

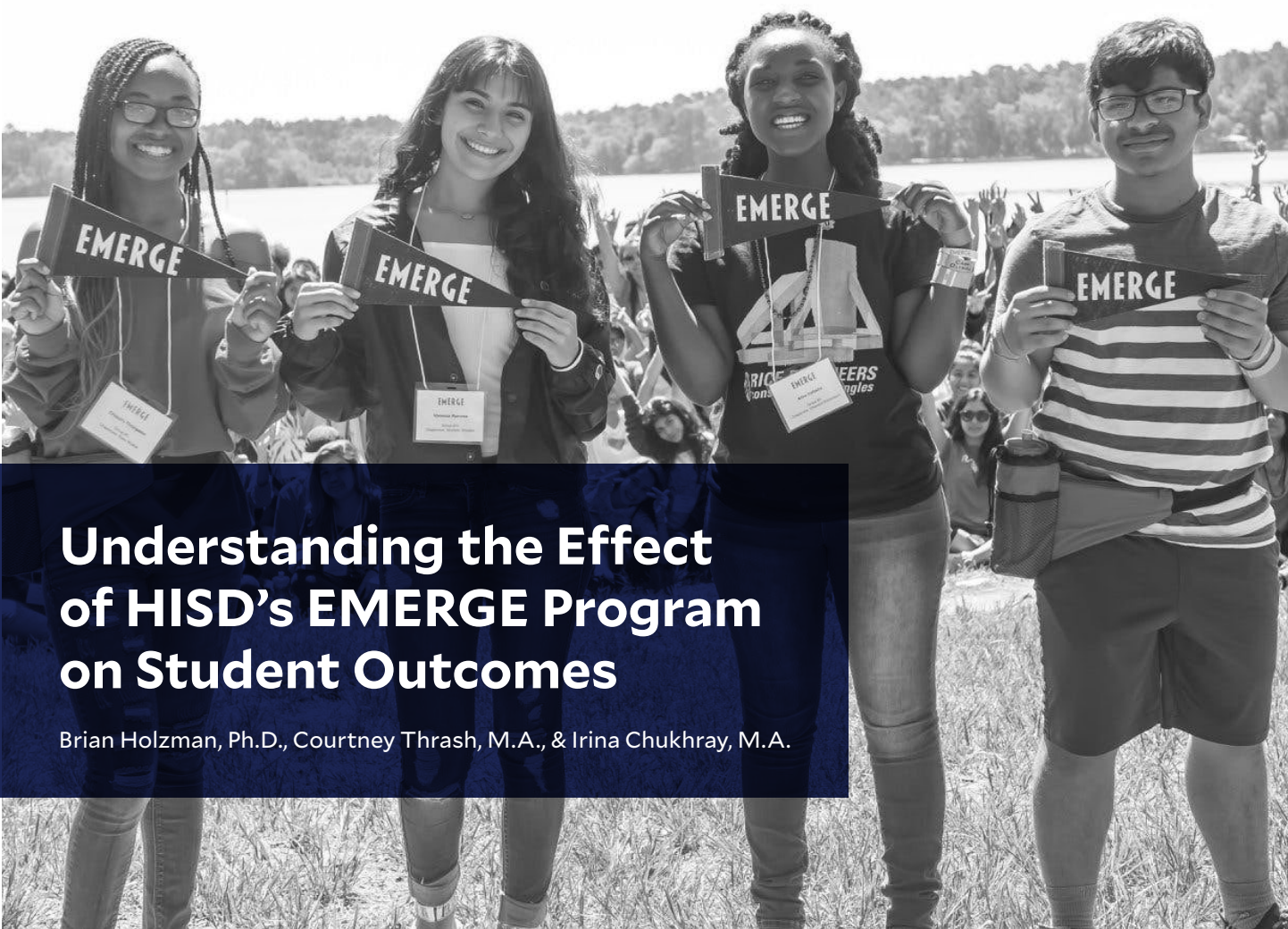


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# Understanding the Effect of HISD's EMERGE Program on Student Outcomes

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## Research Brief

for the Houston Independent School District

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**About HERC.** Focusing on the most pressing challenges facing the region, the Houston Education Research Consortium (HERC) is a research-practice partnership between the Kinder Institute for Urban Research and 11 Houston-area school districts. HERC research is developed directly alongside district leaders with findings shared with decision makers—culminating in long-term, equity-minded solutions, opportunities and growth for Houston and beyond.

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## Research Brief

# Understanding the Effect of HISD's EMERGE Program on Student Outcomes

**H**igh-performing first-generation and economically disadvantaged students are more likely to attend colleges and universities that are less competitive than their academic qualifications allow, which makes them less likely to graduate. EMERGE is a multiyear, personalized college advising program that aims to address this problem by preparing academically high-performing first-generation and economically disadvantaged students to attend and graduate from the nation's most selective colleges and universities. The costs associated with this high-touch approach warrant investigating how EMERGE compares with low-touch information packets and general district support. This first-ever causal study of EMERGE compared students who were admitted to HISD's EMERGE program with comparable students who applied but were not admitted and were close to the admission cutoff.<sup>1</sup> The analyses showed students admitted to HISD's EMERGE program were significantly more likely to apply to selective colleges, submit more applications to selective colleges, and enroll in selective colleges. Information packets were ineffective.

## Key Findings

### Applications to selective colleges and universities

- There was a positive effect of admission to HISD's EMERGE program on applications to selective colleges and universities.
- EMERGE students were 19 percentage points more likely to apply to Top 1 Barron's colleges and 18 percentage points more likely to apply to Top 1 or 2 Barron's colleges, relative to general district support students.

- EMERGE students submitted 1.6 more applications to Top 1 Barron's colleges and 2.7 more applications to Top 1 or 2 Barron's colleges, almost double the number compared to general district support students.
- There was no effect of the information packet intervention on applications to selective colleges and universities.<sup>1</sup>

<sup>1</sup> All estimates produced in this report are intent-to-treat effects from sharp regression discontinuity models (i.e., the effect of admission). Local average treatment effects from fuzzy regression discontinuity models based on partial compliance data (i.e., the effect of participation) are substantively similar and available from the authors upon request.



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### Enrollment at selective colleges and universities

- There was a positive effect of admission to HISD’s EMERGE program on enrollment at selective colleges and universities.
- EMERGE students were three times as likely to enroll at Top 1 Barron’s colleges and twice as likely to enroll at Top 1 or 2 Barron’s colleges, relative to general district support students.
- There was no effect of the information packet intervention on enrollment at selective colleges and universities.

### SAT scores

- There was no effect of admission to HISD’s EMERGE program on SAT verbal, math, or composite scores.
- There was no effect of the information packet intervention on SAT scores.



# Background

**E**ducational attainment is associated with a variety of social and economic outcomes, including employment, earnings, health, and civic engagement (Ma, Pender, & Welch, 2019). The type of college a student attends, including whether it is a highly selective one, may also matter. Attending a selective institution has positive effects on graduation rates and labor market outcomes (Black & Smith, 2004; Hoekstra, 2009; Long, 2008), particularly for Black and Hispanic students and students from less-educated families (Dale & Krueger, 2014). However, most high-achieving students from low-income families do not apply to a single selective college or university (Hoxby & Avery, 2013). Because high-achieving low-income students are less likely to apply to selective institutions, they may suffer from *academic undermatch*, which is when students attend colleges and universities less competitive than their academic qualifications may allow (Smith, Pender, & Howell, 2013). Given the positive effects of college selectivity on student outcomes and the fact that undermatch is more pronounced among low-income students, identifying strategies to reduce undermatch and encourage students from socioeconomically marginalized backgrounds to apply to and enroll in selective institutions is a policy imperative with implications for educational equity.

EMERGE is a college access program that began in HISD and has since spread to other local school districts. The program aims to prepare academically high-performing students from first-generation and economically disadvantaged backgrounds to successfully attend and graduate from the nation's most selective colleges and universities. EMERGE is a highly personalized approach to college advising that provides high school students with biweekly after-school programming in small group settings. Students in the 2016-2017 EMERGE cohort studied in this analysis experienced an average student-counselor ratio of 7-to-1). In addition to this advising, EMERGE has provided students with vouchers to enroll in an SAT preparation course at a local provider (this service has since been discontinued due to budget constraints) and takes students on a fully-compensated week of college visits before their senior year of high school. Through this suite of supports, EMERGE hopes it can encourage high-performing students from socioeconomically marginalized backgrounds to apply to and enroll in selective institutions and potentially reduce academic undermatch.

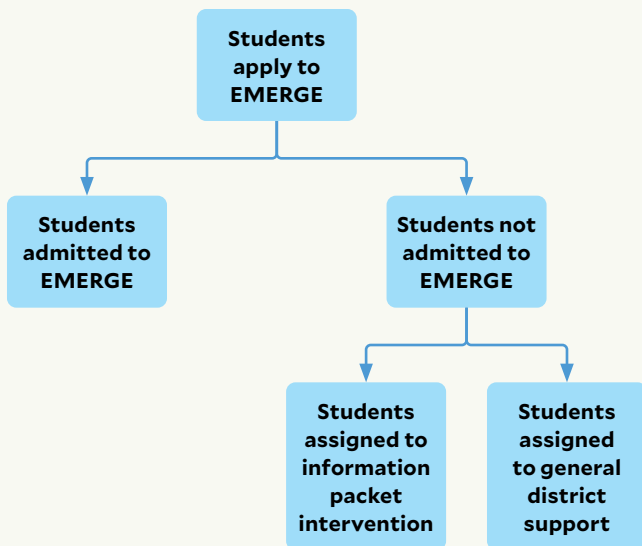
**FIGURE 1 Student Groups in the Analyses**


Figure 1 above illustrates the student groups in the analyses. HISD’s EMERGE program is competitive, and students must submit an application to participate. During the 2016-2017 school year, students applied in the fall, and programming began in the spring. About one-quarter of applicants were admitted to the program.<sup>2</sup> The remaining students were randomly assigned to two groups. The first group, called general district support, received the regular advising supports provided by HISD schools. The second group was part of an information packet intervention, in addition to the regular HISD supports. These students received two packets of information about the SAT and the college application process during the junior year of high school.<sup>3</sup> The goal of this additional component was to determine whether low-cost, less-intensive information-sharing could help high-performing students from socioeconomically marginalized backgrounds prepare for the SAT, apply to, and enroll in selective colleges and universities.

2 Details on EMERGE’s application process may be found in Appendix A of a prior HERC research brief entitled *Who Applies to EMERGE?*, which is available at <https://kinder.rice.edu/research/who-applies-emerge>.

3 Information packets were designed by HERC staff with input from EMERGE and HISD staff, as well as a faculty member at the University of Pennsylvania. Additional details are available from the authors upon request.

## Research questions

Given EMERGE’s focus on the application process to selective colleges and universities, this study examined the effect of admission to HISD’s EMERGE program on students’ college-going outcomes. Using HISD administrative data and EMERGE application data, this study asked two questions:

1. *What is the effect of EMERGE admission on...*
  - a. Applying to selective colleges and universities?
  - b. The number of applications submitted to selective colleges and universities?
  - c. Enrollment at selective colleges and universities?
  - d. SAT scores?
2. *What is the effect of the information packet intervention on...*
  - a. Applying to selective colleges and universities?
  - b. The number of applications submitted to selective colleges and universities?
  - c. Enrollment at selective colleges and universities?
  - d. SAT scores?

Please keep in mind that the information packet intervention was not part of HISD’s EMERGE program; it was designed by the research team to assess less expensive alternatives to supporting students.

To address these research questions, one cohort of sophomore students who applied to HISD’s EMERGE program in fall 2016 were tracked through the fall semester following high school graduation (N = 1,078). The sample included 262 students admitted to EMERGE, 409 students who received information packets on the SAT and the college application process, and 407 students who received the general district support provided by HISD. The analyses used in this study allow the results to be interpreted as causal effects. Please see Appendix A for sample characteristics and Appendix B for post-hoc demographic subgroup analyses. Additional details on the data, sample, and analytic strategy are available from the authors upon request.

## DEFINITIONS USED IN THE STUDY

### **EMERGE students**

Students who applied to the HISD’s EMERGE program and were admitted.

### **General district support students**

Students who applied to HISD’s EMERGE program but were not admitted. They received no additional information or support, aside from what their high school offered.

### **Information packet students**

Students who applied to HISD’s EMERGE program but were not admitted. They received information packets about the SAT and the college application process, aside from what their high school offered.

### **Top 1 Barron’s Colleges**

Colleges and universities that are considered the “most competitive” according to the Barron’s College Admissions Selector. These institutions typically required a high school rank in the top 10-20%, average grades of A to B+, SAT subsection scores between 655 and 800, ACT scores at 29 or above, and admitted fewer than one-third of applicants.

### **Top 2 Barron’s Colleges**

Colleges and universities that are considered “highly competitive” according to the Barron’s College Admissions Selector. These institutions typically required a high school rank in the top 20-35%, average grades of B+ to B, SAT subsection scores between 620 and 654, ACT scores between 27 and 28, and admitted between one-third and one-half of applicants.

In the analyses that follow, results are shown for **Top 1 Barron’s Colleges** and **Top 1 or 2 Barron’s Colleges**. The latter category is a more expansive definitive of selective and includes application to and enrollment at **either** Top 1 Barron’s Colleges **or** Top 2 Barron’s Colleges.

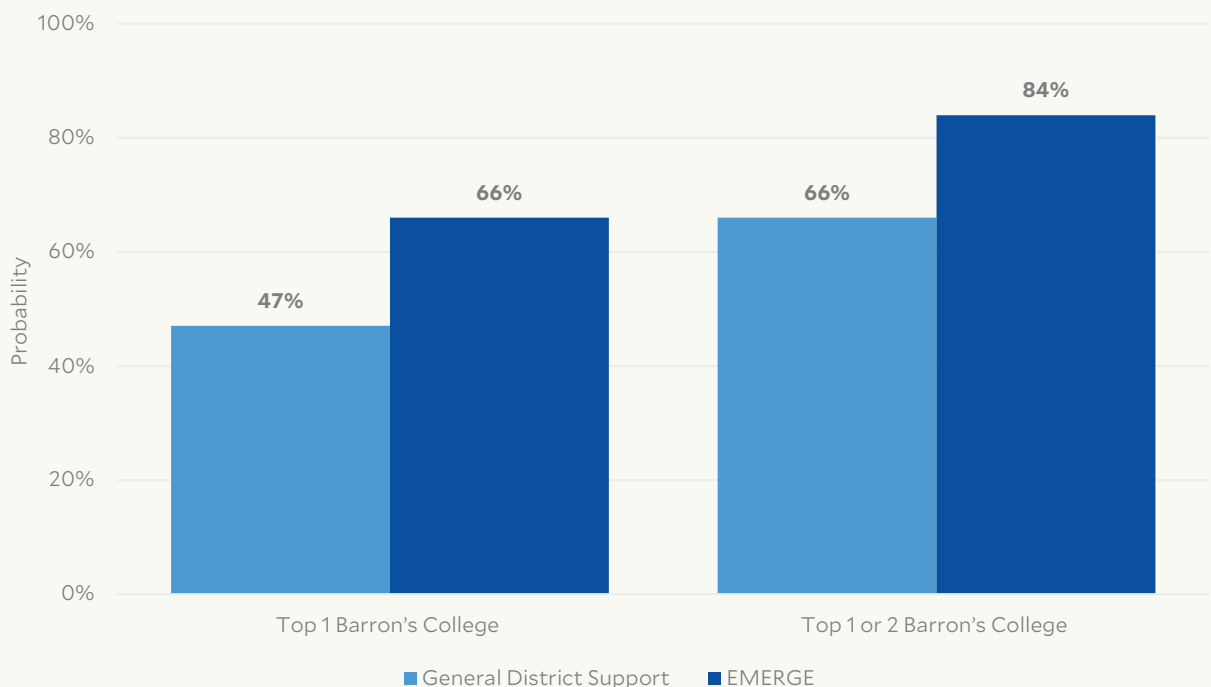
# Key Findings

## 1 There was a positive effect of EMERGE admission on applying to Top 1 and Top 2 Barron's colleges.

Being admitted to HISD's EMERGE program had a positive impact on applying to any selective college or university, relative to the general district support group. As shown in Figure 2, 47% of general district support students applied to a Top 1 Barron's college while 66% of EMERGE students applied to a Top 1 Barron's college. This means the EMERGE program increased applications to Top 1 Barron's colleges by 19 percentage points, relative to general district support.

Additionally, 66% of general district support students applied to a Top 1 or 2 Barron's college, compared to 84% of EMERGE students. Therefore, EMERGE had an 18-percentage point impact on applications to Top 1 or 2 Barron's colleges, relative to general district support.

FIGURE 2 Probability of Applying to a Top College by Initial Assignment

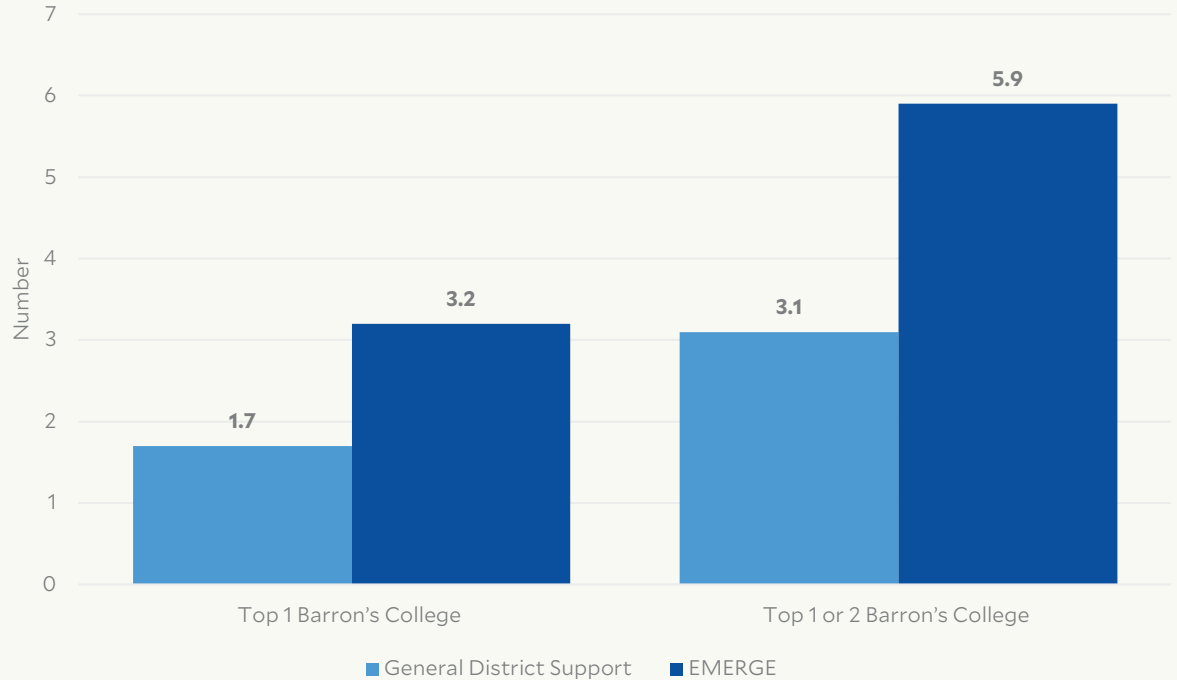


Notes: Analyses were restricted to students within 8 points of the cutoff that determined admission to EMERGE, centered around each school's admission cutoff. EMERGE's impacts on Top 1 and Top 2 Barron's college application were both statistically significant at the 0.05 level.



FIGURE 3

### Predicted Number of Applications to a Top College by Initial Assignment



**Notes:** Analyses were restricted to students within 8 points of the cutoff that determined admission to EMERGE, centered around each school's admission cutoff. EMERGE's impact on the number of Top 1 Barron's college applications was statistically significant at the 0.01 level, while the impact on the number of Top 2 Barron's college applications was statistically significant at the 0.001 level.

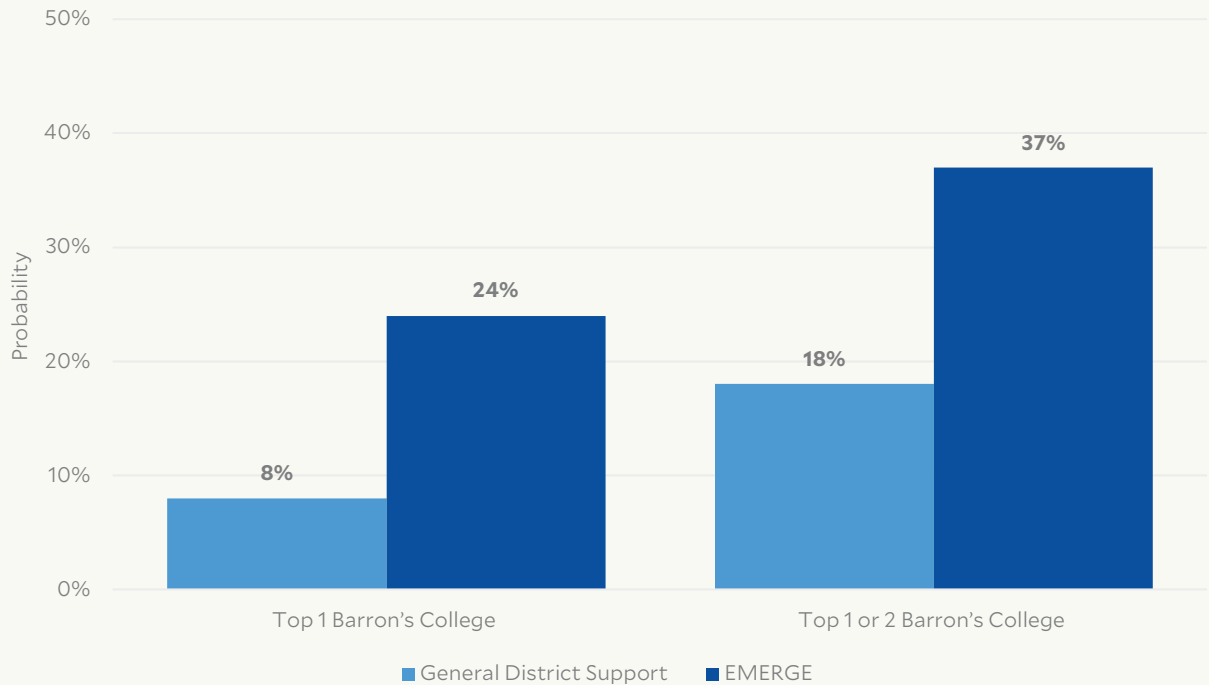
## 2 There was a positive effect of EMERGE admission on the number of applications submitted to Top 1 and Top 2 Barron's colleges.

Students admitted to HISD's EMERGE program submitted more applications to selective institutions than students in the general district support group. As shown in Figure 3, on average, general district support students submitted 1.7 applications to Top 1 Barron's colleges, while EMERGE students submitted 3.2 applications to Top 1 Barron's colleges. This represents an EMERGE program impact of about 1.6 additional Top 1 college applications submitted.

Additionally, general district support students submitted 3.1 applications to Top 1 or 2 Barron's colleges compared to 5.9 applications submitted by EMERGE students. This represents an EMERGE program impact of about 2.7 more Top 1 or 2 college applications.

FIGURE 4

## Probability of Enrollment in a Top College by Initial Assignment



**Notes:** Analyses were restricted to students within 8 points of the cutoff that determined admission to EMERGE, centered around each school's admission cutoff. EMERGE's impact on the number of Top 1 Barron's college enrollment was statistically significant at the 0.05 level, while the impact on the number of Top 2 Barron's college enrollment was statistically significant at the 0.01 level.

### 3 There was a positive effect of EMERGE admission on enrollment at Top 1 and Top 2 Barron's colleges.

Students admitted to HISD's EMERGE program were more likely to enroll in a selective college or university during the semester following high school graduation (fall 2019) than students in the general district support group. As shown in Figure 4, 8% of general district support students enrolled at a Top 1 Barron's college, while 24% of EMERGE students enrolled at a Top 1 Barron's college. This means the EMERGE program had about a 15-percentage point impact on Top 1 Barron's college enrollment, relative to general district support.

Additionally, 18% of general district support students enrolled at a Top 1 or 2 Barron's college compared to 37% of EMERGE students. Therefore, the EMERGE program effect on Top 1 or 2 Barron's college enrollment was 19 percentage points.

## 4 There was no effect of EMERGE admission on SAT verbal, math, or composite scores.

Admission to HISD's EMERGE program had no effect on students' SAT verbal, math, or composite scores.

## 5 The information packet intervention had no impact on SAT scores, applications to selective colleges and universities, or enrollment at selective colleges and universities.

The analyses found the information packets, which discussed the SAT and the college application process, had no effect on student outcomes. When compared to the general district support students, students who received information packets did not score higher on the SAT, were not more likely to apply to Top 1 or Top 2 Barron's colleges, and were not more likely to enroll at a Top 1 or Top 2 Barron's college.

# Conclusion

## Implications

Overall results indicate that being admitted to HISD’s EMERGE program has positive effects on applying to and enrolling in selective colleges and universities. These results are encouraging and suggest that intensive, personalized assistance programs can help students from historically underrepresented backgrounds navigate the college application gauntlet. Moreover, these findings are in line with prior studies that have found intensive interventions that provide personal assistance with the college application or financial aid processes improve college outcomes (Belasco, 2013; Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; Castleman & Goodman, 2018; Oreopoulos & Ford, 2019).

Although admission to HISD’s EMERGE program had a positive effect on applying to and enrolling in selective colleges and universities, there was no effect on SAT scores. EMERGE provided students with vouchers to take an SAT preparation course through a local provider. According to conversations with EMERGE personnel in HISD, nearly all students used the vouchers and enrolled in one of the local provider’s SAT preparation courses. Despite this fact, there are many unknowns regarding how students used the vouchers or the quality of instruction received. For example, the research team has no information on how often students attended the course or whether they put in a great deal of effort. More importantly, it must be pointed out that the support offered by the local test preparation provider was likely different from the one-on-one, long-term advising EMERGE personnel provided students in their program. In addition, the comparison group of general district support students were also very high-performing, and it is very possible many chose to participate in a SAT preparation course on their own.

While EMERGE may be considered costly—according to HISD, the annual cost per student is about \$2,500 (Hess, 2018)—this level of investment may be needed to ensure that high-achieving students from first-generation and economically disadvantaged backgrounds have equitable college opportunities. In fact, this \$2,500 annual cost pales in comparison to the amount of money middle- and upper-income parents spend on their children (Kornrich, 2016). In 2010, the richest 10% of families spent over \$7,000 per young child over the course of three months; among the bottom 25% of families, that amount fell below \$1,000 (Kornrich, 2016). That \$6,000 gap corresponds to just three months of a child’s life, or \$24,000 over the course of a year, which is nearly 10 times more than the amount HISD’s EMERGE program spends on students in a single year. Therefore, EMERGE may help level the playing field and provide less advantaged students with the investment and resources they need to apply to and enroll in selective institutions.

Given that college access programs like EMERGE may be considered costly, it becomes important to determine whether lower-cost resources like information packets can support students. However, results showed that information packets used in this study had no effect on SAT scores, applications to selective colleges and universities, or enrollment in selective colleges and universities. These findings may not be too surprising. EMERGE is a sustained, personalized college access program, while the information packets were single points of contact that were not customized for each student. Additionally, the information provided in the packets might not have been what the students needed most or might not have been conveyed in an effective way.

While some research has found no benefit to low-cost information-sharing (Bergman, Denning, & Manoli, 2019; Gurantz et al., 2019), other research has discovered it can be valuable to students (Dynarski, Libassi, Michelmore, & Owen, 2021; Hyman, 2019; Jensen, 2010). More work ought to be done to understand for whom, when, what, and how to maximize this specific support for students in the face of limited resources for college advising.

## Recommendations

1. HISD should continue college advising efforts to help more students who aspire to go to college to apply to and enroll in institutions that are an appropriate academic match since, as mentioned earlier, attending more selective institutions matched with one's qualifications may be beneficial with respect to financial aid opportunities and college graduation rates. This research brief provides evidence that EMERGE helps students enroll in selective colleges and universities. HISD should expand EMERGE, as well as ensure other students who have the qualifications and desire to attend college have access to the resources they need to navigate the college application process and choose an institution that fits their goals, preferences, and needs.
2. Although the information packet intervention used in this study had no effect on student outcomes, HISD should continue to look for additional supplementary ways to provide college information to the student population. Some prior research suggests that information packets and other low-cost nudges can help students navigate the college application process and enroll in college after graduating from high school. Additional research may shed light on information-sharing—how to share information, what information to share, who to share information with. Addressing these questions may help HISD serve a wider number and variety of students more effectively.



# Appendix A.

## Sample characteristics

Variable	Mean
Initial Assignment	
General District Support	0.38
Information Packet	0.38
EMERGE	0.24
Centered Rank	-10.60
Age	15.19
Female	0.67
Race/Ethnicity	
Hispanic	0.63
Black	0.22
Asian	0.08
Other	0.07
Foreign-Born	0.15
English Learner	0.04
Special Education	0.04
Economically Disadvantaged	0.77
First-Generation	0.72
Sibling Participated in EMERGE	0.05
No. Advanced Courses Taken	3.56
STEM Endorsement	0.31
<i>Note.</i> N = 1,078 EMERGE applicants from the Houston Independent School District in fall 2016.	

# Appendix B.

## Post-hoc demographic subgroup analyses

Analyses were conducted to determine whether the effect of EMERGE varied by demographic subgroup. These subgroup analyses had much smaller sample sizes, so caution should be used when interpreting and discussing the findings.<sup>4</sup> Nevertheless, some patterns arose.

### Gender differences

For instance, the effect of EMERGE on college application and enrollment behavior appeared concentrated among female students. Female students who were admitted to EMERGE were more likely to apply to and eventually enroll in selective colleges and universities, when compared to female students who were not admitted to EMERGE. In contrast, these patterns were not as pronounced for male students, particularly with respect to applications. In the U.S., female students are now more likely to attend and graduate from college than men (Jackson & Holzman, 2020) and earlier HERC research showed female students in HISD were more likely to attend college after graduating from high school and less likely to drop out of college in the first few years of attending (Thrash, Heard, Kennedy, & Hanson, 2020).

### Racial/ethnic differences

Subgroup analyses showed that Black and Hispanic EMERGE students were more likely to apply to selective colleges and universities than Black and Hispanic students who applied to but were not admitted to EMERGE. Analyses also suggested Black and Hispanic EMERGE students submitted more applications to selective institutions. However, the effects on enrollment differed by race/ethnicity. While the effects of EMERGE on selective college enrollment for Hispanic students remained positive, the effect for Black students was negligible. For Black students, a desire to learn about Black culture and history and to connect with the Black community may lead many to consider attending Historically Black Colleges and Universities (HBCUs) (Freeman, 1999). Currently, no HBCUs fall in the Top 1 or 2 Barron's categories. To explore whether HBCU enrollment might explain the negligible effect of EMERGE on selective college enrollment among Black students, the research team took a close look at students who satisfied three conditions: 1) was a Black student admitted to EMERGE, 2) applied to at least one Top 1 or 2 Barron's college, and 3) did not enroll in a Top 1 or 2 Barron's college. Among this population of students, 46% ended up enrolling in an HBCU. Therefore, HBCU enrollment might be why EMERGE's effects on enrollment differed by race/ethnicity.

<sup>4</sup> These results are available from the authors upon request. The authors conduct two-tailed tests with p-values ranging from 0.001 to 0.20. The male and Black subsamples are smaller than the female and Hispanic subsamples. In their interpretation of these post-hoc analyses, the authors focus on broad patterns rather than specific statistical tests.

## School context differences

Additional subgroup analyses suggested the effect of EMERGE on applications might be greater for students in high schools with lower college-going rates.<sup>5</sup> EMERGE students who attended schools with lower college-going rates were more likely to apply to selective colleges and universities, relative to general district support students at these schools. In contrast, these patterns did not appear for EMERGE students who attended schools with higher college-going rates. To some extent, the effect of EMERGE on the number of college applications submitted was more concentrated among students who attended schools with lower college-going rates, as well.<sup>6</sup> The effects on enrollment were similar at both types of schools, however. Still, these findings suggest the EMERGE program may be more impactful at schools with a less-pronounced college-going culture. In the absence of EMERGE, high-performing students at high schools with a less-pronounced college going-culture may not have as much exposure to information or access to support that can enable them to apply to selective institutions; EMERGE may help fill in the gap for students at these high schools.

5 Schools with lower college-going rates sent about 9-44% of students to four-year colleges, whereas schools with higher college-going rates sent about 44-85% of students to four-year colleges.

6 The effect of EMERGE on the number of applications to Top 1 and 2 Barron's colleges was larger and statistically significant among students who attended schools with lower college-going rates, whereas the effect was smaller and nonsignificant among students who attended schools with higher college-going rates. The effects on the number of Top 1 applications were similar in magnitude at both types of schools and, at best, marginally significant.

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The Houston Education Research Consortium (HERC) is a research-practice partnership between the Kinder Institute for Urban Research and 11 Houston-area school districts. HERC aims to improve the connection between education research and decision making for the purpose of equalizing outcomes by race, ethnicity, economic status, and other factors associated with inequitable educational opportunities.



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