# Predictors of School Year Student Mobility in the Houston Region

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**Overview.** This study identified student characteristics associated with school year mobility for more than 260,000 students in grades 4 through 8 who began the 2016-17 school year at a school in one of ten Houston area school districts. Of these students, 20,154, or just under 8%, changed schools at least once during the school year. Three characteristics stood out in predicting whether a student changed schools. First, Black students were more likely to be mobile during the year than students from other race/ethnicity groups, but a portion of these differences were explained by other characteristics. Second, students with lower STAAR scores in the prior school year were more likely to change schools than their peers with higher STAAR scores. Finally, prior mobility predicted future mobility as students who changed schools in the previous school year were more likely to be mobile again than their non-previously mobile peers.

### Key Terminology

**School Year Mobility:** when a student changed the school they attended during the 2016-17 school year

**Prior Year Mobility:** when a student changed schools during the 2015-16 school year, the year prior to the study

**Prior STAAR Scores:** a student's STAAR scores in the 2015-16 school year, the year prior to the study

## Key Findings

### Predictors of School Year Mobility in the Houston Region

- **Black students were more likely to change schools during the school year than peers from other race/ethnicity groups.** However, a portion of these differences were accounted for by other characteristics, including STAAR test performance and mobility in the prior school year.
- **Students with lower prior year STAAR scores were more likely to change schools than peers with higher prior year STAAR scores.** Students missing prior STAAR scores were about as likely to move as students with lower scores.
- **Students who changed schools during the 2015-16 school year were more than 3x as likely to change schools during the 2016-17 school year as students who did not change schools during the prior year.**

# Background

Changing schools is a common occurrence in Houston area public schools. Of the 260,101 students in grades 4 through 8 who began the 2016-17 school year in one of 10 Houston area school districts, more than 20,000 changed schools at least once during the school year. Research shows school year mobility tends to result in negative outcomes for students (Hanushek et al., 2003; Rumberger, 2003; Schwartz et al., 2017; Stroub & Gill, forthcoming). Understanding the characteristics predicting students' likelihood of school year mobility can help districts and schools identify students who may be more at-risk of changing schools and provide better supports and resources to mobile students when they arrive at their schools. Accordingly, this brief summarizes key findings from analyses exploring which student characteristics best predict whether a student will change schools during the school year.

Previous studies examining which student characteristics predict the likelihood of a student changing schools during the school year have produced varied and occasionally contradictory findings. Several consistently identify race/ethnicity (Mordechay, 2017; Schwartz et al., 2009; Finch et al,. 2009) and family residential changes (Rumberger, 2003; Welsh, 2017) as key characteristics in predicting school year mobility. Prior literature examining whether lower family socioeconomic status (SES) predicts student mobility have produced inconsistent results, however. Some studies find that lower SES students are more likely to change schools during the year (Finch et al., 2009), while others find that SES is not a meaningful predictor of school year mobility when accounting for other characteristics (Rumberger, 2003). Similarly, there is not clear consensus on whether lower performing students (Rich & Jennings, 2015; Rumberger, 2003) or higher performing students (Finch et al., 2009) are more likely to be mobile. Prior literature has not explored the role mobility in previous school years may play in predicting mobility in subsequent years, which is a key element of this study.

Given the inconsistent findings from prior research on what predicts student mobility, this study explores this question by looking at predictors of school year mobility in Houston region public school districts.

## Research Question

HERC's primary research question related to the predictors of school year mobility was:

*What student characteristics best predict whether a student changes schools during the school year?*

## Data and Methods

Data used for this study came from the Public Education Information Management System (PEIMS) from the Texas Education Agency (TEA). These analyses examined 260,101 students in grades 4 through 8 who began the 2016-17 school year in one of 10 Houston area school districts. For more information about the sample, please see Appendix 2, Table 1. For more information about methods, please see Appendix 1.

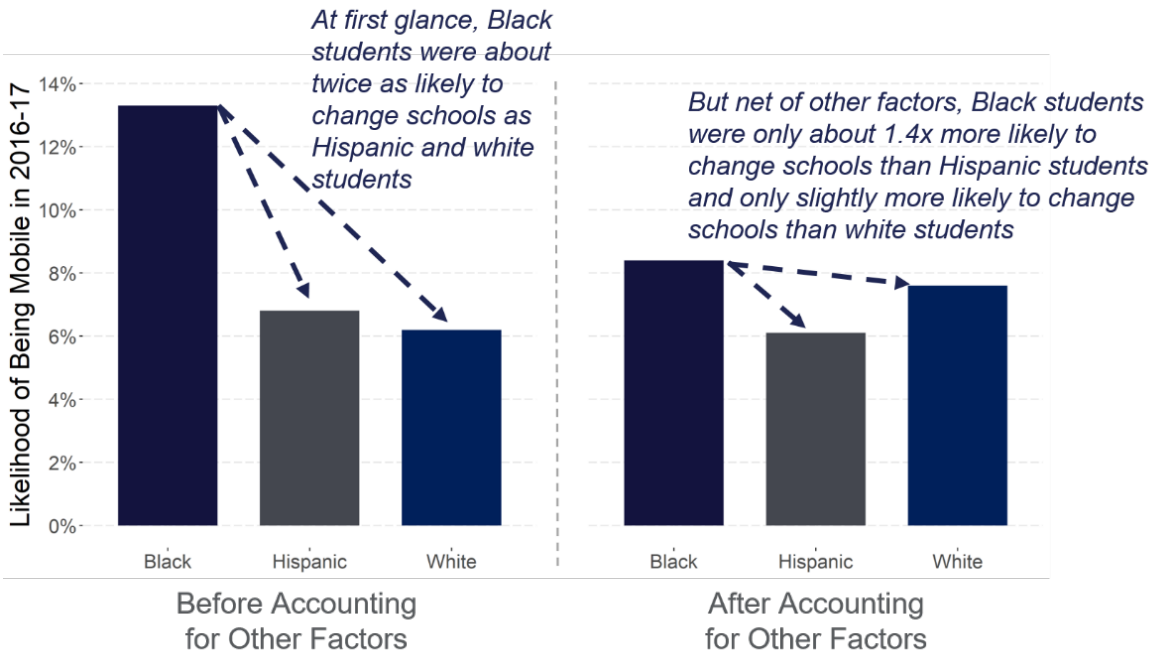
# Key Findings

## 1 Black students were more likely to be mobile during the school year than peers from other race/ethnicity groups, but gaps narrowed when accounting for other characteristics.

Black 4th-8th graders were more likely to change schools during the 2016-17 school year than their peers from other race or ethnicity groups. Before accounting for other student characteristics, Black students were nearly twice as likely to change schools during the school year as Hispanic and white students.

However, after accounting for other student characteristics (i.e. sex, economic disadvantage status, limited English proficiency (LEP) status, grade level, school district, prior year mobility, and 2015-16 STAAR scores) via statistical modelling, Black students were predicted to be about 1.4x as likely to change schools as their Hispanic peers. Likewise, Black students were predicted to be only slightly more likely to change schools than white students.

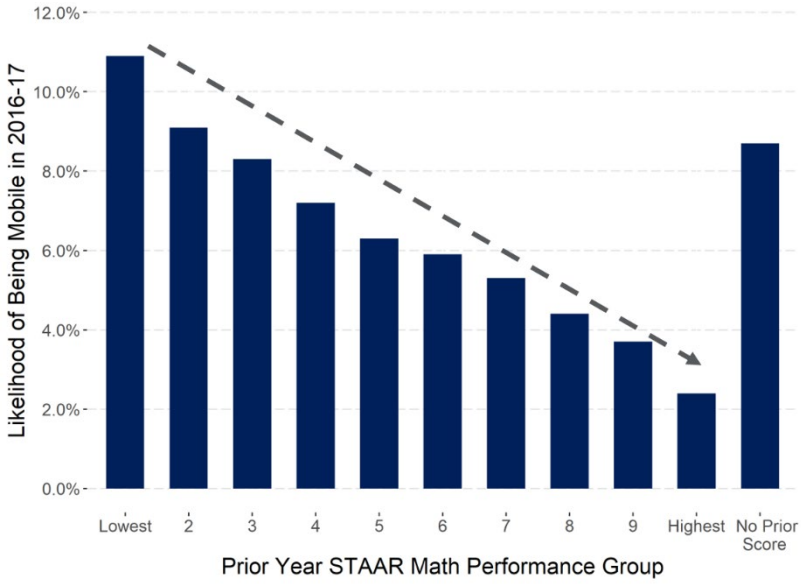
**Figure 1. Race/ethnicity gaps in the likelihood of school year mobility shrink when accounting for other student characteristics**



## 2 Students with lower prior STAAR scores were more likely to be mobile during the school year than peers with higher scores.

As students' STAAR math scores increased, their chances of changing schools decreased. Specifically, as shown in Figure 2, students in the lowest prior year performance group were 4-5x more likely to be mobile during the 2016-17 school year than their peers in the highest performance group.[1]

**Figure 2. Students with lower STAAR scores in 2015-16 were more likely to be mobile during the 2016-17 school year**



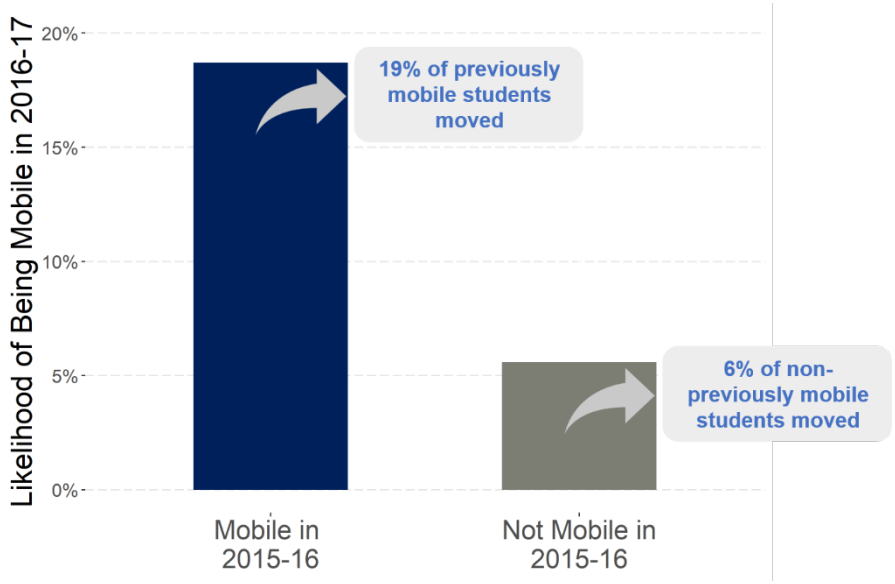

Student performance explained more of the differences in student mobility between Black and other race or ethnicity groups shown in Figure 1 than other student characteristics, such as sex, economic disadvantage status, limited English proficiency (LEP) status, grade level, and school district.

[1] "Performance group" refers to a student's STAAR math score decile in 2015-16. For more detail, please see Appendix 1.

## 3 Students who changed schools in the 2015-16 school year were more than 3x as likely to change schools in 2016-17.

Finally, students who changed schools during the prior school year were more likely to change schools again the following year than students who did not change schools in the previous year. As seen in Figure 3, students in 4th-8th grades who changed schools during the 2015-16 school year were more than 3x as likely to be mobile during the school year in 2016-17 as their peers who had not changed schools in the previous school year.

**Figure 3. Students who changed schools in 2015-16 were more likely to change schools again in 2016-17**




To determine what might account for the higher mobility among Black students, the research team analyzed the various predictors described in this report separately (these analyses are available upon request). The student characteristics described on page 3 did little to account for differences in mobility between Black students and students from other race/ethnicity groups on their own. Individually, however, both 2015-16 STAAR scores and 2015-16 mobility explained a similarly substantial portion of the reduced mobility gap discussed on page 3. Taken together, prior year STAAR performance group and prior year mobility were important pieces of the puzzle in predicting whether a student would be mobile during the school year.

# Conclusion

## Implications

The findings outlined in this report have several implications. First, 2015-16 STAAR performance and 2015-16 school year mobility explained much of the higher 2016-17 school year mobility of Black students. Knowing these mechanisms play an important role in predicting whether students change schools during the school year means that interventions that identify previously mobile students and support lower performing students may help reduce student mobility. Such steps may be especially beneficial to lower performing students and Black students, given that both groups tended to be disproportionately affected by mobility.

Students with lower STAAR scores during the 2015-16 school year were more likely to be mobile in 2016-17 than students with higher scores in the previous year. By identifying students with lower past STAAR scores, schools may be able to target interventions that not only reduce future student mobility, but also improve student performance.

Finally, the connection between past and future mobility pointed to a "cycle of mobility," in which the same group of students continued to be more likely to change schools year after year. This association presents schools and districts a powerful opportunity to identify potentially mobile students based on whether they changed schools in the prior school year and to provide needed academic and social and emotional supports. When mobility does occur, schools should continue supporting mobile students into the following school year to disrupt the cycle of mobility.

This study identified several predictors of school year mobility. Understanding that lower past STAAR scores and past mobility predict future mobility can help schools and districts identify potentially mobile students and provide supports accordingly. Nevertheless, this information is unable to tell them *why* students change schools and help them develop more specialized student supports.

Future studies of mobility in the Houston region may identify why families decide to change schools during the school year through interviews or surveys. Learning the various motivations at play may be helpful, as different reasons for changing schools may require different intervention plans. Circumstances that may influence mobility, such as a family's housing or socioeconomic situation, may be outside school or district control, but understanding these mechanisms in a more complete way can help educators and administrators identify potential partnerships with other resources or organizations within the community providing families support in those areas. In contrast, potential explanations like a student's connectedness to their school community is within a school's control. The findings in this report highlight important, actionable patterns, but they do not explain the reasons for those patterns. Both pieces of information together could be powerful tools in supporting students and families as they progress through their educational journeys.

# Conclusion

## What role does school play?

Prior literature suggests that school characteristics, such as student demographics, disciplinary practices, or academic performance, may influence student mobility (Rich & Jennings, 2015; Rumberger, 2003). To understand what predicted whether an individual student changed schools during the school year, this report focused on individual characteristics, such as student demographics, prior performance, and if a student changed schools in the previous year. But context matters, and understanding the role of context—specifically, the school a student attends—may be an important part of the student mobility story. With this understanding, steps were taken to explore what relationship, if any, a student's starting school might have with school year mobility (please see Appendix 1 for a more thorough discussion of these steps). Findings suggested that while schools might have played a role in predicting student mobility, they did not substantively alter the role played by the individual student predictors discussed in this report. Future research is needed that focuses more specifically on how school and social context may influence school year mobility in the Houston area.

# Appendix 1

## Data

Using Public Education Information Management System (PEIMS) data from the Texas Education Agency (TEA), this brief studied 260,101 in grades 4-8 who began the 2016-17 school year in one of 10 Houston area school districts. Of those students, 20,154 (7.8%) were mobile at least once during the school year.

## Variables

The following student characteristics were included in analyses:

### Outcome Variable

A dichotomous indicator of a student's mobility status in 2016-17, constructed utilizing TEA student attendance data. These data were broken into six-week attendance periods. Students were coded as "mobile" for the year if they ended any of these attendance periods at a different school than they started it. Because these data allowed for a maximum of one school change per attendance period (for a total maximum of six school changes per year), they did not necessarily capture every school change a student might have made if they changed schools multiple times in a given attendance period.

### Predictors of Interest

Race/ethnicity, a five-category measure (Asian, Black, Hispanic, white, and other) with Hispanic students as the reference group, built from TEA student demographic data.

Mobility status in 2015-16, a dichotomous indicator of a student's mobility in the prior school year constructed using the same methodology described for the outcome variable above.

2015-16 STAAR math and reading scores, an 11-category indicator of a student's STAAR performance in the prior school year. HERC focused on 4$^{th}$-8$^{th}$ graders because students did not begin taking STAAR tests until 3$^{rd}$ grade. Students were grouped into performance deciles (referred to as "performance group" in the report) based on their 2015-16 scores, with the first decile being the 10% of students with the lowest prior scores and the 10$^{th}$ decile being the 10% of students with the highest prior scores; students missing 2015-16 STAAR scores were included as a separate 11$^{th}$ category. The lowest performance group served as the reference group.

### Control Variables

Student sex, a dichotomous indicator with "male" coded as 1 and "female" coded as 0.

Student economic disadvantage status, a dichotomous indicator with "economically disadvantaged" coded as 1 and "not economically disadvantaged" coded as 0.

Student limited English proficiency (LEP) status, with "LEP" coded as 1 and "not LEP" coded as 0.

Student grade level, ranging from 4$^{th}$ through 8$^{th}$ grade, constructed as an indicator of a student's maximum grade level in a given school year. Some students might have multiple grade levels in a year; this variable measured the highest grade they were enrolled in during the 2016-17 school year.

Student starting school district, an indicator of the school district in which a student began the school year, included in statistical models as fixed effects and discussed in more detail below.

# Appendix 1

## Methods

Researchers utilized logistic regression with the dichotomous indicator of school year mobility in 2016-17 as the outcome variable. Results presented in the body of this report referred to the marginal effects of the relationships resulting from these regression analyses.

Fixed effects for a student's starting school district were included to account for system- or policy-level variations that may influence students' interest in or ability to change schools. The districts included in this analysis included some with robust, highly utilized school choice systems, as well as more traditional, residentially zoned districts with limited opportunity opportunities to attend schools outside a student's zone. This variation allowed the analyses to account for differences across districts and to explore which other factors predicted school year mobility, regardless of any policy differences across school districts.

Researchers then examined which variables, if any, were associated with higher predicted likelihoods of changing schools during the school year. Interaction effects between 2015-16 STAAR scores and race/ethnicity, 2015-16 STAAR scores and economic disadvantage status, and economic disadvantage status and race/ethnicity were also analyzed.

Standard errors were clustered by the school at which a student began the 2016-17 school year.

All relationships described in the body of this report were statistically significant.

For logistic regression results, please see Appendix 2, Table 2.

To take into account school-to-school differences in composition, culture, and mobility climate, researchers separately tested both school "fixed effects" and "random effects"—methods which attempt to take into account the extent to which school characteristics might influence or mediate student mobility, without necessarily teasing out which specific school characteristics played a role. To further test the robustness of the findings in this report, researchers also utilized "coarsened exact matching" (CEM), which matched mobile and non-mobile students on the variables of interest, as well as their starting school, to better balance the analytic sample. The results from these checks indicated that the school at which a student began the school year might play a role in predicting whether they changed schools, but they did not substantively change the role played by the student characteristics discussed in this report. (These results are available from the author upon request.) For the sake of parsimony, researchers elected to report findings from the statistical models accounting for starting school district, rather than individual schools.

# Appendix 2

## Table 1.

*Descriptive Statistics*

| | % of Students | Group Sample Size | % of Group Mobile in 2016-17 |
|---|---|---|---|
| Asian | 6.6% | 17,087 | 4.2% |
| Black | 19.6% | 51,103 | 13.1% |
| Hispanic | 55.5% | 144,376 | 6.7% |
| Other | 2.0% | 5,278 | 9.1% |
| White | 16.2% | 42,257 | 6.0% |
| Current Limited English Proficiency (LEP) | 23.9% | 62,040 | 7.7% |
| Economically Disadvantaged | 68.5% | 178,127 | 8.9% |
| Female | 48.8% | 126,802 | 7.5% |
| Mobile in 2015-16 | 7.6% | 19,801 | 25.2% |

Total Sample Size: 260,101 students

Overall % Mobile for Sample in 2016-17: 7.8%

*Note*: "Other" race/ethnicity category includes students identified as American Indian, Pacific Islander, and Two or More Races

# Appendix 2

## Table 2.

*Logistic Regression Predicting the Likelihood of School Year Mobility in 2016-17*

| Variable | *B* | *SE* | *OR [95% CI]* |
|---|---|---|---|
| Constant | -2.33** | .09 | |
| Male | .05** | .02 | 1.05 [1.01 1.08]** |
| Asian | -.18** | .05 | .84 [.76 .93]** |
| Black | .39** | .02 | 1.48 [1.42 1.54]** |
| Other | .41** | .06 | 1.51 [1.36 1.69]** |
| White | .30** | .03 | 1.35 [1.28 1.43] |
| Economically Disadvantaged | .19** | .02 | 1.21 [1.16 1.26]** |
| LEP | -.38** | .02 | .69 [.66 .72]** |
| Mobile in 2015-16 | 1.43** | .02 | 4.17 [4.00 4.34]** |
| 2015-16 STAAR Math: 2nd Decile | -.23** | .03 | .80[.75 .84]** |
| 2015-16 STAAR Math: 3rd Decile | -.34** | .03 | .71 [.67 .75]** |
| 2015-16 STAAR Math: 4th Decile | -.51** | .03 | .60 [.57 .64]** |
| 2015-16 STAAR Math: 5th Decile | -.65** | .03 | .52 [.49 .56]** |
| 2015-16 STAAR Math: 6th Decile | -.73** | .03 | .48 [.45 .51]** |
| 2015-16 STAAR Math: 7th Decile | -.87** | .04 | .42 [.39 .45]** |
| 2015-16 STAAR Math: 8th Decile | -1.07** | .04 | .34 [.32 .37]** |
| 2015-16 STAAR Math: 9th Decile | -1.25** | .04 | .29 [.26 .31]** |
| 2015-16 STAAR Math: 10th Decile | -1.68** | .06 | .19 [.17 .21]** |
| 2015-16 STAAR Math: Missing Score | -.24** | .03 | .79 [.74 .84]** |
| 4th Grade | -.03 | .09 | .97 [.82 1.15] |
| 5th Grade | -.10 | .09 | .90 [.76 1.06] |
| 6th Grade | .02 | .09 | 1.02 [.87 1.21] |
| 7th Grade | -.01 | .09 | .99 [.84 1.17] |
| 8th Grade | -.02 | .09 | .98 [.83 1.15] |

*Note.* Stata does not report coefficients for specified reference groups, so reference group results are not reported in this table. This model also included fixed effects for the school district in which a student began the 2016-17 school year and clustered standard errors by school. Pseudo $R^2$ = .09. Model $\chi^2$ = 12164.66.

*p<.05, **p<.01 (two-tailed tests)

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