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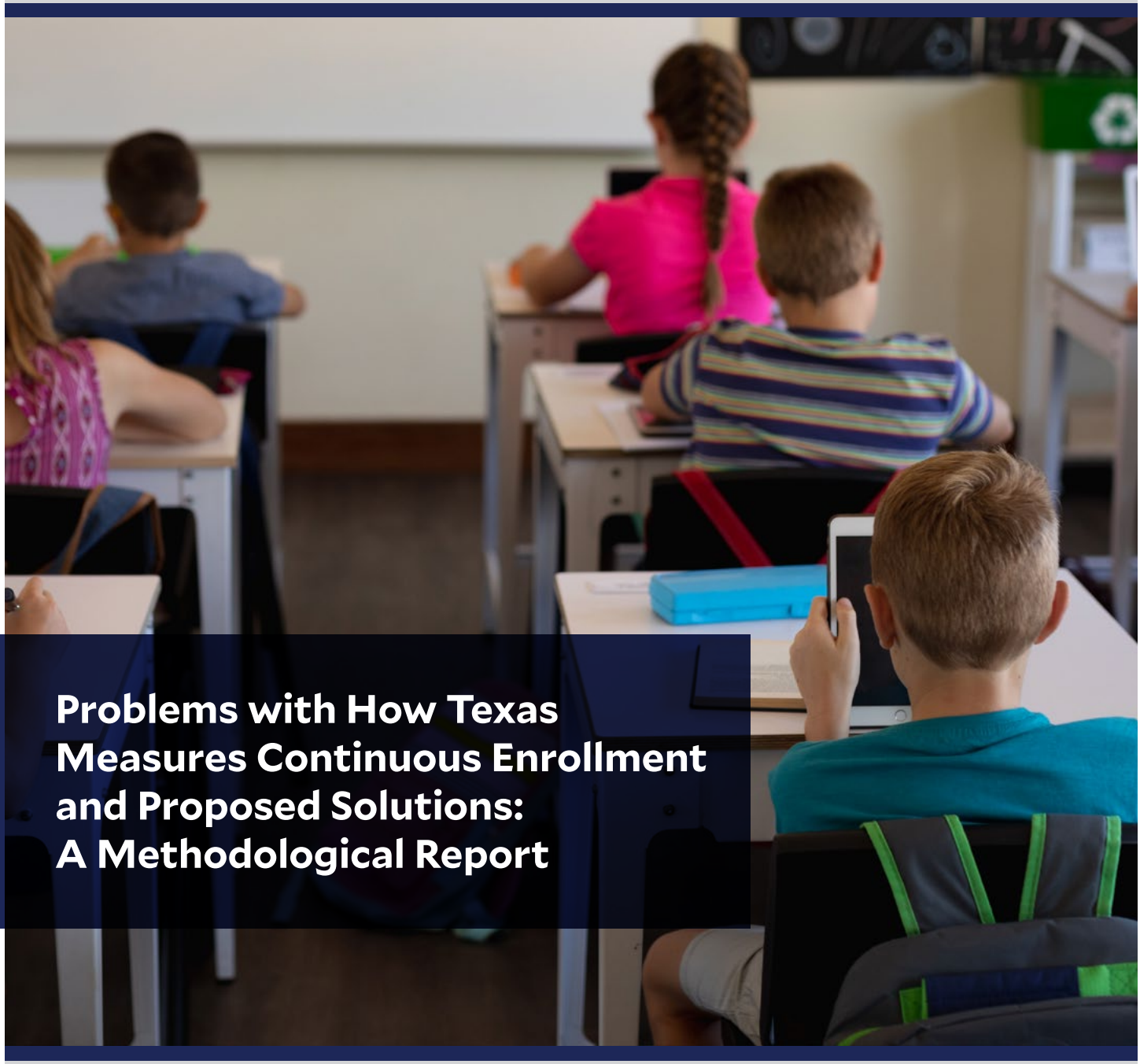

Problems with How Texas Measures Continuous Enrollment and Proposed Solutions: A Methodological Report

Research Brief

for the Houston Independent School District

September 2022

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Research Brief

Problems with How Texas Measures Continuous Enrollment and Proposed Solutions: A Methodological Report

Texas's current definition of continuous enrollment does not sufficiently capture the benefit of stable educational experiences. Broadly, Texas defines continuous enrollment as remaining in the same school district for several years. Its definition does not take into consideration changing schools within districts or students who leave and return to a district. As a result, the state classifies over 70% of students in Texas and in the Houston area as continuously enrolled, suggesting a level of stability in schools that does not align with the lived experiences of students and teachers. It also fails to predict how well students do on state tests once prior performance is considered. To highlight these shortcomings and emphasize the importance of stability in students' education, two new definitions of continuous enrollment are compared with the existing definition while answering four research questions:

1. What percentage of students are continuously enrolled?
2. What predicts the percentage of students continuously enrolled at a campus?
3. What is the relationship between campus continuous enrollment and schools' performance on state accountability tests?
4. What is the relationship between continuous enrollment and students' performance on state accountability tests?

The newly proposed definitions identify a smaller percentage of students as continuously enrolled and show that being continuously enrolled is beneficial to students. The link between campus continuous enrollment and campus performance remains tenuous. Recommendations for practice and policy are discussed.

Three Definitions of Continuous Enrollment

Three definitions of continuous enrollment were tested: the state's current definition and two newly proposed definitions. The proposed definitions were constructed to align with the state's current definition in both its conceptual basis and ease of calculation. Texas currently defines continuous enrollment as being enrolled in the same district over multiple years. Specifically, starting in third grade, students are defined as continuously

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enrolled if, at the start of the school year, they are in the same district as they were in for the preceding two years. In fourth grade and every subsequent grade, the applicable time frame stretches back over the preceding three years. The three definitions of continuous enrollment tested in this report were:

- **Definition 1**—Texas' current definition of continuous enrollment
- **Definition 2**—Definition 1 + no non-structural school changes
- **Definition 3**—Definition 1 + Definition 2 + 95% or higher average daily attendance

Definition 1 is the current definition of continuous enrollment used in Texas. Definition 2 builds on the current definition to require students stay in the *same school* across time except for when a student completes the terminal grade at a campus and needs to change schools to continue their education (e.g., transition from elementary to middle school, also known as making a structural school change). Finally, Definition 3 has the same requirements as the first two definitions, as well as the additional requirement that students maintain an average daily attendance rate of 95% or higher for each of the years included in determining continuous enrollment.

Key Findings

The three definitions of continuous enrollment provided very different pictures of how "stable" education was in schools across the state.

- The current definition (Definition 1) suggests that most students in the state qualify as continuously enrolled (more than 70%), but this does not reflect student mobility rates or many students' lived experiences. The new definitions suggest between one-third and one-half of students in the state were actually continuously enrolled.

Despite differences in the numbers of students identified as continuously enrolled, the definitions revealed some similar patterns of continuous enrollment across student groups.

- For example, according to each definition, Black students had the lowest rates of continuous enrollment. The race/ethnic group with the highest continuous enrollment rate differed across definitions.

Schools had consistent continuous enrollment rates across time.

- Schools with higher percentages of continuously enrolled students tended to maintain those higher percentages of continuously enrolled students over time, just as schools with lower percentages of continuously enrolled students tended to maintain lower percentages over time.

The percentage of continuously enrolled students at a school was only weakly related to a school's accountability scores no matter which definition was used.

- Schools with more continuously enrolled students tended to have higher scores on accountability measures, but the association was small. The percentage of continuously enrolled students at a school could change by as much as 10 percentage points and only change performance by a point or two.

New definitions better predicted students' STAAR math and reading scores. For some grades, the current definition predicted lower performance.

- Using the state's current definition, students who were continuously enrolled in Grades 4–7 appeared to score higher on STAAR math and reading tests, but that association was entirely accounted for by prior performance. In some cases, once prior performance was considered, continuously enrolled students were actually expected to do worse than their non-continuously enrolled peers.
- In contrast, Definition 3—requiring zero non-structural mobility and average daily attendance of 95% or higher—predicted higher STAAR math and reading scores for students even after considering prior performance.

Background

Introduction

In their ongoing effort to address educational inequality in Texas, TEA introduced the concept of "continuous enrollment" to distinguish between students who have experienced more stable educational experiences from students who have not (i.e., students who have changed schools). The logic behind "continuous enrollment" is to assess how well schools are doing in teaching and growing the students they have and have had in their classrooms for an extended period of time. Texas classifies students as "continuously enrolled" starting in the third grade using the following definition:

1. At the start of third grade: A student is considered continuously enrolled if they were in the same district the previous two years.
2. At the start of fourth grade (and each subsequent year): A student is considered continuously enrolled if they were in the same district the previous three years.

Despite the centrality of this concept to current state accountability efforts, very little research has examined it. This report attempts to provide some insights into the concept of "continuous enrollment."

Research Design

According to the current definition, most students in the state of Texas were continuously enrolled, which contradicts other recent research documenting the hundreds of thousands of school changes that take place around the state every school year (Potter et al., 2019). In addition to the high number of students, the state's current definition also suggested relatively equal levels of continuous enrollment across student groups who typically face very different social and structural conditions—for example, economically disadvantaged students and non-economically disadvantaged students had similar continuous enrollment rates. Finally, and perhaps most confusing about the state's current definition, when looking to see if continuous enrollment benefited students' performance, the initial benefit of being continuously enrolled was erased once prior performance was included. In other words, according to the state's current definition, continuous enrollment does not predict how well students do on STAAR math and reading tests.

Given the wealth of research showing the negative consequences associated with student mobility (Stroub & Gill, 2021), it would seem like the opposite of mobility—i.e., stability—would benefit students. To test this hypothesis, two new measures of continuous enrollment are introduced to build on the state's current definition by adding more stringent requirements for students being classified as continuously enrolled with the goal of getting closer to capturing "stability" in students' educational experiences.

Three Definitions of Continuous Enrollment

As described above, Texas currently defines continuous enrollment at the district level. That is, a student who stays in the same district over multiple years is considered to be continuously enrolled. For smaller districts, such as districts who may have a limited number of elementary schools, even fewer middle schools, and perhaps only a single high school, this definition likely does a good job of capturing stability in a students' educational experiences. In contrast, in larger school districts with dozens of elementary, middle, and high schools, the definition is not capturing stability in students' educational experiences as clearly. Students can move around inside large districts multiple times and never enroll outside their original district, and while those moves within districts mean the student is most cer-

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tainly changing schools and experiencing mobility, they would be counted by the state as continuously enrolled.

To address this shortcoming of the current measure, two new definitions of continuous enrollment were introduced so that a total of three definitions of continuous enrollment were tested:

- **Definition 1**—the current definition of continuous enrollment
- **Definition 2**—Definition 1 + no non-structural school changes
- **Definition 3**—Definition 1 + Definition 2 + 95% or higher average daily attendance

For purposes of these definitions, structural mobility is defined as school changes that occur when a student is going from elementary school to middle school, or middle school to high school—these are moves necessitated by the student finishing the terminal grade offered by a campus. Non-structural mobility consists of school changes between similar level schools, such as elementary to elementary school or middle to middle school that occur for reasons other than completing the terminal grade at a campus. For Definition 2, the criteria of "no non-structural school changes" means that a student could change schools from elementary to middle school and still qualify as continuously enrolled. However, if a student changed schools from one elementary school to another, then they would not qualify.

To calculate the average daily attendance rate for Definition 3, a student's total number of days present and total number of days eligible were first summed across all six six-week grade periods to create a total number of days present and a total number of days eligible in a given academic year. Total number of days present was then divided by total number of days eligible; that quotient was multiplied by 100 to create a percentage. This process was repeated separately for each school year. For a student to qualify as being continuously enrolled according to Definition 3, they had to satisfy the conditions for Definition 1 and Definition 2, and had to maintain an average daily attendance rate above 95% for each of the school years included in the determination of continuous enrollment. For example, to determine if a sixth grader was continuously enrolled, their average daily attendance rate would be calculated for their fifth-grade year, fourth-grade year, and third-grade year. If a student was in the same district in sixth grade as in those three previous years (i.e., Definition 1), had made no non-structural school changes (i.e., Definition 2), and had an average daily attendance above 95% for each of third grade, fourth grade, and fifth grade, then they would qualify as continuously enrolled according to Definition 3.

Current Study

Research Questions

To explore patterns of continuous enrollment in the state and to understand its potential importance for students' learning, each of the three definitions was applied to the following research questions:

1. What percentage of students are continuously enrolled?
2. What predicts the percentage of students continuously enrolled at a campus?
3. What is the relationship between campus continuous enrollment and schools' performance on state accountability tests?
4. What is the relationship between continuous enrollment and students' performance on state accountability tests?

Results from analyses answering each research question are reported for each definition and compared to highlight differences in their utility.

Data and Methods

Each definition of continuous enrollment and campus and student body data for this study came from the Public Education Information Management System (PEIMS) from the Texas Education Agency (TEA). Importantly, in creating new measures of continuous enrollment, a key feature of the current definition is that it is calculated using a single data file—the October Snapshot file from the PEIMS data. Any newly proposed definitions would need to minimize the computational burden in creating measures. For this reason, the two new measures that are introduced rely on only two files: the October Snapshot data file and the PEIMS six-weeks attendance file. In total, three definitions of continuous enrollment were tested. Descriptions of how variables were created, including each of the three definitions of continuous enrollment as well as the outcome measures for this study can be found in Appendix A. For more detail and discussion of the analytic models themselves, please see Appendix B.

Results

1 Each definition of continuous enrollment provided a different picture of how "stable" education was across the state and in the Houston area.

Research Question 1: What percentage of students are continuously enrolled in Texas schools and Houston area schools?

Definition 1

According to Definition 1, the state's current definition, 72.3% of students in Texas public schools and 72.9% of students in Houston-area public schools are continuously enrolled (Figure 1a and Figure 1b). The percentage of students continuously enrolled differed by race/ethnicity and immigrant status. For example, about 77.2% of Hispanic students in Houston area schools were continuously enrolled, compared to 60.6% of Black students and 71.5% of Asian students. For immigrant students, about 58.2% were continuously enrolled, compared to around 74.5% of non-immigrant students.

Other groups did not differ as much on continuous enrollment. For example, there was little difference between the percentage of continuously enrolled students based on English learner status or economically disadvantaged status.

FIGURE 1a

Overall more than 70% of students were continuously enrolled in Texas, according to Definition 1.

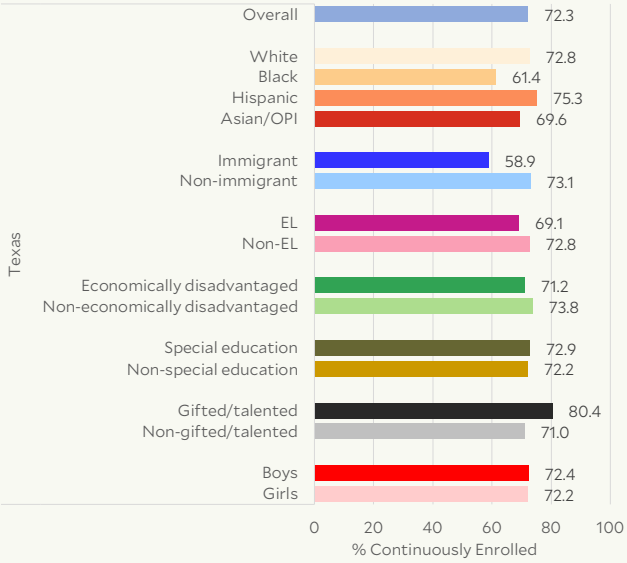
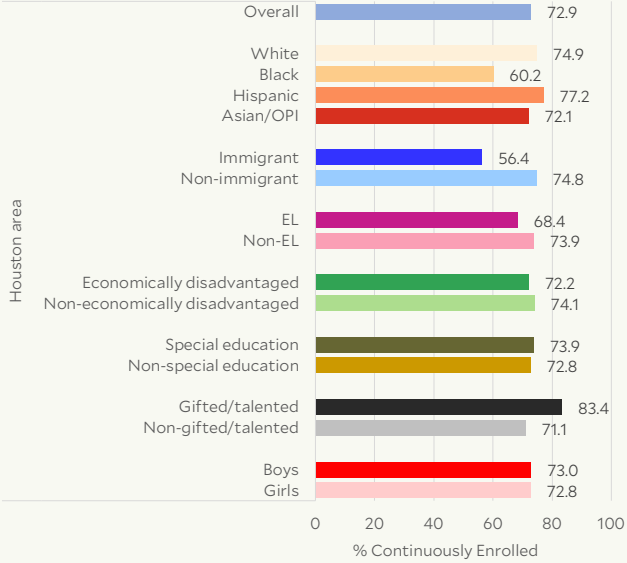


FIGURE 1b

Overall more than 70% of students were continuously enrolled in the Houston area, according to Definition 1.



Definition 2

According to Definition 2, requiring no non-structural school changes, the percentage of students qualifying as continuously enrolled dropped to 56.4% in both Texas public schools and Houston-area public schools (Figure 2a and Figure 2b). There continued to be differences in continuous enrollment by race/ethnicity, but Hispanic students no longer had the highest percentage continuously enrolled. Instead, Hispanic students, White students, and Asian students had relatively similar levels of continuous enrollment (about 60% in the state and Houston area), and Black students had the lowest continuous enrollment at around 40%. Immigrant status also continued to show differences in continuous enrollment, but in contrast to Definition 1, there were also differences by English learner status and economically disadvantaged status. A higher percentage of non-English learners—about 57.5% in Texas—were considered continuously enrolled compared to English learners—about 49.7% in Texas, and a higher percentage of non-economically disadvantaged students were continuously enrolled—around 61.5% in Texas—than were economically disadvantaged students—about 52.5% in Texas. That the requirement of no non-structural moves created this distinction in continuous enrollment for these groups suggests that for both English learners and economically disadvantaged students, school changes were taking place, but they tended to stay within a district. These school changes taking place within a district were captured by Definition 2 in a way that was not captured by Definition 1.

Definition 3

According to Definition 3, requiring no non-structural school changes and an average daily attendance of 95% or higher for each eligible year, around 36.9% of students in Texas public schools and 38.6% of students in Houston area public schools were continuously enrolled (Figure 3a and Figure 3b). Similar to Definition 1 and Definition 2, there continued to be a difference in continuous enrollment by race/ethnicity, but for Definition 3, Asian students had the highest percentage continuously enrolled—about 48.3% in Texas—while Black students continued to have the lowest percentage continuously enrolled—around 28.8% in Texas. White students and Hispanic students were in between with about 38% being continuously enrolled in Texas. The story for immigrant students is a little different between the state and the Houston area: In both cases, a higher percentage of non-immigrant students were continuously enrolled, but the difference was a little larger in the Houston area than in the state. For English learners, an interesting reversal took place in comparison to Definition 2 (which showed more non-English learners being continuously enrolled). For Definition 3, in Texas and in the Houston area, English learners and their

FIGURE 2a

Overall more than half of students were continuously enrolled in Texas, according to Definition 2.

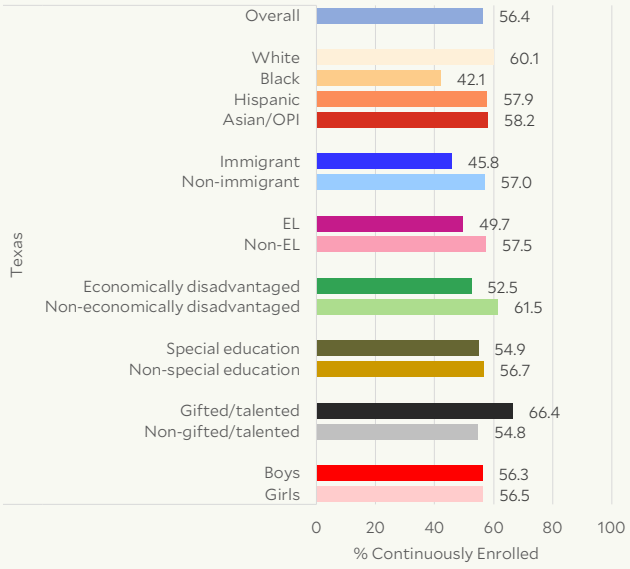
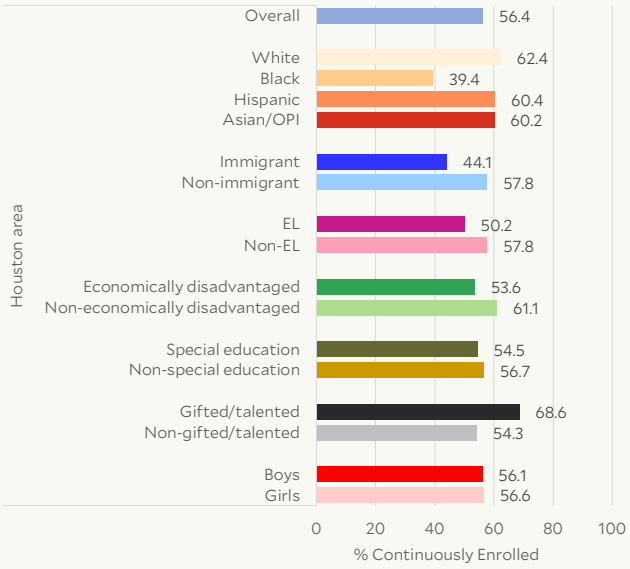


FIGURE 2b

Overall more than half of students were continuously enrolled in the Houston area, according to Definition 2.



non-English-learner peers had about the same percentage continuously enrolled. Finally, economic status continued to matter, with a lower percentage of economically disadvantaged students being continuously enrolled according to Definition 3 than non-economically disadvantaged students.

Research Question 1 Summary

The picture of stability in Texas schools is much different depending on the definition of "continuous enrollment." The state's current definition—Definition 1—shows a picture where the majority (almost three-quarters) of students were experiencing fairly stable and consistent educational experiences from one school year to the next. In contrast, both Definition 2 and Definition 3 present less stability in Texas. A little more than one-half of students were experiencing continuous enrollment according to Definition 2, and a little more than one-third were experiencing it according to Definition 3. To swing from a super majority to not even a plurality of students depending on the definition raises serious questions about how much stability students actually experienced.

While there were very notable differences in the total percentage of students identified as continuously enrolled depending on the definition, there were some patterns that remained throughout. Specifically, each definition showed differences by race/ethnicity. In particular, Black students experienced the lowest levels of continuous enrollment. Regardless of the definition, Black students appear to be consistently experiencing less stability in their education. On the flip side, there was no race/ethnic group that consistently had the highest levels of continuous enrollment. A similarly consistent story across definitions showed recent immigrant students less often continuously enrolled than non-immigrant students. This also points to some of the academic experiences of these recent arrivals to the US during their early engagement with the Texas public school system. Lastly, the varied percentages associated with English learner status and economically disadvantaged status raise further questions about the utility of Definition 1.

FIGURE 3a

Overall about a third of students were continuously enrolled in Texas, according to Definition 3.

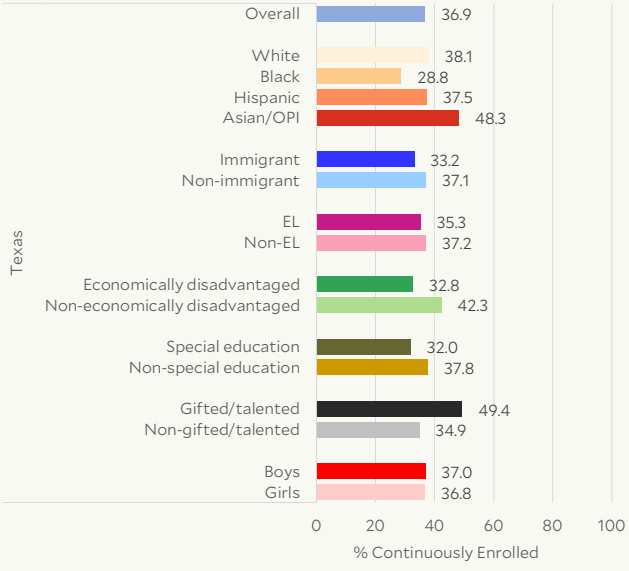
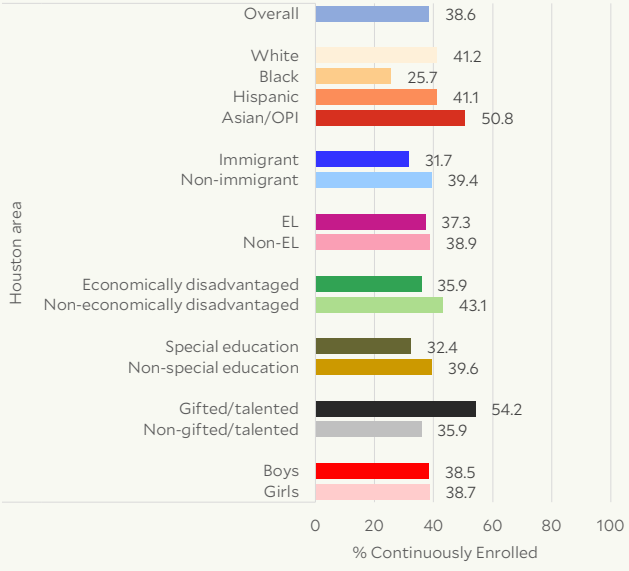


FIGURE 3b

Overall about a third of students continuously enrolled in the Houston area, according to Definition 3.



2 A campus's continuous enrollment in the previous year was the strongest predictor of its current continuous enrollment.

Research Question 2: What predicts the percentage of students continuously enrolled at a campus in the Houston area?

Definition 1

According to Definition 1, average campus continuous enrollment in Texas was 72—on average, a campus in Texas had 72% of eligible students qualify as continuously enrolled. The strongest predictor of a campus's continuous enrollment in a particular school year was its continuous enrollment in the previous school year (Figure 4). This means that campuses with higher continuous enrollment one year tended to have higher continuous enrollment the next year, and similarly, campuses with lower continuous enrollment tended to experience lower continuous enrollment from year to year. Other variables were predictive of a campus's continuous enrollment (e.g., a campus's Index 1 score); however, none of these variables were as substantively meaningful as continuous enrollment in the previous year. For Definition 1—and a trend that will be repeated for Definition 2 and Definition 3—continuous enrollment at a campus was highly correlated from one year to the next.

Definition 2

According to Definition 2, average campus continuous enrollment in Texas was 54—on average, a campus in Texas had 54% of eligible students qualify as continuously enrolled, defined as students who made no non-structural school changes and remained in the same school district. Using this definition, the strongest predictor of a campus's continuous enrollment in a particular school year was also its continuous enrollment in the previous school year (Figure 5). Utilizing Definition 2, the evidence again showed that campuses with higher continuous enrollment tended to maintain those higher levels of continuous enrollment over time. A similar pattern could be found at the other end of the continuous enrollment spectrum: campuses with lower continuous enrollment tended to experience lower levels consistently over time. Other variables predicted campus continuous enrollment, such as campus Index 1 performance, but no other variable made a substantively similar contribution to understanding and estimating a campus's continuous enrollment than previous continuous enrollment.

FIGURE 4

Continuous enrollment in the previous year was the strongest predictor of a campus's current continuous enrollment under Definition 1.

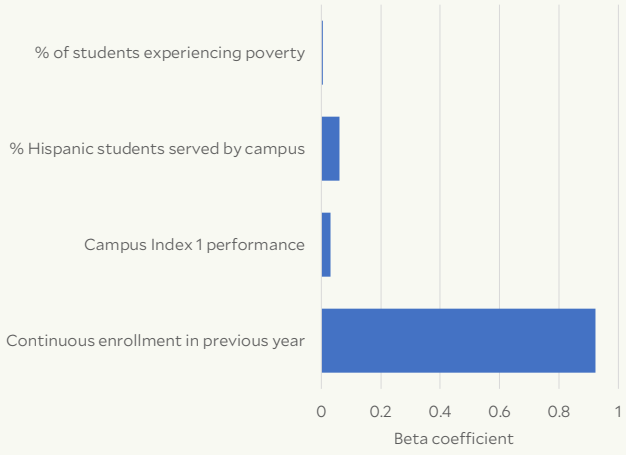
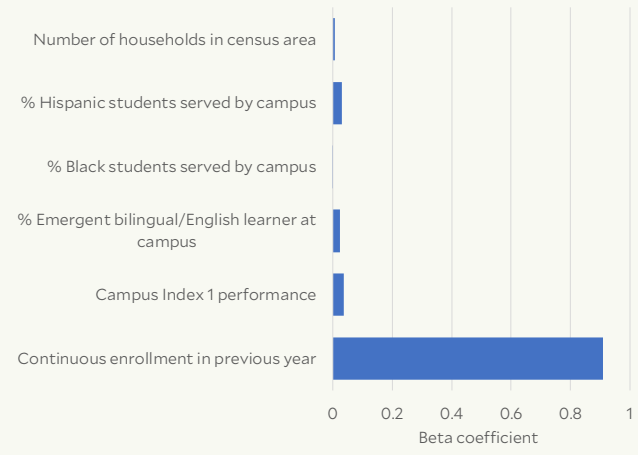


FIGURE 5

Continuous enrollment in the previous year was the strongest predictor of a campus's current continuous enrollment under Definition 2.



Definition 3

According to Definition 3, average campus continuous enrollment in Texas was 36—on average, a campus in Texas had 36% of its eligible students classified as continuously enrolled. Definition 3—defining continuous enrollment as a student making zero non-structural moves and maintaining at least a 95% average daily attendance across all eligible years—told the same story as the first two definitions: The strongest predictor of a campus's continuous enrollment in a particular school year was its continuous enrollment in the previous school year (Figure 6). Also, like the first two definitions, other variables were associated with a campus's continuous enrollment, but none of the other variables predicted it in a meaningful way.

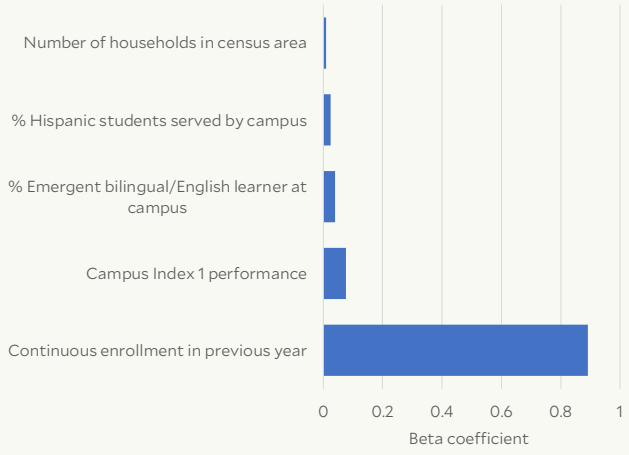
Research Question 2 Summary

The best predictor of a campus's continuous enrollment was its prior continuous enrollment. This pattern was true across definitions, despite average continuous enrollment varying dramatically between Definition 1, Definition 2, and Definition 3. The story told by these analyses suggests a high level of consistency in continuous enrollment at campuses around Texas. Importantly, this finding does not mean that a campus's continuous enrollment is etched in stone. Values of continuous enrollment at a campus changed over time: The average standard deviation of a campus's continuous enrollment for Definition 1 was 4.4; for Definition 2 was 5.1; and for Definition 3 was 3.9. This can suggest that from one year to the next, a campus's continuous enrollment value for Definition 1 would be expected to go up or down by about 4.4 points. Some campus scores would change by more than that, others less, but the average change would be about 4.4 points. To this end, according to each definition, campuses were not typically changing from experiencing very high levels of continuous enrollment (e.g., 80+) to very low levels of continuous enrollment (e.g., 20 or less), but the number fluctuated.

All three definitions told a similar story about consistency in continuous enrollment over time—or at least, consistency in what was measured. This consistency means that none of the definitions produced a statistically noisy measure. Findings from the second research question make clear that all three of the definitions are capable of measuring something that is relatively consistent about a school over time.

FIGURE 6

Continuous enrollment in the previous year was the strongest predictor of a campus's current continuous enrollment under Definition 3.



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3 Higher continuous enrollment rates were often associated with higher STAAR index scores; however, the relationship was small.

Research Question 3: What is the relationship between campus continuous enrollment and schools' performance on state accountability tests?

Definition 1

Using the state's current definition of continuous enrollment, Definition 1, the percentage of students at a campus who were continuously enrolled had only a small positive association with a campus's performance on the accountability indexes (Figure 7). These analyses were run separately for elementary, middle, and high schools because the meaning of an index sometimes varied across grade level type.

Associations were typically small between campus continuous enrollment and campus performance. To highlight how small, findings were converted into standardized units, meaning their interpretation represents the number of points an index score would be expected to change if the continuous enrollment rate at a school increased by a full standard deviation. Standardized coefficients help to see if a large increase in the independent variable (i.e., campus continuous enrollment) translates into a large increase in the dependent variable (i.e., campus performance on the accountability indexes). In brief, large changes in campus continuous enrollment—as measured by Definition 1 (though similar findings were observed for other definitions)—does not translate to large changes in campus performance.

The largest associations between campus continuous enrollment and campus performance were seen for Index 4. Specifically, a one standard deviation increase in the percentage of continuously enrolled students at a campus was associated with about a one-point increase in Index 4 scores for elementary schools and middle schools, and about a 1.5-point increase for high schools.

To offer some comparison of the relatively small size of the association between campus continuous enrollment and campus performance, measures of campus mobility rates were included and standardized. Compared to the biggest association between campus continuous enrollment and performance —where a standard deviation change was associated with a 1.5-point increase in Index 4 scores for high schools—a one standard deviation change in a campus's student mobility rate was associated with a 9.5-point decrease in Index 4 scores for a campus. Standardized regression estimates for campus student mobility are available from the author upon request.

FIGURE 7 **Accountability Index scores and continuous enrollment (Definition 1).**

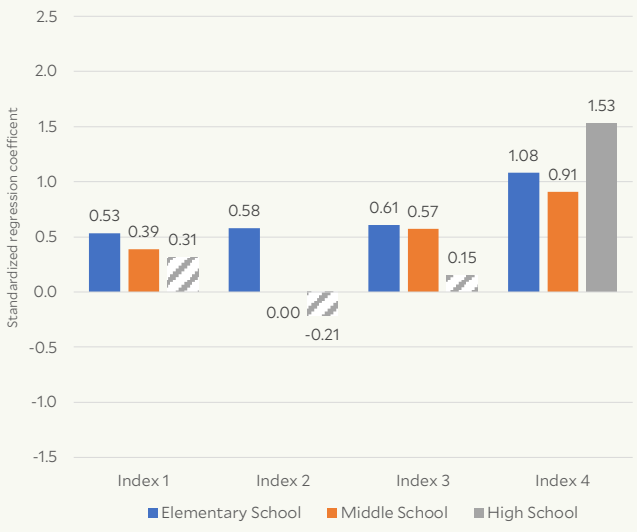
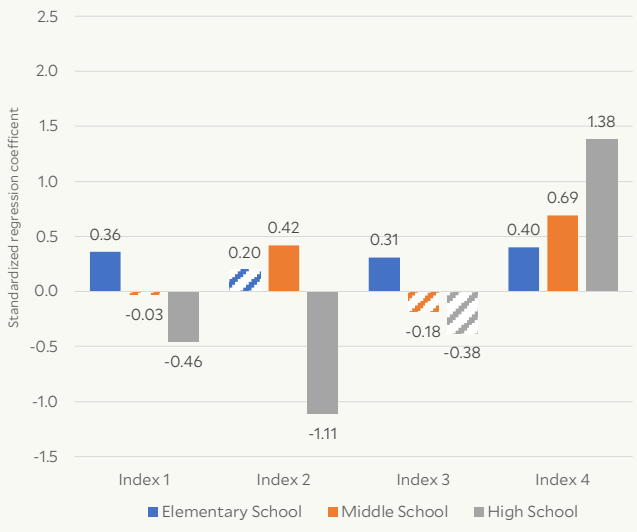


FIGURE 8 **Accountability Index scores and continuous enrollment (Definition 2).**



Definition 2

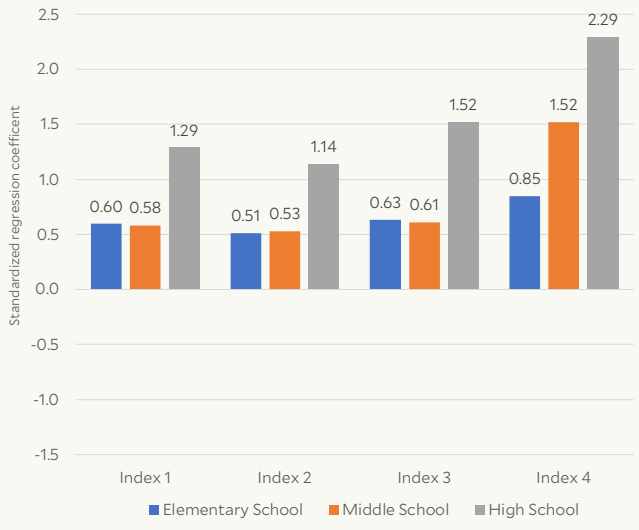
Using Definition 2, which required zero non-structural moves for a student to qualify as continuously enrolled, the percentage of students at a campus who were continuously enrolled was inconsistently related to a campus's performance on the accountability indexes (Figure 8). For example, four of the associations were not statistically significant (as indicated by the striped bars in the graph), and while six associations were positive between campus continuous enrollment and performance, they were often small and there were two associations that were negative.

Similar to Definition 1, the largest association was between campus continuous enrollment and Index 4 performance for high schools; however, the second largest association was actually negative and showed that the more students at a high school campus who were continuously enrolled, the lower the campus scored on Index 2. Specifically, for a one standard deviation increase in campus continuous enrollment—as measured by Definition 2—there was a one-point decrease in campus performance on Index 2.

There was only one significant association between campus continuous enrollment and Index 3, and it was a small, positive association for elementary schools. Index 4 was the only index that had all positive associations between campus continuous enrollment and performance for all three: elementary, middle, and high schools.

FIGURE 9

Accountability Index scores and continuous enrollment (Definition 3).



Finally, to highlight the relatively small contribution of campus continuous enrollment to campus performance, in the model looking at the largest association between continuous enrollment and performance — where there was an expected gain of about 1.4 points in Index 4 scores in high schools—a standard deviation change in student mobility rates at the campus translated to a 9.3-point decline in Index 4 scores.

Definition 3

Using Definition 3, the most stringent definition of continuous enrollment, the percentage of students at a campus who were continuously enrolled was consistently related to higher campus performance on accountability indexes. Despite the consistency in the association, their magnitude was often small (Figure 9). Still, unlike the other two continuous enrollment definitions, each of the associations for Definition 3 was significant and positive.

Similar to the other two definitions, the largest association between continuous enrollment and campus performance on the accountability indexes was observed in high schools for Index 4.

Across all four indexes, the largest associations between continuous enrollment and campus performance were observed for high schools. Campus continuous enrollment for elementary and middle schools was positive but often small. In addition to being small, elementary and middle schools tended to see similarly sized benefits from continuous enrollment for Index 1, Index 2, and Index 3 (as evidenced by the similar heights of the blue and orange bars in the graph below). For Index 4, while high schools saw the greatest increase in performance associated with having more students continuously enrolled, middle schools saw greater benefit than elementary schools.

Despite the most consistent evidence among the three definitions of continuous enrollment indicating a positive association with campus performance, the associations using Definition 3 were relatively small. For example, the largest association between campus continuous enrollment and campus performance —where a standard deviation increase translated to a 2.3-point increase in Index 4 scores for high schools—paled in comparison to the 8.6-point decline in Index 4 score predicted by a similarly sized change in campus student mobility rate.

Research Question 3 Summary

The relationship between campus continuous enrollment and campus performance as measured by accountability indexes was consistently positive only for Definition 3, and for each of the definitions, any detected association was small. Higher rates of continuous enrollment at a campus—something that presumably would mean a more stable campus environment—did not translate to significantly higher campus performance. This conclusion would seem to contradict much of the literature on student mobility at schools—the more students change schools (i.e., the more student mobility at a campus) the lower a campus's performance (Gill, 2021). The typical explanation offered is that the amount of student mobility at a campus translated to a more disrupted learning environment for students who were not mobile. Therefore, higher continuous enrollment would mean a more stable campus environment where it seems reasonable to expect performance to increase.

Future research is needed to fully understand the phenomenon of continuous enrollment at a campus. Three potential mechanisms may be undermining the usefulness of continuous enrollment to explain campus performance.

First, the sum of continuously enrolled students at a campus may not sufficiently capture the idea of what it means to have stability at a campus. This may be particularly true for Definition 1, and possibly even Definition 2, where campuses already have 70% and 56% of students continuously enrolled, respectively. If the percentage of continuously enrolled students at a campus went from 80% to 90%, would there be a discernible difference in the stability perceived by students at the campus?

The second—and related—mechanism through which continuous enrollment could still matter is that continuous enrollment does not function incrementally but categorically. The relationships tested by this study between campus continuous enrollment and campus performance assumed that incremental increases in continuous enrollment would correspond to incremental increases in performance. This may not be true. Instead, it could be that the lived experiences of students—in terms of perceived campus stability—are roughly the same in schools with 40% continuously enrolled students and in schools with 70% continuously enrolled students. There may be certain thresholds that translate to substantively different experiences for students—such as, high-, medium-, and low-continuously enrolled schools—such that incremental increases are negligible within each category of school, but the lived experiences are meaningfully different between categories.

The third and final mechanism has less to do with continuous enrollment and instead focuses on the contrasting experience of student mobility in a school. Potentially, the level of continuous enrollment at a school may not matter if a certain threshold is crossed for a campus's student mobility rate. Student mobility and continuous enrollment are not reciprocals of each other—particularly for Definition 1—and it may be that regardless of what a campus's continuous enrollment level is, if the campus experiences a certain amount of student mobility, then it does not matter what its continuous enrollment is or how much it changes. In terms of modeling, the association between campus continuous enrollment and campus performance could be moderated by campus student mobility rate. The current study did not consider the way student mobility could be counteracting the benefits derived from continuous enrollment.

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4 The state's current definition of continuous enrollment is not associated with a student's score on STAAR math or reading tests—and for some grades, it appears to lower performance.

Research Question 4: What is the relationship between continuous enrollment and students' performance on state accountability tests?

The final test of the continuous enrollment definitions is perhaps its most important: Does continuous enrollment matter for students' learning? To answer this question requires two steps: The first is looking to see if the performance of continuously enrolled students is better than the performance of non-continuously enrolled students, and if it is, the next step is looking to see whether continuous enrollment is responsible for those higher scores. In other words, to what extent is continuous enrollment contributing to students performing better?

This two-step test can be accomplished using a stepwise regression model, which starts with a very simple linear regression analysis for Step 1 and then creates a much more stringent model for Step 2. For purposes of discussion and display, these two steps are going to be referred to as "simple means" and "full" models. The measure of student performance used for these analyses was STAAR math and reading performance in Grades 4, 5, 6, and 7. Data from five school years were used for these analyses, looking at student performance from the 2013-14 school year through the 2017-18 school year. Results are aggregated across years, but individual years of data are also available from the author upon request.

Definition 1

For both math and reading, in Grades 4, 5, 6, and 7, students who were continuously enrolled according to Definition 1—the state's current definition—had higher average STAAR scores than students who were not continuously enrolled—as evidenced by the positive difference values shown in the figures below (Figures 10 and 11). To understand if it is being continuously enrolled that is helping students do better requires separating the influence of continuous enrollment from other potential influences on students' outcomes.

Regression analyses were used to separate out the contribution of continuous enrollment from other influences. When other influences were considered, the state's current definition of continuous enrollment was no longer associated with math performance in grade 4 or grade 5 and was actually negatively related to performance in Grade 6 and Grade 7. For reading, there is a similar story (Figures 12 and 13).

Definition 1 of continuous enrollment is not related to students' performance in math or reading.

Definition 2

For both math and reading, in Grades 4, 5, 6, and 7, students who were continuously enrolled according to Definition 2—which allowed students to only make structural school changes—there was again early evidence suggesting that continuous enrollment was beneficial for students. On average, students who were continuously enrolled had higher average STAAR math and reading scores than students who were not continuously enrolled in Grades 4, 5, 6, and 7—as evidenced by the positive values for the difference scores in the figures below (see Figures 10 and 11). Note, the size of the bars in the figures below show larger positive values for the simple mean differences between continuously enrolled and not continuously enrolled students when comparing students according to Definition 2 than Definition 1. The larger positive values for Definition 2 means that the second definition predicts a larger benefit to students' test scores, on average, than Definition 1.

The simple mean requires teasing out the influence of continuous enrollment from other influences, so Figures 12 and 13 show the results from regression analyses that build on the simple mean comparison to take into consideration other influences related to student performance. When the other influences were included—in the Full model—there was some evidence that continuous enrollment still mattered for math in Grade 4 and Grade 5, though less so in Grade 6, and no evidence of it mattering for Grade 7. For reading, the evidence was less clear still.

Definition 2 of continuous enrollment is not clearly related to students' performance in math or reading.

FIGURE 10

Students who were continuously enrolled according to Definition 2 or 3 had higher average math scores than students who were continuously enrolled according to Definition 1.

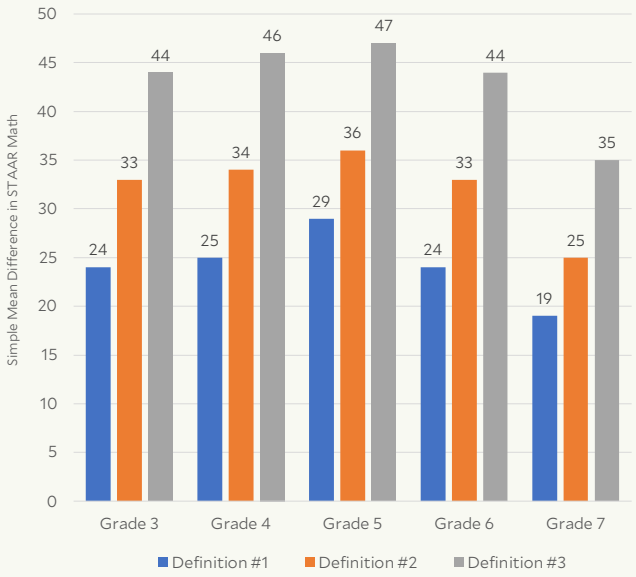
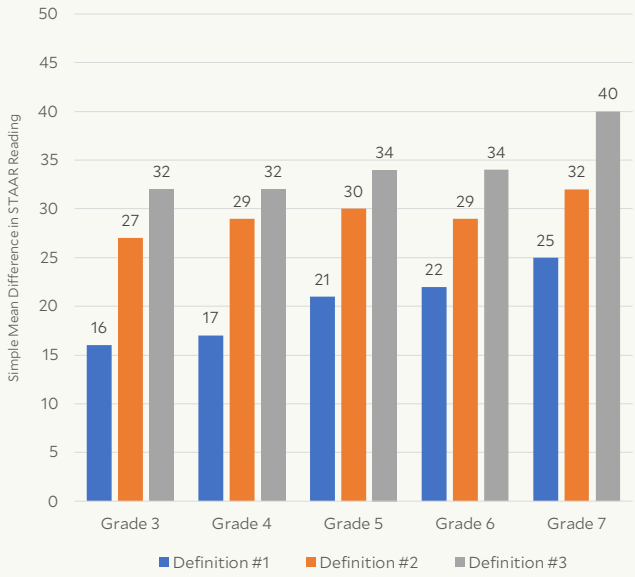


FIGURE 11

Students who were continuously enrolled according to Definition 2 or 3 had higher average reading scores than students who were continuously enrolled according to Definition 1.



Definition 3

For both math and reading, in Grades 4, 5, 6, and 7, students who were continuously enrolled according to Definition 3—which allowed zero non-structural changes and required students to maintain a 95% average daily attendance rate each year—once again showed that students who were continuously enrolled scored higher than students who were not continuously enrolled. For this most stringent definition of continuous enrollment, the comparison of simple means showed the largest benefit to being continuously enrolled (e.g., the gray bar is the tallest) of all the definitions. In math, for Grades 4, 5, and 6—the simple mean difference between continuously enrolled students and non-continuously enrolled students was nearly 45 points (Grade 7 was about 35 points). In reading, for these same grades, the benefit was also largest for Definition 3, albeit the simple mean comparisons were not quite as large—with differences ranging between 30 and 35 points.

Much of the advantage attributed to continuous enrollment in the simple mean comparison was explained by other influences, but even after these other influences were considered, there was still a positive benefit associated with being continuously enrolled—an advantage that was larger than any of the other definitions tested.

Definition 3 of continuous enrollment is associated with a positive, albeit small, benefit to students' math and reading performance.

Research Question 4 Summary

Students who were continuously enrolled tended to score higher than their peers who were not continuously enrolled on math and reading STAAR assessments. While each definition of continuous enrollment was associated with higher scores when doing simple mean comparisons, the benefit of a student being continuously enrolled was less clear once other influences on performance were considered. This was particularly true of the state's current definition of continuous enrollment.

Definition 1, the current definition used by Texas, showed the smallest advantage of the three definitions tested in terms of students' math and reading scores. The "benefit" to continuous enrollment when doing simple mean comparisons vanished once other influences on performance, such as student characteristics, was considered. For some of the models, once these other influ-

FIGURE 12

Definition 1 is not related to student performance after considering other student influences.

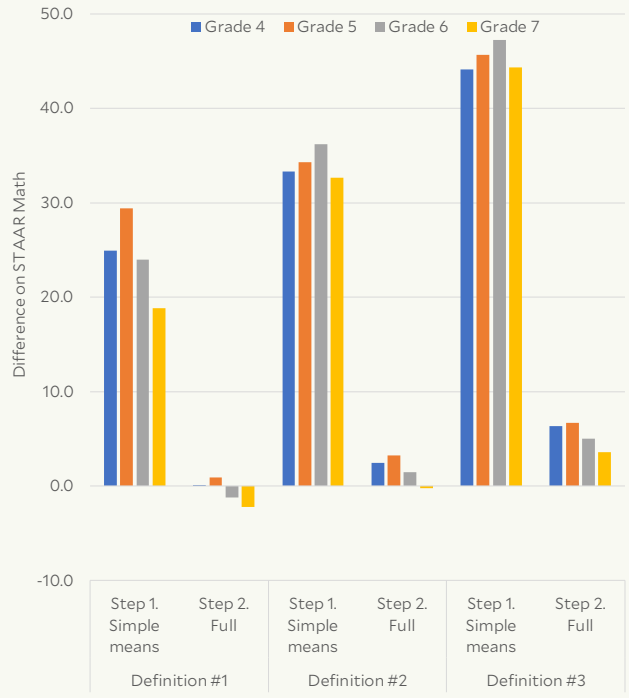


FIGURE 5

Definitions 2 and 3 matter for students' reading performance, but Definition 1 does not.

ences were considered, continuous enrollment showed a negative association with student performance.

Definition 2, building on the current definition by requiring zero non-structural school changes, was associated with larger mean differences, and these differences tended to remain after other influences were considered, particularly for the reading models.

Definition 3, building on the second definition to also include requiring an average daily attendance of 95% or higher for the duration of the eligibility period, was associated with the largest mean differences between continuously enrolled and non-continuously enrolled students. That difference remained the largest even after other influences were considered.

The current definition of continuous enrollment used by Texas does not robustly predict performance. It is related to simple mean differences that fail to hold up after other influences are considered. For purposes of accountability and reporting to the state, it is likely schools and districts will be judged only on simple mean comparisons. These simple mean comparisons will show that continuous enrollment appears to be associated with higher performance for students.

However, the "benefit" attributed to the current definition is a product of who is continuously enrolled and less to do with the status of being continuously enrolled—as revealed by the "step 2" analyses in Figure 12 (for math) and Figure 13 (for reading). In other words, for Definition 1, continuous enrollment is related to higher performance because higher-performing students become continuously enrolled; whereas for Definition 2 and especially Definition 3, becoming continuously enrolled results in discernible gains to students' performance.

Conclusions

Results Summary

The state's current definition paints a picture where the majority of students are continuously enrolled and where students from many different backgrounds are experiencing stable learning environments. This is not the reality that many students experience.

The state's current definition is additionally only weakly connected with campus performance. The newly proposed definitions improved upon this linkage, but none of the measures produced strong links between campus continuous enrollment and campus performance, suggesting further work is needed to understand what continuous enrollment at the campus level means and how to best measure it.

Finally, once other influences of performance were considered, the state's current definition of continuous enrollment no longer predicted a student's math and reading STAAR performance.

Implications and Recommendations

Together, the findings of this report show that the current definition of continuous enrollment used by the state is an inadequate measure for understanding stability in learning and that it can be improved using definitions requiring little additional administrative burden.

Texas currently defines continuous enrollment based on a student being in the same *district* over time. It does not take into account students changing schools within a district—a frequent occurrence—or students leaving and returning to a district—a less frequent occurrence. For larger districts in Texas, including those in the Houston area who combined serve more than 1 million children, students can and often do change campuses several times and stay within the same district. According to Texas, that mobile student would be counted as continuously enrolled.

However, changing schools is detrimental to student learning, no matter if they cross a district border or remain in the same district (Stroub & Gill, 2021). The current definition of continuous enrollment used by Texas does not adequately capture stability in students' educational experiences.

An improved definition—particularly Definition 3 that incorporates both stability and high attendance—would extend upon the current definition to capture something about students' long-term involvement with and exposure to the climate, culture, and practices of particular schools and districts. This would provide the state with a definition of continuous enrollment that reflects something about a student's stable learning environment and begins to unpack how well schools and districts do with the students they have access to for an extended period of time. Were an improved definition of continuous enrollment embraced by the state, such as Definition 3, it would incorporate into accountability a measure that is more closely connected to performance, a measure that is more reflective of the lived experiences of students and teachers, and a more accurate depiction of stability and instability, mobility, and continuous enrollment in Texas public schools.

Appendix A

Appendix A: Variables

The three definitions of continuous enrollment were measured according to the descriptions provided earlier in the report. Definition 1 was measured using multiple years of PEIMS October Snapshot data to determine if a student was enrolled in a school in the same district for multiple years in a row. Definition 2 extended upon Definition 1 by identifying the campus and grade of each student as recorded in the October Snapshot for each school year. The terminal grade at a school was determined by identifying the highest grade at a campus with more than 5% of a campus's total student body enrolled in it to adjust for small reporting errors in the original data. Once the terminal (i.e., highest) grade level was determined, if a student was enrolled in the highest grade and then in the subsequent year changed schools and was attending a higher grade, then that school change was labeled a "structural change" and not counted against the student. If a student changed schools after being in the terminal grade but had not advanced a grade, or changed schools after being in one of its non-terminal grades, the student was identified as making a non-structural school change and no longer qualified as continuously enrolled according to Definition 2. Finally, building on the work to create Definition 1 and Definition 2, the PEIMS six-weeks attendance file was used for Definition 3. If students' average daily attendance was below 95% for any of the years used for determining continuous enrollment, they no longer qualified as continuously enrolled.

For the first research question, estimating the percentage of students in Texas and Houston-area schools who were continuously enrolled, PEIMS October snapshot data were used to determine which students were eligible to be continuously enrolled (i.e., in Grade 3 or higher) and where those students were enrolled for the prior years' October Snapshots. The percentage of students continuously enrolled was calculated by dividing the number of continuously enrolled students by the number of students eligible to be continuously enrolled and then multiplying by 100. More details on how students were identified as continuously enrolled can be found in Appendix B.

For the second research question, identifying the predictors of campus continuous enrollment, the study calculated the percentage of eligible students at each campus who were continuously enrolled and then tested four sets of predictive factors: 1) student body characteristics, 2) neighborhood features, 3) campus attributes, and 4) nearby alternative schooling options (the fourth set of predictive factors was only included in analyses looking at the Houston area, not statewide models). Neighborhood measures came from the American Community Survey (ACS). Alternative schooling options were only included in models of the Houston area, and information on alternative schooling options came from the Common Core of Data and the Private School Survey. For more information on the specific predictive factors considered as well as details about the analytic model, please see Appendix B. Campus continuous enrollment (CE) was measured separately for each school year, using the following equation:

$$\%\ CE\ (at\ a\ campus) = \frac{Number\ of\ Students\ who\ Qualify\ as\ CE}{Number\ of\ CE—Eligible\ Students\ Enrolled\ at\ the\ October\ snapshot} \times 100$$

For the third research question, testing the association between campus continuous enrollment and school performance on state accountability, campus values of the percentage of students continuously enrolled were tested to see if they were related to the four STAAR index scores. The four STAAR index scores were:

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1. **Index 1** (Student Achievement): the percentage of a campus's students scoring "approaches grade level" or higher on all STAAR exams
2. **Index 2** (Student Progress): the percentage of a campus's students meeting or exceeding expected yearly progress
3. **Index 3** (Closing Gaps): performance of economically disadvantaged students and students from historically disadvantaged race/ethnic groups
4. **Index 4** (College, Career, & Military Readiness (CCMR)): For elementary and middle schools, this is similar to Index 1. For high schools, this measures postsecondary readiness.

The independent variable of interest was campus continuous enrollment percentage, but the linear regression models also controlled for several other variables. Details on these analyses can also be found in Appendix B.

For the fourth and final research question, looking at the association between a student being continuously enrolled and their STAAR reading and math performance, students' continuous enrollment status was determined based on the three definitions and compared against their performance on Grade 4, Grade 5, Grade 6, and Grade 7 STAAR math and reading performance. These analyses started with a comparison of simple means, and then considered prior achievement, students' demographic characteristics, and the campus they attended. For more information on the specific variables and analytic methods used, please see Appendix B.

Appendix B

Appendix B: Research Methodology

Research Question 1: What percentage of students are continuously enrolled?

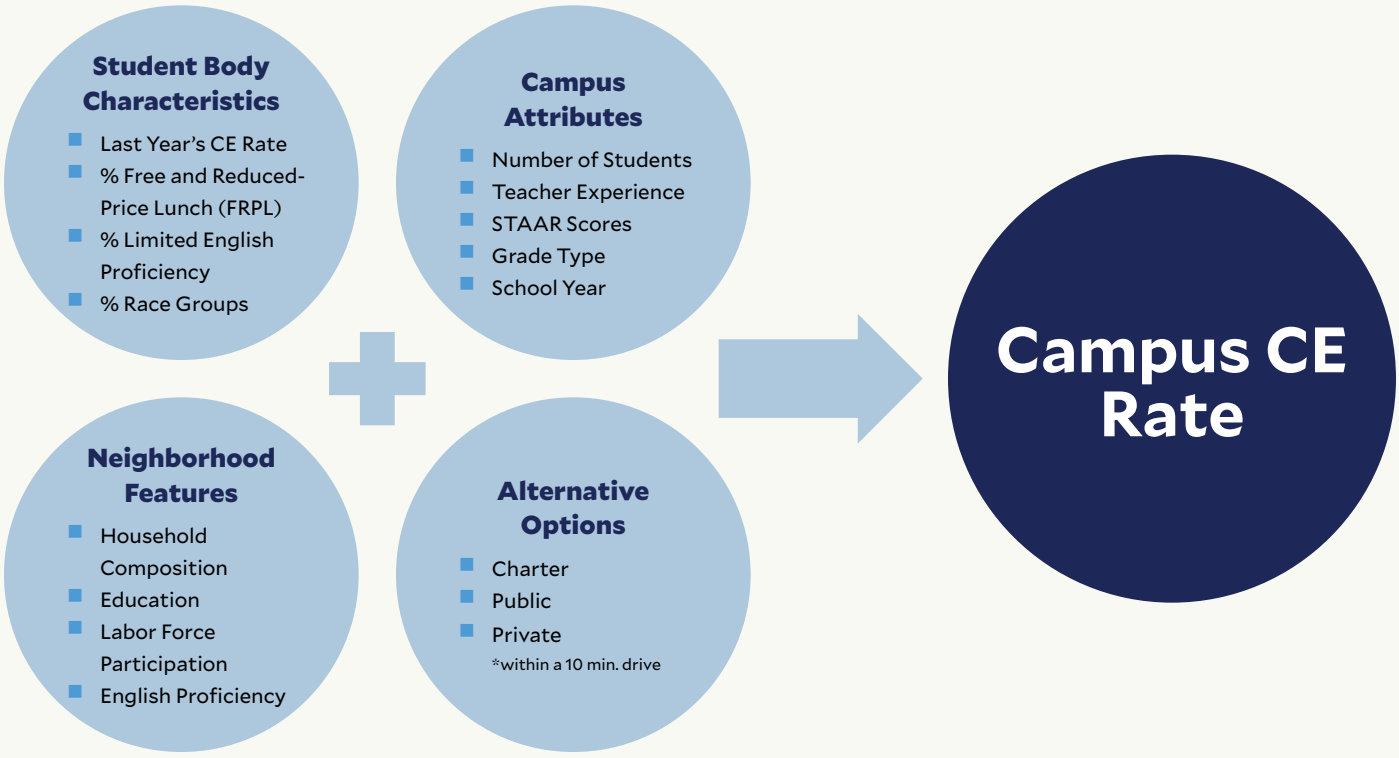
Public Education Information Management System (PEIMS) October snapshot data were used to determine which students were eligible to be continuously enrolled (i.e., in Grade 3 or higher) and where those students were enrolled for the prior years' October snapshots. The percentage of students who were continuously enrolled was calculated for all students, and then separately by different student groups (e.g., race/ethnicity, immigrant status, economic disadvantage status).

Research Question 2: What predicts the percentage of students continuously enrolled at a campus?

Student-level information about continuous enrollment status was aggregated to the campus level. The number of students continuously enrolled at a campus was divided by the number of students eligible for continuous enrollment at a campus to determine campus continuous enrollment. This process was done for all campuses in the state. Estimates were calculated separately for each year to allow campus continuous enrollment to vary over time.

For Research Question 2, campus continuous enrollment in a given school year was predicted using a

FIGURE B1 **Factors considered in analysis**



set of independent variables. See Figure B1 for a list of the variables included and an illustration of the conceptual model used for the analysis. Variables in the Alternative Options circle were only included in analyses focused on campuses in the Houston area. Analyses reported herein are based on models looking at campuses across the state. Houston-area analyses are available from the author.

Research Question 3: What is the relationship between campus continuous enrollment and schools' performance on state accountability tests?

Utilizing the same data constructed for answering Research Question 2, analyses for the third research question linked in data on campus performance. Campus performance was measured utilizing performance on the four accountability indexes: Index 1, Index 2, Index 3, and Index 4. Since the indexes have slightly different meanings depending on the grade levels taught by a school, analyses for Research Question 3 were done separately for elementary schools, middle schools, and high schools.

Linear regression was used to answer Research Question 3, setting the campus performance indexes as the dependent variable and setting several independent variables, including campus continuous enrollment. Specifically, the set of campus-level control variables specified in Research Question 2 were used again for Research Question 3, with the exception of the prior year's continuous enrollment (only current year's continuous enrollment was included). See Figure B1 for list of included control variables.

Measures of campus continuous enrollment and student mobility rates were normalized by dividing the original variable by the standard deviation for the year. The resulting variables, when included in linear regression models, allow for the interpretation of their coefficients as "for every 1 standard deviation change in X, there is a b1 unit change in Y." In the case of these analyses, "for every 1 standard deviation change in campus continuous enrollment, there was a b1 point change in campus Index score."

Research Question 4: What is the relationship between continuous enrollment and students' performance on state accountability tests?

Student-level STAAR data were used to test the association between a student being continuously enrolled and their performance on the state's standardized test. Math and reading performance were tested. Analyses were run looking at performance separately by grade level, such that estimates were produced separately for each grade. Analyses started with simple mean comparisons, which involved calculating the average math and reading STAAR performance of continuously enrolled students and comparing against the average math and reading STAAR performance of non-continuously enrolled students. For the purposes of simple mean comparisons, estimates were produced for Grade 3, Grade 4, Grade 5, Grade 6, and Grade 7. Building on the simple mean comparisons, regression analyses were run with students' STAAR score as the dependent variable and several variables as independent variables. Of particular importance, the regression models included students' prior-year STAAR performance and an indicator for year. Because prior-year STAAR scores were used in the model, it was possible to produce these regression models only for Grade 4, Grade 5, Grade 6, and Grade 7. (Grade 3 could not be included in the regression models, because there is no earlier grade in which STAAR is administered.) The full regression model included controls for the student's economic disadvantage status, race/ethnicity, sex, English learner status, special education status, immigrant status, gifted/talented status, age, and experience of grade retention.

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