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Does School Context Moderate the Relationship between Student Mobility and Academic Performance? Longitudinal Evidence from Missouri

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Abstract

Student mobility is highly prevalent in the United States and has negative impacts on students' academic performance. Within-year mobility may be especially disruptive. However, research on the impacts of within-year mobility is limited, and less is known how impacts may vary across different geographies, such as differences between urban and suburban/rural areas. Thus, this study leverages longitudinal student-level data collected over nine years across five large counties with diverse geographic characteristics to investigate how within-year school mobility impacts academic performance over time. Using random-effect panel regression models results indicate that within-year mobility predicted significant declines in academic performance the following year. However, transferring to higher-performing schools initially led to poorer performance, with gradual improvement over time. Findings suggest that school context does matter. We provide implications for policy and practice.

Keywords: Student mobility, within-year mobility, academic outcomes, random-effect panel regression

Does School Context Moderate the Relationship between Student Mobility and Academic Performance? Longitudinal Evidence from Missouri

Student mobility or students moving from one school to another (Rumberger, 2015) remains a significant concern for policy-makers due to its demonstrated negative impact on academic performance (Engec, 2006; Han, 2014; Hanushek et al., 2004; Min, 2021; Reynolds et al., 2009; Rumberger, 2015; Sherrer, 2012). In addition to the severity of student mobility, the scope of student mobility amplifies its importance to policy-makers. For instance, recent studies indicate that student mobility is exceedingly common, especially in urban areas, with estimates reaching up to 40% (Metzger et al., 2018). Beyond academic performance, student mobility has also impacted student behavior (Jabbari et al., 2025) among other social and emotional outcomes (Welsh, 2017). Nevertheless, there are significant gaps in the current literature that limit our understanding of student mobility. For instance, certain studies note that academic performance may be *more* negatively impacted by mobility that occurs within the school year rather than between years (Engec, 2006; Min, 2021), and yet few studies focus on within-year mobility (Welsh, 2017). Furthermore, research on student mobility often overlooks potential adaptation processes and factors that may help students adjust to new school contexts over time. Moreover, research on student mobility typically focuses on a single geographic context and rarely considers how impacts may vary across different geographies, such as differences between urban and suburban/rural areas. To address these gaps, this study leverages longitudinal student-level data collected over nine years across five large counties with diverse geographic characteristics to investigate how within-year school mobility impacts academic performance over time. In doing so, we examine how the effects of within-year mobility on ELA and math test scores vary across destination schools with different levels of student proficiency *over time*, as well as how these effects differ between urban and suburban/rural areas.

Background

This section provides an overview of the literature related to our study. It should be noted that some of the research summarized in this paper is also described in other papers in our series on student mobility in St. Louis (Jabbari et al., 2025; Terada et al., 2025; Wallace et al., 2025a; 2025b). The literature suggests that student mobility is often associated with negative school outcomes (Dinnen et al., 2020; Engec, 2006; Hanushek et al., 2004; Min, 2021; Reynolds et al., 2009). However, data shows that impacts on academic performance vary across student characteristics and school contexts. In a comprehensive review of United States (U.S) student mobility, Welsh (2017) identified several key factors that may moderate the impacts of student mobility, including the student's grade level, the student's familial and personal background, the reason for the school change, the frequency of school changes, the student's previous history with school changes, the timing of the school change, and the contexts of the departure and destination schools. In this section, we first review the literature on student mobility and academic achievement. We then consider mobility timing and school context.

Mobility and Academics

Although it is difficult to assess the causal impact of student mobility on student academics, as the factors motivating the move play a crucial role and yet can be difficult to measure, the literature consistently shows student mobility is correlated with negative academic outcomes (Rumberger, 2015). Leveraging longitudinal data from Nashville, Grigg (2012) utilized fixed-effects models to estimate the effect of student mobility on academic performance. Grigg found that within-year mobility was associated with significant decreases in both ELA and math achievement. Focusing on both student and school outcomes, Sherrer (2012) first leveraged multi-level modeling with the Early Childhood Longitudinal Study (ECLS) and found that mobile students' reading achievement was roughly 2–3 points lower than that of their non-mobile peers. Sherrer also found that this relationship was consistent across schools with varying levels of socioeconomic status (SES). Then, leveraging aggregate data from 21 elementary schools in a medium size district in the U.S., Sherrer found that a school’s SES was negatively related to student mobility and that student mobility was negatively related to ELA and math proficiency. Referencing the literature on both disruption and social connectedness, Sherrer (2012) demonstrated that student mobility has both negative individual and collateral effects. Han (2014) expanded on the notion of collateral effects by examining 2,560 public schools from the School Survey on Crime and Safety (SSOCS). Utilizing multiple regression models, Han found that urban schools and schools serving a student body with over 50 percent of minority students experienced more mobility than other schools. Han also found that after controlling for a variety of school background characteristics, school mobility was negatively associated with standardized test performance. Beyond academic performance, Han found that school mobility was negatively associated with principals’ perceptions of their students’ aspirations and positively associated with principals’ perceptions of their students’ levels of insubordination.

Mobility Timing

The severity of the effects of mobility can differ based on the timing of the move. For instance, Egnec (2006) used cross sectional data from almost 800,000 K-12 public school students in Louisiana during the 1998-1999 school year. Leveraging descriptive methods, Egnec found that student mobility was significantly correlated with decreased academic performance—and that these effects were worse for students who experienced within-school year moves. More recently, Min and colleagues (2021) analyzed a longitudinal sample of 34,299 students from a large urban district, using a multiple membership model. They discovered that within-year mobility had more harmful effects on academic performance than between-year mobility. These effects were particularly harmful for Asian-American students—who typically had the highest reading and math scores—as well as for Black and Hispanic students. Additionally, Prior and Leckie (2021) examined data from 476,968 secondary school students in England and found that within-year mobility had a more detrimental impact on student achievement compared to between-year mobility. The authors highlighted that students who moved within the school year faced disruptions, such as the shocks causing the initial move, more limited school choices during the school year, and discontinuities in curriculum. Finally, Stamp and colleagues (2022) studied 545 secondary school students in Montreal and found that those who changed schools within the year were significantly more likely to drop out than those who moved between years.

School Context

Concerning the context of destination schools, Hanushek et al. (2004) demonstrated that the context of the destination school plays an important role on the impact of student mobility on academic performance. Analyzing math performance data from 4th to 7th graders across 3,000 Texas public schools, Hanushek et al. (2004) found that students who moved within their district experienced greater academic setbacks than those who moved outside their district. Here, it's important to note that moves to a new district often led to improved school quality, whereas moves within the same district did not. Moreover, these setbacks were particularly severe for low-income students—a finding supported by other studies (e.g., Reynolds et al., 2009).

Theoretical Framework

Student mobility can have social and psychological impacts (Welsh, 2017), which can help situate and explain the academic impacts associated with student mobility. Adapting to a new school environment can both cause discomfort and disrupt learning, which can be sources of stress for students. Beyond the initial stress of school transitions, students must adapt—either proactively or maladaptively—to their new school environment. Thus, as noted by Jabbari et al. (2025), theories of transition stress and social adjustment can offer a valuable perspective on understanding the relationship between student mobility and student outcomes, as well as how this relationship can differ across varying school contexts.

Transition stress, or stress associated with planned or unplanned transitions from one context to another, can be associated with student mobility. Here, context includes roles, expectations, conditions, relationships, and environments (Mikal et al., 2013). Described by Goldstein et al. (2013), transition stress can be associated with higher test anxiety, lower academic performance, and reduced ability to bond with peers. Indeed, transition stress can negatively impact academic outcomes. Although transition stress tends to diminish over time, this diminishment depends heavily on the context of the new school. Margetts (2014) highlights the challenges students face when transferring schools and the factors that influence the success of these transitions. Here, Margetts (2014) notes that children are particularly at risk of transition difficulties when their skills, attitudes, and knowledge do not align with those of their new school. These difficulties may be particularly salient when transferring to a higher achieving school, as students may not be able to bridge the curriculum gap from their old school to their new school (Keels, 2013).

However, many students eventually adapt to their new environments. According to Social Adjustment theory, students need to understand acceptable behavior and have strong interpersonal relationships with peers and teachers in order to succeed in culturally and socially defined tasks within their school environment (Lerner et al., 2013). While Social Adjustment theory can readily apply to students' behavior (Kuperminc et al., 1997), it can also apply to students' academic performance. For instance, DeRosier (2012) connected social adjustment success to academic outcomes, finding that a student's ability to successfully adjust to a new environment was directly associated with their ability to succeed academically. Here, DeRosier (2012) found that increased social acceptance was positively correlated with increased academic achievement, as well as self-esteem, in math and reading. These findings are relevant for students experiencing mobility who must adjust both socially and academically to new school environments, especially if these adjustments occur in the middle of the school year. To adjust positively, students must learn the school norms and build strong relationships peers and teachers, which can take time and may explain instances of early transition stress. Moreover, if a student's new school environment is more effective at promoting learning than the previous school environment (e.g., more learning resources, less disruptions, higher teacher expectations, etc.), then these students may actually increase their learning through the adaptation process. Beyond developing a better understanding of acceptable behavior, students may build relationships with high-performing peers, adopt effective study habits, and receive more rigorous instruction. Nevertheless, as noted by Jabbari et al. (2025), much of the literature on student mobility focuses on immediate outcomes and often overlooks the longer-term process of adaptation, leaving this aspect less understood.

Data and Methods

Data and Sample

Data were collected as part of a larger project and paper series on student mobility in St. Louis. Thus, the methods section of this and other papers in the series are similar to our first paper, Terada et al., (2025). Student- and school-level data for our empirical analysis comes from the Missouri Department of Elementary and Secondary Education (DESE). The student-level enrollment and core demographic data were collected from the 2009-2010 school year through the 2018-2019 school year. The student-level sample in the datasets includes complete records for any student from 3rd through 8th grades who attended a public school (including a public charter school) in one of the five St. Louis area counties throughout the study period: St. Louis City, St. Louis County, St. Charles County, Franklin County, and Jefferson County. Student-level data were then merged with publicly available school-level assessment and discipline data from the DESE.

Based on our focus on unstructured moves to other schools occurring during the school year from 3rd to 8th grades, a small proportion of observations were removed through listwise deletion. Specifically, we removed summer school records, records in which entry dates are the same as the exit dates ("no shows"), records in which the exit code is stop-out, drop-out, or deceased, and records that we were not able to match at the school-level (e.g., for students that attended a school that was closed in 2018-2019). Given our longitudinal design, we excluded students who repeated any of the same grades for two or more years and students who did not have test scores in any of the 3rd through 8th grades. A visual depiction of our data cleaning process can be found in Appendix A. While our five-county analysis allows us to understand student mobility across an entire metropolitan region, we also include a subsample analysis of one county—St. Louis City—to explore mobility dynamics within a central city. The final analytical sample includes 70,518 students (423,108 student-level records): 7,253 (43,518 records) for St. Louis City and 56,752 (340,512 records) for the other four counties.

Measures

Dependent Variables

For the analysis, we used state assessment scores in the Missouri Assessment Program (MAP). Because the score ranges are different by grade and school year, we standardized MAP scores by grade and school year with a mean of zero and standard deviation of one. Therefore, all of the standardized MAP scores can be compared.

Independent Variables

For student transfers, we constructed a polynomial variable by dividing student transfer records into three categories: 0 = student remained in the school during a given school year; 1 = student transferred to another school during a school year; and 2 = student transferred to another school the previous year. Other student-level characteristics included race/ethnicity (White, Black, Hispanic, Asian, and others), gender (female and male), lunch status (free, reduced, and regular-priced), special education status (student with and without an Individualized Education Plan; IEP), English language status (ELL and non-ELL), homeless status (homeless and not homeless), residency status (resident in the attending school district and not a resident in the attending school district), and charter school attendance (attends a charter school and does not attend a charter school). Additionally, school-level characteristics included the number of enrolled students, percentages of each race/ethnicity group (White, Black, Hispanic, and other race/ethnicity), percentages of free/reduced lunch students, percentages of special education students, percentages of students with proficient or advanced levels in state-level math and ELA assessments in 8th grade, and rates of in- and out-of-school suspensions.[12] We re-scaled school-level variables to obtain more manageable coefficients for easy interpretation. Specifically, we divided the number of enrolled students by one hundred and the rest of the school-level variables by ten.

Analytic Approach

Regression Modeling

We utilized random-effect panel regression models. Unlike fixed-effect models, random effect models allowed us to estimate the effects of time-invariant characteristics, like student race and ethnicity, which—given the prior literature—are key variables of interest in the relationship between mobility and performance. We applied the following regression models:

$$Y_{i\in s,t} = \alpha + \beta_1 T_{it}^1 + \beta_2 T_{it}^2 + X_{it}\,\gamma^{\text{ind}} + \varepsilon_{it} \quad (1)$$

where $Y_{i\in s,t}$ is the standardized ELA or math assessment score of student i in school s in a school year t, α is the intercept, T_{it}^1 is the transfer of an individual student i during school year t, β_1 captures the impact of the student transfer, T_{it}^2 is one year after the transfer of an individual student i during school year t, β_2 captures the impact transferring in the following year, X_{it} is a vector of individual student i's variables at a school year t, γ^{ind} is individual-level variables, and $\varepsilon_{is,}$ is the error term.

We then added school-level characteristics to the previous model:

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[1] Rates are calculated as the total number of suspension occurrence per 100 students.
[2] Here, it is important to note that some school-level variables were subject to "blinding" due to very low numbers. For example, if a statistic was derived from less than 10 students, the Missouri Department of Elementary and Secondary Education coded it as missing. Not wanting to further limit the sample, we recoded these statistics as 0, due to their small size

$Y_{i\in s,t} = \alpha + \beta_1 T_{it}^1 + \beta_2 T_{it}^2 + X_{it}\gamma^{\text{ind}} + X_{st}\gamma^{\text{sch}} + \varepsilon_{it}$ (2)

where X_{st} is a vector of school-level variables of student i during school year t, γ^{sch} is school-level variables, and the remaining variables are the same as those in Equation 1.

We then investigated the extent to which the relationships between student transfers and student academic performance in math and ELA varied across schools with different levels of student proficiency. To estimate the relationships, we added an interaction term to the previous model:

$Y_{i\in s,t} = \alpha + \beta_1 T_{it}^1 + \beta_2 T_{it}^2 + X_{it}\gamma^{\text{ind}} + X_{st}\gamma^{\text{sch}} + (T * Proficiency)_{it}\mathrm{B} + \varepsilon_{it}$ (3)

where $(T * Proficiency)_{it}$ is the relationship between student transfer T and a school-level average percentage of students with proficient or advanced levels in the assessment $Proficiency$; the remaining variables are the same as those in Equations 1 and 2.

Results

Sample Description

Table 1 presents descriptive statistics for the entire sample. On average, over 90.78% of students remained in their respective schools, 5.45% of students transferred to another school, and 3.77% transferred to another school the year before[3]. For gender, 51.17% were male students. For race/ethnicity, 60.51% were white students, 31.57% were Black students, 3.57% were Hispanic students, and 1.77% were Asian students, and 2.59% were students from other races or ethnicities. 47.87% of students did not qualify for free or reduced-price lunch, 46.81% of students qualified for free lunch, and 5.32% of students qualified for reduced price lunch. 17.25% of students qualified for special education services and 10.71% of students were designated as ELL. 96.65% of students were not homeless. 97.45% of students resided

[3] The reason why there are fewer lagged transfers is because we don't consider lags for transfers occurring in 3rd grade, as well because students who transfer in consecutive years are considered current transfers, not previous transfers.

in their school's catchment area or the geographical area assigned to their school. 97.14% of students attended traditional public (e.g., not charter schools).

Appendix B presents descriptive statistics for St. Louis City and the other four counties, respectively. St. Louis City had higher percentages of student transfers in both the first year of transfer (8.93%) and the year following a transfer (6.09%) than the other four counties (the first year=4.17%; the year following a transfer=2.98%). Standardized assessment scores in St. Louis City were lower in both math (-0.54) and ELA (-0.51) than the other four counties (math=0.10; ELA=0.10). The percentage of Black students was much higher (79.09%) in St. Louis City than in the other four counties (24.91%), while the percentage of White students was much lower (12.95%) than in the other four counties (67.02%). The percentage of students who qualified for free lunch was also much higher (88.32%) in St. Louis City than in the other four counties (38.54%) At the school level, the percentage of ELL was also higher (8.99%) in St. Louis City than in the other four counties (2.87%).

Panel Regression

Tables 2 (math) and 3 (ELA) examined the association between student transfers and student performance, along with student-level characteristics (Model 1) and student- and school-level characteristics (Model 2). In addition, we examined how school-level proficiency rates moderated the relationship between student transfers and student performance (Model 3).

Starting with student- and school-level characteristics (Model 2), when compared to students who remained in their schools, transferring in a given year or transferring in a prior year was significantly associated with a decrease in math performance (β = -0.109*** and β = -0.057***, respectively). Similarly, transferring in a given year was significantly associated with a decrease in ELA performance (β = -0.092***), and transferring in a prior year was significantly associated with a decrease in ELA performance (β =-0.047***).

For all student- and school-level variables, we used a coefficient plot to visualize the coefficients (Figures 1 and 2). As seen in figure 1, several student-level characteristics were significantly associated with a decrease in standardized math assessment scores, including: Black students (β = -0.510**), Hispanic students (β = -0.207**), and students from other race/ethnicity (β = -0.192**)—when compared to white students, students who qualify for free lunch (β = -0.125***) and students who qualify for reduced price lunch (β = -0.0762***)—when compared to non-reduced price lunch homeless students (β =-0.0267**); ELL students (β = -0.0386***); students not residing in their school's catchment area (β = -0.141***); and special education students (β =-0.285***). Conversely, Asian students (β = 0.178***) and students attending a charter school (β = 0.0426***) were significantly associated with an increase in math assessment scores. For school-level variables, a one-unit increase in the number of enrolled students (β = 0.00565***), the percent of Black students (β = 0.0180***), the percent of Hispanic students (β = 0.0564***), the percent of students from other race/ethnicity groups (β = 0.00427***), the percent of students who qualify for free or reduced price lunch (β = 0.00530***), the percent of special education students (β = 0.0401***), and the percent of students with proficient or advanced levels in the math assessment (β = 0.0113***), was significantly associated with an increase in standardized math assessment scores. Conversely, a one-unit increase in the percent of ELL students (β = -0.0540***) was significantly associated with a decrease in math assessment scores. Results predicting ELA performance demonstrated similar results (Figure 2).

For all moderation effects, we used margin plots to visualize the relationships between transferring, individual performance, and the school-level percentages of students who were performing at proficient or advanced levels in math and ELA assessments (Figures 3 and 4). Compared to students who remained in their schools, transferring in a given year was negatively moderated by increased school-level math performance (β = -0.002***); transferring in a prior year was also negatively moderated by increased school-level math performance (β = -0.001***) (Model 3). As seen in Figures 1, transferring to a higher performing school in a given year or the year before was schools was associated with lower levels of math performance when compared to students who did not transfer. Similar moderation effects were found in ELA.

When considering differences across geographies (Appendix C), we observed both similarities and differences between St. Louis City and the other four St. Louis counties. For example, when compared to students who remained in their schools, transferring in a prior year was significantly associated with a larger decrease in ELA performance in St. Louis City (St. Louis City: β = -0.027*; four counties: β = -0.044***). Concerning moderation, when compared to students who remained in their schools, transferring in a given year was positively moderated by increased school-level ELA performance in St. Louis City, yet negatively moderated by increased school-level ELA performance in the surrounding counties (St. Louis City: β = 0.002*; four counties: β = -0.001*). Here it is also important to note that there was no significant moderation for transferring in a prior year in St. Louis City, while transferring in a prior year was negatively moderated by increased school-level ELA performance in the surrounding counties. Similarly, considering math, there was no significant moderation for transferring in a prior year in St. Louis City, while transferring in a prior year was negatively moderated by increases school-level math performance in the surrounding counties.

Discussion

Our study addresses an important gap in the literature that limits our understanding of the consequences of student mobility on academic performance. Our work expands on existing literature to focus on within-year mobility, examine adaptation processes for transitioning students in varying school contexts, and explore the heterogenous impacts of mobility differs across diverse geographies.

Findings

Similar to previous research, we find that transferring during the school year has significant negative impacts on student academic outcomes in both math and ELA. Observing both short- and long-term effects, we see that students experienced a 10.9% standard deviation unit reduction in their math scores and a 9.2% standard deviation unit reduction in ELA scores in the first year of transferring. Overall, students partially adapted to transferring in their second year but still demonstrated enduring academic setbacks: transferred students experienced a 5.7% standard deviation unit reduction in their math scores and 4.7% standard deviation unit reduction in ELA scores in the year after transferring.[4] While our first-year data from students who transferred in a given year align with theories of transition stress, our findings from students who transferred in a prior year demonstrate a degree of social and academic adjustment. Future research should leverage qualitative data to further unpack students' experiences during the first and second years of transferring to better understand the factors influencing adjustment.

Additionally, by using a random effect model, we were able to further unpack the effects of some of the inequalities that have been associated with academic performance.

[4] As academic performance is often assessed during April in Missouri, we can be reasonably certain that the transfer event occurred before academic performance was collected, thus ensuring temporality in our first-year estimates. Nevertheless, it is still possible that some students transferred in May (the last month of the school year).

Specifically, we found that Black, Hispanic, and other race/ethnicity students, students who qualify for free and reduced lunch, homeless students, ELL students, students residing in the school's catchment area, and special education students were all associated with a significant decrease in math and ELA scores *net of transferring*. Conversely, Asian students and charter school students were associated with an increase in test scores.

Findings from this study suggest also that school context matters. Starting with moderation, when compared to students who remained in their schools, transferring in a given year was negatively moderated by increased school-level math performance such that transferring to a higher-performing school decreased students' performance during the year of the transfer and—to a lesser—extent in the year after the transfer. This suggests that students may not be able to bridge the curriculum gap in higher-performing schools but that this becomes less challenging over time.

Finally, when comparing outcomes between St. Louis City and the surrounding counties, we found that, overall, students in St. Louis City experienced smaller setbacks in ELA in the second year of the transfer. Here, students in the surrounding counties may experience greater challenges in adapting to more rigorous curriculums. Interestingly, in ELA, we saw divergent trends in St. Louis City and in the surrounding counties depending on school performance. In St. Louis City, students in their first year of transferring do worse than non-transferring students in low-performing schools, but better than non-transferring students in high-performing schools. For better or worse, students appear to "outpace" their counterparts in St. Louis City, suggesting the importance of school quality in urban educational environments. However, in the surrounding four counties, students in their second year of transferring do better than non-transferring students in low-performing schools, but worse than non-transferring students in high-performing schools. Here, transferring students may not be able bridge the curriculum gap in high performing schools. We also found that, descriptively, students in St. Louis City transferring to schools with relatively high proficiency in Math scores tended to score similarly in Math in their second year when compared to non-transferring students who attended similar schools. This finding suggests delayed, but positive form of academic adjustment to a new school context for transferring students in urban educational settings—particularly in math.

Limitations

Despite this study's contributions, it has limitations in both internal and external validity. While we collected data on student mobility for five large counties over an extended period of time, the dynamics we observed may be quite different in other regions around the country. Research that uses nationally representative federal survey data may better represent the broader impacts of student mobility on academic performance across the country. Moreover, leveraging source of exogenous variation that affect student mobility, such as school closures, may rule out additional confounders related to transferring that our random effect panel regression models could not address.

Implications

Our findings have significant implications for both theory and policy. Regarding theory, our results highlight the critical role that school context plays when students are adapting to new school environments. Although transferring students experience transition stress that can adversely affect their academic performance, the impact varies depending on the school context. Our findings suggest that not all school transitions have negative consequences, but rather certain school environments seem to be more detrimental to the academic outcomes of transferring students than others. Our data shows that school context is particularly in urban areas, where transferring students at high performing schools in St. Louis City were performing just as well as other non-transferring students at high-performing schools one year after the move.

In terms of policy, our findings demonstrate the negative long-term effects *on average* associated with transferring during the school year on academic performance. While there are several factors associated with transferring, including familial factors that may not be directly tied to our education system, our research (Wallace, 2025a) suggests that academic performance is an important predictor. Indeed, this study highlights a vicious cycle in which low-performing students transfer, which then further lowers their performance. When considering the strong influence of early academic performance on student mobility, policy-makers should consider effective strategies that focus on boosting early academic performance, such as universal pre-kindergarten (Gormley et al., 2005). In addition to trying to prevent transfers, schools should also consider efforts to support transferring students. For instance, schools and districts may want to develop mechanisms to share relevant social and academic information for students that do transfer, so that destination schools can be better prepared to serve these students.

Conclusion to the Paper Series

This paper series originated from a multi-institutional research practice partnership that identified student mobility—especially student mobility occurring during the school year—as a core problem affecting students and teachers. The lived experiences of our practitioners with student mobility were also reflected in state reported mobility rates. DESE reported average student mobility rates in St. Louis at 38%. However, these exceptionally high rates included in-bound transfers and summer or between-year transfers, which is different than how we operationalized student mobility. Rather, DESE's operationalization of student mobility may more closely align with "churn". At the same time, when cross-checking with collaborating researchers at SLU PRiME we found that another discrepancy in the state-reported data resulted from individual districts and schools including first-day-of-the-school-year "no-shows" as mobile students, as well as considering chronically absent students to be mobile (Chung & Delaney, 2024; Medler et al., 2024). As our team identified the average within-year mobility rate to be around 9%, one of the implications of our study is the importance of operationalizing key terms and ensuring that these operationalizations match the identified problems and lived experiences of our on-the-ground practitioners.

Nevertheless, while student mobility rates in St. Louis are much lower than previously thought and are generally on a gradual decline (Chung & Delaney, 2024; Melder et al., 2024), school partners in the SRPC still feel the negative effects. Our school partners suggested that understanding who is most likely to transfer within the school year and why can guide their efforts to better support these students. Further, existing research shows student mobility often negatively impacts academic performance (Engec, 2006; Han, 2014; Hanushek et al., 2004; Min, 2021; Reynolds et al., 2009; Rumberger, 2015), graduation, (Gasper et al., 2012; Rumberger & Larson, 1998; South et al., 2007; Stamp et al., 2022), and other social and emotional outcomes (Welsh, 2017). The severity of impact often depends on the timing of the transfer (within- or between-year mobility), which could reflect different phenomena (e.g., a student getting "pushed out" during the school year versus a family seeking another school during the summer). Nevertheless, research tends to group these types of transfers together (Welsh, 2017). Thus, in order to develop targeted strategies to reduce both the occurrence of within-year mobility and the negative effects of within-year mobility on students, a nuanced understanding of the patterns, causes, and consequences of within-year mobility is needed.

Our first paper took a broad look at who transfers before the school year is over, and where do they go (inside, outside the district, out of state, etc.) (Terada et al., 2025). We explored associations between student, school, and neighborhood characteristics and student mobility from kindergarten through 12th grade. Aligned with prior research we found high school students, Black students, students receiving special education services, students experiencing unstable housing, and students who qualified for free and reduced-price lunch were all more likely to experience within-year mobility. Conversely, ELL students and non-resident students were less likely to experience within-year mobility. Going beyond individual characteristics, we also identified school and neighborhood characteristics associated with within-year mobility. Most uniquely, we examined where students transfer—a novelty in the research literature. For example, we found that while suspension rates were associated with decreased odds of transferring overall, they were associated with increased odds of transferring to another district. Additionally, higher rates of homeownership were associated with increased odds of transferring to a private school.

In paper two, we took a closer look at how early achievement predicts within-year mobility both in a given year and over time (Wallace et al., 2025a). Specifically, we found that students who performed proficient and advanced were roughly 40% less likely to transfer schools the following year. Additionally, we found accumulating disadvantages over time: with each year that passed, students with low academic performance experienced decreased rates of remaining in their original school. Finally, when accounting for academic performance, marginalized racial/ethnic groups still experienced disadvantages: Black students experienced a roughly 260% increase in the odds of transferring during the school year. Students that qualified for free lunch also experienced increased odds of transferring during the school year.

We then turned our focus to high school students to examine how discipline practices impact within-year transfers over time (Wallace et al., 2025b). Similarly, we found that suspension significantly increases the odds of transferring both in a given year and over time. Specifically, in-school suspension was associated with a 64% increase in odds of transferring during the following year, and out-of-school suspension was associated with a 77% increase in odds. Again, we found accumulating disadvantages over time: with each year that passed, suspended students experienced decreased rates of remaining in their original school. Disparities were also found in high schools: when accounting for punishment, Black students and students that qualified for free lunch were significantly more likely to transfer schools. Finally, it is important to note that in both papers two and three, the effects of academic performance and punishment were attenuated in St. Louis City, suggesting that students may be more likely to get "pushed out" of school for academic and behavior reasons in urban areas.

Lastly, in the current paper, we examined the impact of within-year mobility on student achievement over time and across school contexts. Aligned with prior research we find that within-year mobility has significant short- and long-term negative impacts on both math and English language arts (ELA) performance. However, in the year after the transfer, the negative effect on performance reduces by roughly half. Moreover, we find that destination school context matters: transferring to a higher-performing school decreased students' performance during the year of the transfer and—but did so to a lesser extent in the year after the transfer. Thus, while students may not be able to bridge the curriculum gap in higher-performing schools, initially, this becomes less challenging over time.

Implications of the Paper Series

St. Louis has historically been described as a hypermobile city (Metzger et al., 2018). However, our research suggests previous mobility rates may have more closely reflected "churn rates" and may be masking other issues facing schools, such as chronic absenteeism, or families un-enrolling and re-enrolling, while searching for the right school fit (Chung & Delaney, 2024). In order to better inform policy and practice, researchers should ensure transparency in how they are defining and calculating mobility rates.

Our results highlight significant and extended risk factors for within-school mobility across individual, school and neighborhood characteristics. For the risk factors that are demographic in nature, schools should consider leveraging resources to provide additional supports to students in need. For example, emergency rental assistance could be provided to students who qualify for free lunch when they face evictions or other family hardships. Alternative solutions could also focus on temporary living arrangements for unhoused students, such as "Joe's Place" in Maplewood Richmond Heights, which offers unhoused students a safe home environment while supporting their transition to adulthood ("Joe's Place", 2024). Early warning systems could be implemented, as well, to identify students who may be at risk of transferring, such as students with low academic performance. Given the importance of early academic performance, policy-makers could consider effective strategies at boosting early learning, such as universal pre-kindergarten (pre-K). At the other end of the spectrum, high schools could consider alternatives to punitive discipline, such as strategies that are rooted in restorative justice. While these strategies focus on transfer prevention, efforts should also be made to better support students who inevitably transfer. For example, given the large proportion of between-district transfers, districts may want to consider ways of sharing students' relevant academic information or adopting similar curriculums.

Next Steps

This project was the first step in a long-term effort to better support schools through a research practice partnership. While this step involved understanding some of the core aspects of the phenomenon prioritized by practitioners—within-school mobility—we adhere to adage that the goal of research is not merely to describe social problems, but rather to help solve them. Description is useful insomuch as it can help pinpoint opportunities for intervention. In this regard, we are currently working with a small subset of schools from the SRPC to tailor a school belonging intervention for students that have recently transferred. Additionally, for the 24-25 school year, the SRPC is providing data capacity support for a pilot at one of its partner school networks which seeks to provide support directly for families dealing with housing instability, one of the strongest predictors of student mobility identified in our study. We are also considering broader social policies that may reduce family instability that contributes to student mobility. For example, we are currently collecting data on St. Louis's recent general basic income experiment (GBI) to determine if providing money to families may help decrease rates of mobility.

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Table 1

Results of descriptive statistics for five counties

		Never transferred		Year of transfers		Following year after transfers		Total (423,108)	
Student-level variables	Category	**%/Mean**	**SD**	**%/Mean**	**SD**	**%/Mean**	**SD**	**%/Mean**	**SD**
Transfer		90.78%		5.45%		3.77%			
Assessment score in math		0.04	0.99	-0.47	1.00	-0.40	1.00	0	1
Assessment score in ELA		0.04	0.99	-0.44	1.03	-0.38	1.01	0	1
Gender	Female	48.89%		48.31%		48.12%		48.83%	
	Male	51.11%		51.69%		51.88%		51.17%	
Race/Ethnicity	White	62.40%		42.01%		41.76%		60.51%	
	Asian	1.86%		0.75%		0.89%		1.77%	
	Black	29.54%		51.63%		51.26%		31.57%	
	Hispanic	3.64%		2.77%		3.02%		3.57%	
	Others	2.56%		2.84%		3.06%		2.59%	
Lunch status	Unreduced lunch	50.88%		19.15%		16.91%		47.87%	
	Free lunch	43.64%		77.42%		78.93%		46.81%	
	Reduced lunch	5.48%		3.43%		4.16%		5.32%	
Homelessness	Not Homeless	97.28%		90.10%		90.82%		96.65%	
	Homeless	2.72%		9.90%		9.18%		3.35%	
ELL status	Not ELL	89.14%		90.75%		90.73%		89.29%	
	ELL	10.86%		9.25%		9.27%		10.71%	
Residency	Resident in the attending district	97.31%		99.07%		98.38%		97.45%	
	Others	2.69%		0.93%		1.62%		2.55%	
IEP	Not IEP	82.82%		83.07%		80.53%		82.75%	
	IEP	17.18%		16.93%		19.47%		17.25%	
Charter school	Not charter school	97.10%		98.00%		97.00%		97.14%	
	Charter school	2.90%		2.00%		3.00%		2.86%	
School-level variables									
Number of enrolled students		586.95	244.77	505.42	235.17	535.78	243.15	580.57	245.06
Percentage of Black students		27.98	34.40	43.16	41.26	42.77	40.96	29.36	35.34
Percentage of Hispanic students		3.65	4.22	3.18	4.39	3.30	4.35	3.61	4.23
Percentage of White students		62.49	33.30	49.44	39.25	49.46	38.79	61.29	34.08
Percentage of other race/ethnicity		5.89	4.94	4.19	3.97	4.47	4.12	5.74	4.88
Percentage of free/reduced lunch		46.60	29.00	64.31	27.76	63.13	28.45	48.19	29.34

Percentage of ELL students	3.01	5.57	2.89	6.29	2.73	5.58	2.99	5.61
Percentage of special education students	14.01	3.96	14.72	7.36	14.60	5.92	14.07	4.31
Rate of out-of-school suspension	1.07	2.40	1.57	3.02	1.80	3.30	1.12	2.49
Percentage of students with proficient/advanced levels in math	39.75	19.6	30.13	19.8	30.47	19.55	38.88	19.8
Percentage of students with proficient/advanced levels in ELA	47.68	18.38	37.12	19.51	39.24	19.15	46.79	18.69

Table 2

Results of panel regression with math assessment scores, five counties

	Model 1	Model 2	Model 3
Transfer (reference=Never transferred)			
First year of transfer	-0.112***	-0.109***	-0.0558***
	(0.00491)	(0.00483)	(0.00888)
Second year of transfer	-0.0591***	-0.0571***	-0.0331***
	(0.00527)	(0.00515)	(0.00997)
Gender (reference=Female)			
Male	-0.00534	0.00117	0.00113
	(0.00567)	(0.00532)	(0.00532)
Ethnicity (reference=White)			
Asian	0.209***	0.178***	0.178***
	(0.0242)	(0.0218)	(0.0218)
Black	-0.592***	-0.510***	-0.509***
	(0.00683)	(0.00839)	(0.00839)
Hispanic	-0.224***	-0.207***	-0.206***
	(0.0139)	(0.0132)	(0.0132)
Others	-0.220***	-0.192***	-0.191***
	(0.0135)	(0.0129)	(0.0129)
Lunch (reference=Unreduced lunch)			
Free lunch	-0.155***	-0.125***	-0.124***
	(0.00397)	(0.00394)	(0.00394)
Reduced lunch	-0.0878***	-0.0762***	-0.0758***
	(0.00542)	(0.00525)	(0.00525)
Homeless (reference=Not homeless)			
Homeless	-0.0527***	-0.0267***	-0.0272***
	(0.00741)	(0.00718)	(0.00718)
ELL (reference=Not ELL)			
ELL	-0.0413***	-0.0386***	-0.0387***
	(0.00491)	(0.00480)	(0.00480)
Resident (reference=Resident in the attending school)			
Others	0.00567	-0.141***	-0.143***
	(0.0121)	(0.0130)	(0.0130)
Special Education (reference=Not Special Ed.)			
IEP	-0.256***	-0.285***	-0.285***
	(0.00551)	(0.00535)	(0.00535)

Charter school (reference=Not charter school)			
Charter school	0.0498***	0.0426***	0.0437***
	(0.0109)	(0.0108)	(0.0108)
Number of enrolled students		0.00565***	0.00572***
		(0.000536)	(0.000536)
Percentage of Black students		0.0180***	0.0177***
		(0.00119)	(0.00119)
Percentage of Hispanic students		0.0564***	0.0568***
		(0.00517)	(0.00516)
Percentage of other race/ethnicity		0.00427***	0.00422***
		(0.000416)	(0.000416)
Percentage of free/reduced lunch		0.00530***	0.00528***
		(0.00118)	(0.00118)
Percentage of ELL students		-0.0540***	-0.0541***
		(0.00368)	(0.00367)
Percentage of special education students		0.0401***	0.0397***
		(0.00376)	(0.00376)
Rate of out-of-school suspension		-0.00968+	-0.00973+
		(0.00544)	(0.00544)
Proficiency rate in math assessments		0.0113***	0.0115***
		(0.0000846)	(0.0000873)
First year of transfer # Proficiency rate in math assessments			-0.00173***
			(0.000231)
Second year of transfer # Proficiency rate in math assessments			-0.000776**
			(0.000255)
Constant	0.334***	-0.338***	-0.345***
	(0.00469)	(0.0102)	(0.0102)
Observations	423108	423108	423108
R-squared for within model	0.0000769	0.0324	0.0324
R-squared for overall model	0.270	0.372	0.373
R-squared for between model	0.201	0.284	0.284

Standard errors in parentheses
$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Model 1: Only student-level variables are included.
Model 2: Student- and school-level variables are included.
Model 3: Student- and school-level variables and interaction of transfer years and school-level proficiency rates are included.

Table 3

Results of panel regression with ELA assessment scores, five counties

	Model 1	Model 2	Model 3
Transfer (reference=Never transferred)			
First year of transfer	-0.096***	-0.0917***	-0.0775***
	(0.00489)	(0.00483)	(0.0106)
Second year of transfer	-0.040***	-0.0465***	-0.0164
	(0.00510)	(0.00504)	(0.0117)
Gender (reference=Female)			
Male	-0.233***	-0.228***	-0.228***
	(0.00572)	(0.00548)	(0.00548)
Ethnicity (reference=White)			
Asian	0.116***	0.0891***	0.0891***
	(0.0215)	(0.0200)	(0.0200)
Black	-0.546***	-0.471***	-0.470***
	(0.00681)	(0.00838)	(0.00838)
Hispanic	-0.217***	-0.208***	-0.207***
	(0.0137)	(0.0133)	(0.0133)
Others	-0.219***	-0.202***	-0.201***
	(0.0130)	(0.0128)	(0.0128)
Lunch (reference=Unreduced lunch)			
Free lunch	-0.145***	-0.119***	-0.119***
	(0.00391)	(0.00395)	(0.00395)
Reduced lunch	-0.087***	-0.0685***	-0.0683***
	(0.00521)	(0.00517)	(0.00517)
Homeless (reference=Not homeless)			
Homeless	-0.070***	-0.0564***	-0.0567***
	(0.00729)	(0.00715)	(0.00715)
ELL (reference=Not ELL)			
ELL	-0.054***	-0.0198***	-0.0198***
	(0.00478)	(0.00479)	(0.00478)
Resident (reference=Resident in the attending school)			
Others	0.0120	-0.134***	-0.135***
	(0.0118)	(0.0128)	(0.0128)
Special Education (reference=Not Special Ed.)			
IEP	-0.287***	-0.306***	-0.306***

	(0.00557)	(0.00552)	(0.00552)
Charter school (reference=Not charter school)			
Charter school	-0.00356	0.0429***	0.0433***
	(0.0106)	(0.0107)	(0.0107)
Number of enrolled students		-0.00695***	-0.00696***
		(0.000542)	(0.000542)
Percentage of Black students		0.0183***	0.0182***
		(0.00118)	(0.00118)
Percentage of Hispanic students		0.0310***	0.0310***
		(0.00513)	(0.00513)
Percentage of other race/ethnicity		0.00182***	0.00179***
		(0.000422)	(0.000422)
Percentage of free/reduced lunch		-0.00732***	-0.00735***
		(0.00119)	(0.00119)
Percentage of ELL students		-0.0221***	-0.0220***
		(0.00383)	(0.00382)
Percentage of special education students		0.0185***	0.0183***
		(0.00367)	(0.00367)
Rate of out-of-school suspension		-0.0834***	-0.0835***
		(0.00520)	(0.00520)
Proficiency rate in ELA assessments		0.00842***	0.00849***
		(0.0000879)	(0.0000904)
First year of transfer # Proficiency rate in ELA assessments			-0.000372
			(0.000237)
Second year of transfer # Proficiency rate in ELA assessments			-0.000760**
			(0.000256)
Constant	0.440***	-0.00255	-0.00534
	(0.00475)	(0.0102)	(0.0103)
Observations	423108	423108	423108
R-squared for within model	0.000174	0.0137	0.0137
R-squared for overall model	0.278	0.352	0.352
R-squared for between model	0.211	0.270	0.270

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1

Results of panel regression with math assessment scores in student- and school-level variables, five counties

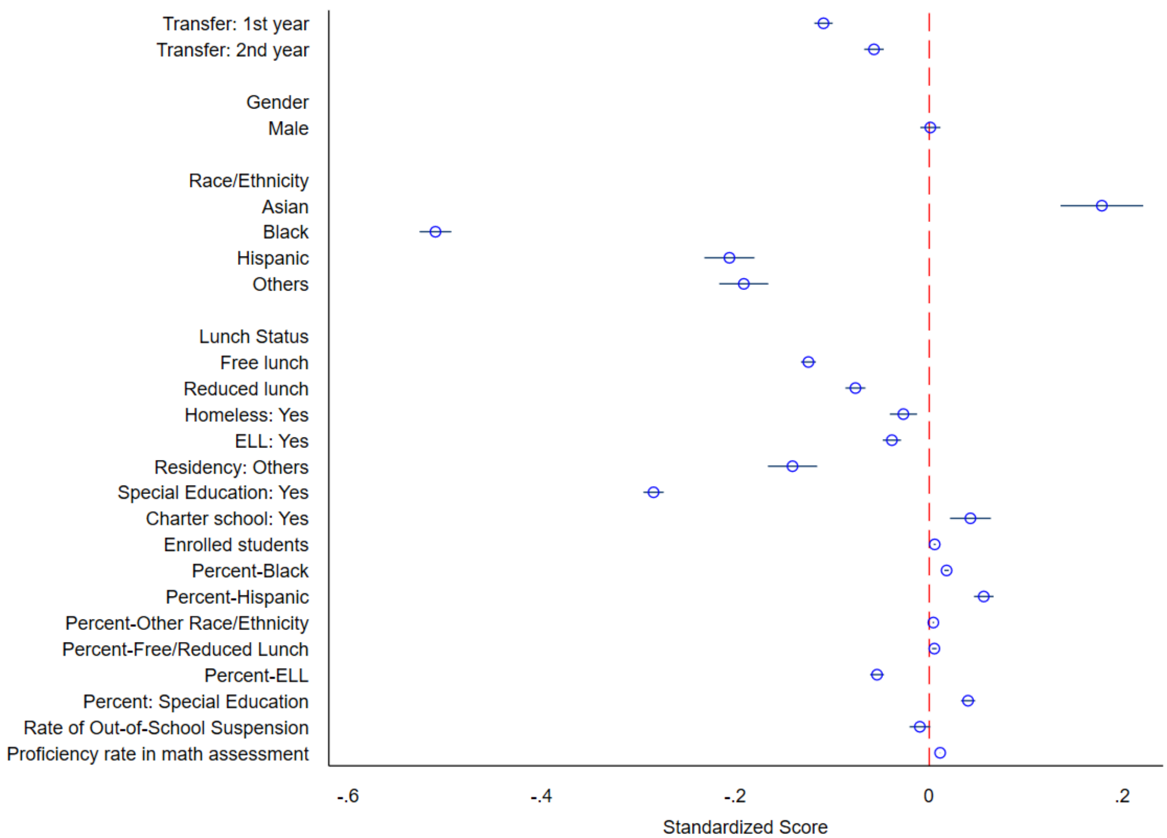


Figure 2

Results of panel regression with ELA assessment scores in student- and school-level variables, five counties

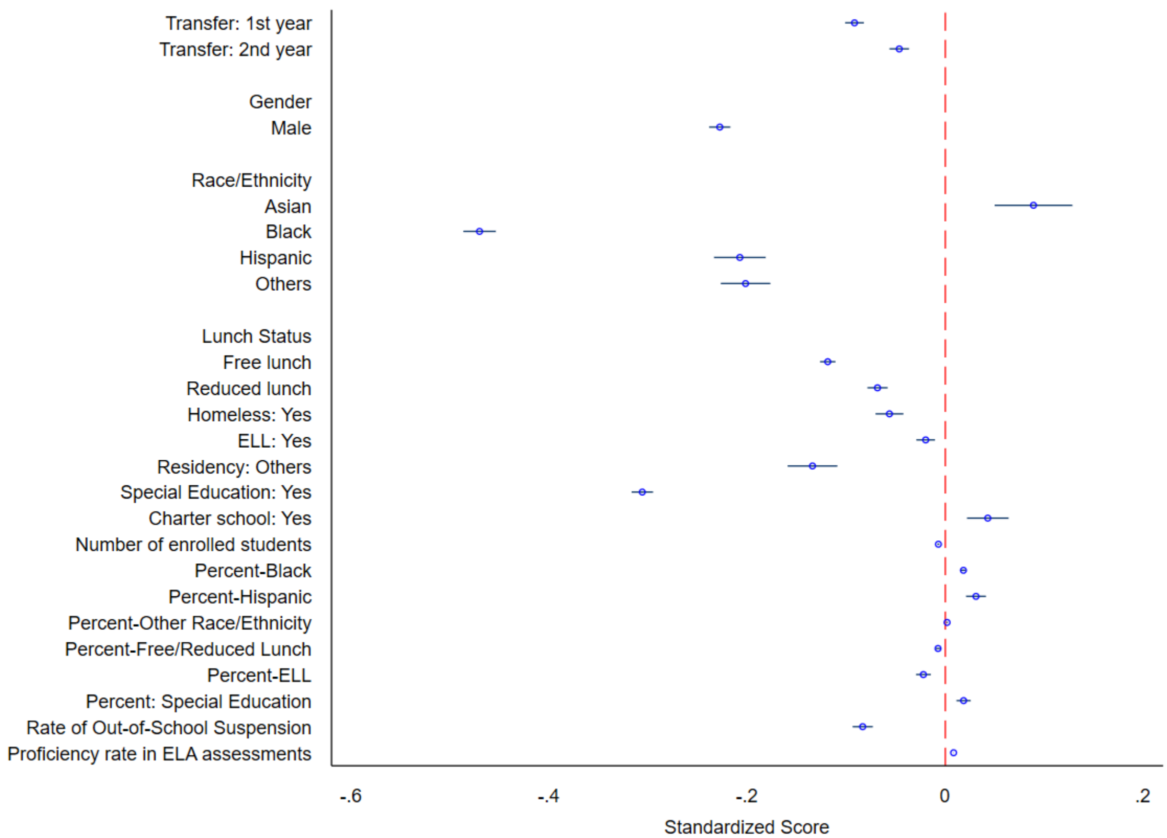


Figure 3

Margin plots for transfer year and proficiency rate in math assessments, five counties

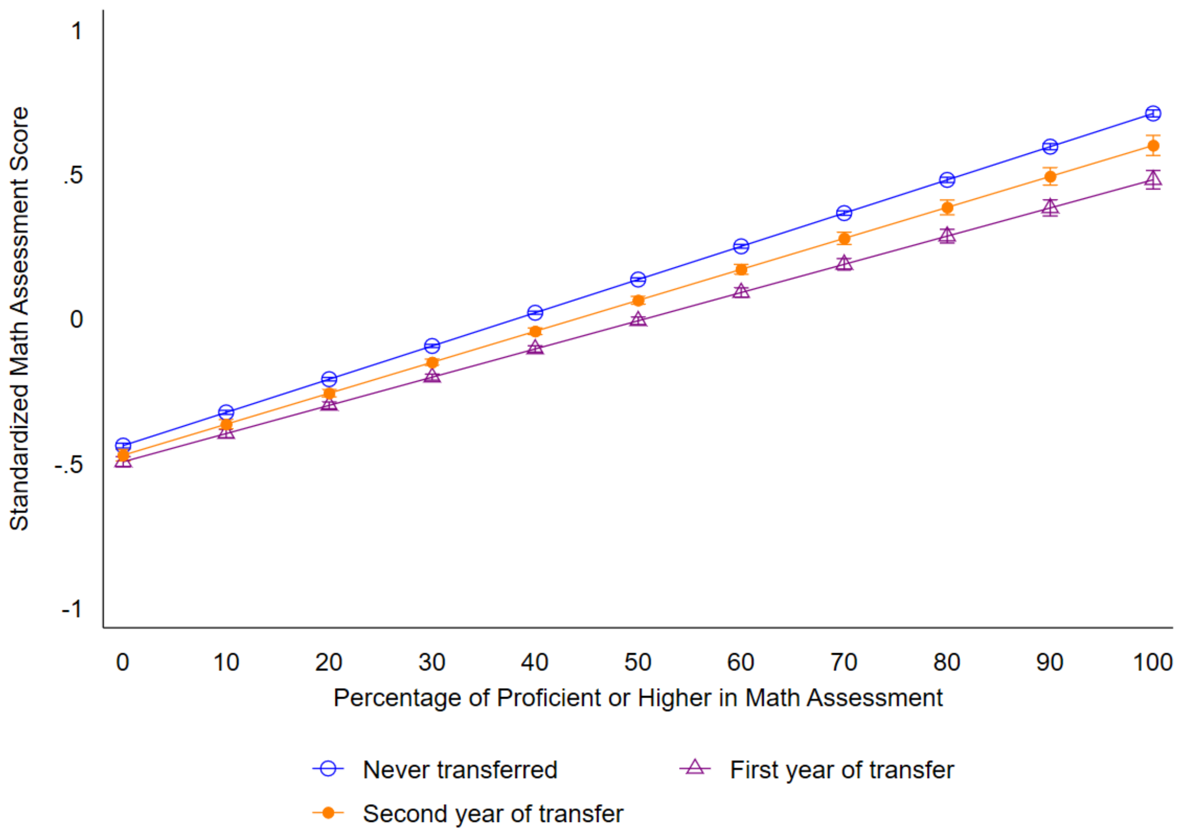
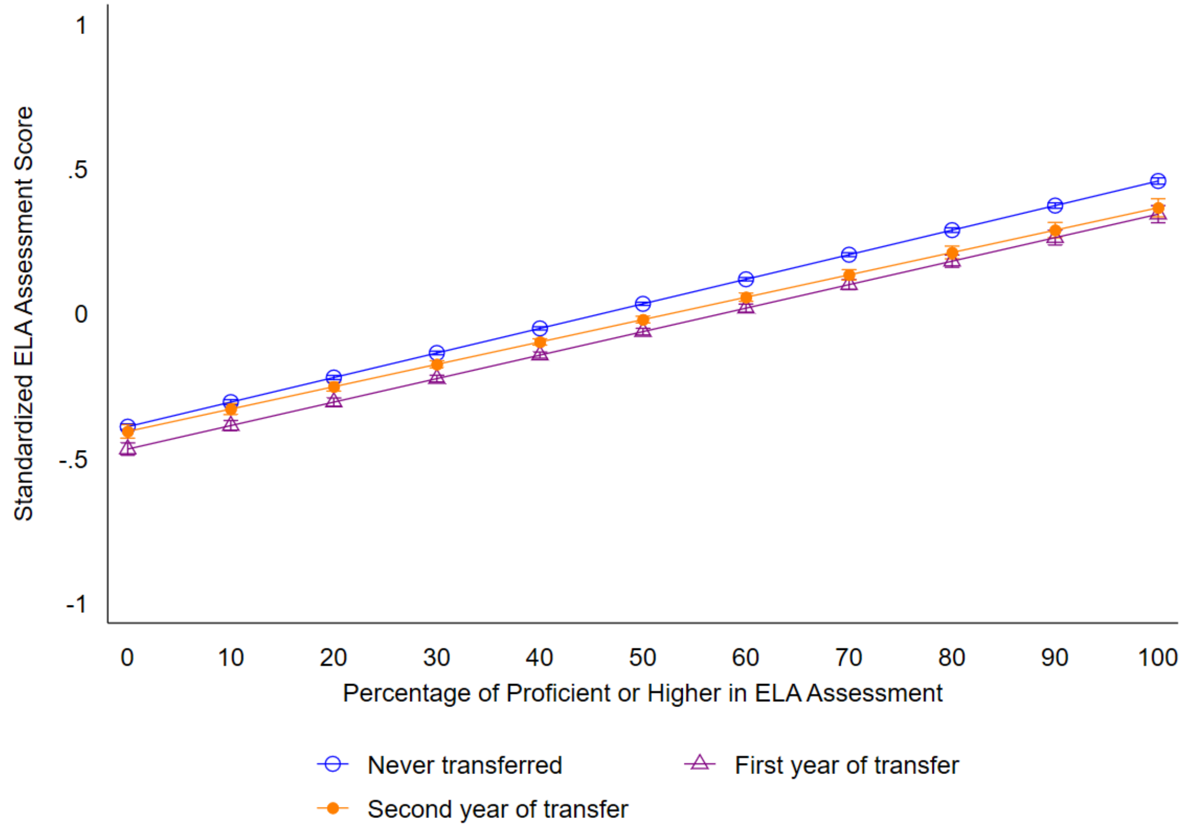


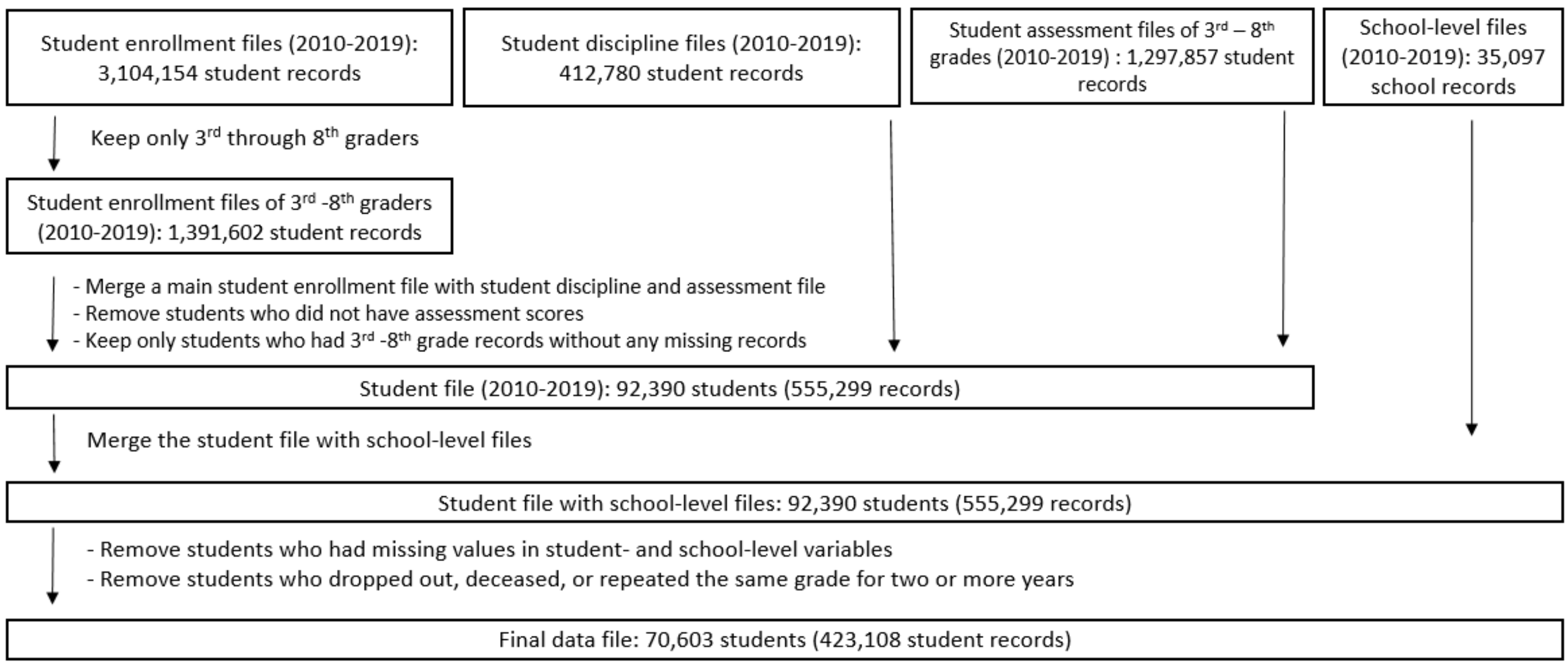
Figure 4

Margin plots for transfer year and proficiency rate in ELA assessments, five counties



Appendix A

Data Cleaning Process



Appendix B

Table B1

Results of descriptive statistics, St. Louis City only

		Never transferred		Year of transfers		Following year after transfers		Total (43,518)	
Student-level variables	Category	**%/Mean**	**SD**	**%/Mean**	**SD**	**%/Mean**	**SD**	**%/Mean**	**SD**
Transfer		84.97%		8.93%		6.09%		100.00%	
Assessment score in math		-0.49	1.01	-0.83	1.02	-0.78	1.02	-0.54	1.02
Assessment score in ELA		-0.47	1.05	-0.8	1.08	-0.72	1.03	-0.51	1.05
Gender	Female	50.03%		47.71%		47.93%		49.69%	
	Male	49.97%		52.29%		52.07%		50.31%	
Race/Ethnicity	White	13.82%		7.69%		8.52%		12.95%	
	Asian	1.88%		0.93%		1.02%		1.74%	
	Black	77.60%		88.04%		86.76%		79.09%	
	Hispanic	5.41%		2.26%		2.38%		4.95%	
	Others	1.28%		1.08%		1.32%		1.27%	
Lunch status	Unreduced lunch	9.17%		8.05%		4.56%		8.79%	
	Free lunch	87.73%		90.25%		93.78%		88.32%	
	Reduced lunch	3.10%		1.70%		1.66%		2.89%	
Homelessness	Not Homeless	89.53%		81.46%		81.15%		88.29%	
	Homeless	10.47%		18.54%		18.85%		11.71%	
ELL status	Not ELL	86.78%		92.46%		91.25%		87.56%	
	ELL	13.22%		7.54%		8.75%		12.44%	
Residency	Resident in the attending district	97.00%		99.28%		98.11%		97.27%	
	Others	3.00%		0.72%		1.89%		2.73%	
IEP	Not IEP	86.70%		87.35%		85.07%		86.66%	
	IEP	13.30%		12.65%		14.93%		13.34%	
Charter school	Not charter school	74.01%		91.64%		88.31%		76.46%	
	Charter school	25.99%		8.36%		11.69%		23.54%	
School-level variables									
Number of enrolled students		478.50	234.05	419.16	220.87	443.43	224.48	471.06	233.04
Percentage of Black students		72.48	29.58	78.13	30.26	76.44	31.62	73.23	29.83
Percentage of Hispanic students		5.42	8.66	2.72	5.10	2.89	5.43	5.03	8.29
Percentage of White students		18.20	24.27	15.90	25.73	17.24	27.01	17.94	24.59

Percentage of other race/ethnicity	3.90	4.37	3.22	3.97	3.43	4.16	3.81	4.33
Percentage of free/reduced lunch	86.69	21.57	87.53	20.12	86.30	22.11	86.74	21.48
Percentage of ELL students	7.49	11.56	4.87	10.25	4.30	8.80	7.07	11.35
Percentage of special education students	13.18	5.15	14.73	5.77	14.52	5.20	13.40	5.23
Rate of out-of-school suspension	2.60	3.94	2.97	4.16	3.18	4.32	2.66	3.98
Percentage of students with proficient/advanced levels in math	21.29	16.37	18.14	15.53	18.39	15.73	20.83	16.29
Percentage of students with proficient/advanced levels in ELA	29.44	18.11	24.64	16.08	26.51	16.74	28.83	17.92

Table B2

Results of descriptive statistics, four counties only

		Never transferred		Year of transfers		Following year after transfers		Total (340,512)	
Student-level variables	**Category**	**%/Mean**	**SD**	**%/Mean**	**SD**	**%/Mean**	**SD**	**%/Mean**	**SD**
Transfer		92.84%		4.17%		2.98%		100.00%	
Assessment score in math		0.14	0.96	-0.39	0.96	-0.31	0.97	0.10	0.97
Assessment score in ELA		0.13	0.96	-0.35	0.99	-0.29	0.98	0.10	0.97
Gender	Female	48.67%		47.96%		47.80%		48.62%	
	Male	51.33%		52.04%		52.20%		51.38%	
Race/Ethnicity	White	68.65%		45.81%		46.04%		67.02%	
	Asian	1.96%		0.84%		1.01%		1.88%	
	Black	23.21%		47.34%		46.39%		24.91%	
	Hispanic	3.55%		3.03%		3.30%		3.52%	
	Others	2.64%		2.98%		3.26%		2.67%	
Lunch status	Unreduced lunch	58.38%		24.18%		21.28%		55.85%	
	Free lunch	35.91%		71.85%		73.78%		38.54%	
	Reduced lunch	5.71%		3.97%		4.94%		5.61%	
Homelessness	Not Homeless	98.39%		92.81%		93.27%		98.01%	
	Homeless	1.61%		7.19%		6.73%		1.99%	
ELL status	Not ELL	89.27%		90.54%		90.82%		89.37%	
	ELL	10.73%		9.46%		9.18%		10.63%	
Residency	Resident in the attending district	97.21%		98.78%		98.14%		97.30%	
	Others	2.79%		1.22%		1.86%		2.70%	
IEP	Not IEP	82.35%		81.76%		79.22%		82.23%	
	IEP	17.65%		18.24%		20.78%		17.77%	
Charter school	Not charter school	99.77%		99.49%		98.94%		99.73%	
	Charter school	0.23%		0.51%		1.06%		0.27%	
School-level variables									
Number of enrolled students		608.81	237.63	536.39	230.32	567.76	237.65	604.57	237.86
Percentage of Black students		22.30	30.22	38.69	39.81	37.85	39.28	23.45	31.26
Percentage of Hispanic students		3.48	3.24	3.23	4.04	3.40	4.01	3.47	3.30
Percentage of White students		67.95	29.52	53.60	38.01	53.96	37.39	66.94	30.40
Rate of other race/ethnicity		6.27	5.00	4.45	4.03	4.80	4.20	6.15	4.96
Percentage of free/reduced lunch		40.03	25.35	58.12	27.48	56.94	27.82	41.28	25.92

Percentage of ELL students	2.57	4.14	2.58	4.90	2.55	4.66	2.57	4.19
Percentage of special education students	14.13	3.75	14.85	8.12	14.72	6.46	14.18	4.14
Rate of out-of-school suspension	0.84	2.01	1.32	2.62	1.51	2.87	0.88	2.07
Percentage of students with proficient/advanced levels in math	42.96	18.14	33.38	18.76	33.94	18.47	42.29	18.33
Percentage of students with proficient/advanced levels in ELA	50.86	16.26	40.4	17.91	42.64	17.35	50.18	16.55

Appendix C

Subsample Analyses in Math

Table C1

Results of panel regression with math assessment scores, St. Louis City only

	Model 1	Model 2	Model 3
Transfer (reference=Never transferred)			
First year of transfer	-0.107***	-0.112***	-0.0703***
	(0.0129)	(0.0127)	(0.0192)
Second year of transfer	-0.0604***	-0.0590***	-0.0723***
	(0.0140)	(0.0137)	(0.0211)
Gender (reference=Female)			
Male	-0.0248	-0.0118	-0.0117
	(0.0179)	(0.0170)	(0.0170)
Ethnicity (reference=White)			
Asian	0.0184	0.0847	0.0856
	(0.0762)	(0.0738)	(0.0739)
Black	-0.485***	-0.444***	-0.442***
	(0.0273)	(0.0269)	(0.0269)
Hispanic	-0.226***	-0.225***	-0.223***
	(0.0443)	(0.0425)	(0.0425)
Others	-0.212***	-0.197***	-0.196***
	(0.0515)	(0.0497)	(0.0497)
Lunch (reference=Unreduced lunch)			
Free lunch	-0.102***	-0.0900***	-0.0909***
	(0.0158)	(0.0165)	(0.0165)
Reduced lunch	-0.0292	-0.0311	-0.0317
	(0.0238)	(0.0236)	(0.0236)
Homeless (reference=Not homeless)			
Homeless	-0.0398*	-0.0180	-0.0184
	(0.0156)	(0.0151)	(0.0151)
ELL (reference=Not ELL)			
ELL	0.00625	-0.00974	-0.00973
	(0.0151)	(0.0144)	(0.0144)
Resident (reference=Resident in the attending school)			
Others	0.0209	-0.0401	-0.0449
	(0.0260)	(0.0306)	(0.0307)

Special Education (reference=Not Special Ed.)			
IEP	-0.269***	-0.278***	-0.279***
	(0.0213)	(0.0207)	(0.0207)
Charter school (reference=Not charter school)			
Charter school	0.120***	0.0893***	0.0889***
	(0.0127)	(0.0145)	(0.0145)
Number of enrolled students		-0.00597**	-0.00589**
		(0.00221)	(0.00221)
Percentage of Black students		0.00366	0.00332
		(0.00384)	(0.00385)
Percentage of Hispanic students		0.0684***	0.0682***
		(0.0101)	(0.0101)
Percentage of other race/ethnicity		-0.00204	-0.00203
		(0.00156)	(0.00156)
Percentage of free/reduced lunch		0.0432***	0.0434***
		(0.00406)	(0.00407)
Percentage of ELL students		-0.0502***	-0.0505***
		(0.00658)	(0.00658)
Percentage of special education students		0.0949***	0.0950***
		(0.0101)	(0.0101)
Rate of out-of-school suspension		-0.0178+	-0.0178+
		(0.0107)	(0.0107)
Proficiency rate in math assessments		0.0152***	0.0154***
		(0.000339)	(0.000350)
First year of transfer # Proficiency rate in math assessments			-0.00230**
			(0.000775)
Second year of transfer # Proficiency rate in math assessments			0.000702
			(0.000792)
Constant	-0.0139	-0.859***	-0.864***
	(0.0292)	(0.0462)	(0.0462)
Observations	43518	43518	43518
R-squared for within model	0.000165	0.0482	0.0483
R-squared for overall model	0.194	0.291	0.291
R-squared for between model	0.131	0.207	0.207

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C2

Results of panel regression with math assessment scores, four counties

	Model 1	Model 2	Model 3
Transfer (reference=Never transferred)			
First year of transfer	-0.113***	-0.103***	-0.0304*
	(0.00596)	(0.00589)	(0.0122)
Second year of transfer	-0.059***	-0.0530***	-0.0288*
	(0.00636)	(0.00623)	(0.0137)
Gender (reference=Female)			
Male	0.00264	0.00839	0.00838
	(0.00625)	(0.00589)	(0.00589)
Ethnicity (reference=White)			
Asian	0.237***	0.185***	0.184***
	(0.0256)	(0.0231)	(0.0231)
Black	-0.538***	-0.502***	-0.500***
	(0.00800)	(0.00969)	(0.00969)
Hispanic	-0.203***	-0.201***	-0.200***
	(0.0151)	(0.0144)	(0.0144)
Others	-0.196***	-0.185***	-0.184***
	(0.0149)	(0.0143)	(0.0143)
Lunch (reference=Unreduced lunch)			
Free lunch	-0.141***	-0.121***	-0.120***
	(0.00432)	(0.00427)	(0.00427)
Reduced lunch	-0.082***	-0.0744***	-0.0740***
	(0.00580)	(0.00562)	(0.00562)
Homeless (reference=Not homeless)			
Homeless	-0.042***	-0.0191*	-0.0200*
	(0.00936)	(0.00910)	(0.00910)
ELL (reference=Not ELL)			
ELL	-0.051***	-0.0453***	-0.0453***
	(0.00541)	(0.00537)	(0.00537)
Resident (reference=Resident in the attending school)			
Others	-0.0167	-0.132***	-0.133***
	(0.0142)	(0.0153)	(0.0153)
Special Education (reference=Not Special Ed.)			
IEP	-0.267***	-0.292***	-0.292***
	(0.00594)	(0.00578)	(0.00578)
Charter school (reference=Not charter school)			

Charter school	0.103***	0.132***	0.133***
	(0.0283)	(0.0262)	(0.0262)
Number of enrolled students		0.00767***	0.00772***
		(0.000591)	(0.000590)
Percentage of Black students		0.0238***	0.0235***
		(0.00142)	(0.00142)
Percentage of Hispanic students		0.0639***	0.0644***
		(0.00663)	(0.00663)
Percentage of other race/ethnicity		0.00494***	0.00490***
		(0.000462)	(0.000461)
Percentage of free/reduced lunch		0.00427**	0.00412**
		(0.00139)	(0.00139)
Percentage of ELL students		-0.0633***	-0.0636***
		(0.00480)	(0.00480)
Percentage of special education students		0.0292***	0.0287***
		(0.00438)	(0.00439)
Rate of out-of-school suspension		-0.00524	-0.00496
		(0.00695)	(0.00694)
Proficiency rate in math assessments		0.0112***	0.0114***
		(0.0000969)	(0.0000995)
First year of transfer # Proficiency rate in math assessments			-0.00214***
			(0.000299)
Second year of transfer # Proficiency rate in math assessments			-0.000699*
			(0.000334)
Constant	0.362***	-0.323***	-0.328***
	(0.00498)	(0.0115)	(0.0115)
Observations	340512	340512	340512
R-squared for within model	0.000175	0.0300	0.0300
R-squared for overall model	0.246	0.346	0.347
R-squared for between model	0.181	0.262	0.262

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure C1

Results of panel regression with math assessment scores in student- and school-level variables, St. Louis City only

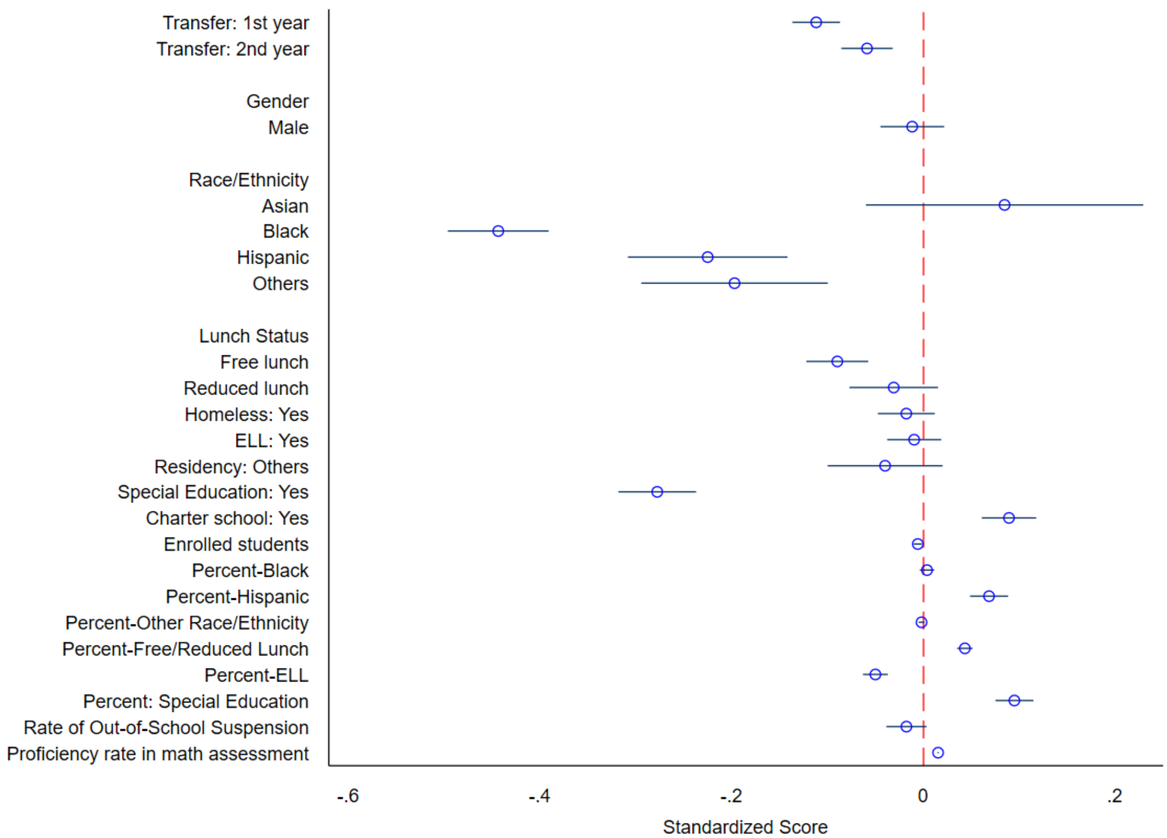


Figure C2

Results of panel regression with math assessment scores in student- and school-level variables, 4 counties only

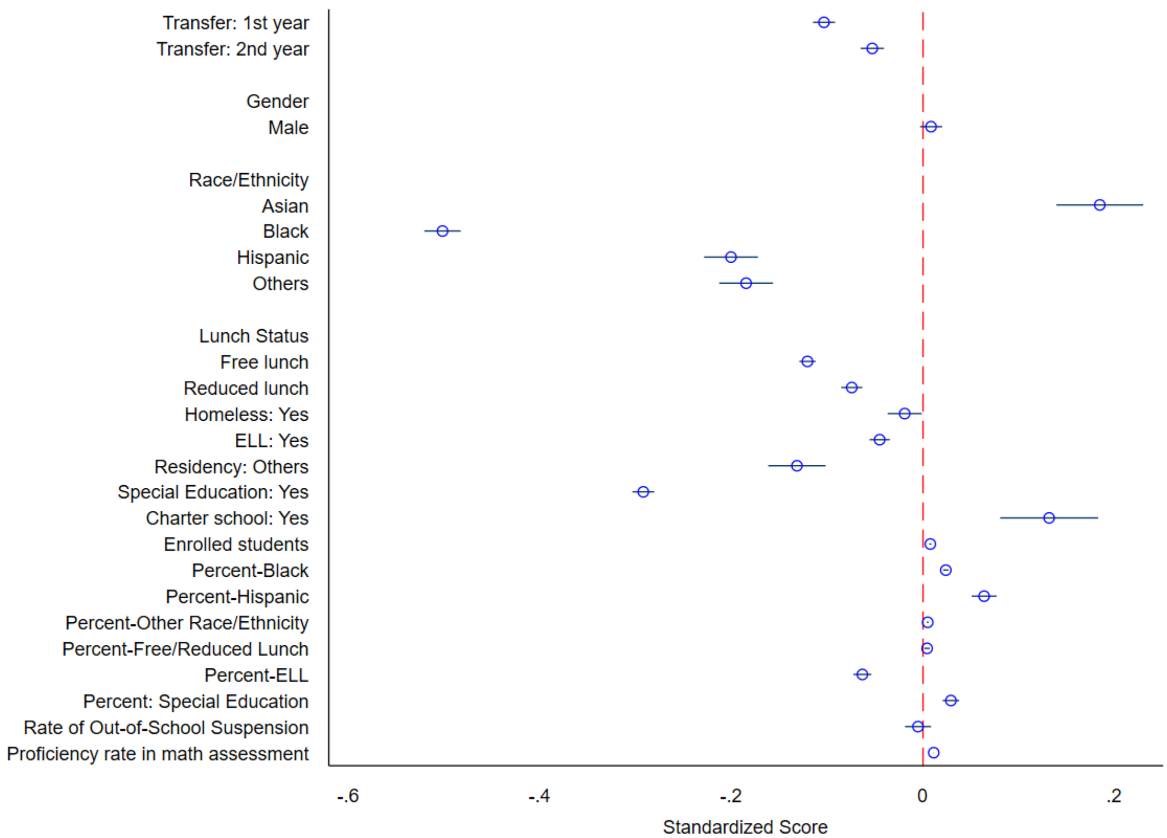


Figure C3

Margin plots for transfer year and proficiency rate in math assessments, STL only

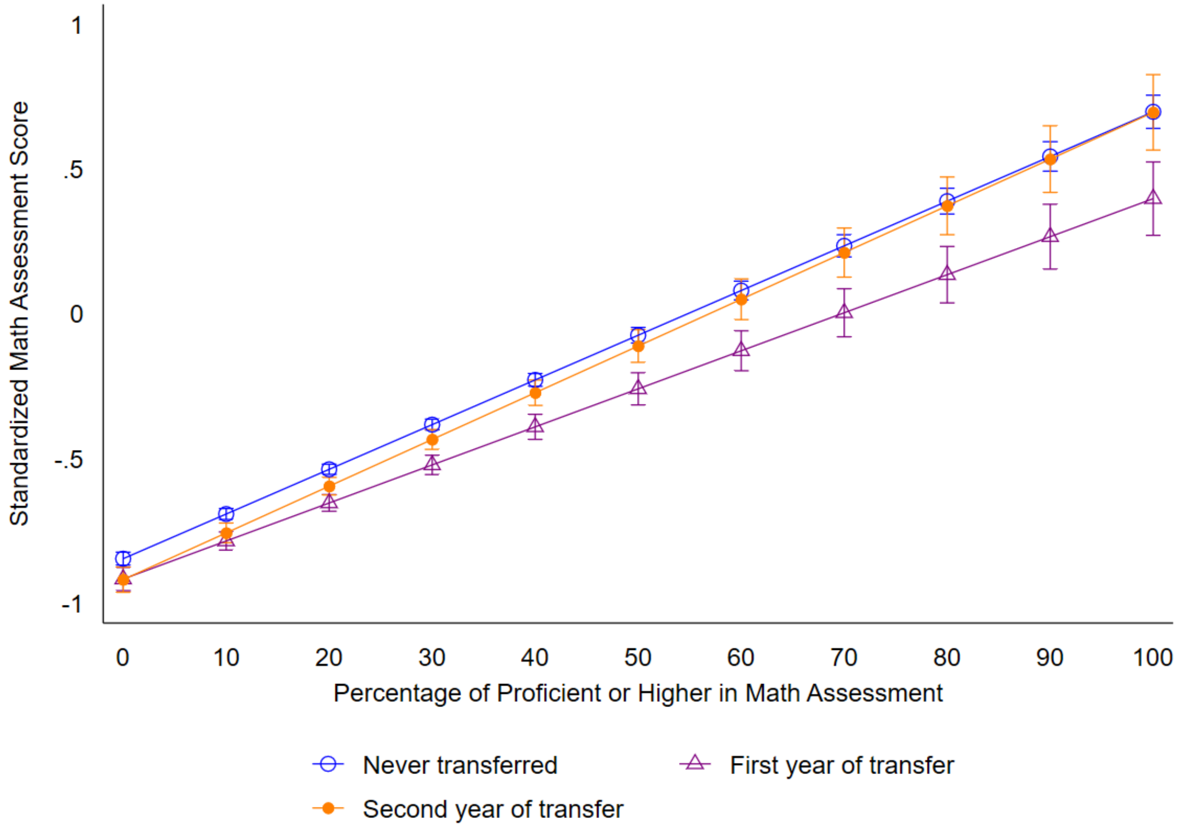
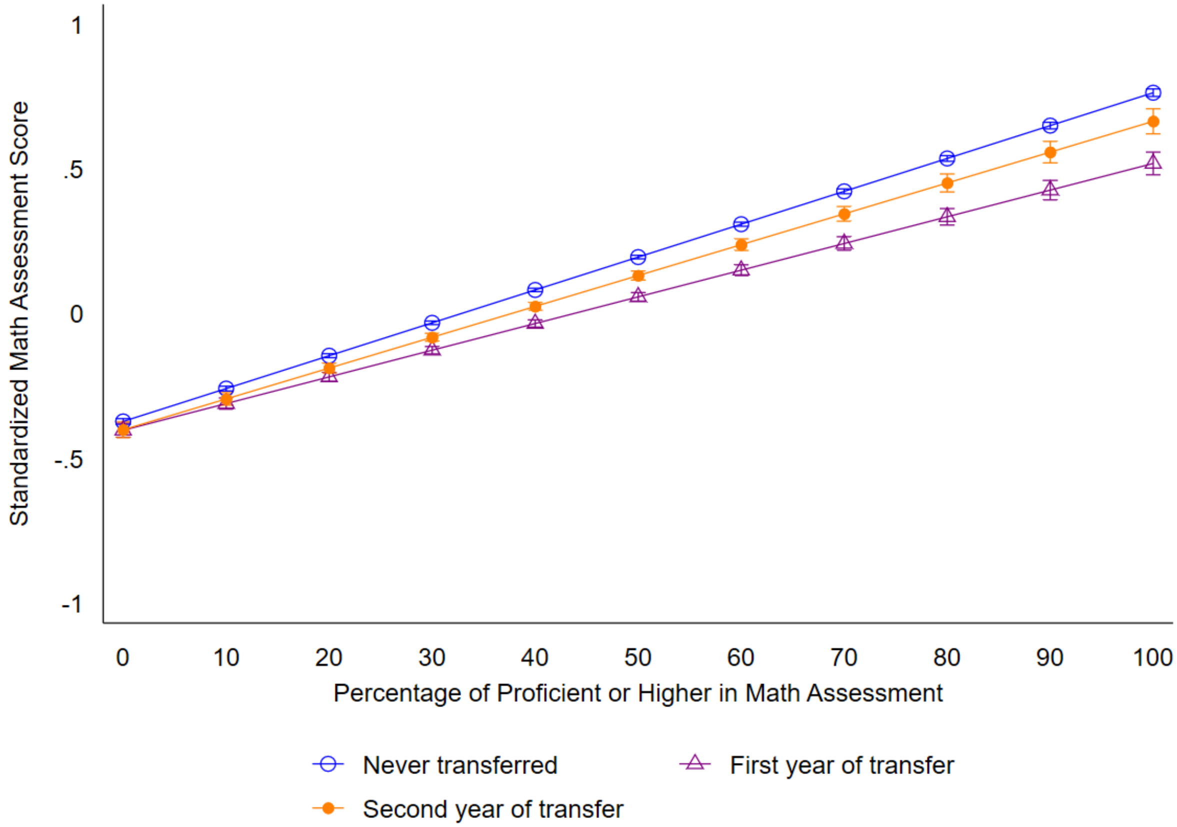


Figure C4

Margin plots for transfer year and proficiency rate in math assessments, four counties



Appendix D

Subsample Analyses in ELA

Table D1

Results of panel regression with ELA assessment scores, St. Louis City only

	Model 1	Model 2	Model 3
Transfer (reference=Never transferred)			
First year of transfer	-0.104***	-0.0954***	-0.141***
	(0.0133)	(0.0130)	(0.0236)
Second year of transfer	-0.0277*	-0.0266*	-0.0328
	(0.0134)	(0.0131)	(0.0249)
Gender (reference=Female)			
Male	-0.224***	-0.213***	-0.213***
	(0.0190)	(0.0180)	(0.0180)
Ethnicity (reference=White)			
Asian	-0.104	-0.0781	-0.0788
	(0.0813)	(0.0749)	(0.0750)
Black	-0.478***	-0.440***	-0.442***
	(0.0303)	(0.0295)	(0.0295)
Hispanic	-0.295***	-0.326***	-0.328***
	(0.0483)	(0.0463)	(0.0463)
Others	-0.217***	-0.244***	-0.246***
	(0.0518)	(0.0511)	(0.0510)
Lunch (reference=Unreduced lunch)			
Free lunch	-0.128***	-0.139***	-0.139***
	(0.0157)	(0.0166)	(0.0166)
Reduced lunch	-0.0102	0.00182	0.00125
	(0.0227)	(0.0227)	(0.0227)
Homeless (reference=Not homeless)			
Homeless	-0.0717***	-0.0522***	-0.0515***
	(0.0161)	(0.0155)	(0.0155)
ELL (reference=Not ELL)			
ELL	-0.0937***	-0.0589***	-0.0594***
	(0.0152)	(0.0147)	(0.0147)
Resident (reference=Resident in the attending school)			
Others	0.0259	-0.0761*	-0.0698*
	(0.0263)	(0.0315)	(0.0316)

Special Education (reference=Not Special Ed.)			
IEP	-0.310***	-0.332***	-0.332***
	(0.0248)	(0.0240)	(0.0240)
Charter school (reference=Not charter school)			
Charter school	0.0633***	0.105***	0.105***
	(0.0130)	(0.0147)	(0.0147)
Number of enrolled students		-0.0142***	-0.0144***
		(0.00227)	(0.00227)
Percentage of Black students		0.0300***	0.0300***
		(0.00415)	(0.00415)
Percentage of Hispanic students		0.0786***	0.0793***
		(0.0106)	(0.0106)
Percentage of other race/ethnicity		-0.00127	-0.00119
		(0.00160)	(0.00160)
Percentage of free/reduced lunch		0.00340	0.00378
		(0.00410)	(0.00411)
Percentage of ELL students		-0.0279***	-0.0284***
		(0.00741)	(0.00741)
Percentage of special education students		0.0447***	0.0445***
		(0.00941)	(0.00940)
Rate of out-of-school suspension		-0.103***	-0.103***
		(0.0103)	(0.0103)
Proficiency rate in ELA assessments		0.0114***	0.0112***
		(0.000337)	(0.000350)
First year of transfer # Proficiency rate in ELA assessments			0.00182*
			(0.000736)
Second year of transfer # Proficiency rate in ELA assessments			0.000232
			(0.000748)
Constant	0.166***	-0.428***	-0.424***
	(0.0316)	(0.0461)	(0.0461)
Observations	43518	43518	43518
R-squared for within model	0.0000797	0.0313	0.0316
R-squared for overall model	0.228	0.322	0.321
R-squared for between model	0.160	0.233	0.232

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D2

Results of panel regression with ELA assessment scores, four counties only

	Model 1	Model 2	Model 3
Transfer (reference=Never transferred)			
First year of transfer	-0.0931***	-0.0850***	-0.0501***
	(0.00594)	(0.00589)	(0.0148)
Second year of transfer	-0.0411***	-0.0442***	-0.0131
	(0.00620)	(0.00615)	(0.0163)
Gender (reference=Female)			
Male	-0.233***	-0.230***	-0.230***
	(0.00624)	(0.00602)	(0.00602)
Ethnicity (reference=White)			
Asian	0.146***	0.105***	0.105***
	(0.0223)	(0.0211)	(0.0211)
Black	-0.492***	-0.450***	-0.449***
	(0.00783)	(0.00951)	(0.00952)
Hispanic	-0.190***	-0.188***	-0.188***
	(0.0145)	(0.0142)	(0.0142)
Others	-0.190***	-0.184***	-0.184***
	(0.0141)	(0.0139)	(0.0139)
Lunch (reference=Unreduced lunch)			
Free lunch	-0.129***	-0.108***	-0.108***
	(0.00424)	(0.00427)	(0.00427)
Reduced lunch	-0.0841***	-0.0697***	-0.0694***
	(0.00560)	(0.00558)	(0.00558)
Homeless (reference=Not homeless)			
Homeless	-0.0575***	-0.0480***	-0.0485***
	(0.00893)	(0.00887)	(0.00887)
ELL (reference=Not ELL)			
ELL	-0.0484***	-0.0131*	-0.0130*
	(0.00520)	(0.00530)	(0.00530)
Resident (reference=Resident in the attending school)			
Others	-0.0224	-0.138***	-0.139***
	(0.0137)	(0.0149)	(0.0149)
Special Education (reference=Not Special Ed.)			
IEP	-0.293***	-0.307***	-0.307***
	(0.00589)	(0.00586)	(0.00586)
Charter school (reference=Not charter school)			

Charter school	-0.00361	0.0504^{+}	0.0510^{+}
	(0.0264)	(0.0261)	(0.0260)
Number of enrolled students		-0.0051^{***}	-0.0051^{***}
		(0.000596)	(0.000596)
Percentage of Black students		0.0204^{***}	0.0202^{***}
		(0.00138)	(0.00138)
Percentage of Hispanic students		0.00734	0.00735
		(0.00652)	(0.00652)
Percentage of other race/ethnicity		0.00226^{***}	0.00224^{***}
		(0.000459)	(0.000459)
Percentage of free/reduced lunch		-0.0071^{***}	-0.0071^{***}
		(0.00138)	(0.00139)
Percentage of ELL students		0.00176	0.00176
		(0.00473)	(0.00473)
Percentage of special education students		0.0147^{***}	0.0145^{***}
		(0.00404)	(0.00404)
Rate of out-of-school suspension		-0.0712^{***}	-0.0711^{***}
		(0.00654)	(0.00654)
Proficiency rate in ELA assessments		0.00804^{***}	0.00812^{***}
		(0.000102)	(0.000104)
First year of transfer # Proficiency rate in ELA assessments			-0.00084^{**}
			(0.000323)
Second year of transfer # Proficiency rate in ELA assessments			-0.00072^{*}
			(0.000346)
Constant	0.468^{***}	0.0264^{*}	0.0230^{*}
	(0.00503)	(0.0114)	(0.0114)
Observations	340512	340512	340512
R-squared for within model	0.000274	0.0104	0.0104
R-squared for overall model	0.256	0.321	0.321
R-squared for between model	0.193	0.243	0.243

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure D1

Results of panel regression with ELA assessment scores in student- and school-level variables, St. Louis City only

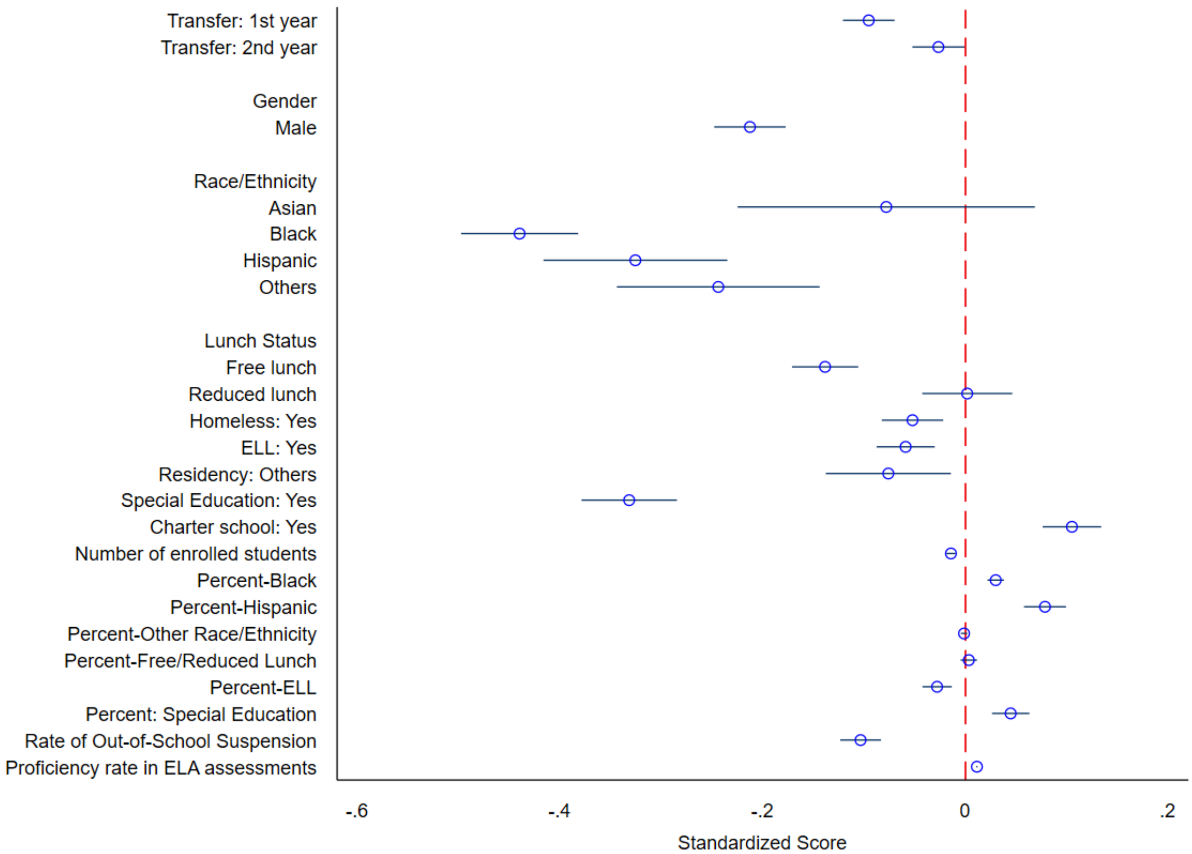


Figure D2

Results of panel regression with ELA assessment scores in student- and school-level variables, four counties only

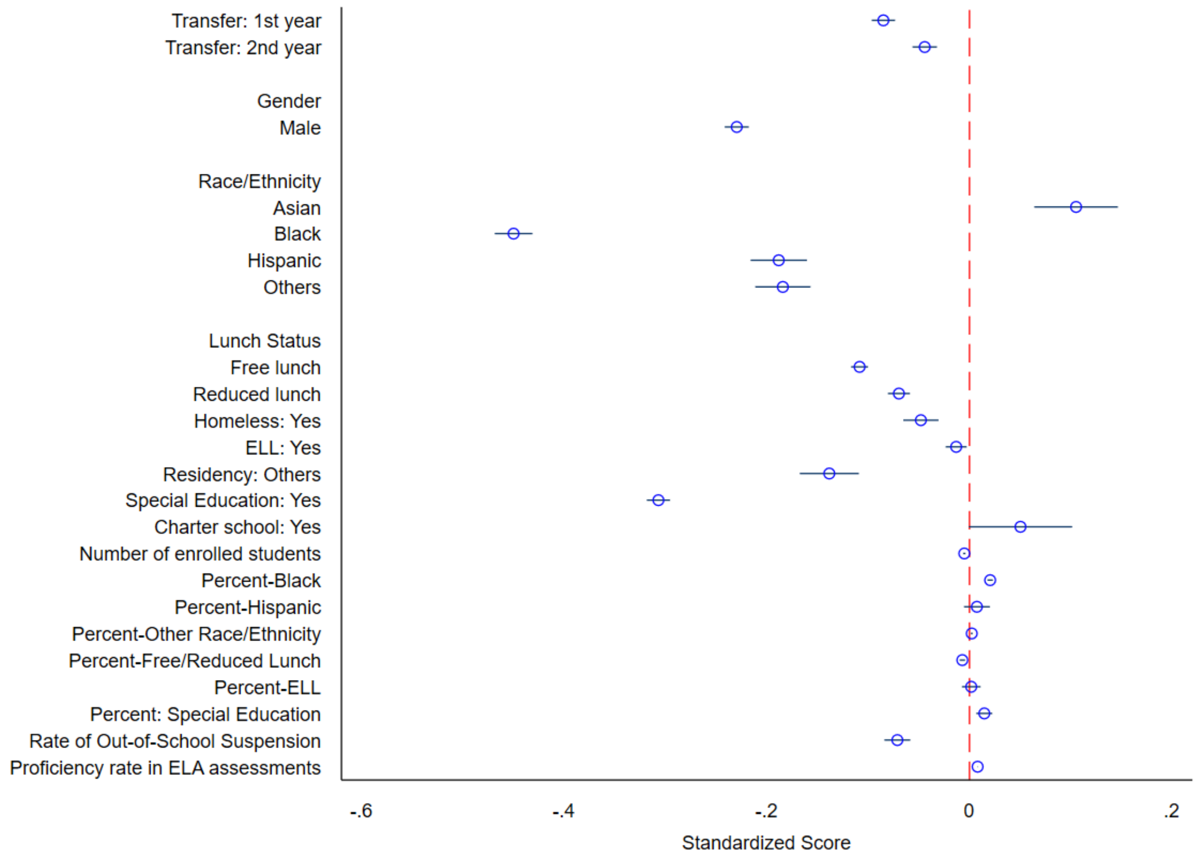


Figure D3

Margin plots for transfer year and proficiency rate in ELA assessments, STL only

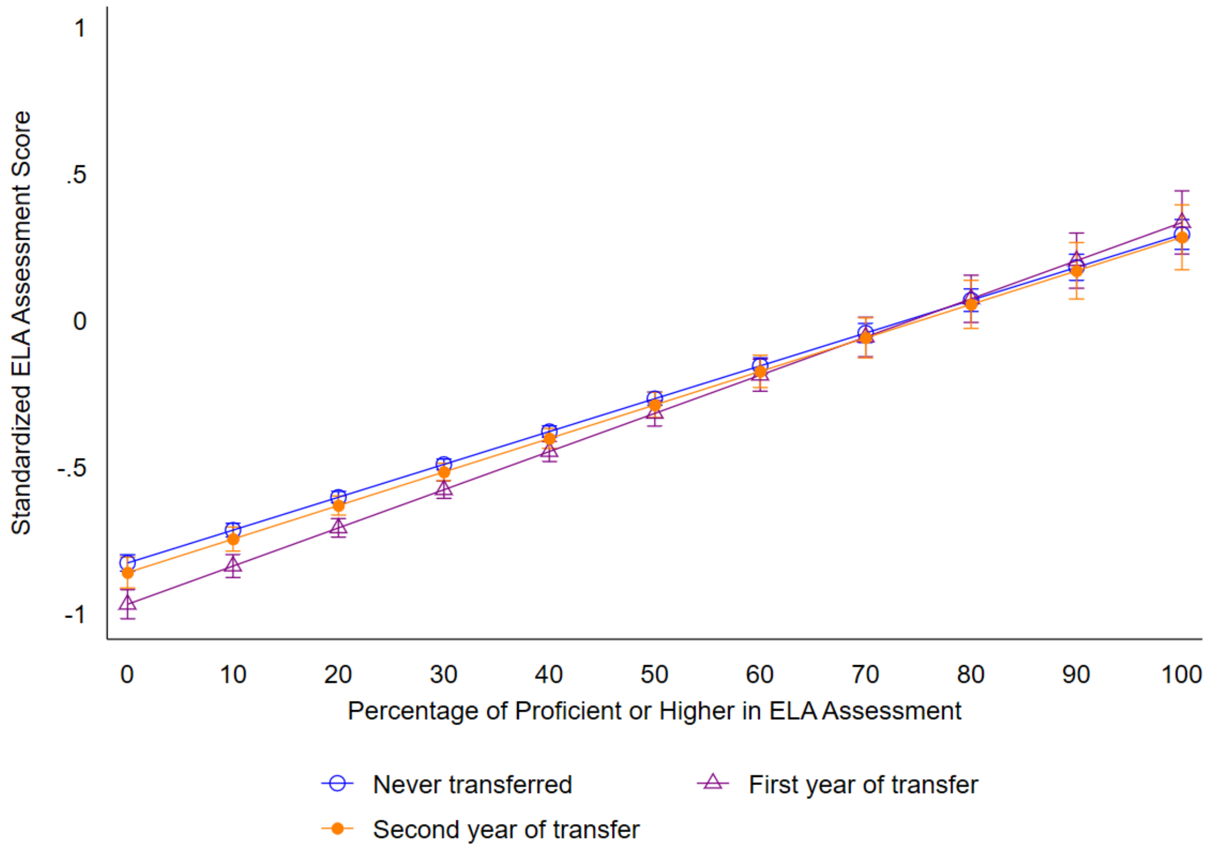


Figure D4

Margin plots for transfer year and proficiency rate in ELA assessments, four counties only