Abstract Title Page
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Title: The Supply and Demand of High-Achieving Hispanic Students

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Abstract Body

Limit 4 pages single-spaced.

Background / Context: Hispanics are the largest minority group in the United States, increasing almost six-fold from 1970 to 2014 (Krogstad & Lopez, 2015). Although Hispanics youth in the U.S. have traditionally had lower college attendance rates, some sources suggest a narrowing of the White-Hispanic postsecondary attendance gap over the last fifteen years (Fry & Taylor, 2013). Nonetheless, overall degree attainment for Hispanics is substantially lower than for other large ethnic groups, including whites, Asians, and African-Americans (Kena et al., 2015).

Recent work has focused on the importance of college sector and quality, as mismatch appears to have a causal impact on college completion rates (Cohodes & Goodman, 2014; Dale & Krueger, 2002; Smith, Pender, & Howell, 2013). Conditional on SAT score, Hispanic students are more likely to forgo college or attend a two-year college, which may have negative consequences for Bachelor degree completion (Belfield & Bailey, 2011; Doyle, 2008; Long & Kurlaender, 2009). Even conditioning on four-year attendance, there are significant differences in attendance and completion patterns between Hispanic and white students (Figure 1). Hispanic students are less likely to attend state flagships or private colleges and universities, and are less likely to attend college out of state. Yet relatively high-performing Hispanic students have higher enrollment patterns at Ivy League schools and, for students above the 75th percentile of the Hispanic distribution, attend more selective institutions, as based on incoming SAT scores of the student body. Even given this bump in selectivity, Bachelor degree completion rates are approximately five to twenty percentage points lower for high-performing and low-performing Hispanic students, respectively. Different preferences of Hispanic students may arise based on a variety of factors, such as informational, financial, or family constraints. Preferences that place students into lower-quality institutions may depress degree attainment, yet separating students from their family, peers, or social structures have also been shown to be costly.

Purpose / Objective / Research Question / Focus of Study: A key question is whether altering Hispanic demand for specific institutions has a causal impact on degree completion. In this paper, we examine a program which provides positive feedback to high-achieving Hispanic students. First, we document that this program substantially alters student demand for postsecondary institutions, particularly in areas where Hispanic students traditionally lag behind their white peers. We then investigate whether these shifts increase postsecondary attainment.

Setting: We use a national sample of Hispanic scholars who take the 11th grade Preliminary SAT / National Merit Scholarship Qualify Test (PSAT/NMSQT, henceforth PSAT). We examine their subsequent high school academic performance, as measured by participation in College Board services (SAT, SAT score sends, Advanced Placement performance). We then follow them for four to six years (depending on the cohort) of subsequent postsecondary enrollment and completion, measured by National Student Clearinghouse data.

Population / Participants / Subjects: We study all Hispanic students who took the PSAT in 11th grade and graduated from high school from 2006-07 through 2008-09, as well as all Hispanic high school graduates residing in the Western and Southwestern portion of the United States from 2003-04 to 2009-10. Although approximately 250,000 Hispanic students take the 11th grade

PSAT in a given year, we focus on approximately 50,000 students who lie relatively close to a threshold for NHRP eligibility.

Intervention / Program / Practice: The National Hispanic Recognition Program (NHRP) identifies the top 2.5% of Hispanic scholars based on the 11th grade PSAT. In order to identify cutoffs for NHRP eligibility, the College Board takes the top Hispanic scholars within each of six regions, which are associated with College Board regional offices. The NHRP does not provide any direct financial reward but sends students a number of signals that might impact their subsequent college preparation and attendance. The College Board sends a letter directly to students that congratulates them and invites them to participate in the program; school counselors are contacted and counseled to encourage these students to apply to top universities, and to honor these awardees through some type of school recognition; and the College Board shares NHRP data to a set of "subscribing four-year postsecondary institutions that are interested in communicating with academically exceptional Hispanic/Latino students". The benefit of this list is that it provides an easy opportunity for colleges to engage in direct outreach to high-performing minority students.

Research Design: We use a regression discontinuity design to estimate the causal impact of NHRP, which compares students just above and below year- and region-specific cutoffs for eligibility. There are strong theoretical reasons for the validity of the empirical strategy. The cutoffs vary by year and are unknown ex ante, and students can only take the test one time in their junior year, which prevents any gaming of maximum scores. As with any test there is also significant measurement error in student ability, and the College Board cautions that differences in scores fewer than eight points should be not be considered statistically different (College Board, 2005). Figure 2 also shows the density of observations near the centered cutoff score, with no evidence of manipulation. Table 1 shows no evidence of breaks in the continuity of observable characteristics in the vicinity of the threshold.

Data Collection and Analysis: We rely on secondary data collected by the College Board on all PSAT takers and their scores from 2003-04 through 2009-10. We link these individual-level records to a number of auxiliary data sources. The first are records on all College Board related activities, which includes an individual's history of SAT attempts, the institutions to which they send their scores, and any Advanced Placement test-taking. The second is the National Student Clearinghouse. As of 2015, over 3,600 postsecondary institutions participate in NSC, which collects postsecondary enrollment information on more than 98 percent of students enrolled in public and private colleges within the United States. The third data source is the NCES-constructed Common Core of Data, which contains information about public school demographics and location. The fourth data source is the list of NHRP scholars from 2006-07 to 2008-09, and the postsecondary institutions that purchased the list of NHRP scholars for these three years.

Findings / Results: NHRP dramatically alters college attendance patterns for many students, increasing the likelihood that students attend college at a four-year institution, out of state, or at a public flagship by two, five, and three percentage points, respectively (Table 2). Effects on degree completion are positive but statistically insignificant, suggesting that these large effects in institutional type are playing a limited role in subsequent completion. We find that these impacts

are primarily driven by changes in college preferences for NHRP scholars, rather than changes in student quality or student preferences. As shown in the right-hand columns of Table 2, shifts towards specific colleges occur predominately towards institutions that purchased the NHRP lists in a given year. Treating initial SAT scores as exogenous (both due to no observed impacts on of NHRP on SAT scores, and the relatively close timing of initial SAT test-taking to when scores are received), we do find positive effects of degree completion for high-performing PSAT students with relatively low SAT scores. Table 3 shows that low SAT students increase their four- and six-year Bachelor degree completion by approximately five and two percentage points, respectively, though only the first value is statistically significant. These results appear strongest in the Western region, where students appear more likely to send their SAT scores to higher-quality, private institutions that do not offer explicit rewards for NHRP recognition.

Conclusions: The National Hispanic Recognition Program is an intervention that provides high-performing Hispanic students positive information about their academic preparation for college, and provides colleges with a cost-saving method for identifying and recruiting high-skilled minority students. Providing a signal of relative "within ethnicity" ability produces no measurable change in short-term academic performance, though the award induces some students to target and attend more selective, private institutions. The award seems to primarily serve as a tool for targeted outreach that induces Hispanic students to engage in postsecondary enrollment patterns in which they traditionally lag behind their white peers: at four-year institutions, both far from home and at state flagships. Providing this type of information for other underserved groups (e.g., first-generation, African-Americans) can increase competition across colleges for their attendance, which may have benefits to those targeted groups, such as a reduced debt load. Unfortunately, large shifts in sector of attendance produce little change in Bachelor degree completion rates, the ultimate outcome metric and where Hispanic students have historically lagged. NHRP does shift the geographic distribution of where students earn their degrees, and potentially alters labor market outcomes through impacts on human capital accumulation or perceived degree quality. Results highlight that more work is needed to understand the causal impact on not just completion, but on college experience and degree quality.

Appendices

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Appendix A. References

References are to be in APA version 6 format.

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Appendix B. Tables and Figures

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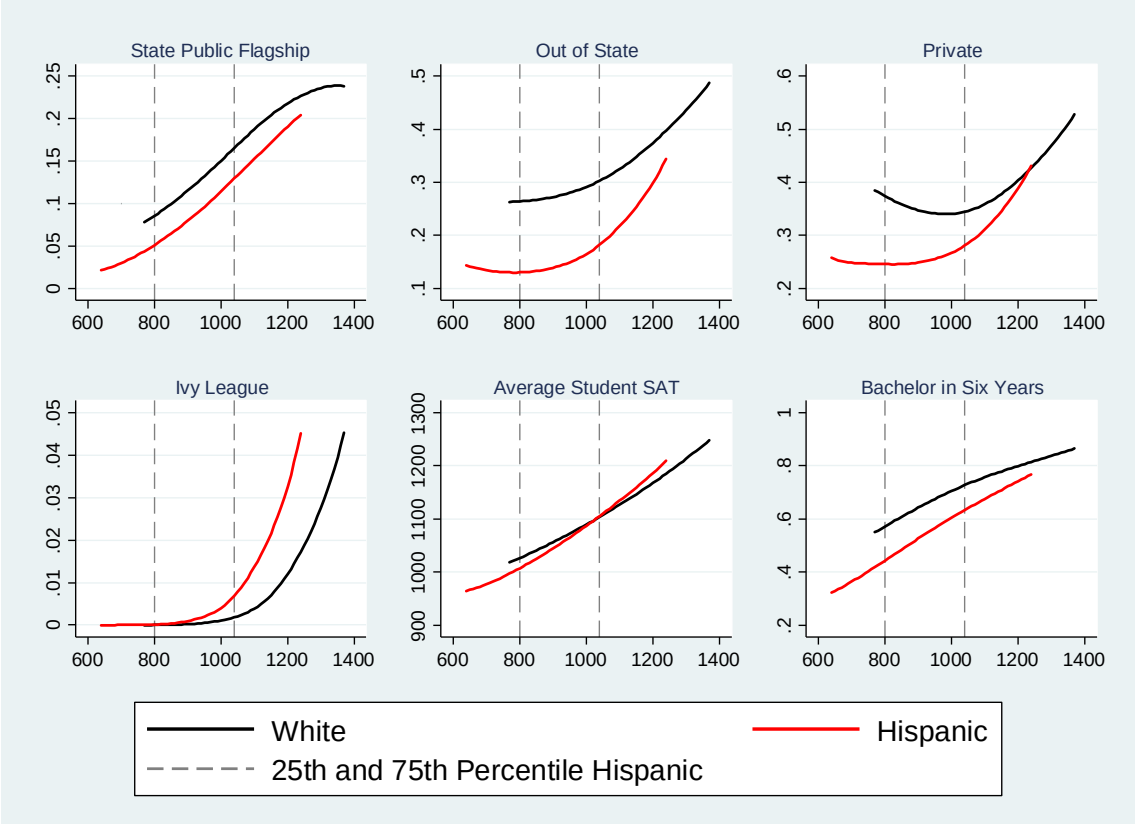
Figure 1. Sector of Four-Year Attendance, by Initial SAT Score



Notes. All results show students between the 5th and 95th percentile of their respective ethnic distribution.

Figure 2. Density of 11th Grade PSAT Scores, Hispanic Students, 2007 to 2009

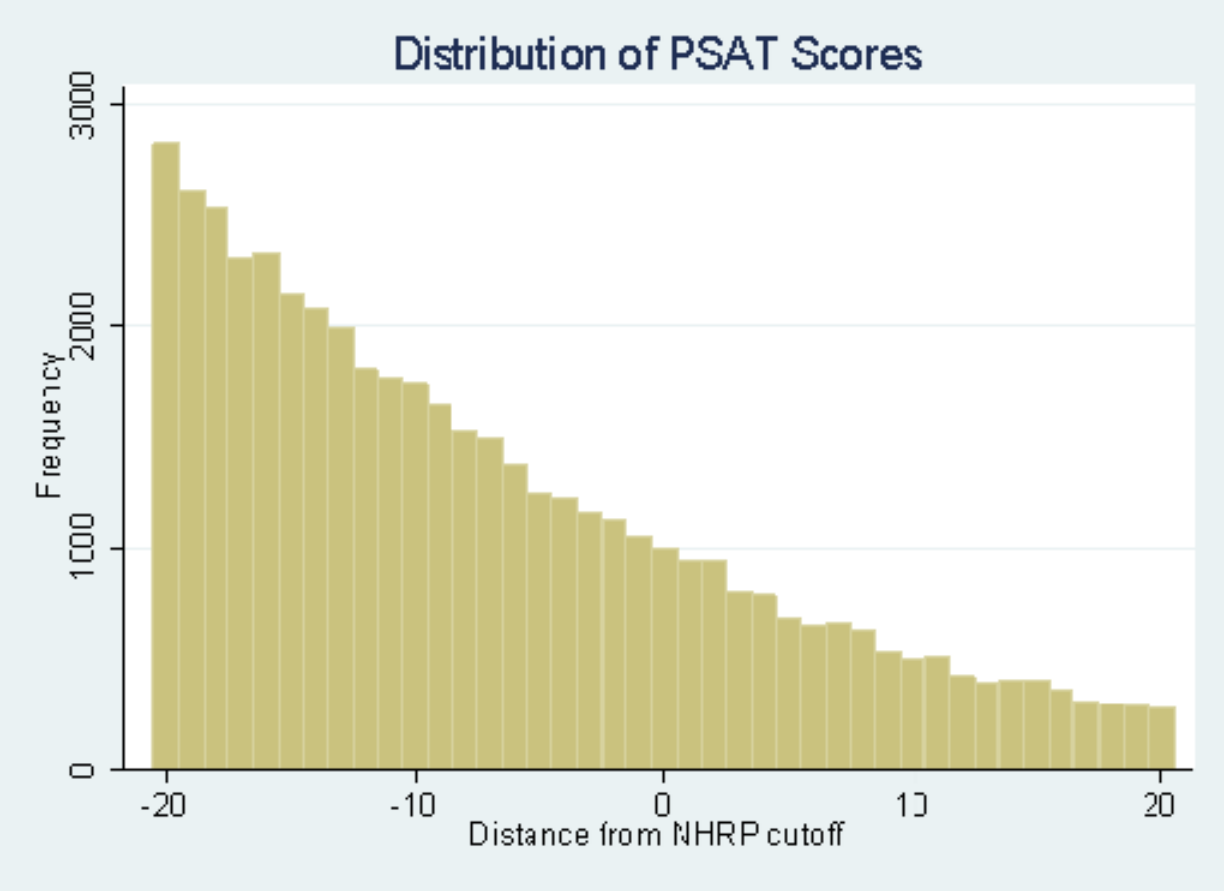


Figure 3. Attendance at NHRP Purchasing Institutions, Hispanic Students, 2007 to 2009

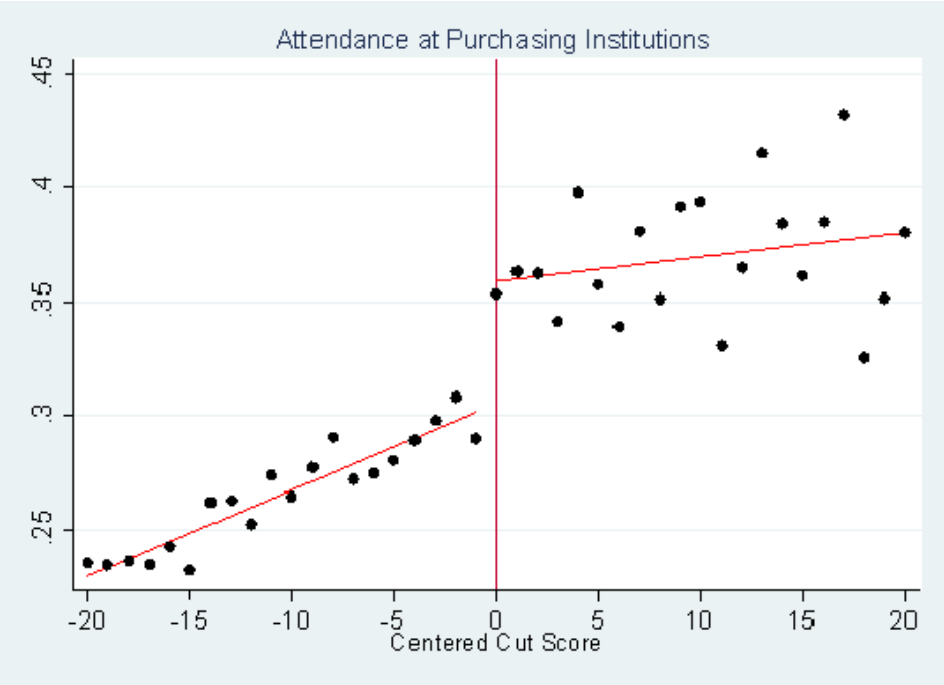


Table 1. Covariate Balance, Hispanic PSAT Takers (2007 to 2009)

	Female	Mexican-American	Puerto Rican	Other Hispanic	GPA PSAT	Previously Took PSAT	Previous PSAT Score
Effect at Cutoff	-0.002	0.007	-0.009	0.002	0.015	0.008	-0.516
	(0.013)	(0.011)	(0.007)	(0.012)	(0.011)	(0.011)	(0.347)
PSAT	-0.001	-0.002*	0.000	0.002+	0.009**	0.003**	0.884**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.030)
PSAT*Cutoff	-0.001	0.002	-0.001	-0.001	-0.003*	0.001	-0.006
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.048)
Intercept	0.506**	0.411**	0.099**	0.490**	3.726**	0.691**	170.910**
	(0.009)	(0.008)	(0.005)	(0.008)	(0.008)	(0.008)	(0.246)
N	31119	31119	31119	31119	30404	31119	21303

Notes. + p<=0.10, * p<=0.05, ** p<=0.01, *** p<=0.001. Results based on linear regressions with triangular kernels over a bandwidth of 15 PSAT points. All regressions include state by year fixed effects and heteroskedastic-robust standard errors.

Table 2. College Results, Hispanic PSAT Takers (2007 to 2009)

	Full Sample			Purchasing		Non-Purchasing	
College Sector	Estimate	Standard Error	Mean Below Threshold	Estimate	Standard Error	Estimate	Standard Error
Two-Year	-0.012+	(0.007)	8.9%	--	--	--	--
Four-Year	0.022*	(0.009)	84.3%	0.054**	(0.011)	-0.032**	(0.012)
Out of State	0.048**	(0.011)	33.0%	0.052**	(0.008)	-0.005	(0.010)
Flagship	0.028**	(0.009)	16.1%	0.029**	(0.007)	-0.000	(0.006)
Private	0.005	(0.012)	38.9%	-0.000	(0.008)	0.005	(0.011)
COFHE	-0.003	(0.008)	12.4%	-0.009*	(0.005)	0.006	(0.007)
Ivy	0.004	(0.006)	4.9%	-0.003	(0.003)	0.007	(0.005)
Degree Completion							
Four-Year	0.007	(0.012)	49.8%	--	--	--	--
Six-Year	0.014	(0.014)	68.5%	--	--	--	--
N		31119		31119		31119	

Notes. + p<=0.10, * p<=0.05, ** p<=0.01, *** p<=0.001. Results based on linear regressions with triangular kernels over a bandwidth of 15 PSAT points. All regressions include state by year fixed effects and heteroskedastic-robust standard errors.

Table 3. Heterogeneous Effects by Initial SAT Score, Hispanic PSAT Takers (All Years)

	N	Four Year	Out of State	Flagship	Private	Mean College SAT	Bachelor in Four Years	Bachelor in Six Years
ALL REGIONS								
Lowest SAT Tercile	18744	0.032*	0.082***	0.026+	0.031+	8.080	0.052**	0.018
		(0.014)	(0.017)	(0.013)	(0.018)	(5.679)	(0.019)	(0.022)
Middle SAT Tercile	13504	0.029*	0.051**	0.039**	0.008	-3.606	0.007	0.022
		(0.012)	(0.016)	(0.013)	(0.017)	(5.154)	(0.018)	(0.021)
Highest SAT Tercile	14931	0.002	0.029+	0.030*	-0.005	1.275	-0.019	-0.019
		(0.011)	(0.016)	(0.013)	(0.016)	(4.848)	(0.017)	(0.019)

Notes. + p<=0.10, * p<=0.05, ** p<=0.01, *** p<=0.001. Results based on linear regressions with triangular kernels over a bandwidth of 15 PSAT points. All regressions include state by year fixed effects and heteroskedastic-robust standard errors.