similar to the score-sending patterns, White students had the highest rate of going out of the state and Hispanic had the lowest rate, and attending an out-of-state institution presented a clear gradient by parental education with students with college-educated parents having the highest out going rate. Table 3 reports out-of-state college attendance rates for 2010 high school graduating seniors taking the SAT.[12]

Sixth, students sending scores to out-of-state institutions often transitioned to actual out-of-state college attendance, more so for White students and students with college-educated parents. Table 4 reports student out-of-state college attendance outcome by their score-sending patterns. Unsurprisingly, students sending scores nowhere had the highest rates of attending no colleges (28 %)—over one-quarter for such students and ranging from one-quarter for White students to nearly 40 % for students with parents lacking a high school diploma. For those attending a college, the majority of these no-score-sending students did

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[11] It is likely that we under-estimate this number if institutions abroad are missing an institution code in the SAT data or if students choose not to send SAT scores to institutions abroad.

[12] National Center for Education Statistics (2000, 2010) report that about 20 % first-time freshmen attended colleges outside of their home states, and that the rates were fairly stable over the past decade. Our analyses show that, among 2010 high school graduating seniors taking the SAT, the out-of-state college-going rate among *college enrollees* was about 23 %, this higher out-of-state college going rate likely reflects that students taking the SAT (and other college admissions tests) are higher achievers compared to those students taking no such tests.

Table 3 Out-of-state college attendance, row percent

2010 SAT Takers, N = 1,454,198	Students attending no colleges/missing (n = 230,467) (%)	Students attending colleges (n = 1,223,731)		
		In-state (%)	Out-of-state (%)	U.S. territory (%)
All	16	77	23	0.00
By race/ethnicity				
White (N = 836,250)	13	73	27	0.00
Black (N = 193,377)	20	78	22	0.01
Hispanic (N = 217,499)	22	88	12	0.01
Asian (N = 135,425)	15	80	20	0.00
Other/missing (N = 71,647)	22	78	22	0.00
By parental education				
BA or higher (N = 719,660)	11	69	31	0.00
AA or some college (N = 355,188)	17	84	16	0.00
High school (N = 177,507)	22	87	13	0.01
Below high school (N = 71,408)	27	92	8	0.00
No response/missing (130,435)	26	80	20	0.01

Source: 2010 SAT data, the College Board

attend an in-state institution.[13] Among students who sent scores to in-state institutions only and subsequently attended college, most ended up attending college in home states, with only about 1–2 % leaving their home states across race/ethnicity and parental education categories. Among SAT takers who sent scores to out-of-state institutions only and subsequently attended college, over three-quarter attended an out-of-state college; among SAT takers who sent scores to both in-state and out-of-state institutions and subsequently attended college, over one-third left their home states for college. For the latter two categories of students, the attendance rates, differed by race/ethnicity groups and parental education. White students had the highest out-of-state attendance rates and Hispanic students had the lowest; out-of-state attendance rates again presented a clear gradient by parent education with students with college-educated parents having the highest rates.

Surprisingly, for students who sent scores to out-of-state institutions only, no-college rates were higher than that of students sending scores to in-state institutions only, and this held across race/ethnicity and parental education categories. For example, even among students with college-educated parents, 13 % of those students sending scores to out-of-state institutions only did not attend any colleges 1 year after high school graduation; in

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[13] Over 60 % of these students attended a 2-year institution based on an auxiliary analysis.

Table 4 Score-sending to actual attendance, row percent

2010 SAT Takers, N = 1,454,198

Score-sending	Students attending no colleges/missing (n = 230,467) (%)	Students attending colleges (n = 1,223,731)	
		In-state (%)	Out-of-state (%)
All			
No score-sending	28	85	15
In-state only	13	98	2
Out-of-state only	15	23	77
Both in and out	9	64	36
By race/ethnicity			
White			
No score-sending	24	83	17
In-state only	10	98	2
Out-of-state only	13	21	79
Both in and out	7	62	38
Black			
No score-sending	31	82	18
In-state only	16	96	4
Out-of-state only	17	32	68
Both in and out	12	69	31
Hispanic			
No score-sending	33	93	7
In-state only	18	98	2
Out-of-state only	19	36	64
Both in and out	12	74	26
Asian			
No score-sending	28	90	10
In-state only	10	99	1
Out-of-state only	27	23	77
Both in and out	11	66	34
By parental education			
BA or higher			
No score-sending	21	79	21
In-state only	9	98	2
Out-of-state only	13	18	82
Both in and out	7	60	40
AA or some college			
No score-sending	26	89	11
In-state only	12	98	2
Out-of-state only	17	34	66
Both in and out	10	72	28

Table 4 continued

2010 SAT Takers, N = 1,454,198

Score-sending	Students attending no colleges/missing (n = 230,467) (%)	Students attending colleges (n = 1,223,731)	
		In-state (%)	Out-of-state (%)
High school			
No score-sending	32	90	10
In-state only	16	98	2
Out-of-state only	20	38	62
Both in and out	13	75	25
Below high school			
No score-sending	39	93	7
In-state only	20	98	2
Out-of-state only	28	44	56
Both in and out	16	81	19

Source: 2010 SAT data, the College Board

comparison, 9 % of those students sending scores to in-state institutions only did not. This is an unexpected finding, particularly considering that the latter group had substantially lower academic achievement and lower family income as shown in Table 9 in "Appendix" section and discussed later. We speculate that students sending scores out-of-state only had no backup plans to attend an in-state institution, and factors related to more competitive admissions for non-resident students and the much higher financial burden of attending an out-of-state institution might have worked against these students. Note that, for students sending scores to both in-state ad out-of-state institutions, less than 10 % attended no college, the lowest rates across score-sending categories, and this also held across race/ethnicity and parental education categories. Of course, this group of students had the best academic preparation as we will discuss later. Nevertheless, it is subject to further empirical examination whether being flexible in college location choices helped these students to realize their college plans.

Multivariate Analyses

For all the outcomes we analyzed above—out-of-state score-sending, number of scores sent, out-of-state college attendance, transition from out-of-state score-sending to out-of-state college attendance—the descriptive analyses present a consistent story by race/ethnicity groups and parental education. That is, White students almost always had the highest rates and Hispanic students had the lowest rates, and there was a clear gradient by parental education with the students with college-educated parents having the highest rates of out-of-state score-sending and college attendance. Multivariate analyses allow us to explore whether these differences in out-of-state score-sending and college attendance by race/ethnicity and parental education can be fully accounted by the differences in family income, academic preparation, high school attended and state of residence.

Summary statistics presented in Table 9 in "Appendix" section show that students sending scores to both in-state and out-of-state institutions had the best academic preparation, i.e., highest test scores, highest proportions earning GPA of A, and ranking in the top 10 % of class and in self-rated math ability. Students sending scores to out-of-state institutions only were in the second best position and were only marginally weaker. In addition to theoretical and practical reasons discussed in "Data and Methods" section, this empirical evidence supports the operation of collapsing "both in- and out-of-state" and "out-of-state only" categories in multivariate analyses.[14] Students sending scores nowhere were on the other end of spectrum in their academic preparation. Although students sending scores to in-state institutions only had substantially better academic preparation than students sending scores nowhere, they were also substantially weaker than students sending scores to out-of-state institutions only. For example, among students sending scores to both in-state and out-of-state institutions, about 55 % earned a GPA of A, and among students sending scores to out-of-state institutions only, about 49 % did so. In comparison, the proportion was 40 % for students sending scores to in-state institutions only and 25 % for students sending scores nowhere.

One point is noteworthy. Although students sending scores to out-of-state institutions only were marginally weaker academically than students sending scores to both in-state and out-of-state institutions, the former seemed to come from more affluent families than the latter. For example, 31 % of the former group graduated from a private high school, compared with 20 % of the latter; 14 % of the former group were from families at the highest income category, compared with 11 % of the latter. Among those attending public high schools, the former group graduated from high schools with a lower proportion of students receiving free or reduced priced lunch and lower proportion of Hispanic students (Table 11 in "Appendix" section).

When we examine students' family income, academic preparation, and (public) high school characteristics by out-of-state college attendance outcomes in Tables 10 and 11 in "Appendix" section, we find that students attending an out-of-state institution were in the best academic and economic position, and students attending no college were in the worst position and students attending an in-state institution were in between. This is consistent with what we just discussed regarding the student characteristics by score-sending outcomes.

Differences by Race/Ethnicity and Parental Education

Given the clear patterns in family income, academic preparation and high school attended by out-of-state score-sending and college going, we expected that these factors would contribute to explain the differences in out-of-state score sending and college attendance by race/ethnicity and parental education. Multivariate analyses show that they do; however, substantial differences by race/ethnicity and parental education still persist after these factors are accounted for.

Table 5 reports odds ratio estimates of race/ethnicity and parental education categories on two outcomes: out-of-state score-sending and college attendance. The estimates of covariates are not reported in Table 5 but are available upon request. As we discussed earlier, "sending

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[14] Nevertheless, a multinomial logit model considering "both in- and out-of-state" and "out-of-state only" categories were also estimated, the results are available upon request. For both categories of students, the patterns by race/ethnicity and by parental education were consistent with those reported here, though the differentials by race/ethnicity were somewhat greater among those only sending scores to out-of-state institutions.

Table 5 Odds ratio estimates on out-of-state score-sending and college attendance

Among SAT Takers sending scores or attending colleges

	Out-of-state score-sending								
	All students					Public school students			
	N = 1,040,710					N = 810,071			
Model	(0)	(1)	(2)	(3)	(4)	(0')	(1')	(4')	(5')
Race/ethnicity (ref: White)									
Black	0.82***	1.03***	1.08***	1.58***	1.78***	0.86***	1.07***	1.73***	1.80***
Hispanic	0.38***	0.53***	0.49***	0.59***	0.81***	0.39***	0.55***	0.84***	0.90***
Asian	0.72***	0.79***	0.49***	0.46***	0.53***	0.72***	0.78***	0.55***	0.61***
Parental education (ref: High School)									
BA or higher		2.72***	1.81***	1.46***	1.49***		2.50***	1.47***	1.41***
AA or some college		1.25***	1.18***	1.12***	1.17***		1.22***	1.17***	1.15***
Below high school		0.77***	0.71***	0.74***	0.83***		0.77***	0.82***	0.85***
Pseudo R^2	0.02	0.05	0.20	0.22	0.29	0.02	0.04	0.27	0.27

	Out-of-state college attendance								
	All students					Public school students			
	N = 1,223,696					N = 959,375			
Model	(0)	(1)	(2)	(3)	(4)	(0')	(1')	(4')	(5')
Race/ethnicity (ref: White)									
Black	0.79***	0.96***	1.07***	1.45***	1.61***	0.80***	0.97***	1.56***	1.69***
Hispanic	0.37***	0.50***	0.52***	0.60***	0.76***	0.37***	0.50***	0.79***	0.85***
Asian	0.68***	0.72***	0.59***	0.55***	0.57***	0.66***	0.69***	0.54***	0.57***
Parental education (ref: High School)									
BA or higher		2.82***	1.90***	1.60***	1.67***		2.58***	1.65***	1.54***

Table 5 continued

	Out-of-state college attendance								
	All students					Public school students			
	N = 1,223,696					N = 959,375			
AA or some college		1.24***	1.17***	1.12***	1.17****		1.22***	1.17***	1.13****
Below high school		0.77****	0.78****	0.82****	0.87****		0.78****	0.85****	0.92****
Pseudo R^2	0.01	0.04	0.10	0.11	0.17	0.01	0.04	0.15	0.15
Control included									
Gender & family SES			Yes	Yes	Yes		Yes	Yes	Yes
Academic achievement				Yes	Yes			Yes	Yes
State fixed effects					Yes			Yes	Yes
Public high school characteristics								Yes	Yes

Source: 2010 SAT data, the College Board

All models also include missing category for race/ethnicity and parental education

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

scores to in- and out-of-state institutions" and "sending scores to out-of-state institutions only" categories are collapsed together into one "out-of-state" score-sending category. The left five columns in Table 5 are estimates obtained for students from both public and private high schools. In addition to the models specified in the "Data and Methods" section, we also estimate the model (0) that only includes race/ethnicity variables. Consistent with what we find in descriptive analyses, minority students are less likely than Whites to send scores to and attend an out-of-state institution, and Hispanic students are the least likely, only about 40 % as likely to do so. Different from Asian students, the lower likelihood for Hispanic and Black students is substantially due to lower levels of parental education (column (0) and (1)). Therefore, compared with White students with similar parental education, Blacks are about equally likely, and Hispanics are half as likely to send scores to or attend an out-of-state institution. Meanwhile, for students of the same race/ethnicity group, those with college-educated parents are nearly three times as likely as those students having high school educated parents to send scores to or attend an out-of-state institution; those with parents lacking a high school diploma are only about 80 % as likely to do so.

The higher likelihood for students with college-educated parents to send scores to and attend an out-of-state institution is substantially derived from high family incomes, and Asians would actually be much less likely to consider an out-of-state institution and leave home states if their family incomes were comparable to that of Whites. Beside gender, Model (2) considers several variables capturing family income. The very large increases in pseudo R^2 statistics indicate that family income variables largely contribute to the differences in out-of-state college-going. Odds ratio estimates of family income variables reveal the greater inclination to consider an out-of-state institution and leave home states for students attending private high schools, coming from high family income categories, and sending scores to more institutions. As a result of including these family income related covariates, the estimates on the "parental education: BA or higher" category drop substantially, as do the estimates on the "Asian" category (columns (1) and (2)), but estimates remain relatively stable for other race/ethnicity and parental education categories.

The higher likelihood for students with college-educated parents to send scores to and attend an out-of-state institution are further derived from academic preparation, and Blacks would be much more likely to consider an out-of-state institution and leave home states if their academic preparation were comparable to that of Whites. To be specific, Model (3) further considers students' academic preparation. Odds ratio estimates of academic preparation variables reveal the greater inclination to consider an out-of-state institution and leave home states for high scoring students, top decile students and students self-rated as top decile in math ability. As a result of including academic preparation variables, the estimates on "parental education: BA or higher" category drop further, however the estimates on "Black" category increase substantially (columns (2) and (3)), but estimates remain relatively stable for other race/ethnicity and parental education categories.

Differences by states contribute to Hispanic students' lower likelihood in out-of-state score-sending and college attendance, but not much to the differences by parental education. Model (4) includes state fixed effects to capture differences by states, and the estimates on "Black" and "Hispanic" categories become larger, especially for Hispanics; but the magnitude of changes are muted for "Asian" and parental education categories. More importantly, differences by race/ethnicity and parental education persist after all covariates are considered. Specifically, Black students are about 80 % more likely to send scores to and 60 % more likely to attend an out-of-state institution than similar White students from the same state; Hispanic students are about 80 % as likely and Asians are about 50 % as likely to do so. Students with college-educated parents are about 50 % more

likely to send scores to and 70 % more likely to attend an out-of-state institution than similar students from the same state but having high school educated parents; students with parents lacking high school diploma are only 80 % as likely to do so.

Note that pseudo R^2 statistics increase substantially when state fixed effects are included, indicating that state variations substantially contribute to differences in students' out-of-state college going. And this is consistent with the findings of the migration research reviewed earlier: college freshmen migration is significantly related to the state variations in postsecondary education opportunities, spatial arrangement and other characteristics. Because the inclusion of state fixed effects leads to larger changes in estimates of race/ethnicity categories but not in estimates of parental education categories, in the next section we examine several large and diverse states and several states with HBCUs to explore the race/ethnicity differences in out-of-state score-sending and college attendance by states.

Among public school students, the differences by race/ethnicity and parental education in out-of-state score-sending and college attendance are marginally attributable to a high school's social-economic status as measured by the percent of the student body qualifying for free or reduced-price lunch. Because high school characteristic variables are only available for public schools, we re-estimate models (1)–(4) for public school students, which we label (1′)–(4′) and then estimate model (5′) that further includes the public high school variables. With rare exceptions, the estimates for race/ethnicity and parental education categories obtained from (1′) to (4′) are similar to those obtained using all students, which is not surprising because 80 % of students attended public high schools. To be parsimonious, we report these estimates from models (1′), (4′) and (5′) in the right section of Table 5. The estimates of race/ethnicity categories become slightly larger in model (5′) as compared with those from model (4′), and the estimates of "parental education: BA or higher" become somewhat smaller. Odds ratio estimates of high school characteristics show that they are significantly related to out-of-state score-sending and college attendance. Compared with students from suburban high schools, those from urban high schools are more likely to consider and attend an out-of-state institution, and the opposite is true for those from rural high schools. The higher proportion of students receiving free or reduced-priced lunch in the high school attended, the less likely students would consider and attend an out-of-state institution. Higher proportions of Hispanic or Asian students are associated with lower likelihoods of out-of-state college going. Taken together, the changes in estimates indicate that Hispanics' lower likelihood in out-of-state college-going is marginally due to their attendance at high schools with high concentrations of poverty and students of their own race/ethnicity group. And the high school attended marginally contributes to higher likelihood in out-of-state college-going among students with college-educated parents.

One point is noteworthy when we compare odds ratio estimates on two outcomes: out-of-state score-sending and college attendance. Thus far, we have discussed estimates of race/ethnicity and parental education on these two outcomes together, and indeed, the estimates are rather similar for both outcomes. However, the odds ratio estimates of "parental education: BA or higher" are substantively higher on attendance outcomes than on score-sending outcomes, and more so as we expand the model to include additional covariates.[15] That is, the higher likelihood for these students to leave are more pronounced

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[15] Using a seemingly unrelated estimation procedure, we formally test whether the estimates of race/ethnicity and parental education categories obtained on score-sending outcomes are different from those obtained on the college attendance outcome. With the exception of "parental education: AA or some college" category, estimates of all race/ethnicity and parental education categories are significantly different. However, the magnitude of differences are larger for "parental education: BA or higher" category and become even larger when we expanded the model sequentially.

when we examine attendance outcomes, more so after family income, academic preparation, state residency and high school characteristics are considered. We reported in Table 4 and discussed earlier, that compared with other students, those with college-educated parents had the highest rates in out-of-state attendance across score-sending categories. Therefore, we consider the more pronounced attendance differentials as a result of highly successful transitions from out-of-state score-sending to college attendance.

Race/Ethnicity Differences by States

Descriptive analyses have shown that Hispanic students had the lowest rate of sending scores to and attending an out-of-state institution; the out-of-state college score-sending and attendance rates were lower for Black students and much lower for Asian students than for Whites. Multivariate analyses further reveal that the low out-of-state college-going among Black and Hispanic students are largely driven by their lower parental education and poor academic preparation; yet Asian students' out-of-state college-going are actually buttressed by their relative higher family income and stronger academic preparation. When parental education, family SES, academic preparation and state variation are considered, Black students are actually much more likely than Whites to leave home states for college, yet Hispanics are about 80–90 % as likely and Asian students are just 50–60 % as likely to send scores to and attend out-of-state institutions.

These findings are somewhat surprising, and in contrast strongly with the findings on attending selective institutions. Earlier studies found that underrepresented minorities had lower chances in applying to and attending selective institutions compared with White and Asian students when academic preparation were considered (e.g. Bowen et al. 2005). Studies on leaving home for college paid particular attention to Hispanic students, leaving much to be understood about Black and Asian students. One might consider that students from different racial/ethnic groups possess different culture or social capital, and one might also consider that racial segregation and concentration of poverty might prompt students to flee far from their home states when opportunities arise.

Another direction is to conduct more detailed analyses on state variations that might be related to these differences. In this study, we examine how racial concentration and the presence of Historically Black Colleges and Universities in a state may affect minority students' out-of-state college-going.[16] Asian students and Hispanic students are highly concentrated in just a few states, and historically black colleges and universities (HBCUs) were established to serve the black community and most are located in the formal states of Confederacy.

There were six states, namely California, Florida, New Jersey, New York, Texas and Pennsylvania, each accounted for more than 5 % of all SAT takers among 2010 high school seniors. HBCUs are located in 21 states and only 11 of these are SAT-dominant states. Among these 11, eight states that each accounted for about 2 % or more of all SAT takers among 2010 high school seniors. Besides Florida, Texas and Pennsylvania, the rest five states were Georgia, North Carolina, South Carolina, Maryland and Virginia. We

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[16] In addition to the racial concentration and the presence of Historically Black Colleges and Universities, state policies also affect minority students' out-of-state college-going decisions. In particular, in the late 1990s, California and Texas banned the use of affirmative action measures in college admissions, which has resulted Black and Hispanic enrollment drops at public institutions (e.g., Tienda et al. 2003; Long 2007; Hinrichs 2012; Arcidiacono et al. 2012). These policies were considered contributing factors that drove highly qualified minorities out-of-state (e.g., Orfield 1998; Santos et al. 2010). Nonetheless, we still find that Hispanic and Asian students in California had a stronger preference to stay compared to those in other states.

therefore investigate the out-of-state score-sending and college attendance for students in these states to gain further understanding of the out-of-state college choices among minority students.

Table 6 shows the state distribution of all SAT takers among 2010 high school seniors and for each race/ethnicity group. Hispanics were highly concentrated in four states—about 30 % were from California, 22 % from Texas, 12 % from Florida and 11 % from New York. Another 5 % Hispanics were from New Jersey, and this proportion was comparable to the state distributions of all SAT takers (about 6 %) and that of other racial/ethnic groups (about 6 % each). We therefore consider that they had a substantial presence in New Jersey. However, the proportion of Hispanics from Pennsylvania was low—2 %—and much smaller than that of all SAT takers, that of Whites and even that of Blacks and Asians, so was the proportion of Hispanics from Georgia, North Carolina, South Carolina, Maryland, Virginia, "other states w/HBCUs" and "all other states." That is, they were an "absolute minority" in these states. Asians were highly concentrated in California and New York, taking a share of 34 and 11 %, respectively. Although the proportion of Asians from New Jersey was not very high, their presence was not doubt substantial when comparing the proportion with that of all SAT takers and that of other racial/ethnic groups, and so was their presence in Maryland, though to a less extent. In Florida, Pennsylvania, North and South Carolina and other states with HBCUs, however, they were clearly an "absolute minority." In contrast, Blacks were not highly concentrated in just few states, top three states for Black SAT takers were New York, Georgia and Texas, each accounted about 10 % of test takers, note that even though about 8 % Black test takers were from California, they were actually an "absolute minority" in that state.

We repeat model estimations separately for students from these states. Table 6 reports odds ratio estimates of race/ethnicity and parental education categories on out-of-state score-sending and college attendance. To be parsimonious, Table 6 only reports the estimates from full model (4) for all students. These state-specific estimates show the low likelihood of Hispanic and Asian students in out-of-state college-going relative to Whites, which is largely driven by students' choices in a few states where they are highly concentrated or their presence are substantial. Without exceptions, in these states, their odds ratio estimates on out-of-state score-sending and college attendance are substantially lower than their odds ratio estimates in the states where they are an "absolute minority." Specifically, in California, Florida, New Jersey, New York and Texas, where Hispanics are highly concentrated or their presence are substantial, they are less likely to send scores to and attend an out-of-state institution compared with similar Whites from the same state. However, in Pennsylvania and other states, where they are an "absolute minority," they are about equally or more likely to consider and do leave compared with similar Whites from the same state. In California, New Jersey, New York, where Asians are highly concentrated or their presence are substantial, they are less than half as likely to attend an out-of-state institution compared with similar Whites from the same state. Particularly in California, Asians are only one-third as likely as Whites to both send scores to and attend an out-of-state institution. However, in other states, where Asians are an "absolute minority," they are 70–80 % as likely, or about equally likely, and even in one case more likely (in South Carolina) to consider and leave compared with similar Whites from the same state. These differential estimates seem to indicate that Hispanics and Asians have a strong preference for staying in states where their own race/ethnicity presence is significant.

This preference of Hispanic and Asian students is even more salient when we consider the following three matters. First, in contrast to Hispanic and Asian students' preferences, the concentration of Black students and presence of HBCUs in a state seem irrelevant to

Table 6 Students' distribution by states: all and by race/ethnicity

2010 SAT Takers, N = 1,454,198

	CA (%)	FL (%)	NJ (%)	NY (%)	TX (%)	PA (%)	GA (%)	NC (%)	SC (%)	MD (%)	VA (%)	Other states w/HBCUs (%)	All other states (%)	Row total (%)
All SAT Takers	14.5	7.1	5.8	11.0	10.2	7.2	4.5	4.0	1.7	3.2	4.1	4.7	22.1	100.0
White	8.7	6.1	5.9	10.4	7.9	9.6	4.3	4.4	2.0	2.9	4.3	5.9	27.8	100.0
Black	7.5	8.5	5.6	12.2	10.6	6.1	10.7	7.1	3.4	7.3	6.1	5.1	10.0	100.0
Hispanic	29.6	11.8	5.3	11.4	21.6	1.9	1.5	1.3	0.4	1.2	1.5	1.0	11.6	100.0
Asian	33.7	3.5	6.1	10.5	7.4	3.0	2.7	1.7	0.5	2.7	3.6	3.5	21.0	100.0

Source: 2010 SAT data, the College Board

whether Black students stay or leave home states for college. Blacks are as likely to leave CA, where they are an "absolute minority," as to leave NY or SC. NY is a top state for Black test takers and their presence is no doubt substantial, and there are nine HBCUs in South Carolina. Second, in contrast to state variations for Hispanics and Asians, the estimates of parental education categories are quite stable across states. Third, the overall out-of-state college going rates seem irrelevant to the state variations in race/ethnicity. Table 7 also reports the state specific out-of-state score-sending and college attendance rates. Consistent with other studies based on aggregate postsecondary enrollment data (Postsecondary Education Opportunity 1996b; Cooke and Boyle 2011), New Jersey has the highest proportion of high school graduates leaving their home state for college; California is among those states with the lowest. Yet, relative to comparable White students from the same state, Hispanics and Asians living in California or New Jersey have the lowest odds of leaving their home states.[17]

Leaving Home States for a Better College?

In this study, when we examine out-of-state college attendance, the assumption is that leaving home states for college provides additional benefits compared with attending college in home states. We are curious whether the assumed benefits are real and therefore examine characteristics of institutions attended. Specifically, we focus on the following three characteristics: public/private status, four-year institution status, and Barron's selectivity. Table 8 compares the proportions of students attending a private, a 4-year, a selective institution (any "most competitive," "highly competitive" and "very competitive" institution based on Barron's selectivity index) and a "most competitive" institution specifically.[18] The proportions are reported for all students, by race/ethnicity, and by parental education. As we discussed earlier, students attending an out-of-state institution usually were better academically prepared and therefore likely to attend more selective institutions; we therefore also restrict the comparison to high-performing students reported in the lower panel of Table 8.[19]

   The top panel of Table 8 shows that, in general, compared with students attending college in their home states, a higher proportion of students leaving home states for college attended a private, a 4-year, and a selective institution, and a much higher proportion of those leaving home states attended a "most competitive" institution. These patterns hold across race/ethnicity and parental education categories. Importantly,

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[17] These low odds might be the result of strong preferences of staying with their own race/ethnicity groups as well as other unique characteristics of the states appearing very attractive to Hispanics and Asians. For example, California offers one of the strongest public post-secondary education systems (Kodrzycki 2001), and New Jersey is within easy access to several greater metro areas on the east coast (Cooke and Boyle 2011).

[18] We also explored academic under-matching that has attracted much attention recently (Roderick et al. 2008; Bowen et al. 2009; Bastedo and Jaquette 2011; Smith et al. 2012). Following a simpler operational definition of the "individual-institutional fit" (Long 2004), we define under-matching as a student' SAT scores are above 75th percentile of incoming freshmen at the institution attended. We found that, among high performing students, under-matching was substantially lower among those leaving their home states for college.

[19] Although academic preparation is an important correlate of out-of-state college attendance, other factors are important too. To rigorously examine whether students going out-of-state for college indeed attend a better institution than comparable students staying in their home states, propensity score matching methods using state-specific data could be an option.

Table 7 Odds ratio estimates on out-of-state score-sending and college attendance, state specific

	CA	FL	NJ	NY	TX	PA	GA	NC	SC	MD	VA	Other states w/HBCUs	All other states
Out-of-state score-sending, full model (4)													
N	158,695	70,117	63,119	103,534	106,939	73,163	49,655	46,089	19,779	35,102	42,695	47,964	223,859
Race/ethnicity (ref: White)													
Black	1.93***	1.30***	1.36***	2.00***	1.75***	2.86***	1.73***	1.38***	1.98***	1.61***	1.79***	2.02***	1.91***
Hispanic	0.58***	0.76***	0.54***	0.72***	0.88***	1.25***	0.95	1.30***	1.27*	1.05	1.17*	1.30***	0.93**
Asian	0.34***	0.81***	0.60***	0.43***	0.68***	0.94	0.65***	0.82***	1.40**	0.67***	0.76***	1.12	0.75***
Parental education (ref: High School)													
BA(+)	1.34***	1.34***	1.47***	1.36***	1.49***	1.64***	1.65***	1.56***	1.34***	1.32***	1.30***	1.31***	1.61***
AA(−)	1.16***	1.12***	1.21***	1.16***	1.14***	1.23***	1.17***	1.14***	1.10	1.14*	1.08	1.03	1.18***
Below HS	0.77***	0.92***	0.81***	0.84***	0.79***	0.93	0.87	0.99	1.19	0.76**	0.86	0.75*	0.83***
Pseudo R²	0.24	0.22	0.32	0.29	0.21	0.24	0.24	0.21	0.20	0.28	0.21	0.27	0.33
% Out-of-state score-sending among SAT Takers sending scores	44 %	46 %	80 %	56 %	49 %	55 %	53 %	43 %	59 %	80 %	62 %	79 %	71 %
Out-of-state college attendance, full model (4)													
N	181,965	86,379	73,676	135,286	120,181	86,912	54,266	49,387	21,642	39,008	49,700	60,725	264,569
Race/ethnicity (ref: White)													
Black	1.56***	1.56***	1.19***	1.90***	1.63***	1.93***	1.94***	1.21***	2.41***	1.34***	1.68***	1.55***	1.47***
Hispanic	0.54***	0.86***	0.54***	0.82***	0.72***	1.21***	0.97	1.23**	1.59***	0.92	1.15*	1.05	0.83***
Asian	0.36***	0.92	0.43***	0.48***	0.60***	0.91*	0.72***	0.87	2.26***	0.52***	0.75***	0.88***	0.69***
Parental education (ref: High School)													
BA(+)	1.56***	1.34***	1.81***	1.58***	1.59***	1.67***	1.86***	1.65***	1.66***	1.68***	1.49***	1.53***	1.73***

Table 7 continued

| | Out-of-state college attendance, full model (4) | | | | | | | | | | | | |
	CA	FL	NJ	NY	TX	PA	GA	NC	SC	MD	VA	Other states w/HBCUs	All other states
AA(−)	1.12***	1.01	1.26****	1.17***	1.07	1.19***	1.16**	1.20**	1.25**	1.23***	1.11*	1.07	1.18***
Below HS	0.74****	0.93	0.93	0.85**	0.97	0.99	0.95	1.06	1.11	0.98	0.94	1.06	0.85****
Pseudo R^2	0.13	0.10	0.18	0.14	0.10	0.09	0.08	0.08	0.07	0.11	0.07	0.15	0.17
% Out-of-state College Attendance among SAT Takers attending colleges	15 %	14 %	43 %	21 %	14 %	19 %	19 %	13 %	12 %	38 %	21 %	35 %	34 %

Source: 2010 SAT data, the College Board

Model specifications see Table 5

*** p < 0.001, ** p < 0.01, * p < 0.05

Table 8 Out-of-state college attendance: institutional characteristics

2010 SAT Takers attending college in The U.S., N = 1,223,146

	N	Private		Four-year		Competitive (most, highly, very competitive)[a]		Most competitive[a]	
		In-state (%)	Out-of-state (%)	In-state (%)	Out-of-state (%)	In-state (%)	Out-of-state (%)	In-state (%)	Out-of-state (%)
All Students									
All	1,223,696	16	59	70	95	44	62	4	20
By race/ethnicity									
White	726,591	18	59	74	96	48	65	4	18
Black	155,612	15	55	67	91	25	33	3	11
Hispanic	170,054	11	61	61	91	35	58	3	22
Asian	115,255	13	66	74	96	59	80	9	40
By parental education									
BA or higher	639,580	18	60	79	97	54	69	6	23
AA or some college	295,898	15	53	65	90	34	41	2	8
High school	138,995	14	54	63	88	31	38	2	9
Below high school	52,252	10	63	57	87	30	45	3	18
High performing students: GPA A, top 10 % self-rated math abilities, test scores at least 1 SD above national mean									
All	56,130	28	80	98	100	87	95	26	66
By race/ethnicity									
White	39,850	29	77	98	100	85	94	23	61
Black	858	38	90	99	100	74	89	38	80
Hispanic	2,458	32	84	97	100	88	96	31	80
Asian	10,785	25	85	98	100	94	98	34	80
By parental education									
BA or higher	47,807	28	79	98	100	88	95	26	66
AA or some college	3,915	27	79	96	100	80	92	20	56

Table 8 continued

2010 SAT Takers attending college in The U.S., N = 1,223,146

	N	Private		Four-year		Competitive (most, highly, very competitive)[a]		Most competitive[a]	
		In-state (%)	Out-of-state (%)	In-state (%)	Out-of-state (%)	In-state (%)	Out-of-state (%)	In-state (%)	Out-of-state (%)
High school	1,198	34	83	96	100	83	92	25	68
Below high school	281	28	94	99	100	94	99	35	91

Source: 2010 SAT data, the College Board

[a] These percentages are derived only among those who attended an institutions with a Barron's selectivity classification

among those leaving their home states for college, we do not observe a disadvantage among Hispanic students nor a clear gradient by parental education. For example, among these students, about 60 % of Whites and Hispanics attended a private institution; about 18 % of Whites, about 22 % and a higher proportion of Hispanics attended a "most competitive" institution.

When we restrict to high-performing students who earned a GPA of A, self-rated as among top 10 % of students in math ability and scored at least one standard deviation above the SAT mean, we see overall the same story. Those leaving home states attended private, selective institutions at higher proportions, though the proportions are higher for both groups of students who stayed and who left. Almost all high-performing students attended a 4-year institution and most attended a selective institution; however, a majority of those leaving home states attended a "most competitive" institution, compared with one-quarter of those staying.

Furthermore, for high performing students, Hispanic disadvantages and differences by parental education disappeared and even flipped for both students who stayed and students who left home states. It seems that high performing Black and Hispanic students and high performing students with parents lacking a Bachelor's degree gained much more in their access to a better college by leaving their home states, possibly as a result of active recruiting from private institutions and the most competitive institutions. For example, for students with college-educated parents, 26 % of those staying in their home state attended a "most competitive" institution, and the proportion increased to 66 % among those leaving; in comparison, for students with parents lacking high school diploma, the proportion increased from 35 to 91 %.

We realize that students consider many factors in choosing a college to attend, such as the majors available, net price, and social and racial climate of the campus, in conjunction with family responsibility. However, the literature repeatedly finds that attending a private, a selective institution often likely leads to higher likelihood of persistence, graduation and better labor market outcomes, particularly among underrepresented minorities and those from low income families (Bowen and Bok 1998; Brewer et al. 1999; Hoxby 2001; Dale and Krueger 2002; Black and Smith 2004; Bowen et al. 2009; Melguizo 2010). It seems that students leaving states for college likely have better future prospects by attending a better college.

Summary and Concluding Remarks

Using the College Board SAT registration and questionnaire data of 2010 high school graduating seniors, we examine differences in out-of-state college-going—one important aspect of the college choice decision that has received limited attention in college choice research. In particular, we focus on differences by race/ethnicity and parental education with regard to two outcomes: out-of-state score-sending and actual attendance. Empirical analyses lead to four major findings. First, among the 2010 graduating seniors taking the SAT, for all outcomes we examined—out-of-state score-sending, number of scores sent, out-of-state college attendance, successful transition from out-of-state score-sending to out-of-state college attendance—there is a consistent story by race/ethnicity groups and parental education. White students almost always had the highest rates and Hispanic students had the lowest rates, and there was a clear gradient by parental education with the students with college-educated parents having the highest rates.

Second, family income, academic preparation, high school characteristics and state of residence contribute to explain the differences in out-of-state score sending and college

attendance by race/ethnicity and parental education. However, substantial differences by race/ethnicity and parental education still persist. The story remains when we further consider public high school characteristics among public school students and when we consider only students from the 24 SAT dominant states and the District of Columbia. Third, state-specific estimates show that Hispanic and Asian students' low likelihood in out-of-state college-going relative to Whites are largely driven by students' choices in a few states where they are highly concentrated or their presence are substantial. It seems that Hispanics and Asians have a strong preference for staying in states where their own race/ethnicity presence is significant. In contrast, the concentration of Black students and presence of HBCUs in a state seem irrelevant to whether Black students stay or leave home states for college. And lastly, compared with students attending college in their home states, a higher proportion of students leaving home states attended a private, a 4-year, and a selective institution. Among those leaving home states for college, we do not observe Hispanics' disadvantages and clear gradient by parental education. Furthermore, it seems that high performing Black and Hispanic and those with parents lacking a Bachelor's degree gained much more in their access to a better college by leaving their home states.

Our findings contribute to the current understanding of college choices regarding college locations. Earlier studies focusing on college selectivity found that students from families of low socioeconomic status were constrained in their choices even after considering their weaker academic preparation and their attendance in high schools with fewer peers going to selective colleges. (e.g. Bastedo and Jaquette 2011). In this study, we established evidence of differences by race/ethnicity and parental education along yet another aspect of college choice—out-of state college-going.

Although the main findings are discouraging, the suggestive findings that students leaving home states did attend a better college are encouraging. Students may consider leave their home states for better educational opportunity and broader job opportunities later in their life. Of course, the financial burden of leaving home states should not be underestimated for those students with limited resources, yet the net expense may not be much higher, particularly for those high performing Hispanic and Black students and those from low income families. Highly selective institutions often practice "need-based financial aid" policies with the result that attending these highly selective colleges are reasonably affordable for low-income families (Hill et al. 2005).

A similarity between findings on out-of-state score-sending and actual attendance indicates how choices in the early stage of the college search process may constrain a student's final enrollment result. Students need to be encouraged to consider and apply to "match" schools, "safety" schools and "reach" schools, which may include out-of-state institutions. Given that those sending scores to in-state institutions only sent to few than 4 institutions (SAT takers can scores to 4 institutions for free), students may do well to consider sending scores to additional institutions, perhaps one out of their home state, to expand their choices.

Appendix

See Tables 9, 10 and 11

Table 9 Summary statistics by out-of-state score-sending

2010 SAT Takers, N = 1,454,198[a]

	No score-sending	In-state only	Out-of-state only	Both in and out
N	412,916	428,257	110,998	501,455
Individual attributes and family SES				
Sex				
Male	0.48	0.44	0.47	0.47
Female	0.52	0.56	0.53	0.53
High school attended				
Public	0.83	0.88	0.69	0.80
Private	0.17	0.12	0.31	0.20
Score-sent				
Count	n.a.	3.45	3.97	6.90
Parental income				
Less than 30K	0.14	0.15	0.07	0.08
Between 30K and 50K	0.11	0.11	0.07	0.08
Between 50K and 100K	0.22	0.22	0.18	0.21
Between 100K and 160K	0.09	0.12	0.14	0.16
More than 160K	0.04	0.05	0.14	0.11
Missing	0.40	0.35	0.40	0.36
Academic achievement				
SAT scores				
Reading	448	483	544	550
Math	454	496	551	563
Writing	436	473	537	543
GPA				
A	0.25	0.40	0.49	0.55
B	0.49	0.46	0.39	0.37
C or lower	0.18	0.09	0.07	0.05
Missing	0.08	0.05	0.05	0.03
Class rank				
Top 10 %	0.07	0.13	0.19	0.23
Second 10 %	0.10	0.14	0.12	0.14
Third 10 % or lower/missing	0.83	0.73	0.69	0.63
Self-rated math ability				
Top 10 %	0.10	0.16	0.24	0.28
Above average	0.27	0.34	0.32	0.35
Average	0.44	0.36	0.27	0.24
Below average	0.05	0.03	0.02	0.02
Missing	0.14	0.11	0.15	0.11

Source: 2010 SAT data, the College Board

[a] Students who sent scores to institutions abroad and in U.S. Territory only are not presented in the table

Table 10 Summary statistics by out-of-state college attendance

2010 SAT Takers, N = 1,454,198[a]

	No college/missing	In-state	Out-of-state
N	230,467	936,659	287,037
Individual attributes and family SES			
Sex			
Male	0.50	0.46	0.46
Female	0.50	0.54	0.54
High school attended			
Public	0.81	0.86	0.73
Private	0.19	0.14	0.27
Score-sent			
Count	2.26	3.44	5.68
Parental income			
Less than 30K	0.17	0.12	0.06
Between 30K and 50K	0.11	0.10	0.06
Between 50K and 100K	0.17	0.24	0.18
Between 100K and 160K	0.08	0.13	0.16
More than 160K	0.05	0.06	0.15
Missing	0.42	0.35	0.39
Academic achievement			
SAT scores			
Reading	455	496	554
Math	464	508	563
Writing	442	486	548
GPA			
A	0.26	0.42	0.52
B	0.46	0.44	0.38
C or lower	0.19	0.09	0.06
Missing	0.09	0.05	0.04
Class rank			
Top 10 %	0.08	0.15	0.20
Second 10 %	0.09	0.13	0.12
Third 10 % or Lower/missing	0.83	0.72	0.68
Self-rated math ability			
Top 10 %	0.13	0.19	0.26
Above Average	0.26	0.33	0.34
Average	0.38	0.34	0.25
Below average	0.05	0.03	0.02
Missing	0.18	0.11	0.13

Source: 2010 SAT data, the College Board

[a] Students who attended institutions in US territory are not presented in the table

Table 11 Summary statistics by out-of-state score-sending and college attendance

2010 SAT Takers from pubic high schools, N = 1,129,938[a]

	Out-of-state score-sending			
	No score-sending	In-state only	Out-of-state only	Both in and out
N	319,462	352,681	73,361	384,029
High school characteristics				
SES				
Students receiving free or reduced-priced lunch	0.37	0.37	0.25	0.27
Urbanicity				
Urban	0.26	0.29	0.23	0.25
Suburb	0.42	0.41	0.49	0.50
Town	0.09	0.08	0.08	0.06
Rural	0.23	0.22	0.20	0.19
Race/ethnicity composition (9–12 Grade)				
Black	0.16	0.16	0.14	0.14
Hispanic	0.20	0.24	0.12	0.15
Asian	0.05	0.07	0.07	0.08
White	0.56	0.52	0.65	0.61

	Out-of-state college attendance		
	Not college/missing	In-state	Out-of-state
N	170,535	759,491	199,884
SES			
Students receiving free or reduced-priced lunch	0.40	0.34	0.23
High school characteristics			
Urbanicity			
Urban	0.31	0.27	0.22

Table 11 continued

	Out-of-state college attendance		
	Not college/ missing	In-state	Out-of-state
Suburb	0.39	0.43	0.52
Town	0.08	0.08	0.07
Rural	0.22	0.22	0.19
Race/ethnicity composition (9–12 Grade)			
Black	0.19	0.15	0.13
Hispanic	0.23	0.20	0.12
Asian	0.06	0.07	0.07
White	0.51	0.56	0.66

Source: 2010 SAT data, the College Board

[a] Students who sent scores to institutions abroad and in U.S. territory only are not presented in the table, students who attended institutions in US territory are not presented in the table

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