The Relationship Between School-Year Mobility and School Performance in the Houston Area

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The Houston Education Research Consortium (HERC), in a study of 10 public school districts in the Houston area, found that the higher the school-year mobility rate at a school, the lower its accountability performance. This association was largest in high schools, where school-year mobility rates fluctuated yearly, but was seen in elementary and middle schools as well. Implications for schools in the Houston area are discussed.

Key Terms

Index 1: Student Achievement – Percent of students scoring Approaches Grade Level or higher on all State of Texas Assessments of Academic Readiness (STAAR) exams at the school level.

School-year mobility – When a student changes the school they attend during the school year.

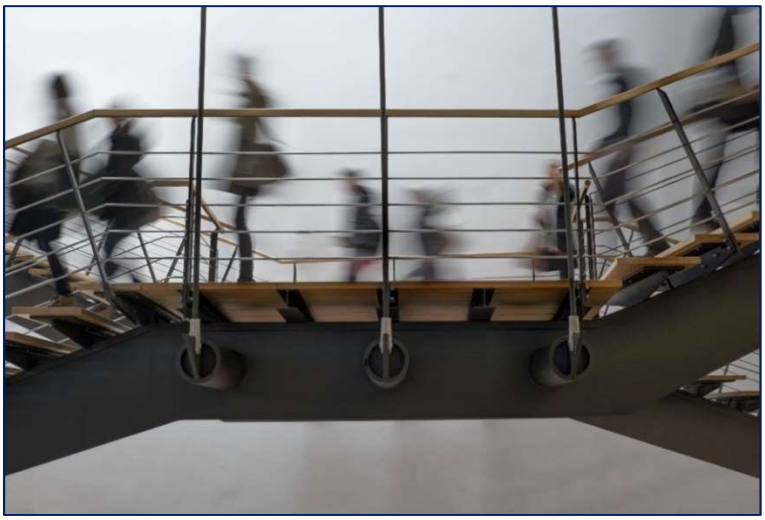
School-year mobility rate – The number of school changes, both in and out of schools, per 100 students at the school level.

School type – Refers to elementary, middle, or high school.

Key Findings

School-year mobility was negatively related to Index 1 scores.

- Higher rates of school-year mobility were linked to lower Index 1 scores.
- School-year mobility was most associated with Index 1 scores in high schools, where a one-point increase in school-year mobility translated to a 0.75-point decrease on Index 1 performance at a school.
- Negative, albeit smaller, associations also existed between school-year mobility and Index 1 performance for elementary and middle schools.



School-year mobility rates changed from year to year at individual schools.

- School-year mobility increased and decreased unsystematically, or without pattern, from one year to the next, fluctuating by about 2 to 3 moves per 100 students each year.

Background

Student mobility – that is, students changing schools – can be detrimental for the academic outcomes of mobile students. Students who change schools tend to experience lower test scores than their non-mobile peers (Grigg, 2012; Reynolds et al., 2009), be at higher risk of getting retained a grade (Rumberger, 2003), and have higher drop-out rates (South et al., 2007). Student mobility may not only affect the academic achievement of the students who change schools (Kerbow, 1996; Welsh, 2017), but also have implications for entire schools, especially when they are rated on student outcomes in state accountability systems (Scherrer, 2013). This may matter in states like Texas, which evaluates the performance of public schools and districts for accountability (Texas Education Agency [TEA], 2017; see Appendix A for a summary) and which has a relatively high student mobility rate—nearly one-third of public-school students experience a school change between fourth and seventh grade (excluding the transition from elementary to middle school) (Hanushek et al., 2004). This brief examines the role of school-year mobility on the accountability performance of Houston-area schools, specifically looking at performance on Index 1.

Beyond Mobile Students

Issues from student mobility tend to focus on the mobile students alone, but what does student mobility do to the academic performance of a student body overall, inclusive of non-mobile students? In Texas, a school's accountability metrics are calculated based only on students who were at the school at the beginning of the year – during the October Snapshot – and at the time of the accountability assessment, which takes place towards the end of the school year. To this end, a school's performance on the STAAR tests, which are used to construct Index 1, reflects the performance of non-mobile students at a school.

Research Questions

This brief examines school-year mobility rates and what they mean for schools, specifically:

1. Were changes in school-year mobility rates associated with changes in school accountability performance?
2. How much did school-year mobility rates change from one year to the next at individual schools?

Data and Methods

To answer these research questions, Public Education Information Management Systems (PEIMS) data were used to identify school-year mobility and calculate a mobility rate for schools in 10 school districts around the Houston area. Additional details on the identification and calculation of school-year mobility rates are available on the HERC website (Potter et al., 2019). Data on school performance were gathered from accountability performance files for the 2012-2013 through 2016-2017 school years. Though the Texas Education Agency (TEA) no longer reports accountability performance index scores, these measures reflect continuing goals of schools and districts, including student performance, closing gaps, and college and career readiness.

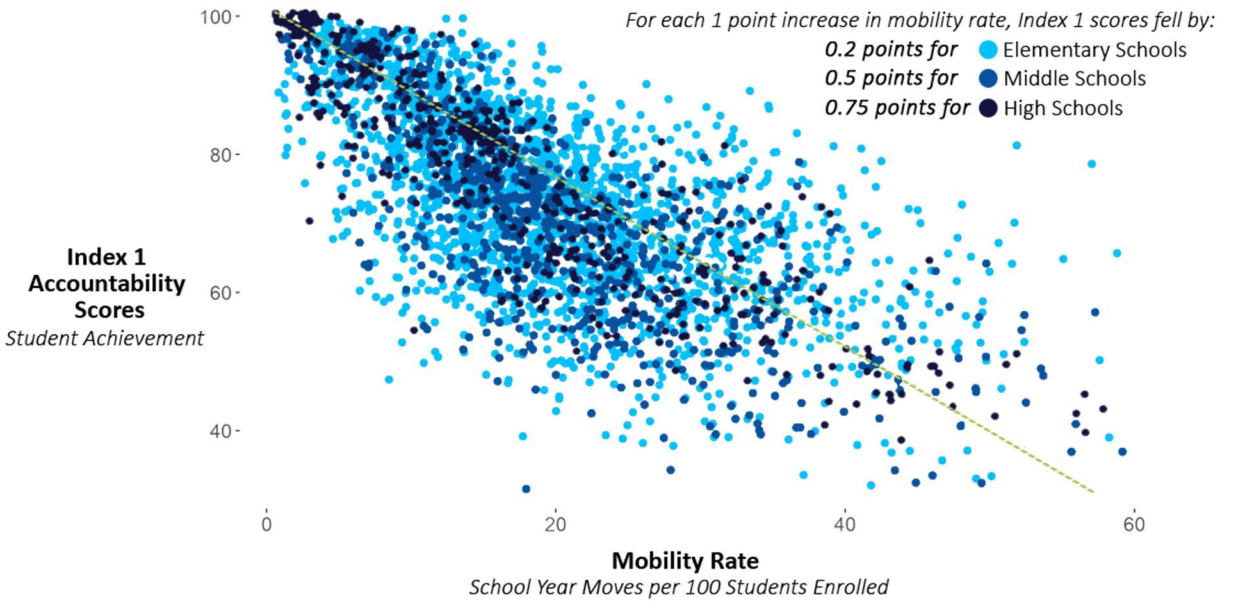
Linear regression models were used to determine if school-year mobility rates at individual schools were related to accountability performance index scores. In addition to including the measure of school-year mobility rate, the analyses included measures of other school characteristics, such as percent of

economically disadvantaged students. For more details on the data and methods used, please see Appendix B. This research brief highlights the association between campus' school-year mobility rates and Index 1 scores. Detailed descriptions of the four accountability performance indices are found on Appendix A. The associations between school-year mobility rates and the other three accountability performance indices are in Appendices C, D, and E.

1 School-year mobility was negatively related to Index 1 scores.

School-year mobility was negatively related to Index 1 scores across all school types. As school-year mobility rate increased, performance on Index 1 decreased at a school (Figure 1). The **decline was most notable in high schools**, where a one-point increase in a school's mobility rate was related to a 0.75-point decline in Index 1 score. Higher school-year mobility rates were related to lower Index 1 performance at elementary and middle schools as well, but the size of the decline was smaller.

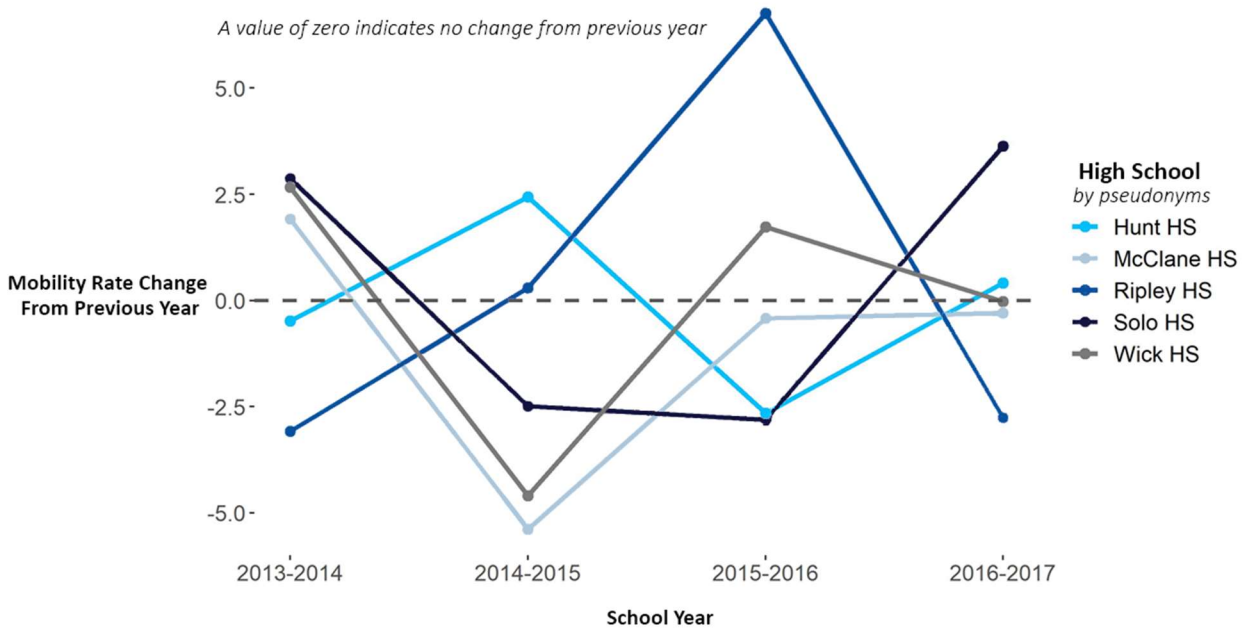
Figure 1. Student achievement decreased as school-year mobility increased for all school types



2 School-year mobility rates changed year to year at individual schools.

On average, school-year mobility increased or decreased by about 2 to 3 moves per 100 students from one year to the next. For many schools in the Houston area, year-to-year mobility rates changed without pattern. Schools might experience an uptick in their mobility one year, only to see a decline the following year. Figure 2 shows examples of changes to school-year mobility rates over time at individual schools. Positive numbers indicate an increase in school-year mobility, while negative numbers indicate a decrease in school-year mobility. The mobility rates shown for all five high schools illustrate the random swings that seemed to occur across schools. Some schools showed back-and-forth positive and negative rates, like Wick HS, while other schools showed gradual to sudden trajectory shifts, like Ripley HS. For schools that experienced an increase in their school-year mobility, their number of moves per 100 students typically increased by about 2 to 3 moves. For schools that experienced a drop in their school-year mobility, their number of moves per 100 students typically dropped by about 2 to 3 moves.

Figure 2. Sample of five Houston-area high schools' changing school-year mobility rates by year



Implications

Implications for schools and districts

Higher school-year mobility rates were associated with lower Index 1 scores at schools around the Houston area. First, schools and districts can try to more effectively identify students that are potentially mobile and provide guidance and support before and through their school change. This may be done using existing research showing which student subgroups are the most likely to become mobile (Potter et al., 2021) and when they are most likely to change schools (Potter et al., 2019).

Second, given that a school's accountability performance is calculated based on non-mobile students, this evidence suggests that mobility matters at a school level, even for those students who are not mobile. The mechanisms linking student mobility to non-mobile student performance are not tested in this research brief, but future research could look to better understand how mobility is disrupting the educational experiences of students at schools around the region. Identifying these mechanisms can provide insight on how to serve both mobile students (e.g., improved integration procedures for getting students settled in schools and classrooms) and non-mobile students more effectively (e.g., identifying and implementing strategies to minimize the disruptiveness created by school-year mobility).

Third, given the amount of year-to-year fluctuation in school-year mobility rates at individual schools, it is possible that a slight shift in mobility for schools teetering on the pass/fail edge could be the event that drags them down or lifts them up. As the findings for high schools and Index 1 indicated, a three-point change in mobility rate could equal about a 2.25-point change in either direction for accountability performance, which could affect a high school near a rating threshold. Perhaps less extreme, schools may find themselves on the edge between two letter grades in the current accountability system, and school-year mobility could be the factor that differentiates a B campus from a C campus

Implications for the state of Texas

State and district policymakers and practitioners should acknowledge the association between student achievement and student mobility while recognizing the limitations of only using quantitative metrics for accountability ratings. Texas lawmakers can remedy this by seeking a qualitative understanding of the varying perspectives within educational settings. Lawmakers can use these perspectives to create accountability systems that take factors like student mobility into account when assigning ratings. Taking accountability measures in innovative directions may be even more necessary as policymakers and practitioners more fully understand the aftereffects of the COVID-19 pandemic on student achievement and school and district responses.

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Appendix

Appendix A. Texas Education Agency Accountability System – 2012-2013 – 2016-2017

The State of Texas Assessments of Academic Readiness (STAAR) tests were used for accountability starting in the 2012-2013 school year. The state gave every district and school an academic rating on four indices that together provided a complete measure of performance. The four indices[1] were:

Index 1: *Student Achievement* – This index measured district and school performance from student achievement across all subjects for all students. Scores were determined by the percentage of assessments that met or exceeded the STAAR Level II Satisfactory Standard, met or exceeded the English Language Learner (ELL) progress measure, or achieved the equivalency standard on end-of-course (EOC) substitute assessments. The index score was determined by the percent of students scoring at or above the Approaches Grade Level standard on all STAAR exams (the proceeding two levels being Meets Grade Level followed by Masters Grade Level), the ELL progress measure, or on EOC substitute assessments.

Index 2: *Student Progress* – Scores were determined by the percent of students meeting or exceeding expected yearly progress on English Language Arts (ELA)/reading and mathematics by student demographic categories (e.g., race/ethnicity, special education, etc.) according to STAAR/ELL measures (*Did Not Meet, Met,* or *Exceeded Progress*).

Index 3: *Closing Performance Gaps* – Scores were given based on the performance of economically disadvantaged students and of the two lowest-performing racial/ethnic groups (based on prior assessment results) on tests that included reading, mathematics, writing, science, and social studies.

Index 4: *College, Career, & Military Readiness (CCMR)* – This index considered the preparation for high school provided by elementary and middle schools, as well as the readiness for college provided by a high school diploma.

[1] Chapter 3 of TEA's Accountability Manual describes the construction and calculations of each index in detail: https://tea.texas.gov/sites/default/files/2017AccountabilityManual_accessible.pdf

Appendix B. Data and Methods

Data

Using student-level Public Education Information Management System (PEIMS) attendance data from the Texas Education Agency (TEA), researchers identified and measured school-year mobility, aggregating this information to the school level. More details on the calculation of school-year mobility rates are available here. These mobility data were combined with other school-level data from the TEA, including school performance and demographic indicators from the Texas Academic Performance Reports (TAPR) and the Academic Excellence Indicator System (AEIS)[2], as well as neighborhood information from the American Community Survey (ACS) 2014-2018 five-year estimates. The resulting dataset was organized in a school-year format, with each school from 10 Houston-area school districts having five years of data spanning the 2012-13 to 2016-17 school years. The final analytic sample contained 3,345 school-year observations.

Variables

The following school characteristics were included in the analyses:

Outcome Variable: a continuous variable indicating a school's accountability performance index score, according to TEA guidelines. For the years of this study, TEA defined four accountability performance indices. Scores in each index ranged from 0-100, and schools were defined as meeting standards in a given index if they scored above a threshold defined by TEA.[3] Researchers analyzed the relationships between the predictors of interest and school performance on each of the four accountability performance indices (one at a time).

Predictor of Interest: school-year mobility rates defined as the number of student moves entering or exiting a school during the school year per 100 students enrolled. For example, a school experiencing a total of 100 student moves during a given school year with a total enrollment of 500 students would have a school-year mobility rate of 20 moves per 100 students.

Control Variables:

- Percent of students at a school considered economically disadvantaged, ranging from 1.3% to 100%.
- Percent of students at a school considered limited English proficient (LEP), ranging from 0% to 90.8%
- Percent of students at a school identified as Black, ranging from 0% to 96.5%.
- Percent of students at a school identified as Hispanic, ranging from 2.3% to 99.5%.
- A normalized indicator of the average percent of students at a school who were considered to have met the state's standards in math and reading in the previous school year. To construct this measure, the percent of students who were considered to have met standards in the school years of the study (and one year prior) in both math and reading were averaged. Next, the averages were normalized within school year so that a school's score in this variable was reported relative to all other schools' score within the analytic sample for that year. This normalization was

[2] AEIS data were used for prior accountability performance indicators from the years before the establishment of the STAAR tests in the 2012-13 school year.
[3] For more information on TEA's accountability system over time, please see: https://rptsvr1.tea.texas.gov/perfreport/account/

performed to account for any changes to math and reading standards that may have occurred during the years of the study.

- A categorical indicator for time.

Methods

Researchers used linear regression analyses to analyze the relationship between school-year mobility rates and accountability performance index scores. Elementary, middle, and high schools were analyzed separately, as were each of the four accountability performance indices. Fixed effects for school district were included, to account for any differences in policy or practice across districts that may influence school-year mobility flows.

To examine year-to-year changes in school-year mobility rate at individual schools, researchers calculated every school's mobility rate change from year 1 to year 2, year 2 to year 3, etc., for each year in the study. These were then grouped by whether a school's rates increased or decreased, then averaged across the analytic sample to determine the average change in mobility rates over time for each year of the study.

This analysis found that mobility rates tended to shift around often from year to year, and that they did not tend to go in one direction or the other consistently (i.e., increased year after year or decreased year after year). In fact, in looking solely at *average change in mobility rate for a given school over the five years in the panel*, most schools hovered around 0. For example, if a school's mobility rate increased by three moves per 100 students from year 1 to year 2, decreased by four moves per 100 students from year 2 to year 3, increased by five moves per 100 students from year 3 to year 4, and decreased by four moves per 100 students from year 4 to year 5, the school's average change in mobility rates over the study's time period was 0; but that average masked that the year-to-year rates were changing regularly, and that the average of the *absolute value* of those changes was actually four moves per 100 students in either direction. This fluctuation is represented in Figure 2 in the body of this report.

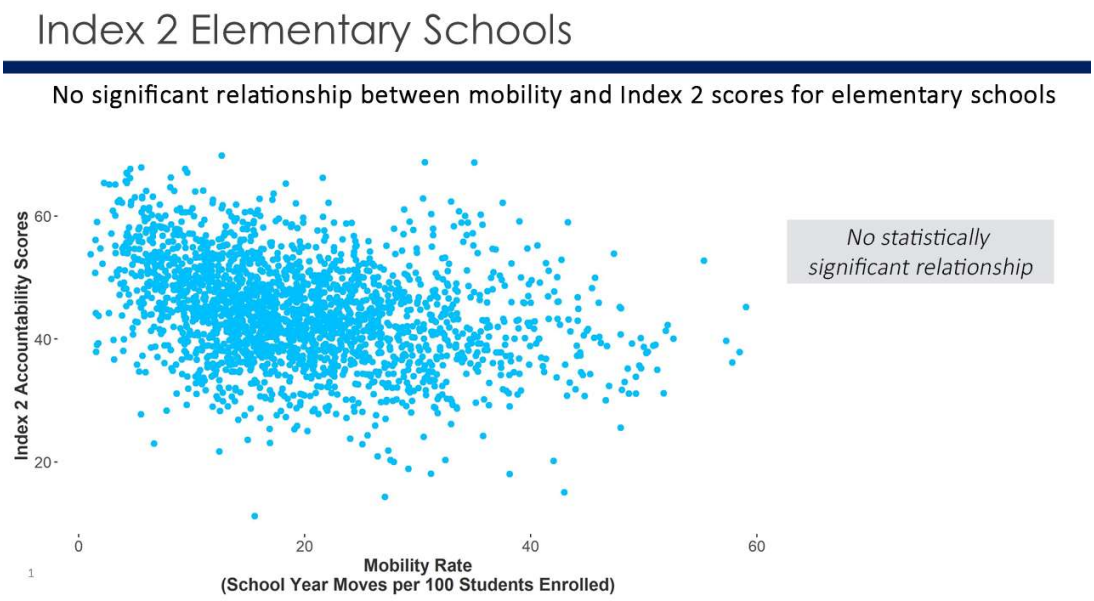
The year-to-year changes in schools' mobility rates were then combined with estimates from the regression analysis to estimate potential changes in campus accountability index score performance associated with year-to-year variability in school-year mobility rates.

As a robustness check, ACS neighborhood characteristics for schools' Census tracts, such as demographic information, socioeconomic factors, and home ownerships rates, were also examined. None, however, were statistically significant nor affected the relationships identified with the predictors of interest.

Appendix C. Index 2 – *Student Progress*

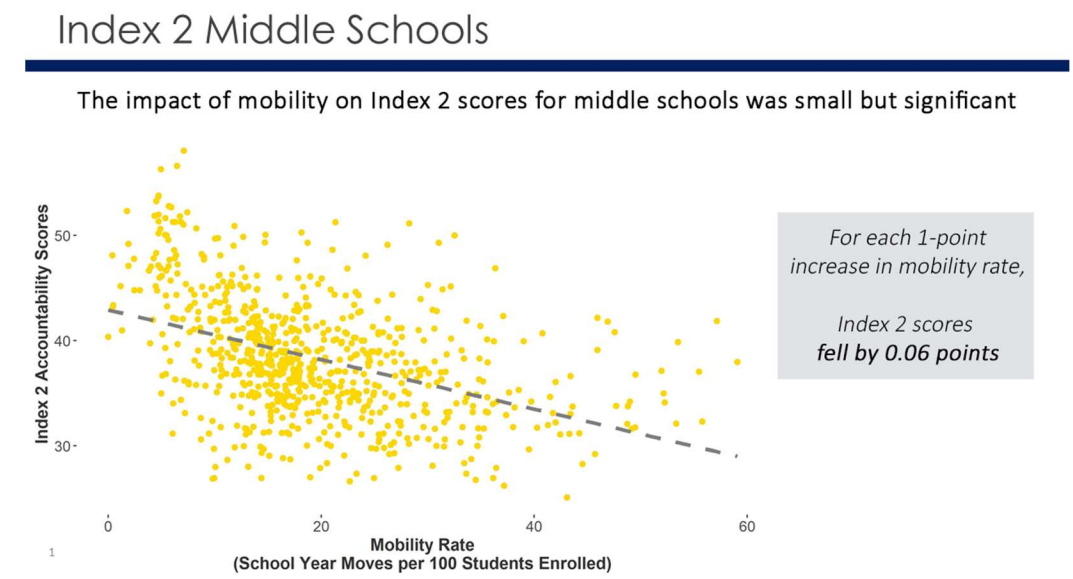
School-year mobility rates were not associated with Index 2 scores for elementary schools; the relationship was not statistically significant (Figure C1).

Figure C1. School-year mobility not associated with Index 2 scores in elementary schools.



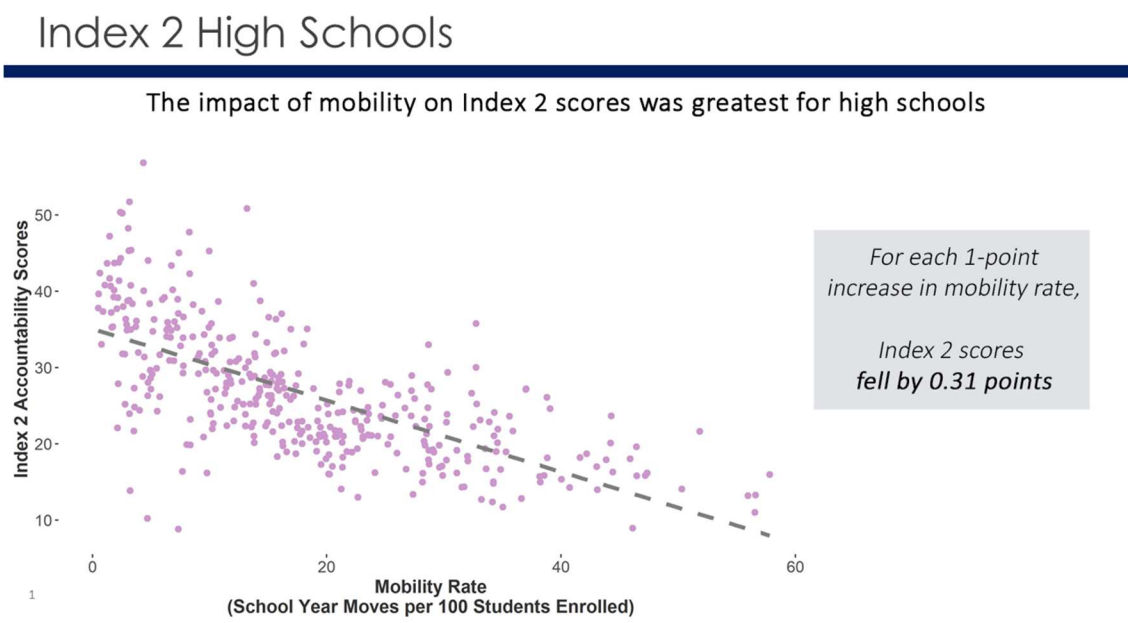
School-year mobility was negatively associated with Index 2 scores at middle schools, but the association was small (Figure C2). A one-point increase in school-year mobility was associated with a 0.06-point decline in Index 2 scores for Houston-area middle schools.

Figure C2. School-year mobility associated with small drop in Index 2 scores in middle schools.



School-year mobility was negatively associated with Index 2 scores at high schools (Figure C3). For each one-point increase in the mobility rate for high schools, the Index 2 score dropped 0.31 points.

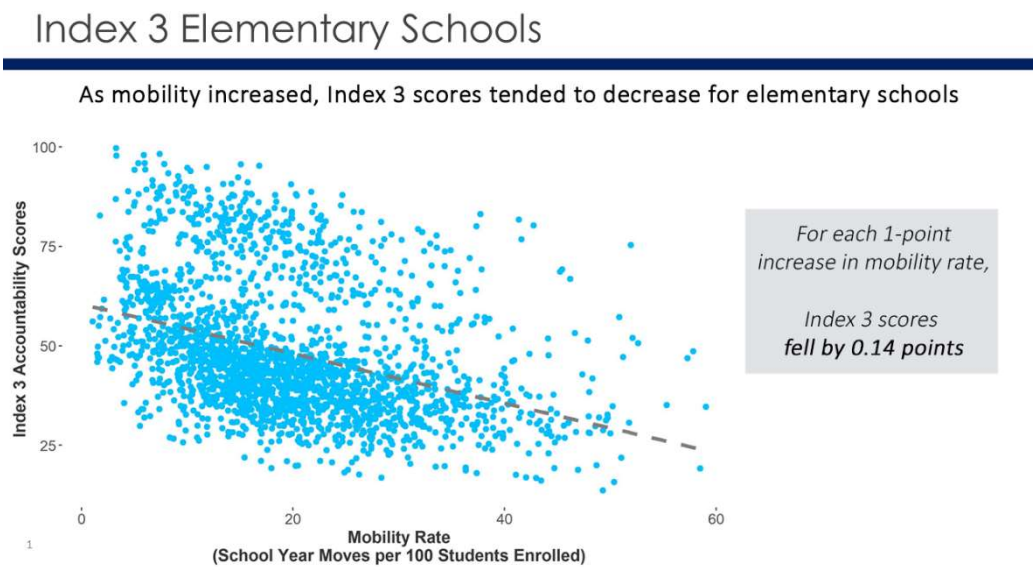
Figure C3. School-year mobility associated with drop in Index 2 scores in high schools.



Appendix D. Index 3 – *Closing Performance Gaps*

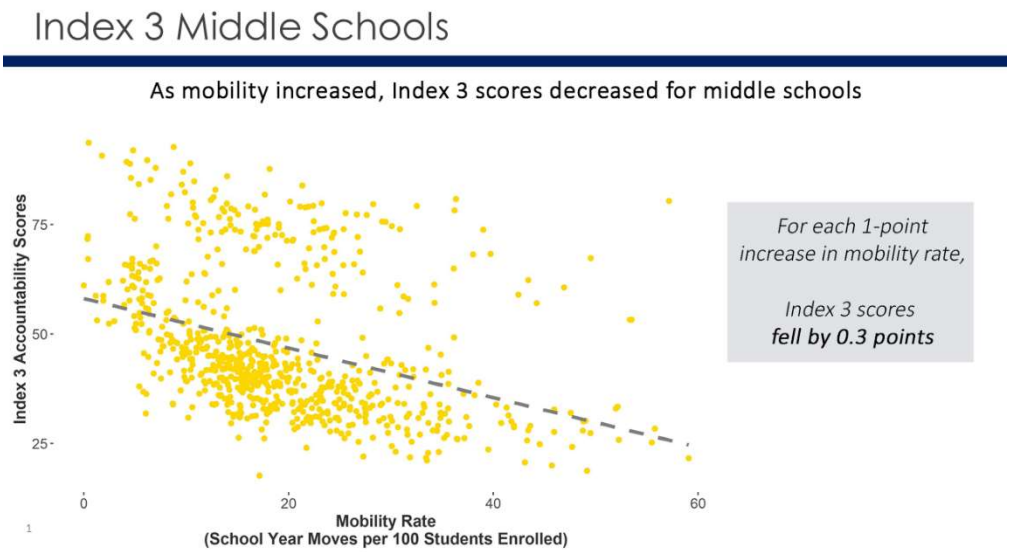
At Houston-area elementary schools, mobility rates were associated with a small drop in Index 3 scores (Figure D1). For each one-point increase in a school's mobility rate, its Index 3 score was expected to drop by about 0.14 points.

Figure D1. As School-year mobility rates increased, Index 3 scores decreased slightly in elementary schools.



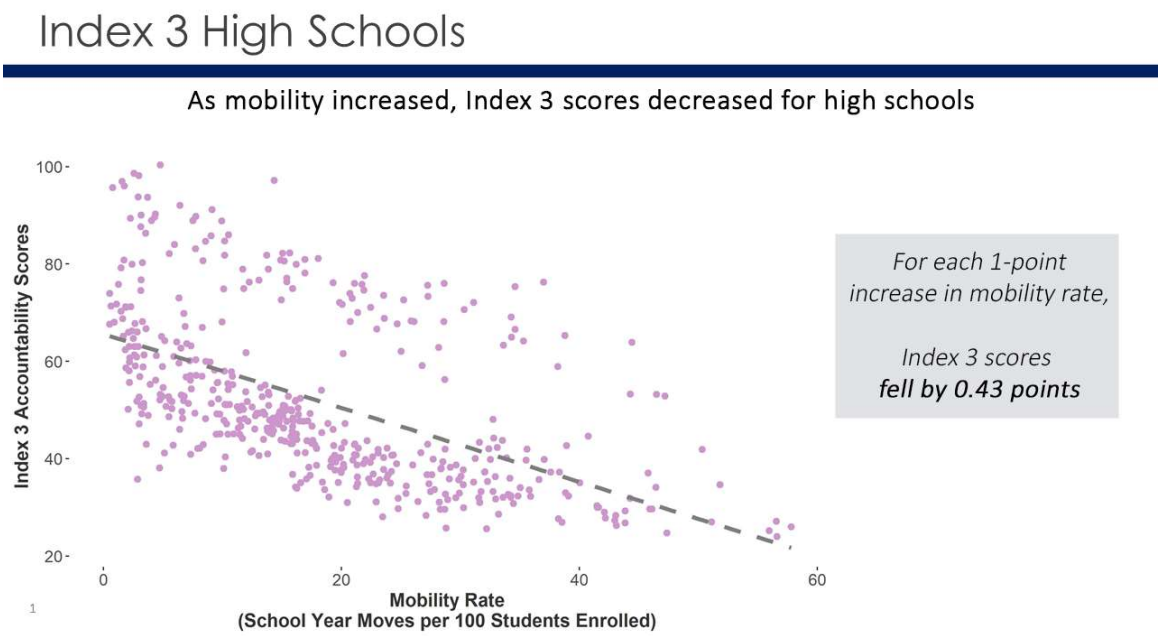
School-year mobility rates were associated with lower Index 3 scores for middle schools in the Houston area (Figure D2). For middle schools, a one-point increase in school-year mobility was associated with a 0.3-point decline in Index 3 scores.

Figure D2. More school-year mobility related to lower Index 3 scores at Houston-area middle schools.



High schools with higher school-year mobility rates tended to have lower Index 3 scores (Figure D3). On average, a one-point increase in school-year mobility rates was related to around a 0.43-point decline in Index 3 scores.

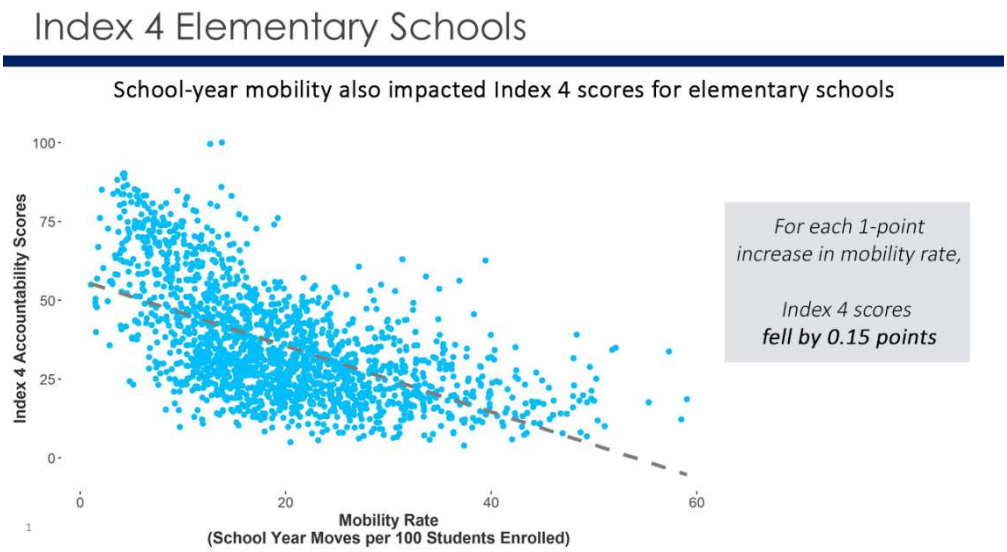
Figure D3. More school-year mobility related to lower Index 3 scores at Houston-area high schools.



Appendix E. Index 4 – *College, Career, and Military Readiness (CCMR)*

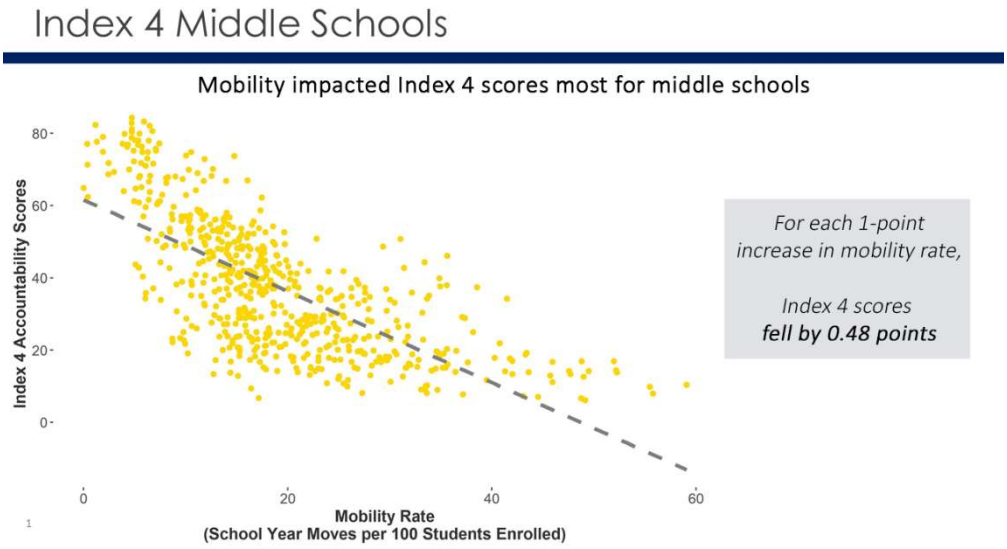
School-year mobility rates were negatively associated with Index 4 scores for elementary schools in the Houston area (Figure E1). For elementary schools, a one-point increase in school-year mobility rates was associated with a 0.15-point decline in Index 4 scores.

Figure E1. More school-year mobility related to lower Index 4 scores at Houston-area elementary schools.



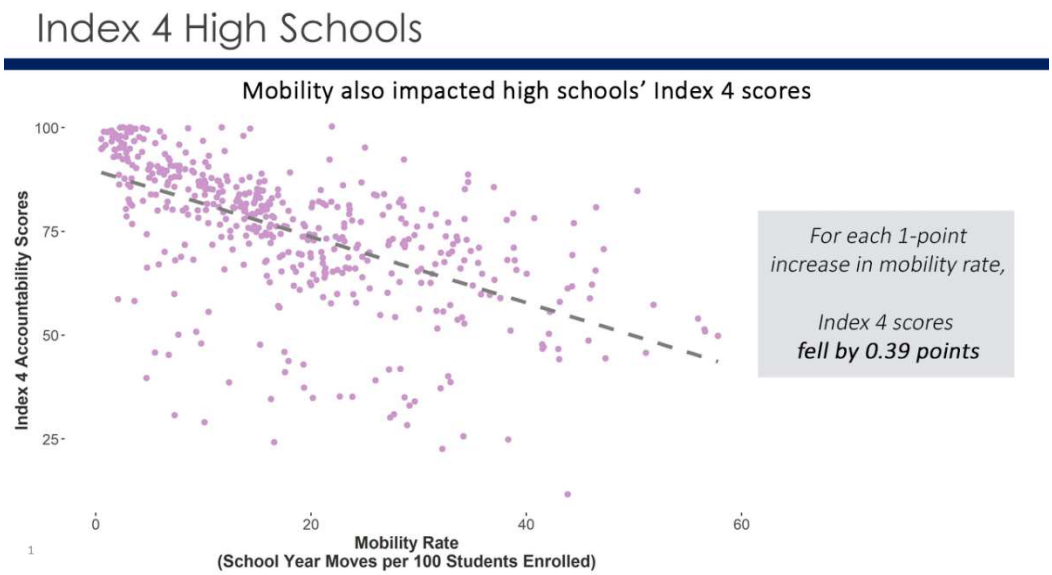
School-year mobility was negatively associated with Index 4 scores at Houston-area middle schools (Figure E2). For every one-point increase in school-year mobility rates at middle schools, Index 4 scores dropped by nearly one-half point.

Figure E2. School-year mobility linked to lower Index 4 scores at Houston-area middle schools.



Higher school-year mobility at Houston-area high schools was related to lower Index 4 scores (Figure E3). On average, a one-point increase in school-year mobility rates at a school was associated with about a 0.4-point decline in Index 4 scores.

Figure E3. School-year mobility linked to lower Index 4 scores at Houston-area high schools.



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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 Rice University 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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