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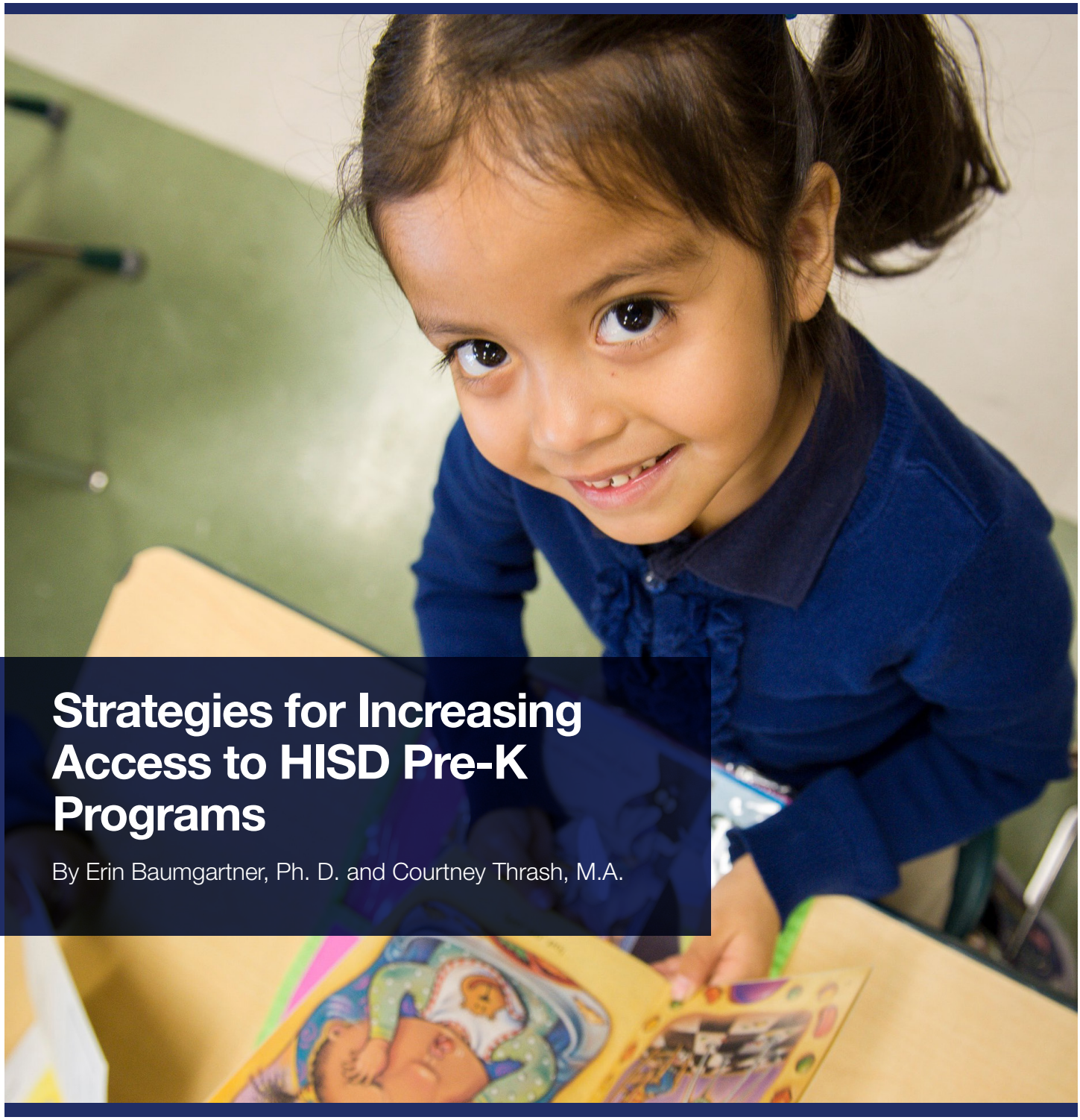

Strategies for Increasing Access to HISD Pre-K Programs

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Research Brief
for the Houston Independent School District

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Citations

Baumgartner, E. (2017). *The Benefits of HISD Pre-Kindergarten: The Relationship Between Years of Exposure and School Readiness.*

Baumgartner, E. & Thrash, C. (2019). *Availability of and equity in access to HISD pre-k programs.*

High, P. C. (2008). *School readiness. Pediatrics, 121(4), e1008-e1015.*

Ramey, C. T., & Ramey, S. L. (2004). *Early learning and school readiness: Can early intervention make a difference?. Merrill-Palmer Quarterly, 50(4), 471-491.*

Abstract

This is the second in a series of briefs examining student access to Houston Independent School District (HISD) pre-kindergarten (pre-k) programs. The current study examined strategies for increasing access to pre-k in HISD, including the intended and unintended consequences of zoning pre-k using existing elementary school zones. We found that among 2018-19 kindergarteners in HISD who did not attend HISD pre-k, approximately two-thirds of students likely qualified for enrollment. Among all kindergarten students who likely qualified for enrollment in pre-k, living within one mile of a program and living in a zone with a pre-k program were both associated with a greater likelihood of enrolling in pre-k the previous year. Zoning pre-k, which could include adding pre-k programs to elementary zones that do not have them and/or establishing Early Childhood Centers (ECCs) as zoned schools, would increase access to pre-k by providing campuses in students' neighborhoods and reducing the distance to the nearest program. We also include projections of pre-k enrollment if HISD opted to switch to a zoned school model for pre-k, based on varying levels of students opting to remain in their zoned school versus exercising school choice.

Background

An important step in ensuring students enter school ready to learn is to provide early learning opportunities for students before they reach their first day of kindergarten.[1] To achieve this goal, a number of school districts around the country offer pre-k programs as a means of providing these early opportunities, at no cost, to families and their children. The district included in this study, the HISD, offers full-day pre-k to at-risk students.[2]

In the first brief in this series, analyses showed there is some variability in who has access to HISD pre-k programs in their elementary zone, in their neighborhood, and within one mile of their residence.[3] Though economically disadvantaged students, one of the groups targeted by the state-level public pre-k policy, were more likely than their peers to have nearby access to programs, we also learned that English learners, also targeted through this policy, did not have greater access to programs than their peers.

Recognizing the need to increase enrollment and access to pre-k in the district, the purpose of this study was to consider ways that increasing access to nearby programs may result in increased utilization of and enrollment in public pre-k. In addition to adding programs in places where none currently exist, namely, elementary school zones, we estimated the increase in students who would have access to pre-k and how including pre-k in the school zoning process might shift whether and where students attend pre-k throughout the district.

This is the second in a series of research briefs regarding student access to and utilization of HISD pre-k programs, with the first brief examining the spatial distribution of HISD pre-k programs (Brief 1). The subsequent briefs examine the ways in which parents make decisions about pre-k programs for their children (Brief 3) and the relationship between access to HISD pre-k and student outcomes at kindergarten entry (Brief 4).

Context of public pre-k in HISD

As a strategy to increase access and enrollment, this district is considering making changes to the way students and families enroll in pre-k. Currently, eligible students are able to apply for seats in public pre-k programs anywhere in the district, provided that there are still seats available on that campus. As an alternative to the current approach, the district is considering changing pre-k to a zoned model, where students would be encouraged to attend their neighborhood school. This more closely aligns with the way all other students (k-12) enroll in campuses in the district. It is important to note that although pre-k would be zoned in this scenario, this district is a school choice district, which means that families would be able to apply to other campuses besides their neighborhood campus, including other neighborhood schools or Early Childhood Centers (ECCs).[4] One final note for the current context is that transportation is not provided for pre-k students in this district.

If the district switched to a zoned model for pre-k, it would mean that existing zoned elementary campuses without pre-k programs would need to add pre-k classrooms. Alternatively, if an ECC existed within the boundaries of an elementary zone without a pre-k program, the district could consider treating the ECC as the zoned campus for pre-k for that area. It is likely that pre-k zoning would add opportunities for students and also redistribute current students on district elementary and ECC campuses.

1 High, 2008; Ramey & Ramey, 2004

2 The student populations eligible for Texas free, public pre-k are: economically disadvantaged, unable to speak/comprehend English (referred to as English learner, in text), homeless, ever in the care of the Department of Family and Protective Services, the child of a member of the armed forces, the child of a peace officer, firefighter, or emergency responder eligible for the Star of Texas award. ("Eligibility for Prekindergarten." Texas Education Agency). At the time of this analysis, the state of Texas only required half-day pre-k, but HISD opted to offer full day pre-k to students.

3 Baumgartner & Thrash (2019)

4 An ECC is a standalone campus that offers early childhood learning opportunities to students in HISD. These campuses primarily include pre-k programs, but in some instances may include other early grade levels (kindergarten, first grade).

Research Questions

1. What proportion of HISD kindergartners, who were likely eligible, enrolled in HISD pre-k?
2. What is the relationship between access to and enrollment in HISD pre-k?
3. How might zoning pre-k in HISD change access to programs for students?
4. What are intended and unintended consequences of zoning for campuses in HISD?

Data and Sample

The data used for this analysis included administrative student- and school-level information from HISD for the 2017-18 and 2018-19 school years. Specifically, student sociodemographic data are from 2018-19 Public Education Information Management System (PEIMS), student address data are from the 2018-19 Enrollment Card file, and school-level geographic data are from public geospatial files available on the HISD website. The sample was restricted to kindergarten students who appear in the 2018-19 PEIMS file and for whom we have addresses that were able to be geocoded. Additionally, we omitted students who live outside of HISD's boundaries, as considerations of access for these students may be less relevant for the district, and omitted students who repeated kindergarten in 2018-19, since they could not have attended pre-k in the 2017-18 academic year. Finally, American Indian and multiracial students were omitted, as the sizes of these populations are small (less than 2% combined) and would likely result in all results for these students being masked. This results in a total of 14,762 students (of 15,639 total enrolled kindergarten students in 2018-19, per PEIMS). We examined kindergarten students instead of pre-k students as to not limit the sample to only those who attended HISD pre-k, but of the universe of HISD-enrolled kindergarteners who could have attended HISD pre-k. In projection analyses, we also included 2018-19 pre-kindergarten students (N=12,998), as a lower boundary for estimating the potential number of students who would enroll in new programs.

Measures

Likely eligible for public pre-k. This is an indicator of whether a student was likely eligible for pre-k based on Texas state policy. To create this variable, we considered whether a student was economically disadvantaged, had limited English proficiency, or was homeless.[5]

Enrolled in HISD pre-k. This indicator reflects whether a student was enrolled in HISD pre-k the year before they enrolled in HISD kindergarten.

HISD pre-k exists in elementary zone. A student was classified as living in a zone with a pre-k campus if there was either a pre-k program on the zoned elementary campus, or if the zoned elementary campus does not have a pre-k program, but an ECC exists in that zone which may serve as a zoned campus for pre-k.[6]

Student characteristics included in the analysis are gender, race/ethnicity, English learner status (EL), and economic disadvantage.

5 Given that we do not have measures of all of the ways that students qualify for public pre-k in Texas, such as having a parent in the armed forces, this variable likely provides an underestimate of the number of students who qualify for public pre-k. See Methodological Appendix in Brief #1: Availability of and equity in access to HISD pre-k programs for further detail.

6 Those zones with ECCs but not pre-k on zoned elementary campus are: Burnet, Cornelius, Durkee, Hilliard, Lewis, Neff, and Tinsley.

Results

What proportion of HISD kindergartners, who were likely eligible, enrolled in HISD pre-k?

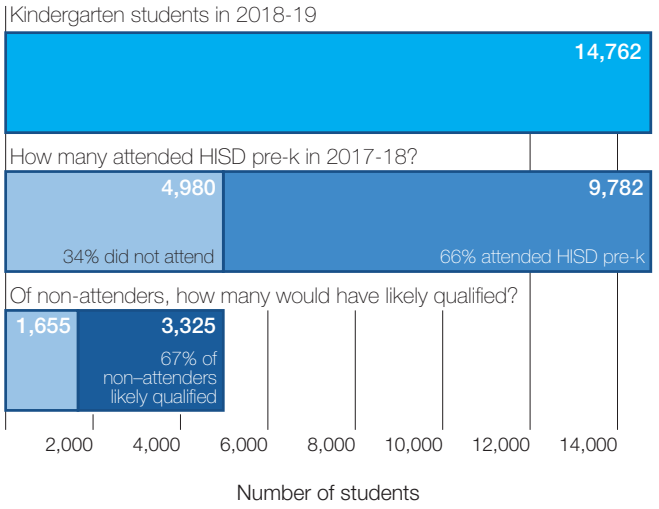
Of the 14,762 HISD kindergartners in our sample, approximately 66% (9,782) attended HISD for pre-k and 34% (4,980) did not attend an HISD pre-k program. Of the 4,980 students who did not attend HISD pre-k the year prior to attending HISD kindergarten, two-thirds (3,325) of those students likely qualified. This suggests that there is potentially a large pool of eligible students who are not attending HISD pre-k. It represents a popul ation that might be important to target if HISD wants to increase enrollment in pre-k, with the goal of increasing students who are entering kindergarten better prepared to succeed in a school setting. (see Figure 1)

In addition, of the full sample of kindergarteners included in this study, we estimated that 12,513 (~85%) likely qualified for enrollment in HISD pre-k. We used this sample of eligible kindergarteners as the population of interest in the projections that follow, as it may provide a better baseline for estimating how many students HISD can reach for pre-k than considering either the current pre-k population or full kindergarten population.

What is the relationship between access to and enrollment in HISD pre-k?

Among the 12,513 likely qualifiers for HISD pre-k in our sample, living in a zone with an HISD pre-k program at the zoned elementary campus was associated with greater odds of attending an HISD pre-k program in the year prior to kindergarten. In Figure 2, we show three different ways to think about access to HISD pre-k, by whether a program exists in the elementary zone in which a student currently resides, the distance to the nearest program, and whether a program exists within one mile. The predicted probability of attending an HISD pre-k is 0.75 for those students who lived in an elementary zone with a pre-k program and only 0.65 for those that lived in an elementary zone without a pre-k program. Additionally, living within one mile of an HISD pre-k program was also associated with greater odds of attending an HISD pre-k program. The predicted probability of attending an HISD pre-k is 0.76 for those who lived within one mile of a pre-k program and 0.70 for those who did not.

Figure 1. HISD pre-kindergarten attendance among 2018-19 kindergarten students.



Source: HISD administrative data (student-level).

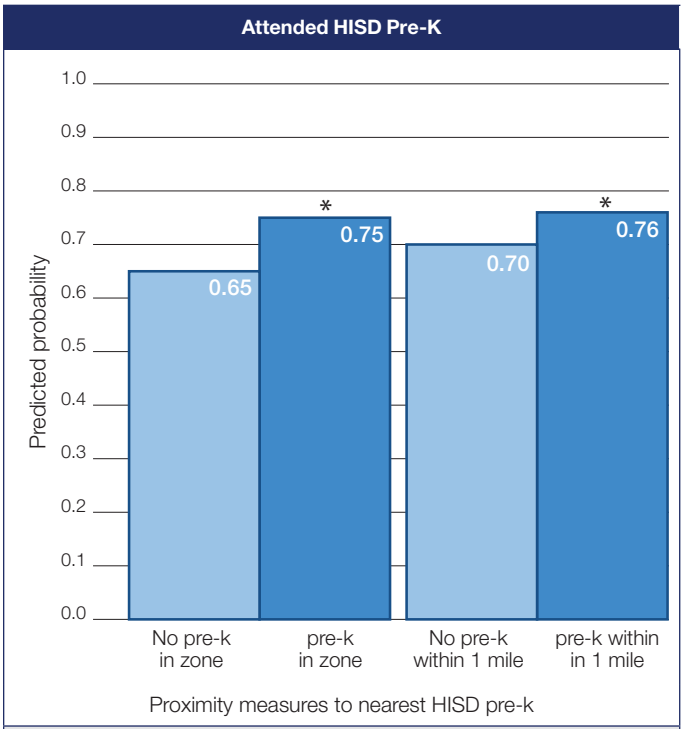
Note: All students who attended HISD pre-k in 2017-18 may not have qualified for free pre-k. Some families choose to pay for their children to attend when space allows. This is a very small proportion of students (likely <3%).

How might zoning pre-k in HISD change access to programs for students?

Recognizing that proximity appears to be related to the likelihood of enrolling, we considered how to increase access to pre-k in HISD. Specifically, based on a policy in consideration by the district, we considered what it would mean for student access if pre-k was zoned in HISD, as described in the introduction section of this brief.

Overall, if pre-k in HISD were zoned, where every existing elementary school zone established a pre-k program within its borders, all 2,249 kindergarteners who likely qualified for pre-k and lived in a zone without pre-k on the zoned elementary campus would now have access to such a program. There are two ways in which HISD can choose to ensure a pre-k program exists in each zone. The first way would be to add a pre-k program on existing zoned elementary campuses currently without programs.

Figure 2. Predicted probability of attending HISD pre-k for 2018-19 kindergarten students who likely qualified for pre-k, by access to pre-k programs.



Source: HISD administrative data (student- and campus-level), 2018-19 & ArcMap Street Maps Premium 2018.

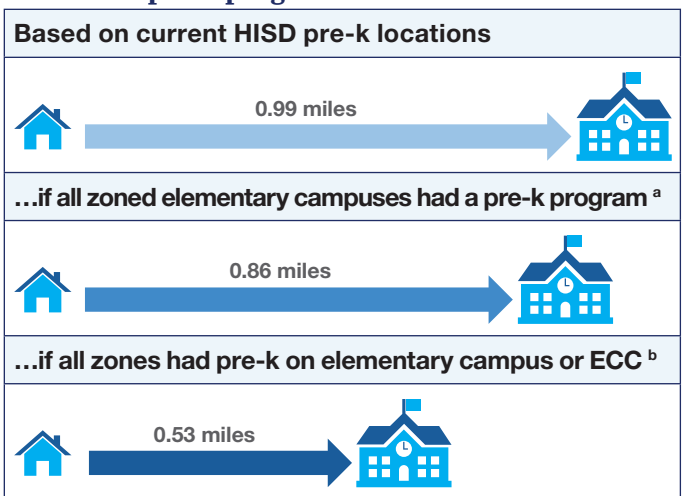
Note: The values presented in this graph are based on estimates derived from odds ratios reported in Appendix Table 1.

* Indicates significant difference between groups ($p<0.05$)

If the district chooses to do this, likely pre-k qualifiers would live closer in proximity to the nearest HISD pre-k program (0.86 miles vs. 0.99 miles)[7] and would have a greater likelihood of living within one mile of an HISD pre-k program (67.9% vs. 60.8%), than they do under current pre-k circumstances. (see Figure 3)

Alternatively, in those zones where pre-k programs do not currently exist on elementary campuses, but ECCs do exist, the district can opt to zone students to ECCs. If ECCs were zoned, 46.1% (784) of likely pre-k qualifiers who currently live in a zone without a zoned pre-k program at the existing zoned elementary campus would now live in a zone with a zoned pre-k program (54 zoned to Burnet (Laurenzo ECC), 103 zoned to Durkee (Farias ECC), 113 zoned to Hilliard (Fonwood ECC), 170 zoned to Lewis (Bellfort ECC), 185 zoned to Neff (Neff ECC), and 159 zoned to Tinsley (Halpin ECC)). Additionally, likely pre-k qualifiers would live closer in proximity to the nearest zoned pre-k program (0.53 miles vs. 0.99 miles) than they do under current pre-k circumstances. Likely qualifiers would also have a greater likelihood of living within one mile of a zoned pre-k program (92.3% vs. 60.8%) if ECCs were considered zoned schools than they do under current pre-k circumstances.

Figure 3. Average distance from student residence to nearest pre-k program in miles.



Source: HISD administrative data (student- and campus-level), 2018-19 & ArcMap Street Maps Premium 2018.

a: This would include adding classrooms to those current zoned elementary campuses which have no programs.

b: This would include adding classrooms to those current zoned elementary campuses which have no programs, or if an Early Childhood Center (ECC) exists in the boundaries of a zone, it would serve as the zoned elementary campus in this scenario.

7 There may be slight variations in the numbers reported in this brief versus the first brief in this series, as the sample of students is slightly different between studies (all kindergarteners in Brief 1, kindergarteners who would have likely qualified for pre-k in Brief 2).

We also considered whether zoning would improve access for students who are classified as English learners (EL) relative to non-EL students, as the first brief in this series found that they were either no more likely, or less likely, to have nearby access to public pre-k. As they are one of the populations targeted by the statewide policy regarding who qualifies for pre-k, this raises questions about how to improve access for EL students. Using the same scenarios outlined above, whether a pre-k was added to every zoned elementary campus where one did not already exist or if an ECC in a zone without a program on the zoned campus could serve as the zoned pre-k program, we find that both scenarios significantly increase access to pre-k for EL students. When we limit the analysis to EL students in our sample, we see that the nearest program is now either 0.84 miles (by adding a program to zoned elementary campus) or 0.52 miles (by zoning to ECC if none at zoned elementary campus), versus 0.96 miles, which is the distance EL students currently live from the nearest HISD pre-k program. Similarly, the proportion of students who have a program within one mile is substantially greater, with 69.7% of EL students having a program within one mile if a program is added to the zoned elementary campus or 93.3% of EL students having a program within one mile if an ECC is used as the zoned program, versus 60.9% of current EL students living within one mile of the nearest HISD pre-k program.

What are intended and unintended consequences of zoning for campuses in HISD?

The previous section outlined how zoning might result in changes in access to pre-k for students and families in HISD. This section considers how schools may be impacted by changing to a zoned model for pre-k in HISD, in both intended and unintended ways.

Based on current pre-k enrollment, approximately 60 students attended each pre-k program on zoned elementary campuses in the district. For the analyses that follow, the base population of students were those kindergarteners who would have likely qualified for HISD pre-k in the 2017-18 academic year, whether or not they actually attended.[8] The purpose of these projections is to help the district and schools better understand how the change to a zoned model for pre-k may impact the number of students enrolling on each campus.

If HISD decides to zone pre-k by adding a program to every elementary zone (whether on a traditional, zoned elementary campus, or at an ECC), we estimate that, on average, 77 students would be zoned to each elementary campus for pre-k. However, given that HISD is a school choice district, though students may live in a particular zone, they may choose to attend another campus if they meet qualifications and space is available. We used three levels of projections to consider how many students may remain in a zone and how many may choose to enroll in another campus. Our estimates of the proportion of students remaining in their zone are at 60%, 70%, and 75%.[9] For brevity, we only describe the rates associated with 60% of students remaining in their zone below, but projections at 70% and 75%[9] can be found in Table 1.

Across the district, if we project that 60% of students attend pre-k in their zone as shown in the first columns in Table 1, then on average 46 students would attend each zoned pre-k program. Given these projections along with the current enrollment in each zone, we find that zones with existing pre-k programs at the zoned elementary campus are likely able to meet the need of the students remaining in the zone (with 23 additional spaces remaining for students exercising school choice).

8 If we considered enrolled 2018-19 pre-k students in our estimates, we would have likely underestimated those who could have attended HISD pre-k and considering all 2018-19 kindergarten students may have led to an overestimate of those who could have attended HISD pre-k. Appendix Table 2 presents estimates based on these student populations (current pre-k students, all current k students) for additional detail.

9 The 60% estimate was based on the proportion of kindergarten students who currently remained in their zone and attended their zoned school. The 70% estimate was based on the proportion of students across the district, and across grade levels, who remained in their zone. And 75% as an estimate was used as a higher bound of the proportion of students who are likely to remain in their zone. As parents of young children are sensitive to distance and there are fewer magnet options for pre-k aged children, there was reason to believe that these students may be more likely to remain in their zone.

A negative number in the section entitled "Seats potentially needed" in Table 1 indicates available seats, based on 2018-19 enrollment in these zones, while a positive number reflects that seats are likely needed to meet demand. Zones without existing pre-k programs at the zoned elementary campus would need to add pre-k classrooms that would accommodate on average 57 pre-k students to meet the need of students projected to attend their zoned elementary campus for pre-k.

We are left with 5,005 students who could potentially exercise school choice by either attending another zoned campus, a non-boundary campus, an ECC, or a charter school. One concern might be that an unintended consequence of zoning is that fewer students attend ECCs — reducing overall enrollment in these programs.[10] We cannot estimate how many students would attend ECCs, specifically, but we can estimate the number of students who may be looking for an option outside of their zone. Our projections show that at a high estimate, over 5,000 students may be looking for options outside of their zone, while a low estimate would be that 3,128 students may choose an option outside of their zone (see Table 1). Additionally, as ECCs in some zones could serve as the zoned pre-k program, this would further ensure a large population of students remain on ECC campuses.

For greater detail and individual campus level estimates, please see HISD Supplemental Appendix, Tables 1 and 2, which provide projections for each campus. Given the finding included in Brief 1 in this series, that EL students have less access to current pre-k programs, estimates of potential EL students living in each zone are provided.

Table 1. Projections for students remaining in elementary zone for pre-k and unmet need based on 2018-19 kindergartners who likely qualified for pre-k.

	Percentage of students staying in their designated zone for pre-k					
	60%		70%		75%	
Variable	Mean	Median	Mean	Median	Mean	Median
Students staying in zone						
All zoned campuses	46	43	54	50	58	53
Zoned campuses with pre-k programs	45	42	52	49	56	53
Zoned campuses without pre-k programs	57	57	66	67	71	71
Seats potentially needed						
All zoned campuses	-14	-17	-6	-10	-2	-7
Zoned campuses with pre-k programs	-23	-19	-16	-13	-12	-11
Zoned campuses without pre-k programs	57	57	66	67	71	71
	Total		**Total**		**Total**	
Students available to attend other schools	**5,005**		**3,754**		**3,128**	

Source: HISD administrative data (student- and campus-level), 2018-19 & ArcMap Street Maps Premium 2018.

Note: "Seats potentially needed" is calculated using the number of pre-k seats which currently exist on the zoned elementary campus in each zone and subtracting the number of students who would stay in the zone at each level of projection. The average number of current seats filled across all zoned campuses is 60, on zoned campuses with and without pre-k programs, the number of current seats filled is 67 and zero, respectively. A positive number would indicate that more seats need to be added to accommodate potential demand, while a negative number would mean there are likely to be extra seats available to students who exercise school chose or opt into paying for HISD pre-k. See HISD Supplemental Appendix for campus level estimates.

10 For reference, approximately 3,500 students attended an ECC in the 2018-19 school year.

Conclusion

The purpose of this study was twofold: to understand the relationship between access to and enrollment in HISD pre-k programs and to consider ways to increase access for students. As shown in the results presented above, there appears to be a strong relationship between the proximity, or accessibility, of HISD pre-k programs and the likelihood of a student enrolling in HISD pre-k in the year before kindergarten, with students who have a program in their neighborhood zone more likely to enroll in pre-k and those who live nearer to the closest program more likely to enroll.

Our recommendation as it relates to this first finding is for the district to consider adding programs throughout the boundaries of HISD where the greatest need exists, whether or not it occurs through the zoning process. In considering previous HERC research that found students benefit from being enrolled in HISD pre-k programs in terms of school readiness, developing strategies to enroll more students in HISD pre-k programs is likely to increase overall rates of school readiness across the district.[11]

The second finding in this study was that in adding programs to zoned elementary campuses where programs do not currently exist or by treating some ECCs as zoned pre-k programs, the availability of nearby programs would be significantly increased for students across the district. One limitation of this study is that we only consider existing HISD structures (zoned elementary campuses or ECCs) as places to add pre-k programs. Given the variety of other campuses in HISD and spaces where no programs may currently exist, there could be even greater access provided if the district considered specific places to locate new programs based on population estimates of our area.

There are a number of reasons why kindergarten students who would likely have qualified for HISD pre-k do not enroll in these programs. These reasons include not living in the district the year before kindergarten entry and opting into other educational or care settings (such as private preschools, daycare centers, or care provided by family/friends). We want to ensure that information and accessibility of programs are not the factors driving non-attendance in HISD pre-k. Significant efforts have been made in recent years by HISD to increase the presence of programs in areas where a large number of students reside through the addition of ECCs, but given the quickly changing demographic context of our city, as well as the spread of families to new areas in the city, it may be time to consider whether programs should be added in areas where need had previously been low. Current efforts of HISD in partnering with organizations like Good Reason Houston to share information about the importance of public pre-k, and how and when to sign up for these programs is a concerted step in improving enrollment rates, but does not fully address the issue of accessibility, which is ensuring programs exist where families live.

11 Baumgartner, 2017

Appendix

Appendix Table 1. Odds ratios from logistic regression models predicting pre-k attendance in HISD for 2018-19 kindergarten students

	Model 1			Model 2		
	Odds Ratio	Std. Error	p-value	Odds Ratio	Std. Error	p-value
Pre-k present in zone	1.602	0.093	***			
Pre-k present within 1 mile				1.322	0.056	***
Race/ethnicity (ref=White)						
American Indian	-	-		-	-	
Asian/PI	1.377	0.184	*	1.382	0.184	*
Black	2.748	0.292	***	2.839	0.301	***
Hispanic	2.818	0.283	***	2.843	0.285	***
Multiracial	-	-		-	-	
Gender (ref=Male)						
Female	1.110	0.046	*	1.100	0.046	*
Economic disadvantage (ref=No)						
Yes	1.986	0.173	***	2.038	0.177	***
English learner (ref=No)						
Yes	2.228	0.110	***	2.229	0.109	***
Intercept	0.252	0.033	***	0.309	0.038	***
N	12,513			12,513		

Source: HISD administrative data (student- and campus-level), 2018-19 & ArcMap Street Maps Premium 2018.

***** p<0.001; ** p<0.01; * p<0.05; † p<0.10**

Appendix Table 2. Projections for students remaining in elementary zone for pre-k and unmet need

	Percentage of students staying in their designated zone for pre-k					
	60%		70%		75%	
	Mean	Median	Mean	Median	Mean	Median
Sample: 2018-19 kindergarten students						
Students staying in zone						
All zoned campuses	54	50	63	59	68	63
Zoned campuses with pre-k programs	52	49	60	57	65	61
Zoned campuses without pre-k programs	76	71	89	83	95	89
Seats potentially needed						
All zoned campuses	-6	-13	3	-5	8	-1
Zoned campuses with pre-k programs	-16	-15	-7	-8	-3	-4
Zoned campuses without pre-k programs	57	57	66	67	71	71
	Total		Total		Total	
Students available to attend other schools	5,905		4,429		3,691	
Sample: 2018-19 pre-kindergarten students						
Students staying in zone						
All zoned campuses	48	46	56	53	60	57
Zoned campuses with pre-k programs	47	46	55	53	59	57
Zoned campuses without pre-k programs	52	57	61	67	65	72
Seats potentially needed						
All zoned campuses	-12	-15	-4	-7	0	-3
Zoned campuses with pre-k programs	-20	-19	-12	-12	-8	-8
Zoned campuses without pre-k programs	52	57	61	67	65	72
	Total		Total		Total	
Students available to attend other schools	5,199		3,899		3,246	

Source: HISD administrative data (student- and campus-level), 2018-19 & ArcMap Street Maps Premium 2018.

Front cover photo courtesy of the Houston Independent School District

Mission

Focusing on the most pressing issues facing the region, the Houston Education Research Consortium (HERC) is a research-practice partnership between Rice University and 11 area school districts. HERC, housed within the Kinder Institute for Urban Research, develops research 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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