Mobility and Student Achievement in Missouri: A Multiyear, Statewide Investigation.

by

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Abstract

Students who change schools often face multiple challenges. A study was conducted to add to the understanding of how moving between school districts may impact the academic performance of students grades kindergarten through 12th grade. Archival data from nearly 500 Missouri school districts between the years 2010 and 2022 was used to examine the association between a school district's mobility rate and academic achievement. Achievement was measured by using ACT composite and subtest scores. In this quantitative correlational study, analyses resulted in a negative relationship between a school district's mobility rate and academic achievement. Furthermore, student mobility had a greater negative effect on larger school districts than on smaller school districts. The results of this study may be used by school leaders to better understand the relationship between student mobility and academic achievement to support students by garnering community engagement, having an intentional school-wide transition program, and building the capacity of teachers to support students during the challenges of school changes.

Dedication

This dissertation is dedicated to my loving family: Kristy, Britain, and Locke. May the fruits of this journey be a blessing to our family.

Acknowledgements

I would like to thank my Lord and Savior, Jesus Christ. Without Him, nothing in this life makes sense or has any meaning. He has been with me through every moment, and His sacrifice has changed my life completely. This dissertation is partial proof that "I can do all things through Christ who gives me strength" (Philippians 4:13).

I thank my parents, Jim and Mary, who raised me to know that God had endowed me with great and wonderful gifts – not to be squandered on self, but to be shared with others. They both encouraged me to pursue more education, seeing it as a key that opens doors. Thank you.

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Chapter 1

Introduction

People within the United States change their address frequently, living in several locations throughout their lifetime. Adults move due to a change of jobs, change in income, or change in marital status (U.S. Bureau of the Census, 2021b). Even though mobility may be an adult decision, it can potentially have a negative effect on children. School-aged children move from one apartment complex to another or from one geographic location to another. If a child moves between schools, then the child will need to meet new people, learn new policies and procedures, and overcome the gap in learning created by the transition (Rumberger & National Education Policy Center, 2015).

Children are not the only ones affected by mobility. Educators are aware of mobile students moving in or out of the classroom during the summer months with grade progressions or during the school year. Socially, a teacher may have to rearrange predetermined groups and introduce the new student to peers with similar interests and dispositions (Rumberger et al., 1999). When a new student arrives, a teacher may need to devote much time to adjust to new personalities and collect enough information to help the child transition (Parke & Kanyongo, 2012). Each transition may involve teaching the new student the policies for the cafeteria, showing students how to move through the hallways, demonstrating dismissal and how to get on the correct bus, modeling where to find items within the classroom, and even guiding students through restroom procedures (Parke & Kanyongo, 2012). Academically, a high-quality teacher will take the time to determine what learning was happening at the previous school to bridge any gaps

between what the student was learning and what the class is currently learning (Locklear, 2017). There is much work to be done each time a new student arrives at a new school.

Educators already feel the increase in school accountability for academic achievement with the implementation of legislation such as the No Child Left Behind Act (NCLB) in 2002 and the Every Student Succeeds Act (ESSA) in 2015. When students come and go from a teacher's classroom and multiple adjustments are needed throughout a term, the teacher's responsibility increases. The Common Core state standards (CCSS) were created as a set of universal curricular alignments to help bridge the gap between schools, districts, and states (Mattes, 2017). Before CCSS, a curriculum taught in Grade 3 in one district may be taught in Grade 2 in a neighboring district to the East and Grade 4 in the neighboring district to the West. Ideally, by defining what content is taught universally at each grade level nationwide, the academic transition for mobile students would create fewer gaps or overlaps. When local, state, and national assessments are aligned to these same standards, academic achievement can be accurately measured, and the teachers of new students can be further informed about what each student knows and is ready for next (Missouri Department of Elementary and Secondary Education [MO DESE], 2022b; Bai et al., 2021). Determining the accurate level of academic achievement of students, especially mobile students, is of the utmost importance for educators because of the urgency to help every student succeed in school.

Background

According to the U.S. Census Bureau (2020), the population of the United States in 2020 was 331.5 million, with 49.2% males and 50.8% females. In terms of race, the U.S. was comprised of 61.6% White, 11.4% Black, 10.2% Multi-racial, and 6.0% Asian.

In 2020, 8.4% of people living in the United States (more than 27 million people) changed residences (U.S. Bureau of the Census, 2021a). There were 62.3 million school-aged children, and 10.6% of children ages 5-17 changed residences, accounting for 5.8 million students (U.S. Bureau of the Census, 2021b). According to the National Center for Education Statistics (NCES), in 2020, the average high school graduation rate was 87%, and the average dropout rate was 6% (NCES, 2022). ACT (2020) reported that 1,670,497 students took the ACT and earned an ACT Composite Average of 20.6 and average subscores of 19.9 in English, 20.2 in mathematics, 21.2 in reading, and 20.6 in science.

According to the U.S. Census Bureau (2020), the population of Missouri in 2020 was 6.2 million, with 49.1% males and 50.9% million females. In terms of race, Missouri included 77.0% White, 11.4% Black, 6.7% Multi-racial, 4.9% Hispanic, and 2.2% Asian. In 2020, 12.8% of Missourians changed residences (U.S. Bureau of the Census, 2021a). According to the MO DESE (2022a), there were 1.2 million school-aged children in Missouri in 2020, with 879,661 enrolled in K-12 public or charter schools. Students had a 19.4% mobility rate, 1.3% dropout rate, 89.4% graduation rate, 85.3% of students attended at least 90% of the time, and 49.3% of students were eligible for free and reduced-price lunches. Of the 60,446 four-year graduates in Missouri in 2020, 75.1% took the ACT exam, earning an ACT composite average of 20.7 and subscores of 19.0 in English, 19.2 in mathematics, 20.8 in reading, and 20.2 in science (MO DESE 2022a).

Statement of the Problem

In 2023, no agreement had been reached regarding the relationship between student mobility and academic achievement. Many researchers have described the

negative effect student mobility had on academic achievement (Cutuli et al., 2013; Grim, 2019; Gullion, 2009; LeBoeuf & Fantuzzo, 2018; Locklear, 2017; Mattes, 2017; Robinson, 2012; Rumberger, 2015). Gullion (2009) analyzed high school mathematics and reading state testing data within Southeastern Indiana and found that non-mobile students had a nine-percentage point higher pass rate in mathematics and a 10-percentage point higher pass rate in language arts than mobile students. Gullion concluded that student mobility had a statistically significant effect on student achievement. Similarly, Locklear (2017) studied third-grade students in a rural North Carolina school district. Non-mobile students outperformed mobile students by 3.3 points, with a mean score of 434.5 for non-mobile students and a mean score of 431.2 for mobile students on an English language arts assessment. Locklear (2017) noted that mobile students scored significantly lower than non-mobile students. Additionally, LeBoeuf and Fantuzzo (2018) analyzed reading scores for early elementary students in Philadelphia and found that mobile students had significantly lower reading scores than students who were not mobile.

The results of other studies showed no significant relationship between student mobility and academic achievement (Bostick, 2016; Dalton, 2013; Friedman-Krauss & Raver, 2015). For example, Dalton (2013) reviewed state math and reading scores for four elementary schools in rural Tennessee, and the results indicated mobility did not significantly affect achievement. Similarly, Bostick (2016) analyzed state assessment data for middle school students throughout Texas. The results did not indicate a statistically significant relationship between mobility and academic achievement.

In addition, there was a mixture of results within studies involving large, often urban settings. For example, the results of a study involving 26,000 students from the Minneapolis Public Schools indicated that the more residential mobility, the larger the achievement gap (Cutuli et al., 2013). Holbrook (2017) conducted a study that focused on 2,300 seventh-grade students and determined that mobile students had a significantly lower achievement level than non-mobile students. Specifically, over three years, non-mobile students scored an average of 6.6 points higher than mobile students on reading and math exams (Holbrook, 2017). Similarly, Grim (2019) studied high school students in Maryland, with results indicating a significant negative relationship between mobility and student achievement. However, these results were in contrast to Bostick's (2016) study involving over one million middle school students, where the researcher found no significant relationship between mobility and student achievement.

The results were not consistent within studies involving small, often rural settings. For example, Rippe (2012) studied 80 high school students in Nebraska, finding no significant difference in academic achievement between mobile and non-mobile students. Similarly, a study involving 213 students from rural Mississippi suggested no significant relationship between mobility and student achievement (Robinson, 2012). However, Friedman-Krauss and Raver (2015) conducted a study involving 381 fourth-grade students, and their findings suggested a relationship between mobility and student achievement. Likewise, Mattes (2017) found a significant relationship between mobility and student achievement in a study involving 314 high school students. Therefore, given the aforementioned inconsistent results within the current body of literature, further

research was warranted regarding the relationship between student mobility and academic achievement.

Purpose of the Study

There were two purposes of this quantitative correlational study. The first purpose was to examine the associations between a school district's student mobility rate and their academic achievement. The second purpose of this study was to examine the associations between student mobility rate and academic achievement in different size school districts (i.e., small, medium, and large school districts).

Significance of the Study

In 2020, one in 10 students in the United States and one in five students in Missouri changed primary residences (U.S. Census Bureau, 2020). According to Grim (2019), mobile students have a myriad of needs each time they transition to a new school, such as "a new schedule and teachers, interaction with different peers, and adjustment to differences in policies and procedures among schools" (p. 1). According to Fiel (2011), to improve school effectiveness, schools use valuable resources such as time, expertise, funding, and space to mitigate student mobility. Because of the mixed results within the current body of literature, the impact of mobility on achievement is unknown, and further research is warranted. If a relationship exists between these variables, the conclusions would require action to address their association. Rumberger (2003) purported that school initiatives, such as preparatory programs for mobile students before they arrive and other efforts that engage students and families to make smooth transitions, might reduce the effects of student mobility. In other words, if schools can mitigate student mobility and prepare for its effects, then students may be able to achieve at a higher rate. The purpose

of the current study is to seek to clarify the effect of mobility on student achievement so that teachers within classrooms and educational leaders may be able to respond more adequately to the needs of mobile students.

Furthermore, this study is significant because while much effort has been put forth into studying student mobility within one grade level (Friedman-Krauss & Raver, 2015; Holbrook, 2017; Locklear, 2017), one school (Hanushek et al., 2001), or urban areas such as New York (Mattes, 2017), Chicago (Kerbow, 1996), Saint Louis (Brake et al., 2009) or Minneapolis (Cutuli et al., 2013; Hinz et al., 2003), or county (Alexander et al., 1996; Grim, 2019; Gullion, 2009), this author seeks to contribute to the current body of literature by examining more than 500 school districts throughout the state of Missouri. According to population researcher White (2021), Missouri's balance of rural, urban, and suburban centers, as well as population and workforce trends, make Missouri a good representation for trends seen in both the Midwest and the United States as a whole. The data and conclusions from this study may assist in determining whether a connection exists between student mobility and achievement. Results may be applied more universally to other states within the Midwest and nationwide.

Delimitations

Delimitations are "self-imposed boundaries set by the researcher on the purpose and scope of the study" (Lunenburg & Irby, 2008, p. 134). This research study had the following delimitations:

1. The sample of the study was limited to K-12 school districts within the state of Missouri as opposed to individual students.
2. This study was conducted using data from 2010-2022.

3. This research focused on the student mobility rate among districts as defined by the state of Missouri and does not consider why a student moves in or out of a school.
4. The measures of academic achievement were limited to ACT scores, including the average composite scores, English, mathematics, reading, and science.
5. In this study, school districts were grouped by size, with small school districts having less than 500 students, medium school districts having 500 to 9,000 students, and large school districts having more than 9,000 students.

Assumptions

Lunenburg and Irby (2008) defined assumptions as the "postulates, premises, and propositions that are accepted as operational for purposes of the research" (p. 135). The current study had the following assumptions:

1. The archival school data for school districts were accurate and complete.
2. Students put forth their best effort on the ACT during the specified timeline.
3. Handling the materials for the ACT was performed legally, ethically, and consistently across the schools and districts in the state.
4. The administration of the ACT was completed, and national and state personnel scored the exam in a standardized manner.

Research Questions

According to Lunenburg and Irby (2008), research questions are meant to define and guide the direction of a study. The following research questions guided this quantitative correlative study:

RQ1

Is there an association between a school district's student mobility rate and academic achievement?

RQ2

Is there an association between a school district's student mobility rate and academic achievement in districts with a small student population?

RQ3

Is there an association between a school district's student mobility rate and academic achievement in districts with a medium student population?

RQ4

Is there an association between a school district's student mobility rate and academic achievement in districts with a large student population?

Definition of Terms

In education, specific terminology is used to describe methods, assessments, and conditions. According to Lunenburg and Irby (2008), "Key terms need to be clarified if they are paramount to the study and referenced or used continuously throughout the dissertation" (p. 8). The following terms are defined for this study:

Academic Achievement

Academic achievement is student performance in each educational subject area and the grade (National Center for Educational Statistics, 2022).

ACT American College Testing (ACT)

The ACT is a test used for college admissions, indicating a student's mastery of core academic subjects (English, mathematics, reading, and science). Scores range from 1 to 36 (Missouri Department of Elementary and Secondary Education, 2012, p. 1).

ACT Composite Score

The ACT composite scores "reflect the average of the highest composite scores received by individual students who have taken the ACT during the school year." ACT composite scores measure postsecondary preparation (MO DESE, 2020).

School Size

A district whose fall enrollment is less than 500 students is considered a small district. A district whose fall enrollment is 500 or more and less than 9000 is considered a medium district. A district whose fall enrollment is 9000 or more is considered a large district. (Missouri State High School Activities Association [MSHSAA], 2023)

Student Mobility.

Student mobility is the measurement of students who "change school districts or charter schools during the school year for any reason other than advancing to the next highest grade, i.e., grade promotion." Student mobility is calculated using the following ratio:

$$\frac{number\ of\ student\ transfers}{fall\ enrollment + additional\ enrollment}$$

(MO DESE, 2020).

Organization of the Study

This chapter included background information, examined the conceptual theories that guided the study, identified the problem statement, addressed the purpose of the

study, stated the significance of the study, listed the research limitations of the study, defined the assumptions of the study, listed the research questions, and defined key terms to be used throughout the study. Future chapters include the current body of literature about student mobility and academic achievement, a description of the research methods, and the results of the study. Additionally, the final chapter includes the study summary, findings related to the literature, and the conclusions.

Chapter 2

Review of the Literature

Reviewed in this chapter is the current literature regarding the impact of mobility on student achievement. Many researchers suggest a connection between residential mobility and a low rate of student achievement (Bostick, 2016; Grim, 2019; Holbrook, 2013; Locklear, 2017; Mattes, 2017; Rumberger, 2015). Other researchers found less conclusive results, stating there is not a strong relationship between residential mobility and a low rate of student achievement (Ernst, 2015; Friedman-Krauss & Raver, 2015; Rippe, 2012; Robinson, 2012). Included in this chapter is a review of the current literature related to mobility and academic achievement when research found a significant relationship between the two variables and when researchers found no significant relationship between them.

Student Mobility

At the turn of the 21st century, student mobility's impact on school districts across the country started to be monitored more closely (Kerbow, 1996; Rumberger & Larson, 1998), and national demands for schools to make adjustments increased (Rumberger, 2002). The No Child Left Behind Act of 2001 (NCBL) was the common name for Public Law 107-110, originally passed by Congress in 2001 but not signed into law until 2002. With the introduction of NCBL came the encouragement for schools to provide additional interventions for students with low achievement, especially between subgroups of race, poverty, special education, and English language learners. The goal of the act was to close the achievement gap by increasing accountability, flexibility, and choice so that no child was left behind. Under NCBL, students were tested in reading, math, and

science using assessments developed by each state. The test results became publicly reported and were linked to rewards and sanctions, including school funding. Testing became high-stakes in nature, and schools felt an urgency to increase student achievement. (NCLB, 2002).

Under NCBL (2002) there were obstacles for mobile students to reach the required levels of achievement. The first obstacle was that some mobile students would not be assessed. With a mid-year transfer, it would be difficult for teachers to diagnose a mobile student's performance adequately and adjust lessons to meet student needs. Secondly, since the design of many interventions to improve performance was long-term, students who switched schools often would not be able to take full advantage of the services schools provided. Though NCBL was designed to help all students, mobile students were still being left behind.

In 2015, the ESSA replaced NCBL as the main federal law for K-12 education. With ESSA came increased flexibility. For example, states were no longer limited to using only their state-developed assessments but could use nationally recognized tests, such as the ACT. With ESSA also came an increase in accountability. Instead of school evaluation being based solely on student achievement, states had to include other factors such as high school graduation rates, college readiness, and absenteeism. Schools were also required to have a plan for schools that had high drop-out rates, were consistently struggling, or had specific subgroups who were struggling. (ESSA, 2015).

With increased accountability in the United States brought on by NCLB and ESSA, there became an urgency for schools to perform well on standardized tests and other accountability measures. When a school did not perform well, there was a need to

uncover the cause, identify at-risk populations, and develop solutions. While gender, ethnicity, socioeconomic status, and English proficiency were some factors defining at-risk populations, there also existed a relationship between these factors and student achievement. Another factor in student achievement is student mobility.

Mobility in the United States

The United States has traditionally had a high rate of mobility. Since the late 1940s, nearly 1 in 5 people living in the United States moved residences year to year. The rate of 20% remained steady from the 1940s through the mid-1960s, when it started to decline (U.S. Bureau of the Census, 2021a). In 1970, 18.7% of the population moved (U.S. Bureau of the Census, 2021a). In 1980, 17.2% of the population moved (U.S. Bureau of the Census, 2021a). In 1990, 17.0% of the population moved (U.S. Bureau of the Census, 2021a). In 2000, 14.2% of the population moved. In 2010, 11.6% of the population moved (U.S. Bureau of the Census, 2021a). In 2020, 8.4% of people living in the United States changed residences, amounting to more than 27 million people (U.S. Bureau of the Census, 2021a). During the 2020-2021 school year, 10.6% of children ages 5-17 changed residences, accounting to 5.8 million students (U.S. Bureau of the Census, 2021b).

Table 1

Percent of U.S. Population Movement by Year

Year	Population Movement
1947	20.2%
1950	21.2%
1960	20.6%
1970	18.7%
1980	17.2%
1990	17.0%
2000	14.2%
2010	11.6%
2020	8.4%

Note. Adapted from "Current Populations Survey: Annual geographic mobility rates by type of movement: 1948-2021," by U.S. Bureau of the Census, 2021.

Most moves within the United States are local moves. In 2019, 65% of all moves were within the same county, with an additional 17% percent within the same state. Within the same year, 14% of moves were across state lines, and 4% were abroad. (Frost, 2020).

People move for a variety of reasons. Some of the most common reasons for moving include changes in employment, marital status, presence of children in the household, neighborhood conditions, local safety, and public services (Mateyka, 2015). According to the Census Population Survey, in 2019, 40% of movers relocated for housing, 27% for family, 21% for job, and 12% for other reasons (Frost, 2020). When

analyzing student mobility, researchers often identify broad categories. Rumberger categorizes mobility into two reasons: voluntary and involuntary. According to Rumberger (2015), reasons for voluntary mobility involved changing jobs or moving to a better home, whereas involuntary reasons involved getting evicted or having a family disruption like a divorce.

Causes for Mobility

Mobile students are most often displaced due to the family changing residence. Nearly 70% of all school changes for secondary students were accompanied by a change of residence (Rumberger & Larson, 1998). A family may relocate for various reasons, including voluntary reasons like finding a better job or a better home and involuntary reasons like unemployment, loss of a home, perceived safety, and divorce. The separation of parents and divorce is often followed by instability for families, including mobility. Families without two parents, primarily single-parent households, and stepfamilies have been found to have a higher rate of school moves (Rumberger & Larson, 1998). Researchers studying Minneapolis Public Schools found that one in three students living with both parents moved as compared to one in ten students living within a two-parent household (University of Minnesota Center for Urban and Regional Affairs, et al., 1998). According to Kerbow (1996), students in mother-father families are more stable than other family configurations. Kerbow (1996) found that 40% of all students only changed schools for a residential change.

Researchers provided additional consideration regarding mobile students. Crowley (2003) linked student mobility to housing concerns, poverty, immigration, and family predicaments. In other words, mobile students may have been working through

more significant issues than simply a school change. Furthermore, Crowley found that the mobility of poor school-aged children directly impacted academic outcomes. Other researchers related the effects of mobility closely to eviction, foreclosure, doubled-up households, and homelessness (Beadle et al., 2006).

In addition to residency changes, researchers identified ethnicity and family income as other predictors of student mobility (Potter et al., 2021; Titus, 2007). Most research results showed that Black and Hispanic families are more mobile than Asian and Caucasian families (Cutuli et al., 2013; Friendman-Krause & Raver, 2015; Grim, 2019; Gullion, 2012; Robinson, 2012; Rumberger, 2015). According to the U.S. Bureau of the Census (2021b), while 10.4% of students nationwide were mobile, almost 40% of them were from families whose gross income was less than $10,000 per year. In other words, the lower the income, the higher the likelihood a student was mobile. Within a study involving suburban students in Saint Louis, Brake et al. (2009) found that 57% of administrators and counselors identified low-socioeconomic factors as students' reason for mobility within their school. Buerkle and Christenson (1999) found that 70% of low-income family mobility causes were involuntarily forced or coping, indicating families faced substandard housing, lack of affordable housing, problems with landlords, property condemnation, or other dangerous building situations.

Potential Effects of Mobility on Students

There were many consequences found to accompany mobility. Mobility for some students impacted the student's overall academics negatively. Kerbow (1996) found that students who moved more than three times (even within the same school system) resulted in a full academic year lag compared to those who did not move. Similarly, within the

Minneapolis public schools, Hinz et al. (2003) found that students who were not new to the district but moved around within the district scored five points lower on standardized reading tests and eight points lower on standardized math tests. Furthermore, students who moved three or more times had scores 20 points lower than the scores of students who did not move (Hinz, 2003).

Another consequence presented within the research was that changing schools disrupted a child's learning within the classroom environment. Parke and Kanyongo (2012) found that students who switched schools often experienced a learning disruption because the student was incorrectly placed, there were curricular inconsistencies between schools and instructors, or they missed key concepts. Additionally, Rumberger's (2015) findings indicated that students may be harmed developmentally due to disrupted relationships with peers and instructors. According to Rumberger (2015), students moving schools decreased their feelings of social connectedness and felt fragmented from lost relationships and the effort needed to create new relationships.

Facilitating learning within a classroom with constant turnover negatively impacted the teacher who readjusted groups when there was a new student and diverted energy to the new student to establish a foundation for current material (Rumberger et al., 1999). According to Rumberger et al. (1999), teachers with high student turnover reported feelings of demoralization, stress, and tension. This classroom disruption for the teacher also impacted the learning of non-mobile students. Hanushek et al. (2001) reported that student turnover adversely affected student achievement for everyone in the school, especially low-income and minority students. Mobile children of poverty had a

higher risk of anti-social behaviors or a feeling of disconnect from teachers, friends, relatives, schools, or other active sources of security (Rafferty et al., 2004).

Another consequence of being mobile presented in literature was the impact on the social capital of students. Social capital was defined as the ability, through social ties, to gain access to and use resources to affect positive change (Rumberger, 2002). With a typical amount of social capital, students and families could easily access school benefits such as counselors, parent-teacher association meetings, tutoring, school programing, special education resources, and college admission information (Scherrer, 2012). Mobile students and families tend to have diminished social capital compared to non-mobile students and less access to the high-quality resources a school offers (Gaddie, 2010; Rumberger, 2002; Scherrer, 2012). Overall, the lack of social capital puts a mobile child at a disadvantage compared to their more socially connected peer.

Changing schools may also be an early indicator of future academic and behavioral troubles. Researchers within Chicago public schools found that students who repeatedly switched schools between preschool and third grade scored significantly lower on fourth grade math achievement tests (Friedman-Krauss & Raver, 2015). The researchers linked increased mobility with increased cognitive dysregulation and decreased mathematics achievement.

When researching the relationship between mobility and student achievement, Smith et al. (2008) found it difficult to simplify mobility into one variable. The researchers concluded that mobility may be the consequence of many extenuating circumstances. In other words, the relationship between mobility and student achievement was complex because many mobile students had similar characteristics,

such as being in poverty, experiencing less connectivity with peers, and having more behavior problems. For example, the income of a family has been found to often correlate with mobility (Bostick, 2016; Cutuli et al., 2013; Dalton, 2013; Grim, 2019). Children in poverty and children within migrant families tended to switch schools more often because of the tendency for low-wage earners to move between jobs more often and the nature of migrant work (Biernat & Jax, 2000). In addition to low socio-economic status (SES), mobile students often were disadvantaged socially, psychologically, and academically (Rumberger, 2002). Mobile students tend to have more behavior problems, exhibit violence and are at a higher risk of dropping out compared to nonmobile students (Malmgren & Gagnon, 2005).

When controlling for SES and other demographic variables, some study findings have indicated that mobility was not significantly related to student achievement (Alexander et al., 1996; Cutuli et al., 2012; Heinlin & Shinn, 2000). Alexander et al. (1996) studied the effects of mobility and student achievement over five years within Baltimore public schools. Mobile students scored lower than nonmobile students, but not significantly when controlling for background demographic characteristics (Alexander et al., 1996). Similarly, Heinlin and Shinn (2000) studied school-aged children in New York City. Heinlin and Shinn's (2000) findings yielded no relationship between mobility and student achievement when factoring in previous testing scores.

Cutuli et al. (2012) have found that mobile students only have a slight disadvantage over nonmobile students. Cutuli et al. examined more than 26,000 students across third through eighth grades in Minnesota. The researchers found that 45% of homeless or highly mobile students scored within or above the average range in math and

reading achievement. Math and reading achievement were lower, and growth in mathematics slowed during their times of residential instability. However, Cutuli et al.'s findings suggest academic resilience as scores rebounded over time.

Mobility is a complex variable that can have various meanings in various contexts. Because of the complex nature of mobility and its interconnectedness with related variables, it is important to look at how current literature describes the relationship between mobility and student achievement. Studies may be organized by the time period the move takes place, whether the move is a residential change, school change, or both a residential and school change, how related variables are considered, the size of the study population, whether the study occurred in an urban, suburban, or rural setting, educational level of the students, and frequency of moves.

Types of Mobility

Additionally, there may be several types of mobility. One type of mobility is a residential move where family members change the home in which they live. Though the family is mobile, students may return to the same school (Dalton, 2013). Other types of mobility may be a school change without the residential move (Grim, 2019). Finally, some students experience a residential move, resulting in a school change. It should be noted that many studies consider the difference between promotional and non-promotional school changes. Promotional school changes occur when a student is promoted from elementary school to middle school, from middle school to high school, or some similar positive change (Rumberger, 2002). A non-promotional school change is a lateral move from one elementary school to another elementary school or some similar move between middle schools or high schools (Rumberger, 2002).

Residential-only moves that do not require a school change pointed to a specific type of change. Typically, this would involve a short move across town or from one part of town to another part (Friedman-Krauss & Raver, 2015). These types of residential changes without school changes are more typical within a suburban or rural setting where moving several miles, the child will remain in the same school (Robinson, 2012; Dalton, 2013; Locklear, 2017). However, an apartment change down the street may require a school change because of the dense population of children within urban settings (Cutuli et al., 2013; Mattes, 2017).

Other students may experience a school change without experiencing a residential change. The school change may happen when boundary lines change within a school district or when students take advantage of school choice to move to different schools (Rumberger et al., 1999). This school change may also happen when districts offer school choice (Grim, 2019). Typically, these types of mobility occur in suburban or urban settings (Cutuli et al., 2013).

Finally, some students experience a move resulting in a residential and school change. These moves can be short or long in distance, within a district, or across state lines. These can happen in urban, suburban, and rural settings. Gullion (2009) studied the effects of interstate and intrastate mobility on student achievement. Gullion (2009) stated that all interstate and intrastate moves studied resulted in both residential and school changes. While moving between states, it was hypothesized that differences in state-mandated curriculum would put students who move between states at a greater disadvantage than those moving within a state. Gullion concluded that overall mobility

had a significant effect, but there was no significant difference between interstate and intrastate mobility.

Cutuli et al. (2013) studied the effects of residential moves and academic achievement. They compared students identified as homeless or highly mobile with students on a free meal program, students on a reduced meal program, and students on neither a free nor reduced meal program. Their findings suggest that as students' residential instability increases, their academic progress decreases, resulting in academic disparities between the named groups.

Occasionally, school move types are categorized as voluntary or involuntary. There are specific reasons associated with each type of move, which help to delineate differences in circumstances. Rumberger (2015) gave the following categories for voluntary moves: school choice, family move, and student-initiated. Rumberger stated the following reasons for involuntary or compulsory moves: family move resulting from a lost job, lost home, eviction, or homelessness, or a student changed families due to death, divorce, foster care, or incarceration. Voluntary moves are often planned and occur between school years, whereas involuntary moves may be unplanned and often occur during the school year.

Mobility During the School Year and Summer Months

Mobility is an ambiguous term that can mean many things depending on context. Some studies are organized to address mobility as the movement between schools during the summer months only (Robinson, 2012; Friedman-Krauss, 2015). Some researchers (Rumberger, 2015; Grim, 2019) define mobility as either a voluntary or involuntary activity regardless of the time period. Finally, other researchers define mobility as any

movement happening during the summer or the school year, whether voluntary or involuntary (Hartman, 2006; Rippe, 2012; Bostick, 2016).

Rippe (2012) studied students of military families within the Bellevue school district outside of Omaha, Nebraska. Students in Rippe's study moved in and out of the district throughout the school year and summer months. The researcher's findings suggested that it was not the timing of the move that determined academic success. However, mobile military children were consistently strong academic performers because of the "positive and welcoming well-organized, goal-linked, and sustainable home, school, and community partnership supporting military dependents success at school" (Rippe, 2012, p. 89).

Size of the Study Population

Many researchers determining a relationship between student mobility and achievement organized their findings by the size of their study's participants. Some studies concentrate on a large population within one city or location (Cutuli et al., 2013; Bostick, 2016; Holbrook, 2017; Grim, 2019). The focus of other studies was on a small population and tracking individual student movements (Robinson, 2012; Rippe, 2012; Friedman-Krauss, 2015; Matthes, 2017). Presented in the literature are both large and small populations with a mixture of conclusions about the relationship between mobility and student achievement.

Cutuli et al. (2013) studied math and reading achievement scores of 26,474 third- through eighth-grade students within Minneapolis Public Schools. Within their longitudinal study, Cutuli et al.'s findings indicated that the more residential mobility, the larger the gap in academic achievement compared to students with no mobility. Bostick

(2016) studied the relationships between mobility and academic achievement measured by the Texas Assessment of Knowledge and Skills with over one million middle school students across Texas over a multi-year period, finding no significant relationship when controlling for economic status. Holbrook (2017) conducted a study with 2,300 seventh-grade students from North Carolina and found a significant difference between academic achievement measured by North Carolina End of Grade assessments between mobile and non-mobile students. Within a longitudinal study, Grim (2019) found a significant relationship between mobility and student achievement measured by PSAT and SAT scores within a study of about 7,200 high school students within a 4-year cohort.

Some research was focused on large groups, and others focused on small populations. Rippe (2012) studied the effects of mobility on 80 military high school students in suburban Nebraska. Rippe found no significant relationship between mobility and subscores on the ACT, grade point averages, or participation in school activities when comparing low, moderate, and highly mobile students to non-military students. Robinson (2012) conducted a study involving 213 grade school students from rural Mississippi. Findings suggested no significant relationship between mobility and student achievement as measured by Mathematics and Language Arts assessments. Friedman-Krauss and Raver (2015) studied 381 preschool through fourth-grade students from Chicago identified as mobile and found an inverse relationship between the number of times low-income children switched schools and the child's math achievement on fourth-grade standardized tests. Mattes (2017) studied the relationship between mobility and student achievement with 314 students in Long Island, New York. Mathes (2017) determined that non-mobile students outperformed their mobile peers.

Many researchers organized their studies to consider the size of the population. Within larger populations, the researchers found a significant relationship between mobility and student achievement more often (Cutuli et al., 2013; Bostick, 2016; Holbrook, 2017; Grim, 2019). Within smaller populations, there were mixed results (Robinson, 2012; Rippe, 2012; Friedman-Krauss, 2015; Matthes, 2017).

Location

Many studies examining the relationships between mobility and student achievement also tend to be organized by location. Differences exist between urban, suburban, and rural settings. Student mobility is present in each setting.

Some researchers focus on urban centers. Cutuli et al (2013) studied the effects of residential instability, homelessness, and mobility on academic achievement for third- through eighth-grade students in the Minneapolis Public Schools. The authors' longitudinal study findings indicated that the higher the residential instability, the bigger the academic gap between their non-mobile peers. Friedman-Krauss and Raver (2015) studied elementary-aged students in Chicago. Their findings showed a negative relationship between mobility and student achievement. Mattes (2017) found a significant relationship between mobility and student achievement measured by mathematics assessments with high school students in Long Island, New York.

Other researchers concentrated on suburban groups. Rippe (2012) found no significant relationship between mobility and academic achievement when looking at 12^{th}-grade students from military families in suburban Nebraska. Holbrook (2017) focused a study on 11 middle schools in a suburban North Carolina school district. Holbrook's (2017) findings showed a significant difference in academic achievement

between mobile and non-mobile students. Similarly, Grim (2019) found a significant relationship between mobility and student achievement when studying its effects with 24 public high schools in suburban Maryland.

There are studies dedicated to rural populations. Gullion (2009) focused on rural students in southeastern Indiana, finding mobility had a significant effect on student achievement. Robinson (2012) found no significant relationship between mobility and student achievement for grade school students in rural Mississippi. Dalton (2013) researched four elementary schools within rural Tennessee, and the results indicated that there was no relationship between mobility and student achievement. Locklear (2017) focused on rural students in southeastern North Carolina, finding a significant relationship between mobility and student achievement.

Instead of focusing on urban, suburban, or rural areas, another approach found in the literature was to study state-wide data. Bostick (2016) studied the relationship between mobility and academic achievement for the entire state of Texas using archival data over six academic years. Data included students' attendance, demographic, and testing history. Though effect sizes for the relationship between academic achievement and mobility were large, when controlling for economic status, the effect sizes were not significant. Bostick's finding suggested there was not a significant relationship between mobility and academic achievement when controlling for economic status.

Educational Level

Many researchers examining the relationship between student achievement and mobility concentrated on primary or elementary-school children. Robinson (2012) studied grade school-aged children and found no significant difference when comparing

mobile and non-mobile students on their academic achievement. Cutuli et al. (2013) found a negative relationship between mobility and academic achievement in their longitudinal study involving Grades 3 through 8. Friedman-Krauss and Raver (2015) found a negative relationship between mobility and student achievement on the fourth-grade mathematics standardized tests for students who moved schools frequently between pre-school and third grade. Locklear (2017) studied three years of third grade students' academic achievement, and the findings suggested a significant relationship between mobility and student achievement.

Other researchers examined secondary students. Gullion (2009) studied the effects of mobility on 10th-grade students and concluded that mobility had a significant effect on student achievement. Rippe (2012) studied graduating seniors of military families and found no significant relationship between mobility and student achievement. Bostick (2016) studied the relationship between mobility and academic achievement for Grade 6, 7, and 8 students, finding no significant relationship when controlling for economic status. Holbrook (2017) found a significant difference in academic achievement between mobile and non-mobile seventh-grade students. Mattes (2017) found that within the population of middle school and high school students taking the Algebra I Common Core Regents exam, the non-mobile students outperformed mobile students.

Finally, Grim (2019) examined the relationship between mobility and student achievement, focusing on an entire district or county of children. Grim studied a 4-year cohort from 24 public high schools within a county in Maryland. The results of the study suggested a significant relationship between mobility and both student performance and graduation status when comparing mobile and non-mobile students.

Frequency of Mobility

A final factor when considering the available literature relating mobility and student achievement is the number of moves (Rippe, 2012; Friedman-Krauss & Raver, 2015; Rumberger, 2015; Grim, 2019). When a researcher follows a cohort of individuals, the specific test score of specific students who are mobile might be tracked (Rumberger, 2015). When this happens, it is possible to track the number of moves a student has over a period of years and compare that to the testing data associated with that student. There tends to be mixed results with this level of comparison.

Friedman-Krauss and Raver (2015) studied the effects of mobility on students between pre-school and third grade. Their results show that students who had three or four school changes had an increased risk of cognitive dysregulation in third grade and lower academic achievement as measured by the math standardized tests in fourth grade. Rumberger (2015) found that student mobility negatively impacts student test scores and high school graduation rates. The impacts tend to be more severe for students who experience multiple school moves. Grim (2019) corroborated Rumberger's (2015) findings. When isolating for mobile students, Grim (2019) found that one move had a negative relationship with academic performance, and the most significant gap in academic performance happened when a student had two or more moves. Grim (2019) further concluded that mobility consistently had a negative effect on a student's likelihood to graduate, and the gap between graduation rates of mobile and non-mobile students further widened with multiple moves.

Rippe (2012) studied small groups of students from military families in suburban Nebraska. The results of Rippe's study indicated that there was no significant difference

between low mobility (one to two moves), moderate mobility (three to four moves), and high mobility (five or more moves) as compared to students of non-military families with no mobility issues. Rippe stated that the culture and support of the family, school, and community allowed for all students to be successful academically.

Mobility When Controlling for Other Variables

Some researchers have found there was no relationship between mobility and student achievement when controlling for a certain type of demographic data. For example, some researchers controlled for income, poverty, or SES. When Dalton (2013) controlled for poverty, the results indicated that mobility did not have a significant effect on achievement. Friedman-Krauss and Raver (2015) asserted that student mobility was a poverty-related risk factor. Their findings within the Chicago area found low-income, ethnic-minority children who repeatedly changed schools between pre-school and third grade had significantly lower math achievement scores on fourth grade standardized tests. Similarly, Bostick (2016) found that the effect sizes for the relationship between student mobility and academic achievement were large. However, when controlling for SES, the results of the study indicated no significant relationship between mobility and academic achievement. In those cases, the researchers concluded that the relationship between mobility and income was so closely related that there was no separate impact on student achievement. Grim (2019) determined that nonmobile students performed better academically than mobile students. However, factors such as SES school tier and eligibility for free and reduced meals may be more significant when determining students' achievement by certain metrics.

Other researchers controlled for ethnicity. Rumberger (1999) found that mobility varies by ethnicity. Whites and Asian American students were less mobile than African American and Hispanic students. Rumberger thus suggested that though student mobility leads to negative impacts on academic achievement and because ethnicity is tied to mobility, it should be considered. Robinson (2012), however, found no significant difference academically between grade school students identified as African American and Caucasian. Mattes (2017) found that being African American was a predictor of performance for mobile students.

Academic Achievement

Because of NCLB (2002) and ESSA (2015), state and local leaders have directed their focus toward school improvement, whose primary metric is academic achievement. School leaders had the flexibility to implement programs to increase the quality of instruction, comprehensive plans to improve the educational outcomes of all students, and to reduce the achievement gap for at-risk subgroups of students (Rumberger, 2015). Among the subgroups included were minority students, students who live in poverty, and students whose performances were consistently low (Potter et al., 2021). Mobile students were often found in one or more of the subgroups. As a metric, academic achievement may be measured in a variety of ways, including state and nationally normed (Scherrer, 2012).

Measuring Academic Achievement

While grades for classes and even grade point averages may be subjective in relation to the teacher, grade-level, or school, researchers have trended toward locally or nationally normed tests to provide insight into academic achievement (ACT, 2022b).

Students are often tested throughout various grade levels to determine the degree of academic growth and development over time for the individual and the school (ACT, 2016). The results of these tests can measure a student's growth or lack of growth, the need for advancement or remediation, and predict the future success of students (ACT, 2022b).

A common metric of academic achievement and goal for many school districts across the United States was to prepare students to be college and career-ready (MO DESE, 2022b). While preparation for future success may have involved a rigorous and diverse curriculum, the measurement of success may be complex. Grade point averages (GPAs) may have indicated success in individual classes and may have been useful in comparing students within the same school; however, comparing GPAs between schools locally, regionally, or nationally continued to be problematic (ACT, 2022b). Districts may look at state-recognized testing as indicators of success. The results of these tests have helped school districts within the same state gain a better understanding of how they compare to other districts locally (MO DESE, 2022b). Additionally, nationally normed tests, such as the ACT, have helped districts expand their understanding of programmatic success by measuring against schools regionally or nationwide (ACT, 2022b).

Students within their middle school years may be tested in mathematics, science, reading, and writing. Bostick (2016) conducted a non-experimental research study using archival data from schools across Texas. He found mobile students scored on average two to six points lower than non-mobile students in mathematics, four to five points lower than non-mobile students in science, two to three points lower than non-mobile students in reading, and one to two points lower than non-mobile students in writing.

Locklear (2017) conducted a three-year study that revealed a significant difference between the achievement of mobile and nonmobile third-grade students on the North Carolina English language arts assessments. Non-mobile students scored better on the assessment. Additionally, Locklear showed that mobile females and males were both outperformed by their nonmobile counterparts, whereas there was no significant difference between mobile females and males.

Students within their high school years may be tested in several subject areas, including mathematics. Mattes (2017) studied the effects mobility had on Algebra I assessment scores. The researchers found that nonmobile students outperformed mobile students. Mattes cited other factors, such as attendance and grade level of mobility, as predictors of performance for mobile students.

A similar three-year study by LeBoeuf and Fantuzzo (2018) supported Locklear's (2017) findings. Within the large urban school district of Philadelphia, reading scores were compared to moves within the district. Students who changed schools scored almost 10% of a standard deviation lower than non-mobile students. LeBoeuf and Fantuzzo (2018) cited a reason for this disparity: students who moved had to adjust to new routines and expectations within their classroom and school.

Though there have been many studies conducted examining the relationship between student mobility and academic achievement, most have utilized local or state tests. Local tests allowed local schools to compare scores and share resources, but the scope was limited to the locality of the testing. The use of a nationally normed test has helped schools to compare their scores state to state and nationally.

American College Testing

Starting in the 1920s, the Scholastic Aptitude Test (SAT) was introduced as an exam to measure academic achievement and preparation for college. The American College Testing (ACT) exam, created by Linquist in 1959, focused the measurements on subjects taught in school as opposed to cognitive reasoning (ACT, 2015). In other words, Linquist sought to create a test to measure how prepared students were in certain subjects as opposed to testing a student's overall intelligence. According to ACT (2007), the exam was a measure of student learning in high school and of "what students were able to do with what they have learned in school" (p. 42). In 2020, the ACT was the leading college admission standardized test.

There were several reasons why school districts have utilized the ACT as a tool for comparison between other districts. ACT was nationally standardized, based on college readiness, and was not the measure of only one state's learning objectives. The use of the ACT allowed schools to compare themselves to other schools across the country (ACT, 2022b). Regularly, the ACT conducted a curriculum survey to ensure its tests accurately measure both what high school instructors taught and what teachers at entry-level college courses expect. The assessment was designed to measure how well a student applied the information deemed essential in entry-level college classes. Because of these factors, school districts utilized the ACT as a valid tool to measure academic achievement (ACT, 2015).

The assessment continued to evolve to report more data to participants and schools. In 2022, the ACT offered subtests of academic achievement in English, math,

reading, science, STEM, and (optional) ELA and writing. The ACT issued scores for each subtest and an average composite score.

The ACT organized its data by cohorts grouped by the year students graduated from high school. For the graduating class of 2022, 1,349,644 students were included in the report. To get a more complete picture, the ACT suggested looking at trends over three, five, and ten years. Table 2 shows the five-year trends for the number of students taking the ACT, average ACT composite score, average score in English, and average score in mathematics (ACT, 2022a).

Table 2

Five-Year Trends for Student Cohorts Taking the ACT

		Average ACT Score		
Year	N	English	Math	Composite
2018	1,914,817	20.2	21.3	20.8
2019	1,782,820	20.1	21.2	20.7
2020	1,670,497	19.9	21.2	20.6
2021	1,295,349	19.6	20.9	20.3
2022	1,349,644	19.0	20.4	19.8

Note. N represents the number of students tested each year. Adapted from "Five Year Trends – Average ACT Scores Nationwide," by ACT, 2022.

The ACT delivered scores to the individuals taking the exam and school districts. Schools across the United States could then use the data to measure the quality of their

instructional practices and degree of preparation for college. Schools could also compare their scores locally and nationally to indicate a level of success (ACT, 2022b).

Researchers have used the ACT as a measurement tool for academic achievement. For example, Jones (2016) compared ACT scores and GPAs to determine if a student's demographic information, such as gender, race, and SES, impacted ACT scores or GPA. The author found that students in the study with higher GPAs had higher ACT composite scores, and students with lower GPAs had lower ACT composite scores. Additionally, Jones' (2016) findings suggested that demographics did not affect differences in math, English, or reading scores, but race influenced the difference in science scores. Herndon (2021) conducted similar research, finding a statistically significant difference for SES on English, mathematics, and sciences subtest scores but not for the composite or reading scores. While Jones (2016) started the research utilizing GPAs, ACT scores gave a more complete picture of academic success, and Herndon (2021) only used ACT scores for comparison.

Fisenne (2015) studied the effects of taking multiple Advanced Placement (AP) or International Baccalaureate (IB) courses on ACT composite scores. The researcher determined that students who took two or more AP or IB courses scored better on the ACT than those who did not. Similarly, Anderson (2016) researched the relationship between the number of AP courses a student took and their academic achievement as measured by the ACT composite scores. The author's findings indicated that the greater the number of AP courses successfully completed, the higher the composite ACT score. Jones (2016) concluded that students who enrolled in at least one AP course performed better on the respective ACT subtests than students who enrolled in regular classes. These

conclusions seem to indicate that rigorous course work, associated with AP and IB courses, aids in developing a student academically and better prepares students for college. In each study, the ACT composite score was used to measure academic success.

Because the ACT can be utilized as a comparison tool for individuals, schools, and districts, many school districts have focused heavily on ACT success. There are numerous studies on the effects of ACT preparation programs on ACT success. Hargis (2015) studied the relationship between an ACT preparation course and student achievement as measured by the ACT English and math scores. The findings indicate that students who took the ACT prep class saw a significant improvement in both English and math from their pre-ACT to their ACT, whereas students who did not take the ACT prep class saw only a minor improvement. Similarly, in a 2020 study, Harmon et al. studied the effects of computerized ACT preparation programs on student ACT performance. The authors' findings indicated that the predicted ACT results from the computerized programs were higher than the actual ACT composite scores achieved by students. While all students scored lower on the exam day than the predicted levels in the classroom, the gap between predicted scores and actual ACT scores was less for white students than for black students. By contrast, Herndon (2021) found no statistically significant differences between student participants and nonparticipants in an ACT preparation course. The contrast of findings is interesting because both Hargis and Herndon studied a similar number of students (267 and 264, respectively) within large suburban high schools within Middle Tennessee.

Additional Testing Methods

Nearly 10,000 schools, districts, and education agencies in 145 countries have adopted an adaptive test created by Northwest Evaluation Association (NWEA) called the Measures of Academic Progress (MAP). Within the electronic MAP test, each of the nine million students received a unique problem set because the next question was generated based on each student's answer to the previous question (NWEA, 2016). NWEA's MAP test is interim as opposed to summative, meaning it was designed to be given at various times during the school year to compute the child's growth over time NWEA, 2016). After test completion, each student's scores were immediately reported to schools and teachers to determine what students already knew and what they would be ready to learn next. In this way, the MAP test was a test to aid in personalizing lessons to the appropriate level for each student (NWEA, 2016). NWEA's MAP test was based on national standards for academic readiness (NWEA, 2016).

Buchsbaum (2013) conducted a longitudinal study utilizing NWEA's MAP assessment with elementary students in Tempe Elementary School District among students considered low SES. Results from Buchsbaum's study indicated that even though students identified with low SES had lower scores than students not identified with low SES, both groups made significant achievement growth over time (2013). Additionally, there was no statistically significant relationship between a student's SES status and their reading scores (Buchsbaum, 2013).

Atlas Prep School determined levels of academic achievement for each student by utilizing MAP to support students in poverty and help them grow (NWEA, 2017). The Atlas Prep Charter School, located in a high-poverty area in Colorado Springs, Colorado,

served 900 middle- and high-school students with high mobility rates. During the 2015-2015 school year, Grade 6 through Grade 12 students scored in the 92nd to 99th percentile nationally in reading, language, and science. During the next year, most Grade 5 through Grade 8 students met or exceeded typical growth goals across all subject areas.

Researchers utilized NWEA's MAP test as a measure of academic achievement in a longitudinal study comparing kindergarten through eighth-grade students in Catholic and public schools. The findings suggested that Catholic school students, on average, scored higher than public school students of the same grade level, Catholic school students entered the school year at a higher level, and public-school students closed the gap during the school year. Additionally, Catholic school students showed less overall growth in both reading and math in lower grades than public school students in the same grades (Dallavis et al., 2021).

Another national assessment was the National Assessment of Education Progress (NAEP). NAEP has served as a standard for student achievement since 1969. NAEP assesses students regarding what they should know and be capable of doing in the areas of reading and math every two years and other subjects periodically. Though individual student data was not transmitted back to schools, NAEP has been used as a comparative tool between urban centers, states, and other nations. Though it can be used as a comparative tool, according to the National Assessment Governing Board (2023), NAEP tested only a small number of students in each state. Within a longitudinal study, Bai et al. (2021) used NAEP Grade 8 mathematics data to compare educational inequality due to family SES to see if there had been a change from 2003-2017. Results from the study indicated that the SES achievement gap had no significant change for 34 states, 14 states'

achievement gaps widened, and only two states' achievement gaps narrowed (Bai et al., 2021).

In addition to national assessments, many states created their own assessment systems as measured by challenging academic standards such as Common Core State Standards or state-wide standards. MO DESE created the Missouri Assessment Program (MAP) to assess student achievement in Grades 5-12 based on the Missouri Learning Standards (MLS). Table 3 shows the subject area and the grade level covered by MAP. MO DESE used the results of the tests to "diagnose individual student strengths and weaknesses in relation to instruction of the MLS and to gauge the overall quality of education throughout Missouri" (MO DESE, 2022b). MO DESE also used the scores as an accountability tool for schools to assist in computing an Annual Performance Report (APR). MO DESE has five performance standards for its Missouri School Improvement Program: (1) academic achievement, (2) subgroup achievement, (3) high school readiness or college and career readiness, (4) attendance rate, and (5) graduation rate (MO DESE, 2022a).

Table 3

Missouri Assessment Program Grade-level Tests

Subject Area	Grade Levels Tested
English Language Arts	3, 4, 5, 6, 7, 8, English I, English II
Mathematics	3, 4, 5, 6, 7, 8, Algebra I, Algebra II, Geometry
Science	5, 8, Biology 1
Social Studies	American History, Government

Note. Adapted from *Guide to the Missouri assessment program,* by MO DESE, 2022. *Retrieved from* https://dese.mo.gov/quality-schools/assessment/guide-missouri-assessment-program

There were a variety of assessments related to a student's level of academic achievement. While NWEA's MAP assessment was a nationally normed exam, it lacks universal usage throughout all states (NWEA, 2016). While NAEP is nationally normed and was utilized in every state, it garnered low participation in each state (National Assessment Governing Board, 2022). Though MO DESE's MAP thoroughly tested students from Grade 3 through Grade 12, only students within Missouri schools participated. The ACT was nationally normed, garnering high participation within each state (ACT, 2022b).

Graduation Rates

For each high school, the graduation rate was a key measurement of success. Whereas most of the 50 states had state-wide requirements for a diploma, some states, such as Colorado, Massachusetts, and Pennsylvania, allowed local education agencies to

determine the requirements. Typically, state requirements involved four years of English, three or four years of mathematics, two to three years of both science and social studies, and electives such as physical education, fine arts, and practical arts for 18 to 24 total credits. According to the NCES (2018), the states with the lowest minimum state requirements were Maine (11 credits), California (13 credits), and Wyoming (13 credits), and 13 states had the minimum state requirement of 24 credits.

Within Missouri, MO DESE set the state minimum high school graduation requirements at 24 credits earned. There are specific minimum requirements within a variety of subject areas. To earn a credit, a student must (1) meet all course requirements and (2) earn a passing grade. Table 4 below shows the graduation requirements for Missouri.

Table 4

Graduation Requirements for Students Enrolled in Missouri High Schools

Subject Area	Units of credit
English Language Arts	4.0
Mathematics	3.0
Science	3.0
Social Studies	3.0
Fine Arts	1.0
Practical Arts	1.0
Physical Education	0.5
Personal Finance	0.5
Electives	7.0
Total Credits	24.0

Note. Adapted from *Graduation Handbook,* by MO DESE, 2017. *Retrieved from* https://dese.mo.gov/media/pdf/graduation-handbook

The MLS, also known as the Show-Me Standards, provided information to ensure students, parents, teachers, and administrators across Missouri had a clear understanding of the expectations in all Grades K-12 public education in Missouri (MO DESE, 2009). Figure 1 shows the core components and goals for students to be academically successful. Students were to acquire knowledge and skills in the six subject areas. When students combined knowledge and demonstratable skills, they were deemed to have academic success.

Figure 1

The Show-Me Standards

<table>
<tr><th colspan="2">The Show-Me Standards
Knowledge + Performance = Academic Success</th></tr>
<tr><td>Communication Arts</td><td rowspan="2">Students in Missouri Public Schools Will:</td></tr>
<tr><td>Mathematics</td></tr>
<tr><td>Science</td><td>Acquire the knowledge and skills to gather, analyze and apply information and ideas.</td></tr>
<tr><td>Social Studies</td><td>Acquire the knowledge and skills to communicate effectively within and beyond the classroom.</td></tr>
<tr><td>Fine Arts</td><td>Acquire the knowledge and skills to recognize and solve problems.</td></tr>
<tr><td>Health/Physical Education</td><td>Acquire the knowledge and skills to make decisions and act as responsible members of society.</td></tr>
</table>

Figure 1. This figure shows the six subject areas and four broad goals that frame the guidance for students in Missouri. Adapted from *Missouri Show-Me Standards*, by MO DESE, 2009. Retrieved from https://dese.mo.gov/media/pdf/Show_Me_Standards_Placemat

Ross (2016) studied the relationship between student mobility and graduation rates within 316 high schools in New Jersey. According to Ross, mobility was a statistically significant predictor of graduation, amounting to 60% of the variance in the graduation rate. In other words, schools with high mobility rates tended to have lower graduation rates. Ross indicated that factors such as inaccurate placement, constant movement, and changing schools could result in students missing components within the

curriculum. If a student missed key components in the curriculum, they tended to form gaps in knowledge and skills and thus were not able to become academically successful. Academically unsuccessful students were unable to graduate.

In Utah, Barrett et al. (2014) studied the effects of interventions designed to boost graduation rates for students with disabilities. The authors' findings suggested that students with disabilities had a 20% higher dropout rate, a 19% higher mobility rate during the school year, higher rates of retention in Grade 12 (32% of students with intellectual disabilities and 53.3% of students with multiple disabilities were retained), and 19% lower graduation rates during the four-year term of high school than the general education peers. Barrett et al.'s findings showed elevated mobility and lowered graduation rates among this population.

Attendance

School attendance is another heavily researched variable related to student academic achievement. If absent, a student is missing instruction, which negatively impacts student learning (Powell, 2013). Because schools receive funding based on attendance, a school with an elevated level of absences will have less money to spend on educational programs (Fiel, 2011). Attendance is a critical element impacting student achievement.

Lamdin (1996) researched 97 elementary schools within Baltimore and found that high levels of attendance had a positive influence on student performance in both mathematics and reading. According to Alanis (2000), Texas students who failed the Grade 5 English test missed significantly more days on average than students who passed the test. Hinz et al. (2003) commented on the link between elevated levels of student

mobility and low levels of attendance for students of poverty in Minneapolis public schools with comparable results as Alanis (2000). Students in Minneapolis who attended less than 84% of the school year scored 20 points lower on the Minnesota Basic Standards Test than students whose attendance was perfect (Hinz et al., 2003). Ruby (2004) found strong correlations between schools' attendance rates and student achievement on the Ohio Proficiency Tests throughout Grades 4, 6, 9, and 12. Ruby found that overall annual attendance averages were significantly higher in the three highest-performing schools than in the three lowest-performing schools.

Summary

Examined in this study was the relationship between student mobility and academic achievement. This researcher examined topics applicable to this study. Research was presented related to student mobility and academic achievement as shown by assessments. The focus was both national in scope and localized to the state of Missouri. The information included in this chapter established connections between literature and research as it related to the study at hand; however, research has not shown a definitive relationship or lack of relationship between student mobility and academic achievement. Chapter three contains a description of the methods used to conduct this research.

Chapter 3

Methods

The purpose of this quantitative correlational study was to examine the associations between a school district's student mobility rate and academic achievement. An additional purpose of this study was to examine the associations between student mobility rate and academic achievement in different size school districts. This chapter focuses on information related to the research design, the participants, the measurements, data collection procedures, data analysis and hypothesis testing, and limitations.

Research Design

A nonexperimental quantitative approach was utilized for this study. A correlational research design was used. According to Creswell (2014), a correlational design is appropriate "to describe and measure the degree or association (or relationship) between two or more variables or sets of scores" (p. 12). The independent variable was the school district's mobility rates. The dependent variables were the average ACT composite, English, mathematics, reading, and science scores. In addition, data on school districts (i.e., small, medium, and large) were also included.

Selection of Participants

The population of this study was public and charter school districts within the state of Missouri. Convenience sampling was utilized for this study. Lunenburg and Irby (2008) defined convenience sampling as "including in the sample whoever happens to be available at the time" (p. 174). The sample was limited to the 488 school districts existing between the years 2010 and 2022 within the state of Missouri.

Measurement

This research study utilized several measurements, including school district size, mobility rate, and ACT scores. Each measurement will be discussed including its origin and how it was calculated. Additionally, the validity and reliability of the ACT will be discussed.

School District Size

School district size was obtained from the fall enrollment number for each school district. Each school district within the state of Missouri takes daily attendance and reports to the MO DESE. The fall enrollment number is the total number of students enrolled in the district on the last Wednesday in September. MO DESE has consistently collected fall enrollment data this way between the years 2010 and 2022. Across the state, the district size ranges from 33 to 25,200 students. MSHSAA has utilized school enrollment to organize schools into six class assignments. Between the years of 2010 and 2022, school districts with less than 500 students were classified as small (classes one and two), districts with 500 to 9,000 students are classified as medium (classes three and four), and districts with more than 9,000 students are classified as large (classes five and six) (MSHSAA, 2023).

Mobility Rate

The mobility rate, as calculated within the state of Missouri, represents the quantity of movement of students in and students out of a school district during a particular academic year. Between the years 2010 and 2022, the mobility rate has been consistently calculated by a formula involving distinct variables: variable 1, the fall enrollment number; variable 2, additional number of students enrolled after the fall

enrollment cutoff date and before the end of the school year; and variable 3, the number of students who transfer in and out of the district throughout the school year. The fall enrollment number is the number of students enrolled in the district on the last Wednesday in September. The mobility rate was calculated using the following formula,

$$M = \frac{variable\ 3}{variable\ 1 + variable\ 2}.$$

This quotient is multiplied by 100 to give it a range of zero to 100, where a rate of zero means the district had no transfers in or out, and 100 means 100% of the student population transferred in or out.

ACT

The dependent variables (i.e., average ACT composite, English, mathematics, reading, and science scores) were measured by ACT. ACT measures the achievement level of students related to the specific subjects taught in high school and early college (ACT, 2015). ACT measures student academic performance in the context of college readiness (ACT, 2022a) and provides information about how well a student performed compared to other students (ACT, 2022b). ACT was offered seven times during the school year, and it was a test administered to each junior in Missouri. The ACT was a timed test comprised of four sections: English, mathematics, reading, and science, with an optional writing test (ACT, 2022b).

For this study, the districts' average composite ACT scores were used. The English section has 75 four-choice multiple-choice questions covering the following content: grammar and usage, punctuation, sentence structure, strategy, organization, and style. Students are given 45 minutes to the English section. The mathematics section has 60 five-choice, multiple-choice questions covering the following content: pre-algebra,

elementary algebra, intermediate algebra, coordinate geometry, plane geometry, and trigonometry. Students are given 60 minutes to complete the mathematics section. The reading section has 40 four-choice multiple-choice questions covering the following content: reading comprehension of what is explicitly stated or implied. Students are given 35 minutes to complete the reading section. The science section has 40 four-choice multiple-choice questions covering the following content: interpretation, analysis, evaluation, reasoning, and problem-solving. Students are given 35 minutes to complete the science section. (ACT, 2015)

The score for each test section of the ACT is calculated by first counting the number of correct multiple-choice responses, creating a raw score. The raw score for each test section is then converted to a scaled score ranging from 1 (low) to 36 (high) (ACT, 2015). A score of 1 means the individual answered two or fewer questions correctly in the section, whereas a score of 36 means the individual answered at most one question incorrectly in the section (ACT, 2022b). The composite score for an individual is the average of the four tests rounded to the nearest whole number (ACT, 2022b).

Based on all students' performance, each school district receives an average composite ACT, average English, average mathematics, average reading, and average science score. Each district's average score is the quotient of the sum of individual scores for all students completing the test in the district divided by the total number of students completing the test in the district.

Validity is the degree to which an instrument measures what it is intended to measure (Luneburg & Irby, 2008). ACT conducted validity (i.e., convergent and discriminant evidence, item and scale structure, and success outcomes) analyses on the

use of the ACT (ACT, 2022b). Regarding content validity, ACT designs each assessment task to correspond with the content and cognitive challenges specific to the associated academic area represented in current high school and college curricula. Each assessment item is critically examined at least 16 times by subject-matter experts to ensure it aligns with academic research on skill targets, sequencing of skills and grade placement, and the ACT national curriculum survey responses from thousands of educators (ACT, 2022b). ACT conducted cognitive lab studies utilizing the think-aloud protocol where examinees would speak their thoughts while responding to assessment items confirming alignment of cognitive processes to desired content standards. Eye-tracking data during lab studies reinforced validity when examinees' gaze patterns matched with the required skill for individual assessment items.

Regarding success outcomes, ACT measured the relationship between high school coursework taken by examinees and scores on the ACT, showing that students who completed the core curriculum tend to achieve higher ACT scores than those who have not completed the core curriculum. For example, in 2021, students completing four or more years of mathematics scored an average of 24.1 on the ACT mathematics subtest, whereas students taking less than three years of math scored an average of 16.0 (ACT, 2022b). Based upon a sample of 189,612 students at 50 post-secondary institutions, ACT Composite scores and high school grade point averages are highly correlated with first-year college academic performance, with the mean correlations of .662 and .627, respectively (Westrick et al., 2021).

Reliability is the degree to which an instrument is a consistent measure (Lunenburg & Irby, 2008). ACT conducted reliability (i.e., internal consistency and test-

retest stability) analyses on the use of the ACT (ACT, 2022b). Regarding reliability, the ACT reliability for the four subtests and the ACT composite score were calculated based on eight tests administered from June 2021 to April 2022. The reliability coefficients were high; Cronbach's alpha was 0.90 or greater for English, mathematics, and composite scores and 0.84 or greater for reading and science (ACT, 2022b).

Data Collection Procedures

The current study used archival data from MO DESE. Permission from MO DESE was not required because Missouri district information, including test scores, school district size, and mobility rates, is open to the public. On December 9, 2023, a proposal for research was submitted to the Baker University Institutional Review Board requesting research approval. On December 11, 2023, approval was granted (see Appendix A). Archival data were then obtained through MO DESE's database. District average ACT composite, English, mathematics, reading, and science scores, district populations, and district mobility rates were retrieved for the years 2010-2022. Data were stored on a secure local hard drive for the length of time required to complete the study and an additional five years.

Data Analysis and Hypothesis Testing

Lunenburg and Irby (2008) described how the research questions and hypothesis testing guide the research. The research questions, as well as the hypothesis testing outlined below, demonstrated how the researcher planned to answer the research questions. This study utilized archival data from MO DESE. These data were imported into SPSS software for analysis.

RQ1

Is there an association between a school district's student mobility rate and academic achievement?

H1. There is a statistically significant association between a school district's student mobility rate and academic achievement.

A simple linear regression was conducted to test H1. The association between the mobility rates and the school district's average ACT composite scores was examined. Simple linear regression was chosen for the hypothesis testing since it examines the prediction of a dependent numerical variable from an independent variable. The level of significance was set at .05.

H2. There is a statistically significant association between a school district's student mobility rate and average English scores.

A simple linear regression was conducted to test H2. The association between the mobility rates and the school district's average English scores was examined. Simple linear regression was chosen for the hypothesis testing since it examines the prediction of a dependent numerical variable from an independent variable. The level of significance was set at .05.

H3. There is a statistically significant association between a school district's student mobility rate and average mathematics scores.

A simple linear regression was conducted to test H3. The association between the mobility rates and the school district's average mathematics scores was examined. Simple linear regression was chosen for the hypothesis testing since it examines the prediction of

a dependent numerical variable from an independent variable. The level of significance was set at .05.

H4. There is a statistically significant association between a school district's student mobility rate and average reading scores.

A simple linear regression was conducted to test H4. The association between the mobility rates and the school district's average reading scores was examined. Simple linear regression was chosen for the hypothesis testing since it examines the prediction of a dependent numerical variable from an independent variable. The level of significance was set at .05.

H5. There is a statistically significant association between a school district's student mobility rate and average science scores.

A simple linear regression was conducted to test H5. The association between the mobility rates and the school district's average science scores was examined. Simple linear regression was chosen for the hypothesis testing since it examines the prediction of a dependent numerical variable from an independent variable. The level of significance was set at .05.

RQ2

Is there an association between a school district's student mobility rate and academic achievement in districts with a small student population?

H6. There is a statistically significant association between a school district's student mobility rate and academic achievement in districts with a small student population.

A simple linear regression was conducted to test H6. The association between school districts' mobility rates and average composite ACT scores was examined in districts with a small student population. Simple linear regression was chosen for the hypothesis testing since it examines the prediction of a dependent numerical variable from an independent variable. The level of significance was set at .05.

RQ3

Is there an association between a school district's student mobility rate and academic achievement in districts with a medium student population?

H7. There is a statistically significant association between a school district's student mobility rate and academic achievement in school districts with a medium student population.

A simple linear regression was conducted to test H7. The association between school districts' mobility rates and average composite ACT scores was examined in districts with a medium student population. Simple linear regression was chosen for the hypothesis testing since it examines the prediction of a dependent numerical variable from an independent variable. The level of significance was set at .05.

RQ4

Is there an association between a school district's student mobility rate and academic achievement in districts with a large student population?

H8. There is a statistically significant association between a school district's student mobility rate and academic achievement in school districts with a large student population.

A simple linear regression was conducted to test H8. The association between school districts' mobility rates and average composite ACT scores was examined in districts with a large student population. Simple linear regression was chosen for the hypothesis testing since it examines the prediction of a dependent numerical variable from an independent variable. The level of significance was set at .05.

Limitations

According to Lunenburg and Irby (2008), "Limitations of a study are not under the control of the researcher. Limitations are factors that may have an effect on the interpretation of the findings or on the generalizability of the results" (p. 133). The following are the limitations of this study:

1. There is a possibility that ACT scores, school district size, and mobility rates could have been reported inaccurately.
2. The sample used is limited to school districts with students who took the ACT between the years 2010-2022.
3. The findings of this study are reflective of Missouri. Therefore, the results may not be generalized or applied to other states.

Summary

Within this chapter, the research methods were presented. This research study utilized a quantitative approach, and a correlational research design was used. Simple linear regression was used to examine the association between student mobility and academic achievement. The participants included public and chapter school districts in Missouri. Measurements for this study included school district mobility rates, school district populations, and average ACT results. Data collection procedures were discussed.

There are four research questions accompanied by eight hypotheses to test. The results of the data analysis and hypothesis testing are reported in Chapter 4.

Chapter 4

Results

The main purpose of this quantitative correlational study was to examine the associations between a school district's student mobility rate and their academic achievement. The second purpose of this study was to examine the associations between student mobility rate and academic achievement in different size school districts. Presented in this chapter are the descriptive statistics and the results of hypothesis testing for the research questions.

Descriptive Statistics

The samples for this study consisted of all public and charter school districts within the state of Missouri between the years 2010 and 2022. There was a total of 518 public and 38 charter school districts. The results of the descriptive statistics for all public and charter school districts were recorded in Table 5.

Table 5

Descriptive Statistics on All Variables for All School Districts

	N	*M*	*SD*
Mobility Rate	5,941	20.89	8.16
ACT composite	5,924	20.00	1.85
ACT English	5,924	19.30	2.24
ACT mathematics	5,924	19.44	1.81
ACT reading	5,924	20.58	2.03
ACT science	5,924	20.17	1.79

Note. N represents the number of school districts with complete records between the years 2010 and 2022.

Additionally, districts were categorized by size (i.e., small, medium, and large school districts). Small districts had less than 500 students with a total of 2,227 complete records over the 13-year range. Medium districts had at least 500 students and no more than 9,000 students, with a total of 3,437 complete records. Large districts had more than 9,000 students with a total of 260 complete records. See Table 6 for descriptive statistics on all variables for small, medium, and large school districts.

Table 6

Descriptive Statistics on All Variables for School Districts Categorized by Size

	N	*M*	*SD*
Small School Districts			
Mobility Rate	2,244	20.55	9.06
ACT composite	2,227	19.53	1.87
ACT English	2,227	18.73	2.32
ACT mathematics	2,227	19.02	1.85
ACT reading	2,227	20.14	2.18
ACT science	2,227	19.73	1.89
Medium School Districts			
Mobility Rate	3,437	20.99	7.20
ACT composite	3,437	20.23	1.72
ACT English	3,437	19.58	2.06
ACT mathematics	3,437	19.63	1.67
ACT reading	3,437	20.80	1.84
ACT science	3,437	20.38	1.62
Large School Districts			
Mobility Rate	260	22.65	11.15
ACT composite	260	21.00	2.37
ACT English	260	20.51	2.70
ACT mathematics	260	20.48	2.26
ACT reading	260	21.40	2.42
ACT science	260	21.14	2.18

Note. N represents the number of school districts with complete records between the years 2010 and 2022.

Hypothesis Testing

The hypothesis testing was performed to address the four research questions. The results of the hypothesis testing are detailed below.

RQ1

Is there an association between a school district's student mobility rate and academic achievement?

H1. There is a statistically significant association between a school district's student mobility rate and academic achievement.

A simple linear regression was conducted to examine the association between a school district's mobility rate and average ACT Composite score. The results of the simple linear regression revealed that a statistically significant regression equation was found, $F(1, 5922) = 686.69$, $p < .001$, $R^2 = .10$. Therefore, there was a significant association between the district mobility rate and average ACT Composite score, $B = -.07$, $t(5922) = -26.21$, $p < .001$. The null hypothesis was rejected. Mobility rate explained a proportion of variance (10%) in ACT Composite scores, as for every one-point increase in mobility rate, the ACT Composite score decreases by .07 points.

H2. There is a statistically significant association between a school district's student mobility rate and average English scores.

A simple linear regression was conducted to examine the association between a school district's mobility rate and average ACT English score. The results of the simple linear regression revealed that a statistically significant regression equation was found, $F(1, 5922) = 508.93$, $p < .001$, $R^2 = .08$. Therefore, there was a significant association between the district mobility rate and average ACT English score, $B = -.08$,

$t(5922) = -22.59$, $p < .001$. The null hypothesis was rejected. Mobility rate explained a proportion of variance (8%) in ACT English scores, as for every one-point increase in mobility rate, the ACT English score decreases by .08 points.

H3. There is a statistically significant association between a school district's student mobility rate and average mathematics scores.

A simple linear regression was conducted to examine the association between a school district's mobility rate and average ACT mathematics score. The results of the simple linear regression revealed that a statistically significant regression equation was found, $F(1, 5922) = 724.30$, $p < .001$, $R^2 = .11$. Therefore, there was a significant association between the district mobility rate and average ACT mathematics score, $B = -.07$, $t(5922) = -26.91$, $p < .001$. The null hypothesis was rejected. Mobility rate explained a proportion of variance (11%) in ACT mathematics scores, as for every one-point increase in mobility rate, the ACT mathematics score decreases by .07 points.

H4. There is a statistically significant association between a school district's student mobility rate and average reading scores.

A simple linear regression was conducted to examine the association between a school district's mobility rate and average ACT reading score. The results of the simple linear regression revealed that a statistically significant regression equation was found, $F(1, 5922) = 545.23$, $p < .001$, $R^2 = .08$. Therefore, there was a significant association between the district mobility rate and average ACT reading score, $B = -.07$, $t(5922) = -23.35$, $p < .001$. The null hypothesis was rejected. Mobility rate explained a proportion of variance (8%) in ACT reading scores, as for every one-point increase in mobility rate, the ACT reading score decreases by .07 points.

H5. There is a statistically significant association between a school district's student mobility rate and average science scores.

A simple linear regression was conducted to examine the association between a school district's mobility rate and average ACT science score. The results of the simple linear regression revealed that a statistically significant regression equation was found, $F(1, 5922) = 664.78$, $p < .001$, $R^2 = .10$. Therefore, there was a significant association between the district mobility rate and average ACT science score, $B = -.07$, $t(5922) = -25.78$, $p < .001$. The null hypothesis was rejected. Mobility rate explained a proportion of variance (10%) in ACT science scores, as for every one-point increase in mobility rate, the ACT science score decreases by .07 points.

RQ2

Is there an association between a school district's student mobility rate and academic achievement in districts with a small student population?

H6. There is a statistically significant association between a school district's student mobility rate and academic achievement in districts with a small student population.

A simple linear regression was conducted to examine the association between a school district's mobility rate and average ACT Composite score in districts with a small student population. The results of the simple linear regression revealed that a statistically significant regression equation was found, $F(1, 2225) = 130.72$, $p < .001$, $R^2 = .06$. Therefore, there was a significant association between the district mobility rate and average ACT Composite score in districts with a small student population, $B = -.05$, $t(2225) = -11.43$, $p < .001$. The null hypothesis was rejected. Mobility rate explained a

proportion of variance (6%) in ACT Composite scores in districts with a small population, as for every one-point increase in mobility rate, the ACT Composite score decreases by .05 points.

RQ3

Is there an association between a school district's student mobility rate and academic achievement in districts with a medium student population?

H7. There is a statistically significant association between a school district's student mobility rate and academic achievement in school districts with a medium student population.

A simple linear regression was conducted to examine the association between a school district's mobility rate and average ACT Composite score in districts with a medium student population. The results of the simple linear regression revealed that a statistically significant regression equation was found, $F(1, 3435) = 554.77$, $p < .001$, $R^2 = .14$. Therefore, there was a significant association between the district mobility rate and average ACT Composite score in districts with a medium student population, $B = -.09$, $t(3435) = -23.55$, $p < .001$. The null hypothesis was rejected. Mobility rate explained a proportion of variance (14%) in ACT Composite scores in districts with a medium population, as for every one-point increase in mobility rate, the ACT Composite score decreases by .09 points.

RQ4

Is there an association between a school district's student mobility rate and academic achievement in districts with a large student population?

H8. There is a statistically significant association between a school district's student mobility rate and academic achievement in school districts with a large student population.

A simple linear regression was conducted to examine the association between a school district's mobility rate and average ACT Composite score in districts with a large student population. The results of the simple linear regression revealed that a statistically significant regression equation was found, $F(1, 258) = 283.70$, $p < .001$, $R^2 = .52$. Therefore, there was a significant association between the district mobility rate and average ACT Composite score in districts with a large student population, $B = -.15$, $t(258) = -16.84$, $p < .001$. The null hypothesis was rejected. Mobility rate explained a proportion of variance (52%) in ACT Composite scores in districts with a large population, as for every one-point increase in mobility rate, the ACT Composite score decreases by .15 points.

Summary

The results revealed that a significant negative association exists between a district's mobility rate and academic achievement. The association between a district's mobility rate and academic achievement, as well as the effect size, was similar for average ACT Composite score, average ACT English score, average ACT mathematics score, average ACT reading score, and average ACT science score. When categorizing school districts by size, however, as the student population grew, the effect size of mobility rate on academic achievement increased. That is to say, the negative impact of mobility rate on students' academic achievement was the largest in school districts with a

large population (i.e., districts with more than 9,000 students). Chapter 5 includes a study summary, findings related to the literature, and the conclusions.

Chapter 5

Interpretation and Recommendations

This study was conducted to examine the relationship between a school district's student mobility rate and academic achievement. Additionally, examined in this study were the associations between student mobility rate and academic achievement when school districts are categorized by size. Chapter 5 includes a summary of the study, findings related to the literature, and a conclusion.

Study Summary

Schools nationwide are charged with providing a quality education for all students. People living in the United States change residences for a variety of reasons, both voluntary and involuntary. When moves occur, students often switch schools. Reported in this study is the association between student mobility and academic achievement. Provided in the following sections is an overview of the study by reviewing the problem, purpose statement and research questions, review of the methodology, and major findings.

Overview of the Problem

Research has been conducted regarding the relationship between mobility and academic achievement. Many researchers described the negative effect student mobility had on academic achievement (Bostick, 2016; Grim, 2019; Holbrook, 2013; Locklear, 2017; Mattes, 2017; Rumberger, 2015). Other researchers reported no significant relationship between student mobility and academic achievement (Ernst, 2015; Friedman-Krauss & Raver, 2015; Rippe, 2012; Robinson, 2012). There were mixed results when studies involved large, often urban settings. Results were also inconsistent within studies

involving small, often rural settings. Given the inconsistent results within the current body of literature, further research was warranted.

Purpose Statement and Research Questions

There were two purposes of this quantitative correlational study. The first purpose was to examine the associations between a school district's student mobility rate and their academic achievement. The second purpose of this study was to examine the associations between student mobility rate and academic achievement in small, medium, and large school districts. To guide this study, four research questions were developed, and eight hypotheses were tested to address the purposes of the study.

Review of the Methodology

The population of this study was 488 public and charter school districts within the state of Missouri between the years 2010 and 2022. A quantitative correlational design using archival data was used. The independent variable was the school district's mobility rates. The dependent variables were the average ACT composite, English, mathematics, reading, and science scores. In addition, school districts were categorized as small, medium, and large. A simple linear regression was conducted to test the hypotheses.

Major Findings

The results of the data analysis indicated that school districts with low mobility rates had high rates of academic achievement, and school districts with high rates of mobility had low rates of academic achievement. The association between a district's mobility rate and academic achievement, as well as the effect size, was similar for average ACT Composite score and ACT subtest scores. When categorizing school districts by size, as the student population grew, the negative effect size of the mobility

rate on academic achievement increased. School districts with a smaller population had a smaller effect size of student mobility on academic achievement when compared to larger school districts, which saw a larger negative impact of mobility rate on students' academic achievement.

Findings Related to the Literature

This section examines the current study's findings as they relate to the literature regarding student mobility and academic achievement. Research question one examined if there was an association between a school district's student mobility rate and academic achievement. Dalton (2013) studied the relationship between student mobility and academic achievement in four elementary schools in rural Tennessee. The researcher concluded that there was no significant relationship between mobility and student achievement. Bostick (2016) studied the relationship between student mobility and academic achievement in a multi-year study involving middle school students throughout the state of Texas. The researcher found that the effect sizes for the relationship between student mobility and academic achievement were large. However, when controlling for SES, the results of the study indicated no significant relationship between mobility and academic achievement. The current study found a significant relationship between student mobility and academic achievement, inconsistent with the findings of Dalton (2013) and Bostick (2016).

Research question two examined if there was an association between a school district's student mobility rate and academic achievement in districts with a small student population. Rippe (2012) studied the relationship between student mobility and academic achievement in suburban Nebraska. Rippe studied 80 students of military families and

found that student mobility did not have a significant relationship with academic achievement. Similarly, Robinson (2012) conducted a study involving 213 grade-school students in rural Mississippi. Robinson (2012) found no significant relationship between mobility and student achievement. Friedman-Krauss and Raver (2015) studied 381 preschool through fourth-grade students from Chicago identified as mobile. The researchers found a significant inverse relationship between the number of times low-income children switched schools and the child's math achievement on standardized tests. Mattes (2017) studied the relationship between mobility and student achievement with 314 students in Long Island, New York. Mattes (2017) determined that non-mobile students outperformed their mobile peers and found a significant relationship between student mobility and academic achievement. The current study found a significant relationship between student mobility and academic achievement in districts with a student population of less than 500 students, inconsistent with the findings of Rippe (2012) and Robinson (2012) but consistent with the findings of Friedman-Krauss and Raver (2015) and Mattes (2017).

Research question three examined if there was an association between a school district's student mobility rate and academic achievement in districts with a medium student population. Gullion (2009) analyzed high school mathematics and reading state testing data within Southeastern Indiana. The researcher found that non-mobile students had a nine-percentage point higher pass rate in mathematics and a 10-percentage-point higher pass rate in language arts than mobile students. Gullion (2009) concluded that student mobility had a statistically significant effect on student achievement. Holbrook (2017) conducted a study that focused on 2,300 seventh grade students and determined

that mobile students had a significantly lower achievement level than non-mobile students. Grim (2019) studied the relationship between student mobility and academic achievement for a 4-year cohort of 7,200 high school students in suburban Maryland. Grim (2019) found a significant negative relationship between student mobility and academic achievement, determining that nonmobile students performed better academically than mobile students. The results of the current study were consistent with the findings of Gullion (2009), Holbrook (2017), and Grim (2019), showing that student mobility has a significant negative association with academic achievement in districts with a student population between 500 and 9,000 students.

Research question four examined if there was an association between a school district's student mobility rate and academic achievement in districts with a large student population. Cutuli et al. (2013) conducted a longitudinal study involving more than 26,000 students from Minneapolis Public Schools. The researchers studied the relationship between student mobility and academic achievement measured by reading and mathematics scores for third- through eighth-grade students. Cutuli et al. (2013) found a negative relationship between mobility and academic achievement, and the effect size of being highly mobile was greater than the effect size of being on a free or reduced meal plan. Similarly, Locklear (2017) studied the relationship between student mobility and academic achievement as measured by third-grade ELA assessment data. Locklear's study included 25,000 students in rural North Carolina. Locklear concluded that non-mobile students significantly outperformed mobile students. The results of the current study were consistent with both the findings of Cutuli et al. (2013) and Locklear (2017)

showing student mobility has a significant negative association with academic achievement in districts with a student population greater than 9,000 students.

Conclusions

School districts are faced with providing a quality education for all students, both mobile and nonmobile students. The results of the current study indicated that there is a significant negative relationship between student mobility and academic achievement. The findings from this study have implications for district and building leaders to be intentional in addressing the needs mobile students bring with them as they transition to a new school. Included in this section are the implications for action, recommendations for future research, and the concluding remarks.

Implications for Action

Results from the study indicate that school districts with a higher mobility rate have a lower level of academic achievement as measured by the ACT. There needs to be a greater understanding of student mobility. Each community is unique, with its own housing and economic variables that impact schools. Each school district should increase its efforts to get involved within the community. By having increased opportunities for the schools to hear from community members and by forging partnerships with local government and community organizations, the district gains valuable information that it can use to benefit its students. When the district and the community work seamlessly with consistently high expectations, all students are enabled to grow.

While many districts have plans for students who move into schools, the plans need to be consistently implemented for both students who transition at the beginning of the term and those who transition during the school term. These transition programs need

to address both the academic and social needs of the student as well as inculcate mobile students to the new culture and climate of the school. District leaders need to ensure that the curriculum is being delivered consistently with national, state, and local standards. Mobile students will benefit from a more seamless transition academically if more consistency of curriculum existed between districts because there would be less gaps within instruction. Socially, a mobile student needs to forge age-appropriate bonds with classmates. Being paired with a friendly and responsible student helps the mobile student to understand the climate and culture of the school more quickly. This mentorship may be best initiated by a counselor or classroom teacher, and be implemented by a group of student ambassadors. Additionally, if the student has further social or emotional needs, a counselor or therapist may need to function in an increased role. The transition program may involve the family of the new student as well. A designated person may meet with a parent periodically to review rules and procedures and answer any questions. Having a transition program that includes parents helps to build the social capital beyond the student. To be successful, these transition programs must have support from district and building leadership, counselors, classroom teachers, and students.

To successfully address the needs of mobile students, classroom teachers need additional professional development. Mobile students face a variety of needs, both academically as well as socially. Teachers who have the most direct contact with students need to understand the unique challenges of mobile students, how to identify them, and how to address the challenges within their classroom or through a tiered school-wide intervention plan. While teachers may have extensive training within their curricular domains, often caring for the advanced emotional needs of students new to the climate of

the building may be challenging. Teacher professional learning should involve the myriad of needs mobile students may be experiencing, how to identify them, and how care is best administered, whether in the classroom or throughout the school.

Recommendations for Future Research

Several recommendations have been generated to help close the academic achievement gap between mobile and non-mobile students. The first recommendation is to replicate this study in other states. The expanded study could provide insight that allows for the further comparison of districts of various sizes.

The second recommendation is to conduct a qualitative study with a mixed-methods research design. Students and families could be surveyed to determine the factors impacting their mobility. Each factor for mobility could be categorized and researched to determine its relationship with academic achievement. Additionally, students and families could be asked how well the new school district met their needs and what would have further helped their transition. These results provide insight that would further impact transition programs.

The third recommendation is to consider additional variables differentiating students, such as gender, race, free and reduced lunch status, involvement in extracurricular activities, frequency of mobility, duration within a district, attendance, and graduation rates. The examination of additional variables might provide additional insights into student achievement.

Concluding Remarks

People within the United States will continue to change residences, and students will continue to change schools. School districts have the responsibility to meet the needs

of all learners. There needs to be a continued effort to provide students with a quality education regardless of where they move. Despite the factors that cause students to move, district and school leaders each have a responsibility to address the needs of students within a mobile and diverse community.

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Appendices

Appendix A: IRB Letter of Approval

BAKER UNIVERSITY
Own Confidence

Baker University Institutional Review Board

December 11, 2023

Dear Jeffrey Nevinksi and James Robins,

The Baker University IRB has reviewed your project application and approved this project under Exempt Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
6. If this project is not completed within a year, you must renew IRB approval.

If you have any questions, please contact me at skimball@bakeru.edu or 785.594.4563.

Sincerely,

Scott Kimball, PhD
Chair, Baker University IRB

Baker University IRB Committee
Jiji Osiobe, PhD
Tim Buzzell, PhD
Susan Rogers, PhD
Steve Massey, EdD