5-2015

The Relationship Between Mobility and Student Achievement

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THE RELATIONSHIP BETWEEN MOBILITY AND STUDENT ACHIEVEMENT

by

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Dissertation

Submitted to the Faculty of

Olivet Nazarene University

School of Graduate and Continuing Studies

in Partial Fulfillment of the Requirement for

the Degree of

Doctor of Education

in

Ethical Leadership

May 2015

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Dissertation Reader — 4-18-15 — Date

Jeffrey S. Williamson — Dissertation Coordinator — 4/18/15 — Date

Program Director — 4-18-15 — Date

Vice President for Academic Affairs — 4-18-15 — Date

ACKNOWLEDGEMENTS

The last three years have taken me on an incredible journey. I have experienced emotions that have run the gamut from extreme happiness to utter heartache on this path to the Ed.D. I could fill pages with the names of those who have supported and encouraged me along the way. For those whose names are not listed, know that you are acknowledged in my heart.

I would like to thank my dissertation advisor, Dr. Kelly Brown, for her encouragement and timely feedback. I never had to wait long to hear back from her with advise on how to improve my dissertation, or better yet, to move on to the next chapter. I also want to thank my reader, Dr. Dale Oswalt, with his suggestions and contributions to my dissertation. To both Dr. Brown and Dr. Oswalt, thanks for laughing with me at my typographical error early in the process.

I would be remiss not to thank the members of my new family, Cohort VI, for their thoughts, prayers, and support. All of you have in some way helped me every step of this journey. This voyage would have been much more difficult without having each of you travel it with me. A special thank you goes to my friend, David Kahn. You were there anytime I needed someone to bounce ideas off of or just to vent frustrations. I am so blessed to have met you on this trip to our Ed.D.

DEDICATION

I dedicate this dissertation to my wife, Debbie. I can honestly say that I never would have completed this journey without your support. You were my editor and cheerleader, but you also knew when to give me some space or tough love along the way so that I could complete this program. In a nut shell, your love has made the difference. I am so looking forward to life after the Ed.D. with you.

In addition, I also dedicate this dissertation to my daughters, Sarah and Abby, and my mother and late father, Virginia and Rex. Sarah and Abby, your perseverance in your own lives has been an inspiration to me. Mom and Dad, thank you for modeling a strong work ethic and always being there to support me. I love you all.

ABSTRACT

Mobility, at least sometime before a student graduates from high school, has become the norm rather than the exception in the United States today. The current study represented one high school administrator's effort to examine mobile students' academic performance. A quantitative, quasi-experimental design was utilized to examine the relationship between student mobility and academic achievement as measured by semester grades in mathematics and English classes, and raw scores on the state high school achievement examination. The results indicated that a statistically significant difference existed between the semester one grades in mathematics and English. However, the results further indicated that there was no statistical significance between the semester two grades in mathematics and English or the raw scores on the state assessment.

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CHAPTER I

INTRODUCTION

As the administrator watched the line of students and parents going through the registration process at a suburban high school, he noticed the varied looks on the students' faces. Some students appeared anxious, while others looked excited about starting a new school year. There was even a small group of students that looked disinterested. The administrator wondered at the time if the students' appearances would be any indicator of how successful they would be this school year.

The registration process is nothing new to students and parents as they begin the start of a new school year. Every school has some type of registration procedure that students and parents have to complete in order to enroll in the school. The problem with the above scenario is that it was well into the school year and many of these students were transferring from other school districts. Some of these students had started the school year in another school. However, others were transferring in and had yet to begin taking classes in the new school year. Whatever the reasons for the transfer, none of these students had the opportunity to begin this new school year from the opening day.

The researcher is employed as an administrator in a suburban high school that is part of a school district in a Midwestern city. One of his administrative responsibilities is student registration. In the three years he has been employed in the school district, he has

noticed a high number of high school students registering after the first day of school and throughout the school year. Some of these students are transferring in to the high school with grades in progress. Grades in progress mean that the student has been attending another school and has transferred before the end of a semester. Other students have been out of school for extended periods of time and enroll without grades in progress.

The researcher's initial concern was how well these mobile students' were acclimating into the high school. Was it going to be difficult to adjust to a new school when they were coming in after the school year began? How long would it take them to get acclimated to their new teachers and classmates? The administrator had numerous discussions with other educators about his concerns. He learned that many of the teachers in his building were also concerned about these students. However, their concerns were not exactly what he expected. Teachers with whom he spoke felt that these students were bringing their state achievement scores down. Although there does not appear to be any research conducted on mobility and the Illinois state high school achievement examination, there is numerous research that does indicate mobility may lower scores on standardized assessments (Engec, 2006; Heinlein & Shinn, 2000; Ingersoll, Scamman, & Eckerling, 1989; Temple & Reynolds, 1999). Teachers felt that these mobile students were increasing the number of failing grades in the building. There is research that indicated mobile students may have lower class scores than their non-mobile peers (Boon, 2011; Thompson, Meyers, & Oshima, 2011). Teachers felt that these mobile students were more often found in the dean's office for disciplinary reasons than the non-mobile students. Researchers have also found evidence that mobile students may have more discipline issues for a variety of reasons (Engec; Gasper, DeLuca, & Estacion,

2012; Romanowski, 2003; Sanderson, 2003a; Schulz & Rubel, 2011; Tucker, Marx, & Long, 1998; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993). Teachers also felt that these late arriving students were bringing the attendance rate down. There is evidence that mobile students may have lower attendance rates than their non-mobile classmates (Hinz, Kapp, & Snapp, 2003; Parke & Kanyongo, 2012). All of these concerns, whether true or not, were real to the teachers with whom the administrator spoke.

The administrator's concern for these mobile students shifted from whether they were acclimating successfully into high school to if the mobility of these students might have an effect on their academic achievement and on the high school's overall academic performance. Were the fears of the staff about the mobile students justified? The administrator specifically wondered how successful these mobile students were in their mathematics and English classes. Mathematics and English are two of the academic areas that Illinois public high schools are judged by on the Prairie State Achievement Examination (Illinois State Board of Education, n.d.c). The Prairie State Achievement Examination (PSAE) is an assessment given each spring to qualifying juniors and seniors. The PSAE is also an Illinois state graduation requirement. Was mobility having an adverse effect on these students' academic achievement? Were students who transferred into the building after school began having greater academic difficulties than those students who started the school year in the building? Were mobile students who took the PSAE scoring lower than their non-mobile peers?

Statement of the Problem

The purpose of this study was to measure the relationship of mobility to the academic achievement of high school students in a Midwestern suburban city. The study was accomplished by comparing a cohort of mobile high school students to a cohort of non-mobile high school students in order to determine if there were any academic differences between the cohorts. The specific academic areas examined were the students' mathematics and English classes. The semester grades in the students' mathematics and English classes, in addition to the raw test scores of those students who took the state high school achievement examination, were analyzed to determine if mobility did have a relationship to academic achievement.

When the Illinois State Board of Education initiated the Prairie State Achievement Examination in 2001, in response to the No Child Left Behind Act (NCLB), it raised the academic bar for public high schools in Illinois (Illinois State Board of Education, n.d.b). Many educators embraced this new assessment as a means of determining the level of academic achievement in our high schools. Were high schools being successful? If so, how were they successful? Other educators looked for excuses as to why schools would be classified as failing schools because of the results of this test. While the validity of the assessment might be questioned concerning how it was used to determine whether a high school was successful, the assessment did increase the level of accountability in Illinois public high schools (Illinois State Board of Education, n.d.a). This study explored one characteristic of high school students that might affect their ability to be successful in the classroom and eventually on the state assessment. This researcher chose to study the characteristic of mobility.

Background

Student mobility is not a new phenomenon within the elementary and secondary school systems of the United States. It has been a concern of educators for many years. According to Rumberger (2003), "Student mobility is the practice of students making nonpromotional school changes, often during the school year" (p. 7). Rumberger analyzed 1998 data from the National Assessment of Educational Progress (NAEP) and found that 34% of fourth graders, 21% of eighth graders and 10% of twelfth graders changed schools at least once in the previous two years. Rumberger further found that more students made changes in the schools they attended, outside of promotional changes, during their school careers than students who remained non-mobile. The non-mobile students followed what might be once considered a traditional pattern of school attendance from elementary through high school. It would appear from this data that mobility, at least some time before a student graduates from high school, may be a more common student characteristic than first believed.

The reasons for a student's mobility are varied. Depending on the situation, the causes may be the result of a positive or negative impact on the student's life. The most commonly reported antecedents of mobility included unemployment of the parents/guardians, change in parent/guardian employment, inadequate housing, eviction, leaving a shared residency situation, relocation, and domestic problems (Fisher, Matthews, Stafford, Nakagawa, & Durante, 2002; Kerbow, 1996; Romanowski, 2003; Schafft, 2006; Smrekar & Owens, 2003). The reasons are as varied as the students who are impacted by this situation. In addition, the reasons themselves may have an impact on the level of a student's academic success. Students whose parents are unemployed may

not have the same educational experiences outside of school than their classmates. Students who live in a disrupted home may not have school as their main priority.

Many studies have been conducted to examine if mobility has any effect on student achievement. Researchers have found that students who change schools frequently tend to fall behind their peers academically, are more likely to be retained for an additional year, are more likely to earn a General Educational Development certificate (GED) rather than a standard high school diploma, and are at a higher risk of dropping out of school (Gasper et al., 2012; Houchens, 2004; Kerbow, 1996; Rumberger & Larson, 1998; Rumberger & Thomas, 2000; Wood et al., 1993). Even though students have little influence on whether they transfer between schools, much of the research indicated that the effect of a school transfer impacted their academic achievement.

Researchers have found that students who are mobile tend to score lower on standardized assessments than their non-mobile peers. These lower assessment scores were found on the California Achievement Test (Heinlein & Shinn, 2000) and the Iowa Test of Basic Skills (Engec, 2006; Ingersoll et al., 1989; Temple & Reynolds, 1999). Mobile students have also been shown to perform lower than their non-mobile peers in individual subjects, such as mathematics (Boon, 2011) and English (Thompson et al., 2011).

Researchers have tried to understand why mobility might cause mobile students to perform lower than non-mobile students. Studies have shown that students who make frequent school changes experienced a disruption in their academics because of a lack of continuity in curricular content and experiences (Engec, 2006; Romanowski, 2003; Sanderson, 2003a; Schulz & Rubel, 2011). Even though all schools have mathematics

and English classes, the concepts taught during a grade level or class often differ from school to school depending on the curriculum, textbook, and materials utilized. The pace at which the curriculum is taught may differ depending on the teacher and the knowledge level of the students in the class. When students move from one school district to another, or even between schools in the same district, there can easily be gaps or overlaps in their curriculum. In addition to content challenges, these mobile students must acclimate to another set of teachers, their teaching styles, and the concepts being taught in the classroom. The transition period for mobile students takes time.

There is some evidence that the age of a mobile student may influence the effect of mobility on their academic achievement. Heinlein and Shinn (2000) found that there was a greater negative effect on achievement for those students who were mobile early during their elementary school grades than students who moved later. The authors implied that this may be because the early elementary grades are critical for obtaining the basic skills and any disruption may have lasting academic effects on the student. In comparison, Swanson and Schneider (1999) found that students who moved early in high school had higher gains in mathematics achievement and a lower dropout rate than those students who transferred during the last two years of high school. Families making school changes during the last two years of high school in an effort to give their student another chance in a new environment are unlikely to find success. However, those students who move early in high school have a longer opportunity to become acclimated to the new high school and receive the supports needed to be successful. Houchens (2004) found that students who made the more traditional change in schools during the summer were twice as likely to receive their high school diploma as students who transferred during the

school year. While family circumstances may not allow for this traditional school change, it may reduce the lack of curricular continuity for the student.

Student mobility has not always been found to have an adverse effect on students' academic achievement. Smrekar and Owens (2003) found that students in the United States Department of Defense schools scored higher, when compared to the United States average, on the 8th grade writing and reading portions of the 1998 National Assessment of Educational Progress (NAEP). The trend of students who attend Department of Defense schools scoring higher than the United States average continued on the 2007 Writing portion of the NAEP (O'Gara & Kanellis, 2008) and the 2009 reading portion of the NAEP (O'Gara & Kanellis, 2010). Department of Defense schools serve the children of military personnel who are stationed overseas and in the United States. Smrekar and Owens found that high mobility is very common in Department of Defense schools. The student population of these schools has a turnover of a third of their students every year. However, mobility is viewed as a part of these students' lives, not as part of a problem. Popp, Grant, and Stronge (2011) found that teachers can offset the impact of mobility through the development of strong student-teacher relationships and the use of effective instructional delivery. Other research (Tucker et al., 1998) indicated a family structure that includes both biological parents can minimize the impact of mobility upon students. Family structure is a characteristic of a student that school personnel cannot control, yet should be considered when a student transfers into a new school.

Mobility may also have an effect on the non-mobile students in the classroom. Because mobile students may transfer into a school with knowledge gaps, they can affect the pacing of the classroom curriculum (Kerbow, 1996). Teachers may feel the need to

slow the pace of the curriculum to meet the needs of the mobile student at the detriment to the rest of the class. Altering the pace of the curriculum is a decision that may have lasting academic effects on all of the students in the class. Mobile students may also have more disciplinary issues that can have a negative effect on the classroom environment (Engec, 2006; Gasper et al., 2012; Romanowski, 2003; Sanderson, 2003a; Schulz & Rubel, 2011; Tucker et al., 1998, Wood et al., 1993). When teachers have to spend more time dealing with classroom management issues, it takes away from instructional time.

Students and their families are going to continue moving for a variety of reasons. Rumberger (2003) found that mobility was more common than non-mobility in school age students. School personnel must understand that this characteristic of many students is not going to change. It is essential that educators understand who these mobile students are, what their needs are, why they are mobile, and how they can provide support for these mobile students so that they can be successful in high school.

Research Questions

This study was guided by the following research questions:

1. What is the relationship between mobility and high school students' semester mathematics grades?
2. What is the relationship between mobility and high school students' semester English grades?
3. What is the relationship between mobility and high school students' Prairie State Achievement Examination scores?

Description of Terms

Adequate Yearly Progress (AYP). The progress in mathematics and reading that a school must reach to be considered on track for 100% proficiency by the 2013-2014 school year (Illinois State Board of Education, n.d.b).

English grade. Semester grades earned by a student in the English class in which they were enrolled during the study.

Grades in progress. Current semester grades brought with a transferring student to their new high school. These grades are averaged with the grades earned at the new high school to determine the semester grade.

Individualized Education Program (IEP). A written plan designed to meet the educational needs of students determined to receive special education assistance (Illinois State Board of Education, 2009).

Mathematics grade. Semester grades earned by a student in the mathematics class in which they were enrolled during the study.

Mobile students. Students that transferred into the high school from another high school after the school year had begun (Rumberger, 2003).

National Assessment of Educational Progress (NAEP). The largest nationally continuous assessment of students in grades 4, 8, and 12 in mathematics, reading, science, and writing (National Center for Educational Statistics, 2012).

No Child Left Behind Act (NCLB). An Act signed into law in January 2002 that requires states to develop assessments in basic skills that are given to all students in select grade levels in order to receive federal school funding (Illinois State Board of Education, n.d.a).

Non-mobile students. Students enrolled on the first day of school that completed the school year at the same high school (Rumberger, 2003).

PowerSchool. A web-based student information system that is published by Pearson Education (Pearson, 2013).

Prairie State Achievement Examination (PSAE). The Prairie State Achievement Examination is an assessment given to all Illinois public school students in grade 11 that measures the students' achievement level in reading, mathematics, and science. Four categories of measurement are used: exceeds standards, meets standards, below standards, and academic warning (Illinois State Board of Education, n.d.c).

Significance of the Study

This study is significant in that it will serve to help high school teachers and administrators understand that student mobility may have an effect on their school. The effect of mobility may extend beyond simply asking the custodian to bring in another desk into the classroom or the teacher finding another textbook. Students who transfer in, especially during the school year, are potentially at academic risk.

The significance of examining the mathematics and English grades of the students in this study is that these are the two core areas that are assessed on the state high school assessment, the Prairie State Achievement Examination, and are reported on the school's state report card. In addition, these two curricular areas largely determine whether a school makes Adequate Yearly Progress (AYP). AYP is the benchmark by which all public schools in Illinois are currently compared. In Illinois, the Prairie State Achievement Examination is the standardized test given to all students in grade 11 (Illinois State Board of Education, n.d.c). Including students' Prairie State Achievement

Examination results is significant because no literature was found that addressed whether mobility affected students' scores on this state assessment. Even though studies by Boon (2011), Engec (2006), Heinlein and Shinn (2000), Ingersoll et al. (1989), Temple and Reynolds (1999), and Thompson et al. (2011) indicated that mobility has a negative effect on grades and standardized achievement tests, it was important to determine whether both of these are true for the high school studied in this research.

Researchers have found that depending on the circumstances, mobility may or may not adversely affect students academically (Boon, 2011; Engec, 2006; Romanowski, 2003; Sanderson, 2003a; Schulz & Rubel, 2011; Smrekar & Owens, 2003; Thompson et al., 2011). This study examined the academic effects in a high school in which mobility is a continual issue. The results enabled the teachers and administrators to have a better understanding of how, or if, mobility has an effect on the students and high school in this study.

The purpose of this study was to help educators understand that mobile students may underachieve in the classroom and on the state achievement examination. If a relationship is discovered between mobility and academic achievement, the results could lead to further research on the development and implementation of specific academic supports for this group of students.

Process to Accomplish

The high school in this study is one of four high schools that make up the school district. The population of the school district was composed of approximately 5,100 students. The ethnic makeup was 37% (1,887) Black, 35% (1,785) White, and 20% (1,020) Hispanic. The low income population was 35% (1,785), while the students with

Individualized Education Programs made up 13% (663) of the entire population. The mobility rate for the entire high school district was reported at 8% (408). Student mobility and its potential effect on academics is a concern throughout the school district.

This study was conducted at a high school located in the south suburbs of a large Midwestern metropolitan city. The population of the high school was composed of approximately 1,100 students. The ethnic makeup was 97% (1,067) Black, 2% (22) Hispanic, and 1% (11) White. The majority of the students, 54% (594), were classified as low income and qualified for the free lunch program. Students with an Individualized Education Program (IEP) made up 15% (165) of the population and received Special Education support. The mobility rate of this high school was 13%. The mobility rate indicated that 13% (143) of the population either transferred into or out of the high school during the school year.

The methodology utilized for this study was a quantitative quasi-experimental design or ex post facto. According to Gay, Mills, and Airasian (2012), ex post facto research tries to determine if there is a cause for differences between groups. Leedy and Ormrod (2013) described quasi-experimental research as a method in which groups are pre-assigned because randomness is not practical. In this study, the pre-assigned characteristic was the mobility of the students.

For this study, the demographics of the cohort of mobile students were matched to the demographics of the cohort of non-mobile students during the sampling process. The matching of the two cohorts was done to ensure the two cohorts were as similar as possible. A between-groups approach to the study was conducted because the research results were comparing the differences between the two groups.

The entire population of mobile students was selected to be a part of this study. Selecting all of the mobile students for this study provided as large a sample as possible. Stratified sampling and simple random sampling were both utilized in the selection of the non-mobile population in this study. Salkind (2012) described stratified sampling as a selection process that ensures the sample matches the population. The population to be matched was the students selected to compose the mobile student cohort. In this step of the sampling process, the researcher utilized stratified sampling to create a pool of possible subjects. In this process the characteristics of each of the students in the mobile sample were used to create a pool of possible non-mobile subjects. The only difference between the two groups of students was in the characteristic of mobility. The characteristics of the student's gender, ethnicity, grade level, socio-economic status, special or regular education status, mathematics class, and English class were all considered in the stratified sampling process. Stratified sampling was used to ensure a high level of representation from the population.

Once a population was determined using stratified sampling that matched the characteristics of each member of the mobile sample, a simple random sampling was used to determine their non-mobile counterpart. According to Salkind (2012), each member of a population has an equal and independent chance of being selected in simple random sampling. All members of each non-mobile population were assigned numbers. A table of random numbers was then utilized to determine the students that would make up this cohort. Simple random sampling was used to ensure a high level of representation from the non-mobile population.

The research questions in this study were:

1. What is the relationship between mobility and high school students' semester mathematics grades?
2. What is the relationship between mobility and high school students' semester English grades?
3. What is the relationship between mobility and high school students' Prairie State Achievement Examination scores?

Mobility and semester were the independent variables in this study. There were three dependent variables that were examined to determine the effect of the independent variables on each. These dependent variables were the students' semester mathematics and English grades during the time of the study, and the raw test scores of students who took the Prairie State Achievement Examination.

Historical data was collected using a preexisting data base. The data base in this study is the student information system of the high school studied and is commercially known as PowerSchool (Pearson, 2013). The researcher had access to all protected student information as part of his duties as an administrator at the high school. In addition to the use of student demographics obtained from PowerSchool in the sampling process, the data collected was the selected students' semester grades in their mathematics and English classes, and the raw test scores of those students who took the state high school achievement examination.

According to Yockey (2011), a One-Within-One-Between Analysis of Variance (ANOVA) is used to analyze group differences when there are at least two independent variables with each having more than one level. One of the independent variables is

between-subjects and the other independent variable is within-subjects. For example, the two independent variables for the analysis of the students' mathematics grades would be mobility and the semester. Mobility would be the between-subjects factor and the two levels would be mobile and non-mobile. Semester would be the within-subjects factor and the two levels would be Semester 1 and Semester 2. A simple effects test would be conducted to examine differences between groups within one level of one of the independent variables when the interaction effects are found to be significant.

According to Salkind (2012), a multivariate analysis of variance (MANOVA) is used to examine differences that occur when there is more than one dependent variable. By measuring more than one dependent variable the chances of finding a group difference increases. MANOVA takes into account relationships between dependent variables that might affect the results. For example, a student's mathematics and English grades could affect their results on the Prairie State Achievement Examination. Students' semester mathematics and English grades, and the raw test scores of students who took the Prairie State Achievement Examination are the dependent variables in this study.

The researcher compared the means of the mobile students' semester mathematics grades, semester English grades, and raw test scores on the Prairie State Achievement Examination to the means of the non-mobile students' semester mathematics grades, semester English grades, and raw test scores on the Prairie State Achievement Examination using Statistical Package for the Social Sciences (SPSS) software. The sampling process attempted to increase the homogeneity between the two cohorts so mobility was the only difference. Differences between the means of the two cohorts for

each of the three research questions may suggest a relationship between mobility and achievement.

Summary

This study addressed any impact student mobility might have in a high school located in the south suburbs of a large Midwestern metropolitan city. The initial relevance of this study was to the administration and the teachers of the high school. While the demographics of the high school in this study were different from those of the entire high school district, student mobility was found in all four high schools. The relevance of this study, in regard to the relationship of mobility to academic achievement, can be extended to the entire high school district and perhaps to all public high schools. If the results indicate that mobility may have a negative impact on academic achievement, then this study will be used to develop a program of support for all students who transfer into the high school. In addition, the results will be shared with the staff of the high school and the district administration in this study. Information gained from this research will be utilized in future school improvement planning for the high school. This study additionally served to expand the research knowledge related to the relationship of mobility to the academic achievement of high school students.

This research was intended to examine the relationship of mobility to academic achievement specifically in the curricular areas of mathematics and English and on the state high school achievement examination. Chapter II of this study represents an overview of the literature addressing student mobility and issues that surround this topic.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of this chapter was to review the literature concerning student mobility and the issues that surround this topic. The chapter begins with examples of how student mobility has been defined in the literature. The reasons why students are mobile are then examined. Research is then presented that demonstrates the negative effects of mobility on student achievement both in the classroom and on standardized assessments. This section is followed with research that illustrates that mobility does not always negatively affect student achievement. Further research is presented that shows the timing of a student's mobility can have either a negative, minimal, or no effect on their academic achievement. Timing refers to either the time of year a student changes school or the age of the student at the time of the school change. Next, the potential effects of student mobility on the non-mobile classmates are examined. Finally, recommendations from researchers on how educators can address the issue of mobility in their schools are presented.

Definitions of Student Mobility

Student mobility is not a new occurrence in schools in the United States. Research shows that it is widespread and may be considered normal for the majority of students, at least at some point during their school careers (Rumberger, 2003). Since student mobility

is a common event, having an understanding of this phenomenon in a student's life could be important. Educators could better meet the needs of their students if they understood the relationship between student mobility and achievement.

According to Rumberger (2003), "Student mobility is the practice of students making nonpromotional school changes, often during the school year" (p. 7). This was similar to the definition utilized by the Office for Standards in Education (2002) that stated pupil mobility is "the total movement in and out of schools by pupils other than at the usual times of joining and leaving" (p. 4). Demie, Lewis, & Taplin (2005) defined pupil mobility as "a child joining or leaving school at a point other than the normal age at which children start or finish their education at that school" (p. 131). Staresina (2004) reinforced these definitions by stating that "student mobility refers to the phenomenon of students changing schools for reasons other than grade promotion" (p. 1). The definitions of student mobility in the literature review all seem to have two common threads. These commonalities are that the definitions examine when the student is changing schools and that mobility is for reasons other than normal grade promotion.

Rumberger (2003) analyzed 1998 data from the National Assessment of Educational Progress (NAEP) and found that 34% of fourth graders, 21% of eighth graders, and 10% of twelfth graders changed schools at least once in the previous two years. Rumberger further found that more students made changes in the schools they attended, outside of promotional changes, during their school careers than students who remained non-mobile. The non-mobile students followed what might be once considered a traditional pattern of school attendance from elementary through high school. Utilizing Rumberger's study, student mobility, at least at some point before a student graduates

from high school, is a more common student characteristic than once believed. The next section of this literature review examined the reasons why students are mobile.

Reasons Why Students are Mobile

The reasons presented in the literature concerning why students are mobile are varied. Depending on the situation, the causes may be the result of a positive or negative impact on the student's life.

The most commonly reported antecedents of mobility were found to center around the two main areas of parental employment and housing circumstances. Parental employment situations included the employment status of the parents/guardians (Fisher et al., 2002; Gibson & Hidalgo, 2009; Romanowski, 2003), if there was a change in the parent/guardian employment status (Demie et al., 2005), and if the family was of low income status (Alexander, Entwisle, & Dauber, 1996; Dobson, 2008; Eadie, Eisner, Miller, & Wolf, 2013; Gasper et al., 2012; Hartman & Franke, 2003; Nakagawa, Stafford, Fisher, & Matthews, 2002; Park & Kanyongo, 2012; Rumberger & Larson, 1998; Schafft, 2006; Scherrer, 2013; Temple & Reynolds, 1999; Wood et al., 1993). Housing circumstances included inadequate housing, eviction, leaving a shared residency situation, and relocation (Demie et al.; Fisher et al., 2002; Hartman & Franke; Kerbow, 1996; Kerbow, Azcoitia, & Buell, 2003; Rumberger, 2003; Rumberger & Larson; Schafft).

Fisher, Matthews, Stafford, Nakagawa, and Durante (2002) conducted a study that included determining the antecedents or sources of elementary student mobility in urban-metropolitan school districts in Arizona. The authors found the most commonly reported sources of mobility were poverty concerns, domestic problems, and the relocation of the

family to better communities. The authors included the unemployment of the parents and inadequate housing situations in their definition of poverty concerns.

Gibson and Hidalgo (2009) and Romanowski (2003) conducted studies of students of migrant families. Mobility was a product of these families' employment circumstances. These students typically start school late, but may also change schools many times throughout the school year because of the families search for employment. Similarly, Demie et al. (2005) found in their research that a large group of students were mobile because of families moving for job related reasons. The authors found that parents would gain job training for a few years and then move on to new employment opportunities.

Directly connected to the employment situation of the parent is the socioeconomic status of the family. Dobson (2008) found that schools with high mobility rates also had a higher percentage of students eligible for free school meals. The author found that mobility was a way of life for these low income families. It was common for these families to leave the area and then return at a later date. This was supported by Gasper, DeLuca, & Estacion (2012) who found that students who switch schools were more likely to come from a household that was socioeconomically disadvantaged. The authors further found that these students came from homes without a computer and whose parents were more likely to receive governmental aid. Rumberger and Larson (1998) found that mobility was highest among those high school students from the lowest socioeconomic level. High school students who came from low socioeconomic families changed schools 31.1% of the time compared to 24.3% of students from the highest socioeconomic level. Parke and Kanyongo (2012) found that Black mobile students constituted a higher

percentage of students who qualified for free or reduced lunch when compared to White or other ethnic subgroup. Nakagawa, Stafford, Fisher, and Matthews (2002) found that schools with high mobility had six times as many students who received free or reduced lunches as schools with low student mobility. Eadie, Eisner, Miller, and Wolf (2013) examined the socioeconomic status of the students in their study. The authors found that 76.7% of those students who were identified as being economically disadvantaged made at least one school move during this four year period. This was more than double the mobility rate of those students who were not economically disadvantaged. Other researchers supported the finding that mobile students are more likely to come from low income families who qualify for free lunches (Hartman & Franke, 2003; Schafft, 2006; Scherrer, 2013; Temple & Reynolds, 1999; Wood et al., 1993).

Housing circumstances are also a major indicator of student mobility. Demie et al. (2005) found that 59.3% (32) of the students were mobile because they were homeless and were relocated into temporary housing. Included in their findings was data that showed that 31.5% (17) of the students were mobile because their families were moving for job reasons. Rumberger and Larsen (1998) found that 70% (8,169) of all school changes for students between the eighth and twelfth grades were caused by a change in residence by the family because they were relocating. Schafft (2006) interviewed 22 low income mobile parents in a rural New York school district. The author found children of these parents made 166 school changes over a five year period. The author found that residential change was the major factor that resulted in school change. Schafft found that the main cause of the residential change was the family being forced from their home. The major reasons given for this forced move included eviction, leaving a shared

residency situation, and leaving temporary Department of Social Services housing. Hartman and Franke (2003) found that mobile students moved frequently for a variety of reasons, most of these reasons were unplanned moves. Included in these unplanned moves were eviction because of unpaid bills, housing code violations, and unemployment. Other researchers supported the finding that mobile students are more likely to come from families who have a lack of adequate housing situations (Fisher et al., 2002; Kerbow, 1996; Kerbow et al., 2003; Rumberger, 2003).

While parental employment and housing situations were most frequently mentioned in the literature, family domestic problems (Demie et al., 2005; Dobson, 2008; Fisher et al., 2002; Kerbow, 1996; Nakagawa et al., 2002; Schafft, 2006; Smrekar & Owens, 2003) and students of certain races (Alexander et al., 1996; Cutuli et al., 2012; Eadie et al., 2013; Herbers et al., 2012; Nakagawa et al., 2002; Parke & Kanyongo, 2012; Rumberger & Thomas, 2000) were also cited as being antecedents of mobility.

Demie et al. (2005) found in their sample of mobile students (54) that 44.4% (24) of these students were mobile because the parent was fleeing violence. Dobson (2008) found that while the families of students who enter high school are typically settled and try to avoid moving, parental separation and family breakups were circumstances which caused mobility. This was supported by Fisher et al. (2002) who found that divorce, separation, and domestic problems can cause changes in residence that result in students changing schools. Family instability was an antecedent found by Kerbow (1996) that often led to residential changes. Nakagawa et al. (2002) found that students were moving because of stressful situations in their homes. These situations included a change in child custody or financial problems. Other researchers supported the findings that mobile

students were more likely to come from families experiencing domestic problems (Schafft, 2006; Smrekar & Owens, 2003).

In their study, Cutuli et al. (2012) found that 68.7% (2,510) of those students who were highly mobile were African Americans. This research supported an earlier study by Alexander, Entwisle, and Dauber (1996) in which the authors found that 78.7% (108) of the students who moved two or more times were African American. Nakagawa et al. (2002) found that schools with high mobility had more minority students, more English Language Learners, and students who scored below the national norms on standardized tests. Parke and Kanyongo (2012) supported this observation when they found that Black students at the high school level were significantly more mobile than either the White or other subgroups identified in their study.

Eadie et al. (2013) conducted a study of public school students in Wisconsin (319,230) during a four year period ending in 2011. They found that 36% (114,923) of all Wisconsin students moved at least once during this four year period. Examining these students by ethnicity, they found that 63% (21,699) of Black students and 44% (11,420) of Hispanic students made at least one school move during this period. However, only 29% (66,794) of White students changed schools. When the authors examined those students who they considered to be highly mobile, five or more school moves, they found that 7.3% (2,504) of Black students and 2.1% (561) of Hispanic fit this criterion. The authors only found 0.9% (2,179) of White students were considered highly mobile.

Herbers et al. (2012) found in a study of the Minneapolis Public Schools that 10% (1,784) of the students were classified as homeless or highly mobile (HHM). Student attendance rate in the HHM classification (90.8%) were over 4% lower than the overall

average attendance rate in the district (95%). The authors found that African Americans composed approximately 68% (1,213) of the HHM students, although they only made up 37% (6,664) of the total population. In comparison, of those students in the district who were not HHM and did not qualify for free or reduced lunches, 78% (4,348) were White, although they only made up 33% (5,944) of the students in the district.

Rumberger and Thomas (2000) conducted a quantitative study to examine the dropout and turnover rates in United States high schools using data from the National Education Longitudinal Study of 1988: High School Effectiveness Study and a follow up study in 1990. The study included 247 schools and 7,642 students who completed both surveys. The authors found that while the mean dropout rate was 7.3% (557), the median rate was 4.2%. This finding indicated that the dropout distribution was positively skewed in this sample. The authors found that the dropout problem was concentrated in a small portion of the high schools. Rumberger and Thomas found that the turnover rate was 20.4% overall, while the range was from 5% to 60%. The authors found that ethnic composition of a school was the most powerful indicator of turnover. Schools with more than 40% Black or Hispanic students had turnover rates that were more than 50% higher than comparable schools with lower percentages of these groups. The authors found that while parochial schools had lower dropout rates than public schools, there were differences between these two types of schools in their turnover rates. The authors found that while dropout rates were influenced by a school's resources, structure, and processes, these had little effect on the turnover rate. Rumberger and Thomas found that turnover rate was most influenced by the school's student composition.

While parental employment, housing situations, family domestic problems, and students of certain races were all cited as being major antecedents of mobility, there were other indicators of mobility that researchers identified. These indicators included the schools and neighborhoods that students were leaving (Fisher et al., 2002; Kerbow, 1996; Kerbow et al., 2003; Rumberger, 2003) and the level of parental involvement and parental makeup (Gasper et al., 2012; Temple and Reynolds, 1999).

Rumberger (2003) found that not all student mobility is caused by students making residential changes. At the high school level, the author found that schools can also contribute to mobility. These contributing factors can be over crowdedness, class size reduction, school choice, and the general climate of the school.

Kerbow (1996) found that while 58% (2,904) of the school changes were a result of changed residencies, more than 40% (2,003) of the changes were a result of only school-related factors. These factors included safety issues at the students' previous school and better academic and extracurricular activity programs at the new school. The author found that even though many of the students were transferring because of perceived better academic opportunities, schools that students left were very similar in achievement levels to the schools to which they transferred.

Kerbow et al. (2003) surveyed Chicago sixth graders and found that 42% (2,103) of those students who were mobile moved because of school-related issues. These issues included safety and academic concerns at their previous school. Fisher et al. (2002) found that a commonly reported antecedent of mobility was the relocation to what the families considered to be better neighborhoods.

Temple and Reynolds (1999) identified variables within their study that were more likely to contribute to mobility. These variables included gender, students of parents who did not graduate from high school, and students whose parents were not involved in their child's schooling. Boon (2011) also found that mobile students' parents were more likely to not have graduated from high school. Gasper et al. (2012) found that students who switched schools were more likely to come from a household where only the biological mother was the parent.

The reasons why students are mobile are varied depending on the circumstances surrounding the school change. However, these school changes may result in an adverse effect on the academic achievement of the mobile student. The next section of this literature review examines the negative effects of mobility on student achievement.

Negative Effects of Mobility on Student Achievement

The reasons for mobility may be as varied as the students who are impacted by this situation. In addition, the reasons for mobility may have an effect on the level of a student's academic success. For example, students whose parents are unemployed may not have the same educational experiences outside of school as their classmates. Another example is that students who live in a disrupted home may not have school as their main priority. While there may be various reasons why mobility can negatively affect student achievement, some of these reasons may have nothing to do with the schools. However, even if the reasons do not have anything to do with the schools, mobility can still impact students.

Research studies place the negative effects of mobility on student academic achievement into one of two major categories. The first category examined in the

literature was the negative effects mobility can have on students performances in the classroom and in meeting graduation requirements (Boon, 2011; Eadie et al., 2013; Engec, 2006; Gasper et al., 2012; Gibson and Hidalgo, 2009; Hanushek, Kain & Rivkin, 2004; Heinlein & Shinn, 2000; Houchens, 2004; Kerbow, 1996; Kerbow et al., 2003; Obradovic et al., 2009; Rumberger & Larson, 1998; Sanderson, 2003a; Sanderson, 2003b; Schulz & Rubel, 2011; Tucker et al., 1998; Wood et al., 1993). The second category surveyed in the literature was the negative effects mobility can have on students' standardized assessment scores (Alexander et al., 1996; Benner, 2011; Cutuli et al., 2012; Eadie et al.; Engec; Grigg, 2012; Heinlein & Shinn; Herbers et al., 2012; Hinz et al., 2003; Ingersoll et al., 1989; Isernhagen & Bulkin, 2011; Parke & Kanyongo, 2012; Parke & Keener, 2011; Pribesh & Downey, 1999; Rumberger, 2003; Smith, Fien, & Paine, 2008; Temple & Reynolds, 1999; Thompson et al., 2011; Voight, Shinn, & Nation, 2012; Weckstein, 2003). The literature review continues with the negative effects mobility can have in the classroom and on progress towards high school graduation.

Kerbow (1996) studied the relationship between mobility and student learning. The author found that students who experience numerous moves fell further behind their non-mobile classmates academically. Kerbow found that the achievement gap grew to approximately one full year of growth by the sixth grade for those students who changed schools four or more times. Heinlein and Shinn's (2000) research supported Kerbow's research. Heinlein and Shinn found that students who moved at least three times by the third grade were twice as likely to be overage by the sixth grade in comparison to those students who did not change schools before the third grade. The decline in academic

growth not only placed the child academically behind in elementary school, but also harmed their chances of being academically prepared for high school.

Schulz and Rubel (2011) also agreed with Kerbow (1996) when they found that mobility contributed to a lack of academic progress and gaps in the curricular information that the students received in their classes. This lack of development was a source of frustration for the mobile students in their study, especially when they joined classes that were either too advanced or too slow for their knowledge base. Schulz and Rubel conducted interviews with mobile students and found that these students would often leave a school in which they were learning a concept in a mathematics or English class, only to move to another school and find that the new class was either beyond or behind where the former school had been in the curricular sequence. This difference in curricular pacing led the students to disengage and resulted in either retention in the elementary grades or failure in their high school classes.

Gibson and Hidalgo (2009) studied mobile migrant students. They found that mobile migrant students have their education disrupted because of the frequent moves resulting from their family's employment changes. The numerous school changes hindered the students' chances for academic success. Students were required to adjust to new curriculum, different teacher instructional pacing, and different high school graduation requirements with every move. The authors found that students missed attendance days during school changes. These lost attendance days, in addition to the school changes themselves, placed the students at an academic deficit.

Kerbow et al. (2003) found that students who were mobile missed exposure to important concepts that were fundamental to higher order thinking skills because of

school days missed during a school change. While the concepts missed may not be important for student success at the time of the school change, the authors found that the consequences of missing these concepts were often delayed until the students needed these concepts during a later date or grade level. Mathematics is a curricular area that may be most affected by missing exposure to key concepts. This is because of the many curricular steps needed to understand and utilize the mathematic concepts.

Wood, Halfon, Scarlata, Newacheck, and Nessim (1993) found that when compared to those students who never or infrequently moved, students who relocated frequently were much more likely to have a delay in development, to have a learning disorder, to have repeated a grade, or to have frequent behavioral problems. Wood et al. concluded that frequent family moves were associated with a greater risk of students failing in school.

Boon (2011) conducted a study that examined the relationship between mobility, academic achievement, coping strategies, and suspensions in students' first two years in high school. The study consisted of self-reported questionnaires completed by 1,050 students in grades 8-10 from three high schools in North Queensland, Australia. The author found that mobile students failed their English classes at a rate of 38.4% (403) compared to the non-mobile students' failure rate of 10% (105). This rate was comparable to the Mathematics classes in which the mobile students failed at a rate of 40% (420) compared to the non-mobile students' failure rate of 17.4% (183). The author also found that mobile students who failed their English and Mathematics classes and had high suspension rates used more negative coping strategies. Boon concluded that the use

of coping strategies may be a technique that mobile students could utilize to better adjust to their new school, teachers, classmates, and curriculum.

Both Engec (2006) and Boon (2011) identified a positive correlation between mobility and the suspension rate of students. In his study, Engec found that students who changed schools during the school year were more likely to be suspended from school than those students who did not change schools. Boon supported these findings when she found that the mobile students in her study (125) had a suspension rate of 37.6% (47). This rate was over twice the non-mobile students' (925) suspension rate of 15.2% (140). There appeared to be a relationship between mobility and a student's behavior in school. Inappropriate behavior on the part of the mobile student can increase the total number of days the student is absent. This increase in the number of missed days is due to time missed for suspensions in addition to those days missed during the actual changing of schools.

Sanderson (2003b) interviewed teachers who had mobile students in their classrooms. The author found that the teachers believed that the mobile students were generally lacking in basic skills and academic foundations. Teachers questioned the continuity of the students' education because of their mobility. Teachers also shared concerns about the loss of instructional time because of gaps in student learning. The comments of the teachers reinforced the idea that there is a loss of instructional time when students change schools. This loss of academic time results in gaps in the mobile students' education.

Tucker et al. (1998) conducted a study to determine the impact of mobility on elementary students. The authors examined information from 4,595 students collected

from the Child Health Supplement to the 1988 National Health Interview Survey in their study. Tucker et al. found that of the entire sample of students, 74.9% (3,442) had moved at least once during their elementary school years. This data supported Rumberger's (2003) contention that mobility is normal for most students. The authors found that the average number of school moves for elementary students was 1.62. The authors also found that 21.5% (740) of these mobile students had academic or behavioral problems in school.

Sanderson (2003a) concurred with Tucker et al. (1998) concerning mobile students' behavior problems when he interviewed teachers of mobile students. The authors found that teachers perceived mobile students as having negative attitudes towards school. This negativity often led to aggressiveness in the classroom which could result in loss of academic time for disciplinary reasons. Sanderson noted that teachers found many mobile students had educational gaps in their learning because of their frequent school moves.

Rumberger and Larson (1998) conducted a study of surveys from the National Educational Longitudinal Study of 1988 and follow-up data collected in 1990, 1992, and 1994 that examined the incidence of student mobility between grades eight and twelve and the effects of the mobility on high school completion. The final sample consisted of 11,671 students. The authors found that 26.8% (3,127) of high school students had changed schools between grades eight and twelve. Rumberger and Larsen did not count promotional school changes in their calculations. They also found that 23.3% (256) of all students who changed schools 2 or more times (1,097) dropped out of high school by the twelfth grade compared to only an 8.3% (709) dropout rate for students who did not

change schools (8,543). Rumberger and Larson also found that students who were retained before the eighth grade were four times as likely to not complete high school as those students who were not retained before the eighth grade.

Houchens (2004) conducted a study that examined the academic achievement of high school students in the Broward County Public Schools of Florida to determine the graduation rates of students who entered the ninth grade during the 1997-1998 and 1998-1999 school years. For this study, the author examined data of the 12,808 students in the 1998 cohort and the 13,127 students in the 1999 cohort who were still enrolled during their fourth year in high school. Houchens found that both mobility and ethnicity influenced whether a student graduated on time. The author found that of the ethnic groups, Asian students were more likely to receive a high school diploma, with White students making up the second highest group. Hispanic and Black students made up the two lowest achieving groups. The author also found that students of low socioeconomic status were less likely to receive a standard diploma than those students of higher socioeconomic status. In addition, non-mobile students were more likely to receive a high school diploma than mobile students. Mobile students were also more likely to leave the district, be retained for an additional year, or receive a GED than non-mobile students. Because Black and Hispanic students made up the larger portion of the students from the low socioeconomic status, these students were at a higher risk of not completing high school on time than their White or Asian classmates.

Gasper et al. (2012) used data from 2,751 students to determine whether changing high schools led to dropping out of school. The authors found that 71.9% (1,977) of the students attended one high school, while 19.8% (545) attended two high schools, and

6.6% (182) attended three high schools. Gasper et al. found that students who attended more than one high school were more likely to drop out than students who stay in the same high school. The authors found that the dropout rate for students who did not change high schools was 8.1% (160), while this rate more than doubled to 19.1% (104) for students who changed schools once, and more than tripled to 25.9% (47) for students who changed schools twice. The authors noted that a change of high school is not the only difference between these groups of students. They found that those students who were mobile were more likely to come from families that were of low socioeconomic status, had fewer family assets, and had a single parent as the head of the household. The authors also found these mobile students had lower academic achievement, were absent more days from school, and were more likely to have been suspended from school for behavioral reasons than their non-mobile classmates. Eadie et al. (2013) agreed with Gasper et al. In their study of Wisconsin public school students (22,463), they found that of those students who did not graduate from high school, 42.6% (1,249) moved at least once during the four year period of the study.

The review of the literature suggested a possible relationship between mobility and the student's ability to be successful in the classroom and to graduate from high school on time. The literature also addressed the negative effects student mobility can have on standardized assessments. While most of the literature dealt with the negative effects on standardized assessments at the elementary level, some research has been conducted at the high school level.

Heinlein and Shinn (2000) conducted a study of 764 sixth grade students enrolled in the New York City Community School District during the 1996-1997 school year that

determined if there was a relationship between student mobility and school achievement. The authors used data from the students' permanent school records and the mathematics and reading scores from the California Achievement Test in their analysis. Included in this data was the total number of students' school transfers before the third grade and between the fourth and sixth grade. The authors considered students who moved at least twice by the end of the third grade or twice between the fourth and sixth grade to be highly mobile. Heinlein and Shinn found that students who moved two or more times by the third grade scored lower on both the third and sixth grade assessments.

Alexander et al. (1996) conducted an earlier study that also examined the potential effects of mobility on mathematics and reading scores from the California Achievement Test. The authors used data spanning five years from elementary school students in the Baltimore City Public Schools. Their population consisted of 767 students who began first grade in the fall of 1982. Similar to Heinlein and Shinn (2000), the authors found that those students who moved two or more times during their elementary school grades scored lower than those students who did not change schools.

Hinz et al. (2003) conducted a study of the Minneapolis School District's plan to address district-wide attendance during the 1999-2000 school year by examining student data from the district's student information system. The authors found that the district's high mobility rate had a negative effect on student reading scores. When the authors compared elementary students who were mobile to those students who were non-mobile, they found that the non-mobile students had average reading scores that were twice as high as those students who moved at least three times during the school year. The authors also found that students with very high attendance had reading scores that were 20 points

higher than those students who had attendance rates of 84% or less. Many times, mobile students have lower attendance rates than non-mobile students. This absenteeism can lead to lower assessment scores.

Cutuli et al. (2012) agreed with Hinz et al. (2003) when they found that highly mobile students had poorer attendance than non-mobile students. The mobile students had lower reading and mathematics achievement scores from the third grade through the eighth grade compared to students who were non-mobile. The lower achievement scores were especially prevalent during the year following the students' mobility.

Grigg (2012) had results similar to Cutuli et al. (2012) in a study of students in grades three through eight in the Metropolitan Nashville Public Schools. The author found that both nonpromotional and promotional school changes were associated with lower reading and mathematics assessment scores in the year after the students' changed schools. On average, the author calculated that a student who changed schools for nonpromotional reasons lost 3% of the expected gains in reading and 6% in mathematics. Grigg determined the academic cost of these school changes resulted in a loss that would be the equivalent of one week of instruction in reading and two weeks of instruction in mathematics.

In an earlier study, Temple and Reynolds (1999) found that because of making school changes, students had a loss in achievement. The authors found that on the seventh grade assessment of the Iowa Test of Basic Skills, each school change was associated with a loss in reading achievement of 1.34 points and mathematics achievement of 1.19 points. The authors found that students who moved four or more times by the seventh grade were six months behind in reading and five months behind in mathematics grade-

equivalent scores. This was a greater loss in academic achievement than identified by Grigg (2012).

Eadie et al. (2013) examined the relationship between changing schools during the previous school year and tenth grade students' performance on the Wisconsin state mathematics and reading assessment. The authors found that students who were non-mobile had significantly higher scores than students who were mobile. This was also true when the authors compared assessment scores of students who moved any year prior to the state tenth grade assessment to students who never moved.

Thompson et al. (2011) collected school level data on student mobility rate and the results of the state's criterion-referenced academic competency test. Thompson et al. found a negative correlation between mobility rate and academic achievement across all elementary grades tested in reading, language arts, and mathematics. The authors also found that reading was the academic area that was most negatively affected by mobility. This negative correlation between reading and mobility was observed at each grade level from the first grade through the fifth grade.

Rumberger (2003) studied data from the National Assessment of Educational Progress. The author found that students who made two or more school moves during the previous two years were half as likely to score in the proficient category of the reading assessment compared to those students who did not change schools. Smith, Fien, and Paine (2008) found similar results in their study. The authors examined the effect of student mobility on reading achievement in second grade students in 34 schools in a northwestern state during the 2005-06 school year. The results showed that reading performance increased the longer a student stayed in the same school.

Herbers et al. (2012) found in their study of students in the Minneapolis Public Schools that oral reading ability in the first grade was a predictor of academic growth in both reading and mathematics in the third through the eighth grade. They found that the overall average oral reading ability of all first graders was 60 words per minute. Those students who were classified as homeless or highly mobile (HHM) read at an average rate of only 41 words per minute. In comparison, those students who were non-mobile and were not of low socioeconomic status read at a higher rate of 87 words per minute. Herbers et al. found that by the time the HHM students reached the eighth grade, they scored 40 points lower on the mathematics portion and 20 points lower on the reading portion of the Measures of Academic Progress (MAP) assessment than students who were non-mobile and not of low socioeconomic status.

Voight, Shinn, and Nation (2012) agreed with Herbers et al. (2012) when they found that students who made school changes in kindergarten through the second grade had significantly lower scores in both reading and mathematics on the third grade Tennessee state assessment. The authors found that for every school change a student made between kindergarten and second grade, the third grade assessment score lowered by 1.5 normal curve equivalents. Normal curve equivalents were determined based on how the student compared to other students in their grade level statewide. Voight et al. found that the achievement gap between mobile and non-mobile students is not made up over time. This gap existed throughout the mobile student's elementary years.

Ingersoll et al. (1989) conducted a study that examined the impact of mobility on the student achievement of 58,400 elementary, middle, and high school students in the Denver, Colorado Public Schools during the 1985-1986 and 1986-1987 school years. The

results of the Iowa Tests of Basic Skills for the elementary grades and the Tests of Academic Progress for the high school grades were used to determine academic achievement. Ingersoll et al. found that the academic achievement levels of the non-mobile students were consistently higher than the achievement levels of the mobile students across all grade levels. When the authors examined subtests of the assessments, they found that in 11 of the 12 grade levels assessed, the effect of mobility was greater in mathematics than in reading. Their findings differed from the results identified by Temple and Reynolds (1999) and Thompson et al. (2011). These authors, in separate studies, found that mobility affected students' reading scores more than mathematic scores in the elementary grades.

Isernhagen and Bulkin (2011) conducted a study that examined the effects of mobility on highly mobile students, non-mobile students, teachers, and schools in Nebraska during the 2007-2008 and 2008-2009 school years. The authors utilized data from criterion-referenced assessments for fourth, eighth, and eleventh grade students in 212 of the 254 Nebraska school districts. The authors found that mobile students scored lower on criterion-referenced assessments than non-mobile students in all three grade levels and in all four areas of the assessment. In examining the results of the eleventh grade assessments, non-mobile students scored 16% higher than mobile students in Reading, 17% higher in Mathematics, 17% higher in Science, and 10% higher in Writing.

Parke and Keener (2011) conducted a study that examined the effect of student mobility on math performance in a large, urban school district in the northeast. The results showed that there was a significant difference between those students who attended the same high school for all four years compared to those students who were

mobile and changed high schools. Parke and Kanyongo (2012) agreed with these results when they found that mobility had a direct impact on 11th grade students' scores on the state mathematics assessment. The authors found that not only did non-mobile 11th grade students score higher on the state mathematics assessment than mobile 11th grade students, but that ethnicity also was a factor. Even though White mobile students scored lower than White non-mobile students, White mobile students scored higher than Black mobile students on the mathematics assessment.

Pribesh and Downey (1999) conducted a study that examined the effects of mobility on academic achievement. The authors used the National Education Longitudinal Study of 1988 and 1992 to examine data collected from both studies for 14,929 students, parents, teachers, and principals. The authors found that mobility lead to a decline in math and reading test scores. Mobile students' math test scores declined by 5.9 points between 1988 and 1992. Mobile students' reading test scores declined by 3.1 points during the same time period.

Engec (2006) found that student performance in Louisiana on the Iowa Test of Basic Skills had a negative correlation with mobility. The author found that students who transferred during the school year had lower achievement scores than their non-mobile peers. Engec noted that these results were consistent within each ethnicity group and grade level.

Benner (2011) examined the effects of loneliness on mobile students. The author found that mobile students were more likely to view themselves as isolated and alone. Benner found that these mobile students had poorer academic achievement by the end of

the 10th grade. They were also less likely to have passed their state high school exit exams than students who were non-mobile and did not consider themselves to be lonely.

While the literature review in this section dealt with the negative effects of mobility on student achievement, Weckstein (2003) suggested the effects may actually be worse than reported. The author proposed that mobile students are not being assessed according to the requirements of the No Child Left Behind Act. Because these students are mobile, there is an increased likelihood that they will be absent from school during the time of the assessment. This lack of assessment results can hinder school personnel in assisting these mobile students in receiving the necessary instruction and supports needed to be successful in school.

When Mobility Does Not Affect Student Achievement

The review of the literature revealed that while mobility has been shown to negatively impact students in the classroom and on standardized assessments, there were studies in which mobility did not always have a negative impact on students (Benner, 2011; Boon, 2011; Franke, Isken, & Parra, 2003; Hartman & Franke, 2003; O'Gara & Kanellis, 2008, 2010, 2011; Popp, Grant, & Stronge, 2011; Smrekar & Owens, 2003; Tucker et al., 1998). These studies revealed that by having procedures and supports in place, school personnel can reduce or eliminate the negative effects of student mobility.

A study was conducted by Smrekar and Owens (2003) that examined the high student achievement in the U.S. Department of Defense Education Activity (DoDEA) schools. DoDEA schools serve the children of parents serving in the military both in the United States and overseas. The authors found that military personnel are typically transferred to a new base every three years. This resulted in DoDEA schools having a

turnover of a third of their students every year, or a mobility rate of approximately 33%. Smrekar and Owens used the results of the 1998 National Assessment of Educational Progress (NAEP) for the quantitative portion of their study and interviews for the qualitative portion. The authors found that the students in the DoDEA schools scored higher, when compared to the U.S. average, on both the 8th grade Writing and Reading portions of the 1998 NAEP. Interviews were conducted with 130 principals, teachers, superintendents, parents, counselors, and military commanders in five U.S. districts and five overseas districts. The authors found during these interviews that while high mobility was very common in DoDEA schools, mobility was viewed as a part of these students' lives, not as a problem.

Smrekar and Owens (2003) identified six themes used by DoDEA schools that reduced the negative effects of high mobility on the students' academics. First, the schools had highly qualified and stable teaching forces. Second, expectations of student achievement were high for all students. The authors found that from the 1998 NAEP, 81% of the students reported teachers' expectations of them were very high compared to only 58% of the national public school sample. Third, students were given individual attention when they arrived at a new school. This attention included a review of their records and an informal assessment of the students' academic progress. Fourth, full-time registration clerks and counselors were on staff to deal with the constant mobility of the population. Fifth, a majority of the schools were small in size which enabled the school personnel to develop relationships with the students and to better meet their needs. Sixth, the schools expected parents to be involved in school and school activities.

The trend of DoDEA students scoring higher on the NAEP than the United States average continued on the 2007 Writing assessment (O'Gara & Kanellis, 2008), the 2009 Reading assessment (O'Gara & Kanellis, 2010), and both the 2011 Reading and Mathematics assessments (O'Gara & Kanellis, 2011). On the 2002 and 2007 writing portions of the NAEP, DoDEA eighth graders ranked fourth each year. In comparing minority students, DoDEA African American eighth graders ranked first in the nation on both the 2002 and 2007 Writing assessments when compared to African American eighth graders in the United States public schools. DoDEA Hispanic eighth graders also ranked first on the 2002 and 2007 writing assessments in comparison to Hispanic American eighth graders in the United States public schools. Both the DoDEA African Americans and Hispanic students in eighth grade continued these high rankings on the 2009 NAEP Reading results. On the 2011 Reading test, these ethnic groups still ranked sixth. On the 2011 Mathematics test, all DoDEA eighth grade students ranked 16th in the nation. However, eighth grade Black and Hispanic DoDEA students continued their high academic accomplishments with a top ranking on the Reading assessment (National Center for Educational Statistics, n.d.). The assessment results of the DoDEA students indicated that the interventions and supports provided by the school personnel serving these students were successful in reducing the impact of high mobility on student achievement.

Other studies have supported the findings of Smrekar and Owens (2003) in supporting the concept that schools can reduce the impact of mobility on student achievement if they have procedures and supports in place. Popp et al. (2011) conducted a study of teachers who had won national or state awards and were teaching in

classrooms with highly mobile students. The authors found that teachers could offset the impact of mobility through the development of strong student-teacher relationships and the use of effective instructional delivery. Popp et al. found that when teachers strived to ensure that all students received the necessary support, mobile students could be successful in school. Popp et al. found these teachers used a variety of instructional activities, including questioning and modeling, in their curricular delivery. Effective teachers of mobile students asked questions beyond the recall level. These teachers also identified as having high student engagement in the classroom.

School personnel, outside of classroom teachers, can also assist students in reducing the effects of mobility. Student Services personnel, such as school counselors and social workers, can provide these mobile students with emotional strategies that can help them to overcome the stresses of changing schools. Boon (2011) found that mobile students who were successful academically and had lower suspension rates utilized positive coping strategies. In Boon's study, Student Service personnel led individual or group meetings. During these meetings, students were shown and taught how to utilize emotional strategies that could improve their academic success. Benner (2011) found that mobile students achieved higher academic progress when they received support from their peers. This support could come during small group sessions conducted by counselors or social workers. Franke, Isken, & Parra (2003) found in their study of an elementary school with high mobility near Los Angeles, California, that by having intake procedures, programs, and services in place, the school was able to reduce the negative effects on student achievement.

The family of the mobile student can also play a role in neutralizing the effects of mobility on student achievement. Tucker et al. (1998) found there was a relationship between the number of school changes a student made and the probability of the student having academic problems. However, the structure of the students' family could minimize the impact of mobility. The authors found that the loss of student achievement was reduced when the family included both biological parents. Hartman and Franke (2003) found that school changes can be beneficial to the academic achievement of the student. They found that students who move to better schools or neighborhoods benefitted academically. School personnel cannot control the family structure of mobile students or the neighborhoods in which their schools are located. However, school personnel can be aware of these indicators as they work to support their mobile student population.

The Timing or the Age of the Student can Affect Achievement

The review of the literature revealed some research that indicated that the time of the year or the age of the student can influence the effect of mobility on academic achievement (Heinlein & Shinn, 2000; Houchens, 2004; Ingersoll et al., 1989; Malmgren & Gagnon, 2005; Swanson & Schneider, 1999).

Swanson and Schneider (1999) conducted a study of 16,489 students that examined the effects of mobility on mathematics achievement, behavioral problems, and high school dropout. The authors used data from the National Education Longitudinal Study 1988-1994 for their research. The authors examined the differences between students who changed high schools during their 9th and 10th grade years compared to those students who changed schools during their 11th and 12th grade years. Swanson and

Schneider found that about 29% (4,781) of high school students were mobile before the end of their 10th grade, while 24% (3,957) were mobile after the 10th grade and by the end of the 12th grade. Swanson and Schneider found that those students who moved early in high school had higher gains in mathematics achievement, fewer discipline problems, and a lower dropout rate in their new school than those students who transferred during the last two years of high school. In addition, the authors found that students who moved early in high school may actually benefit from the move. They found that non-mobile students with a grade average of a D and serious behavioral problems had a 70% chance of dropping out of high school. In comparison, mobile students with similar characteristics who changed schools by the end of the 10th grade had only a 20% chance of dropping out of high school.

Malmgren and Gagnon (2005) conducted a study of 70 high school students with emotional disturbances that examined the effects of school mobility. The authors found that 89% (62) of the students had changed schools at least once by the end of the fifth grade with the average number of school moves for this group being 2.69. Malmgren and Gagnon found that 39% (24) of the students had experienced at least one mid-year school change and 27% (17) had at least two mid-year school changes by the end of the fifth grade. Malmgren and Gagnon concluded that while changing schools was disruptive to the child's academic achievement, mid-year school changes were more disruptive than school changes over the summer months. Houchen's (2004) findings supported those of Malmgren and Gagnon. Houchen examined the timing of a student's mobility. The author found that the timing of a student's school change made a difference in graduation

attainment. Students who changed schools during the summer were twice as likely to receive their high school diploma as students who transferred during the school year.

In separate studies examining the effects of mobility on elementary school students, Ingersoll et al. (1989) and Heinlein and Shinn (2000) found similar results concerning grade level and mobility. They each concluded that the effect of mobility on student achievement decreased as the grade level increased. Their research indicated that student mobility in the early elementary grades had a more significant impact on academic achievement than mobility in the later elementary grades.

Effects on the Non-Mobile Classmates

The review of the literature included evidence that the mobile students were not the only ones affected by their mobility (Hanushek et al., 2004; Hartman & Franke, 2003; Kerbow, 1996; Kerbow et al., 2003; Sanderson, 2003a, 2003b). Teachers and classmates are also affected because of the potential lower knowledge level and disruptive behavior of the mobile students.

Kerbow (1996) found that the pacing of classroom curriculum was slowed because of student mobility. Fifth grade classrooms composed of mostly mobile students were at the same curricular level as fourth grade classrooms composed of mostly non-mobile students. The author also found that those students who had made four or more school changes by the sixth grade were a full year behind in their academic knowledge. This was a concern for not only the mobile students, but also their teachers and classmates. Teachers had to slow the pacing in order to accommodate the lower academic knowledge of the mobile students.

Kerbow et al. (2003) supported Kerbow's (1996) earlier findings in their study of Chicago schools. The authors found that schools who reported higher mobility rates had a slower instructional pace in their mathematics classes. By the fifth grade, schools with a high mobility rate were at the same instructional pace as a fourth grade in a school with low mobility. This meant that even the non-mobile students in these schools were behind in their mathematics curriculum because of the mobility of other students.

Sanderson (2003a) reported that teachers believed that high mobility rate made it challenging to engage all of the students in their classrooms because the mobile students tended to be disconnected during the classroom learning activities. This could have been a result of gaps in the mobile students' education. Teachers felt that all students lost instructional time because of the constant review needed for the mobile students.

While mobile students can affect the pacing of the classroom curriculum, Sanderson (2003b) noted that teachers believed that the behavior of mobile students can also change the climate of the classroom. A common theme during interviews with teachers was that mobile students caused a disruption in the classroom because they arrived with a negative attitude concerning learning. The major form of disruption from the mobile students was in their classroom misbehavior. The teachers also commented that it took time away from previously planned lessons to provide adaptations for the mobile students' educational diversity.

Hartman and Franke (2003) agreed with Sanderson (2003b) when they found that non-mobile students experience educational disruptions because of mobile students entering the classroom. They concluded that teachers must slow down classroom pacing

and deal with the behavioral problems of mobile students who inhibit instructional progress.

Recommendations from the Literature

The review of the literature regarding student mobility included numerous suggestions concerning what school personnel should do to assist mobile students and their families with the transition into a new school (Demie et al., 2005; Engec, 2006; Fisher et al, 2002; Frank et al., 2003; Gibson & Hidalgo, 2009; Hacohen, 2012; Hallett, 2010; Isernhagen & Bulkin, 2011; Nakagawa et al., 2002; Rhodes, 2008; Rumberger, 2003; Schulz & Rubel, 2011). All of these suggestions can be organized into three categories or recommendations. These recommendations are to have an induction process in place, provide support services for the new student, and provide services for the mobile family. All of these recommendations were proposed to help ensure the academic success of mobile students.

Rumberger (2003) suggested that school personnel prepare in advance for incoming mobile students. His suggestions included an orientation video of the school to show to the incoming student and their family and the development of an assessment to determine the classes a student should be assigned. Other researchers (Demie et al., 2005; Isernhagen & Bulkin, 2011; Nakagawa et al., 2002) agreed with Rumberger that mobile students who entered schools that had an induction or transition process in place were more academically successful in their new school. Hacohen (2012) suggested that educators must develop interventions for mobile students because school personnel cannot assume that mobile students will be able to assimilate into a new environment on their own and be successful.

Once the mobile students have enrolled in the new school, the students are still in need of additional support to ensure their successful transition. School counselors were identified in the literature as having a major role in assisting in the integration of these new students. Many authors (Franke et al., 2003; Gibson & Hidalgo, 2009; Hallett, 2010; Rhodes, 2008; Rumberger, 2003; Schulz & Rubel, 2011) recommended that school counselors meet with these mobile students upon their arrival. However, in addition, the authors recommended that a program of support be developed to continue meeting and assisting these students. These programs could include addressing the social and emotional needs of the students, in addition to the students' academic needs. Academic support, in the form of tutoring, was also mentioned in the literature as a means of addressing the potential negative effects of mobility (Engec, 2006; Fisher et al., 2002; Franke et al., 2003).

The families of mobile students can have a big impact on the successful integration of the mobile student. Nakagawa et al. (2002) found that programs and practices, such as offering adult education classes and having a staff member assigned to increase parent involvement, helped with the mobile student's educational success. They found that reaching out to parents was important, especially because school personnel were able to obtain a better understanding of the family's stresses and concerns. In this way, school personnel could better meet the needs of the mobile student. Fisher et al. (2002) and Romanowski (2003) agreed with Nakagawa et al. when they recommended that it was important for teachers to reach out to parents of mobile students to welcome them into the school community and to build connections between families and the school.

Conclusion

The research presented in this chapter defined student mobility and presented reasons why students are mobile. The literature review continued with the negative effects of mobility, along with examples of when mobility does not result in unfavorable effects on students' academic achievement. Recommendations from the authors who have conducted research on student mobility were presented as a means of offering what school personnel are doing to effectively address student mobility in their schools (Demie et al., 2005; Hacohen, 2012; Isernhagen & Bulkin, 2011; Nakagawa et al., 2002; Rumberger, 2003).

In reviewing the literature, most of the researchers focused their work on the impact of mobility on elementary students. While the curricular areas of reading and mathematics were a common area of research, less research was conducted specifically on the relationship between mobility and high school students' mathematics and English grades (Boon, 2011; Schulz & Rubel, 2011). Little research was found that addressed the impact of mobility on standardized achievement scores of high school students (Eadie et al., 2013; Ingersoll et al., 1989; Isernhagen & Bulkin, 2011; Parke & Keener, 2011). In addition, the literature review found a complete lack of research concerning the relationship between mobility and the Prairie State Achievement Examination. Therefore, this study was conducted to examine the relationship between mobility and high school students' mathematics and English grades and scores on the Illinois state high school achievement examination. This research was conducted to expand the research knowledge concerning the relationship between mobility and the academic achievement of high school students.

Chapter III of this study represents the methodology utilized to examine the relationship of mobility to academic achievement, specifically in the curricular areas of mathematics and English and on the Illinois state high school achievement examination.

CHAPTER III

METHODOLOGY

Introduction

The previous chapter reviewed the literature concerning student mobility and the issues that surrounded this topic. The literature review examined the definitions of student mobility and the reasons that led to this mobility. Research was presented concerning the negative effects of mobility on student achievement. The review also presented contrasting studies that illustrated mobility did not always negatively affect student achievement. Further research was presented that showed the timing of a student's mobility could have an effect on their academic achievement. The review then examined research on the potential effects of student mobility on the non-mobile classmates. Finally, recommendations from researchers on how educators could address the issue of mobility in their schools were presented.

This study was guided by the following research questions:

1. What is the relationship between mobility and high school students' semester mathematics grades?
2. What is the relationship between mobility and high school students' semester English grades?
3. What is the relationship between mobility and high school students' Prairie State Achievement Examination scores?

This chapter will present how data was collected in order to answer the study's research questions. The chapter will begin with a description of the research design and the population involved in the study. Then, the data collection procedures and analytical methods utilized in examining the data will be discussed. Finally, the limitations of the research design will be presented in relationship to how these limitations may have had an effect on the results of the study.

Research Design

This study compared the mathematics semester grades, English semester grades, and raw scores on the Prairie State Achievement Examination between two groups of students. One group of students met this study's definition of mobile, while the second group of students met this study's definition of non-mobile. The major goal of the study was to determine if there was a relationship between student mobility and academic achievement in mathematics semester grades, English semester grades, and on the Prairie State Achievement Examination.

The methodology utilized for this study was a quantitative quasi-experimental design or ex post facto. Leedy and Ormrod (2013) described quasi-experimental research as a method in which groups are pre-assigned because randomness is not practical. In this study, the pre-assigned characteristic was the mobility of the students. The two groups in the study consisted of those students who met the definition for either mobile or non-mobile. It is not possible to randomly assign students to either of these two groups, so a quasi-experimental design was the most appropriate experimental method. According to Gay et al. (2012), ex post facto research tries to determine if there is a cause for

differences between groups. While the two groups were defined by their mobility, the differences examined were in relationship to the students' academic achievement.

Population

This study was conducted at a high school located in the south suburbs of a large Midwestern metropolitan city. Descriptive statistics were utilized to gain a better understanding of the demographics of this high school. As shown in Figure 1, the population of the approximately 1,100 students in this high school during the 2012-2013 school year was predominately Black. The ethnic makeup of the high school was 97% Black, 2% Hispanic, and 1% White. In addition, Figure 2 shows that the majority of the students, 54%, were classified as being of low socio-economic status (SES) and qualified for the free lunch program. Figure 3 shows that students with an Individualized Education Program (IEP) made up 15% of the population and received Special Education support.

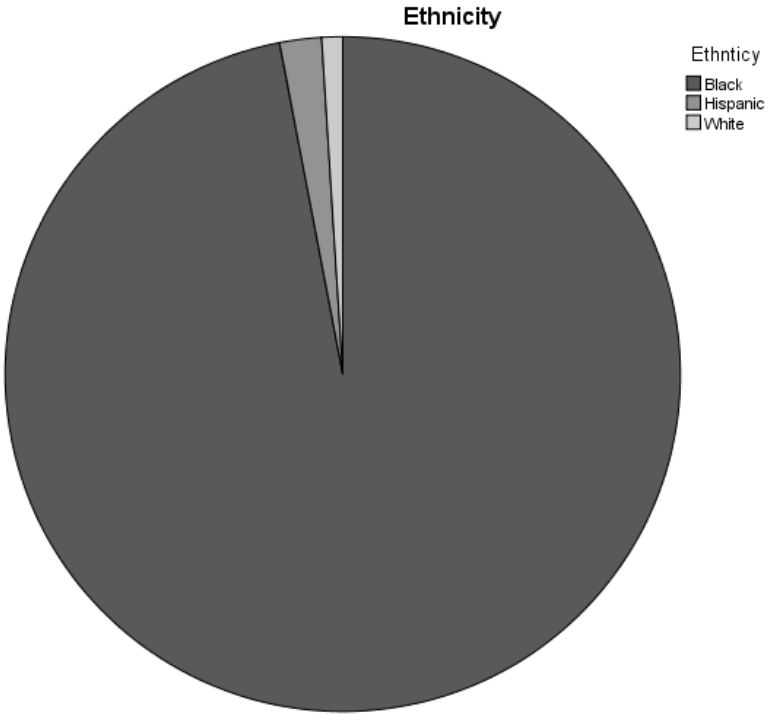

Figure 1. Ethnicity of the students in the school.

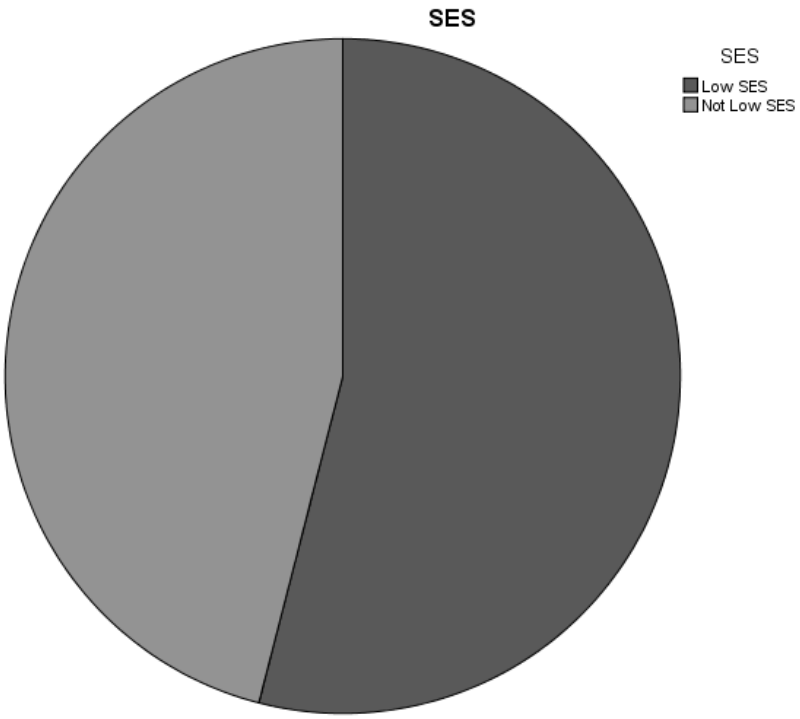

Figure 2. SES of the students in the school.

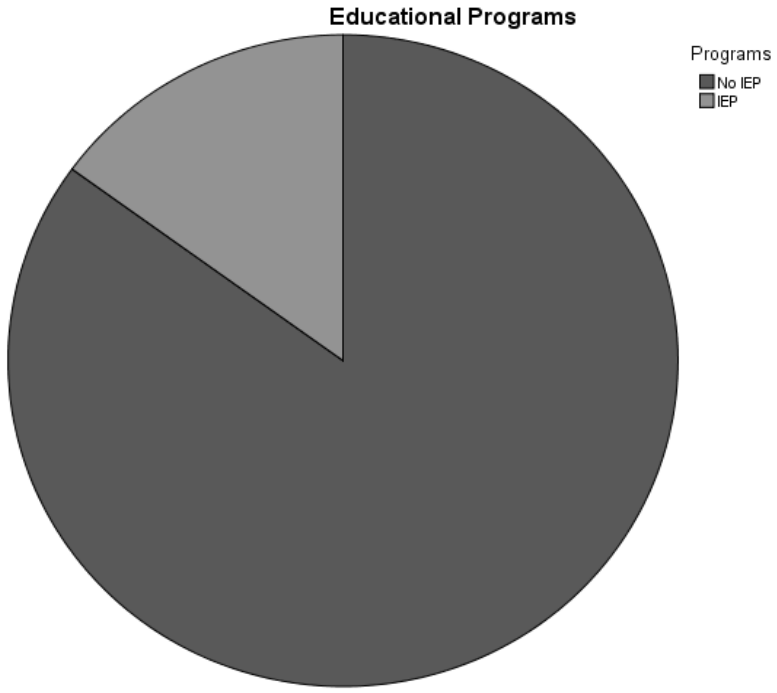

Figure 3. Educational programs of the students in the school.

For this study, mobile students were defined as those students who transferred into the high school from another high school after the school year had begun. Non-mobile students were defined as those students who were enrolled on the first day of school and completed the school year. The demographics of the cohort of mobile students were matched to the demographics of the cohort of non-mobile students during the sampling process. The matching of the two cohorts was done to ensure the two cohorts were as similar as possible.

The entire population of students who met the definition of mobile was selected to be a part of this study. It was determined that 87 students during the 2012-2013 school year met this study's definition of mobile. The demographics of these 87 mobile students were examined by

- grade level,
- gender,
- ethnicity,
- socio-economic status,
- whether they were of regular or special education status,
- the mathematics class in which they were enrolled,
- the English class in which they were enrolled, and
- whether they took the Prairie State Achievement Examination.

Of the 87 identified mobile students, 18 (20.7%) were 9^{th} graders, 31 (35.6%) were 10^{th} graders, 27 (31.0%) were 11^{th} graders, and 11 (12.6%) were 12^{th} graders. The gender distribution was 46 males (52.9%) and 41 females (47.1%). The ethnicity breakdown of the mobile students was similar to the school's overall ethnicity

breakdown. Eighty-four (96.6%) of the mobile students were Black and three (3.4%) were White. The socio-economic status of the mobile students and whether they received regular or special educational support were also similar to the school's overall breakdown. Forty-eight (55.2%) of the mobile students were from low income families and received free lunches. Fourteen (16.1%) of the mobile students had IEPs and received special education support.

Stratified sampling and simple random sampling were both utilized in the selection of the non-mobile population in this study. Salkind (2012) described stratified sampling as a selection process that ensures the sample matches the population. The population to be matched was the 87 students in the mobile cohort. In this step of the sampling process, stratified sampling was utilized to create a pool of possible non-mobile subjects. The characteristics of each of the mobile students were used to create a pool of possible non-mobile subjects. The characteristics of the student's gender, ethnicity, grade level, socio-economic status, special or regular education status, mathematics class, English class, and whether they took the Prairie State Achievement Examination were all considered in the stratified sampling process. Stratified sampling was used to ensure a high level of representation from the population.

It was determined that only 65 non-mobile student populations could be matched with the characteristics of the 87 students who met this study's criteria for the definition of mobile. The characteristics of 22 mobile students failed to match any non-mobile student's characteristics and were removed from the study. The characteristics of the 65 remaining mobile students changed slightly in most of the demographics from the original 87 mobile students. In comparison to the original 87 students, of the 65 mobile

students with matching non-mobile populations, 14 were 9th graders (21.5%, up from 20.7%), 24 were 10th graders (36.9%, up from 35.6%), 21 were 11th graders (32.3%, up from 31.0%), and six were 12th graders (9.2%, down from 12.6%). The gender distribution was 31 males (47.7%, down from 52.9%) and 34 females (52.3%, down from 47.1%). The ethnicity of the 65 mobile students with matching non-mobile populations was 63 Black (96.9%, up from 96.6%) and two White (3.1%, down from 3.4%). Thirty-eight of the 65 mobile students were from low income families and received free lunches (58.5%, up from 55.2%). The largest difference between the original 87 mobile students and the 65 mobile students with matching non-mobile populations was in the percentage of students who had IEPs. Only 2 of the 65 mobile students had IEPs and received special education support (3.1%, down from 16.1%).

Once the populations were determined using stratified sampling that matched the characteristics of each member of the mobile sample, a simple random sampling was used to determine their non-mobile counterpart. According to Salkind (2012), each member of a population has an equal and independent chance of being selected in simple random sampling. All members of each non-mobile population were assigned numbers by the researcher. The Stat Trek Random Number Generator (2014) was then used to create a list of random numbers. The first number generated in each random number list was matched to the non-mobile student with the corresponding number. The identified student was the mobile student's non-mobile counterpart. This random sampling process was used to determine each of the 65 non-mobile students that composed the non-mobile cohort.

Data Collection

Permission to conduct this study and to use the school's database was obtained from the school superintendent before beginning the data collection process.

Historical data was collected using a preexisting data base. The data base in this study is the student information system of the high school studied and is commercially known as PowerSchool (Pearson, 2013). While the researcher had access to all protected student information as part of his duties as an administrator at the high school, the data for this study was not exported until approval was granted. In addition to the student demographics obtained from PowerSchool in the sampling process, data was also collected on the selected students' semester grades in their mathematics and English classes. The raw test scores of those students who took the Prairie State Achievement Examination were obtained through a secure portion of the Illinois State Board of Education website that the researcher had access to as part of his duties as an administrator.

Analytical Methods

The Statistical Package for the Social Sciences (SPSS), Version 21, was the statistical program used by the researcher to organize and analyze the data collected during this study. Test selection was determined by how best to answer the three research questions and by the data collected.

The majority of the data that was entered into SPSS v. 21 was obtained from the high school's student information system, PowerSchool. The raw test scores for the Prairie State Achievement Examination were obtained from a secure portion of the Illinois State Board of Education's website. All demographic information was coded

numerically for each student in this study. Those students who met the definition of mobile were coded as 1, while the non-mobile students were coded as 2. Similarly, males were coded as 1, females as 2; Black students as 1, White students as 2; low socio-economic students as 1, not low socio-economic students as 2; regular education students as 1, and special education students as 2. This information, along with each student's first and second semester mathematics and English classes and grades were entered into SPSS v. 21. In addition, the reading and mathematics raw scores were entered for any student in the study that took the Prairie State Achievement Examination.

The researcher utilized two main statistics to analyze the data for this research. The first statistical analysis was a One-Within-One-Between Subjects Analysis of Variance (ANOVA). According to Yockey (2011), this type of ANOVA is used to analyze group differences when there are at least two independent variables. In addition, each of the independent variables must have two or more levels. One of the independent variables is between-subjects and the other independent variable is within-subjects. The dependent variable is measured on a continuous scale. For example, the two independent variables for the analysis of the students' mathematics grades would be mobility and the semester. Mobility would be the between-subjects factor and the two levels would be mobile and non-mobile. Semester would be the within-subjects factor and the two levels would be Semester 1 and Semester 2. The dependent variable was the semester mathematics grades. A simple effects test was conducted to examine differences between groups within one level of one of the independent variables when the interaction effects were found to be significant. An independent samples *t*-test was utilized as the simple effects test when the interaction effects were significant. The One-Within-One-Between

Subjects ANOVA and independent samples *t*-test were utilized in the data analysis for research questions 1 and 2.

The second statistical analysis was the multivariate analysis of variance (MANOVA). According to Salkind (2012), a MANOVA is used to analyze group differences that occur when there is more than one dependent variable. While a MANOVA resembles a series of *t*-tests for independent samples, it also takes into account any relationships that may exist between the dependent variables. For example, a student's first and second semester mathematics grades could affect their score on the mathematics portion of the Prairie State Achievement Examination. Using a MANOVA, two or more dependent variables while controlling the relationship between them can be studied. The MANOVA was utilized in the data analysis for research question 3.

Initially, the statistical tests were conducted with just the semester grades of the non-mobile students' classes that matched the mobile students' classes. For example, a mobile student may not have enrolled into the school until the second semester. This would mean that the mobile student would only have second semester grades. However, the paired non-mobile student would have both first and second semester grades because they were enrolled in the school for the entire school year. The researcher realized that while the mobile students' semester grades data was complete, the non-mobile students' grade information could be considered incomplete or missing. These non-mobile students had grades that were not entered into SPSS v. 21 because their mobile pairs did not have these matching semester grades. For this reason, the statistical tests were conducted with and without this information to determine if the non-mobile students' potential missing data had any effect on the results of the tests.

Limitations

The researcher was able to identify some potential limitations to the current study. The first limitation originated from the study's definition of a mobile student. The researcher defined a mobile student as a student that transferred into the high school from another high school after the school year had begun. This definition did not take into account any students who may have transferred into the school over the summer. In fact, if these summer transfers completed the school year, then they would have been defined as non-mobile according to the researcher's definition. Non-mobile students were defined as students who were enrolled on the first day of school and completed the school year at the high school in this study. The definition of mobility also did not take into account the number of times a mobile student had changed schools and any cumulative effect these changes could have had on their academic progress.

The second limitation had to do with the reason for the mobile students' move into the high school during this study. Any effect that could have contributed to the reason the student was transferring into the school was unknown. As discussed in Chapter II, the reasons that a student might change schools could include a parents' loss of employment, employment promotion, a change in housing circumstances, family domestic problems, or dissatisfaction with the previous school. Any of these reasons could have had an effect on the student's academic progress before they arrived at the high school in this study.

The third limitation was the size of the sample of the participants. While all 87 of the students who met the definition of mobile were initially included in the study, only 65 were able to be matched to non-mobile students. While 65 pairs of students may have

been sufficient to collect enough data for the first two research questions, there were only nine mobile students that took the Prairie State Achievement Examination during the year of this study. This meant that data was available for only nine pairs of students in the examination of the third research question. This number could be considered too small to provide enough data to accurately answer the research question. Expanding the time frame of the study to more than one school year would have increased the size of the population and the corresponding data available for analysis.

A fourth limitation was that the study utilized data from only one high school. The high school in this study had demographics that were predominately Black and low income. These demographics potentially limit the generalizability across all populations. All four high schools in the school district could have been included in this study to increase the diversity of the demographics of the students. This would have provided data that could have been extended more reliably to the entire population of high school students.

Summary

Chapter III presented the research design, population, data collection procedure, analytical methods, and the identified limitations of this study. The data collected and analyzed was used to provide information to answer the three research questions of this study. Chapter IV will go into more detail concerning the findings and conclusions of this research. In addition, recommendations and implications for future research will be presented.

CHAPTER IV

FINDINGS AND CONCLUSIONS

Introduction

Rumberger (2003) found that more students made changes in the schools they attended, outside of promotional changes, during their school careers than students who remained non-mobile. The mobility rate of the high school in the current study was 13%. Are mobile students at an academic disadvantage? The purpose of this study was to measure the relationship of mobility to the academic achievement of high school students in a Midwestern suburban city. Analyses were conducted on semester mathematics grades, semester English grades, and scores on the Prairie State Achievement Examination to determine if there was any relationship between mobility and academic achievement.

The current study was guided by the following research questions in an effort to determine if there was a relationship between mobility and academic achievement.

1. What is the relationship between mobility and high school students' semester mathematics grades?
2. What is the relationship between mobility and high school students' semester English grades?
3. What is the relationship between mobility and high school students' Prairie State Achievement Examination scores?

Findings

Research Question One

The first research question was, What is the relationship between mobility and high school students' semester mathematics grades? To answer research question one, a 2 x 2 One-Within-One-Between Subjects Analysis of Variance (ANOVA) was utilized to determine any statistical significance between the semester mathematics grades of the students in the current study. The test was conducted with mobility (mobile, non-mobile) as the between subjects factor and semester (semester one, semester two) as the within subjects factor. The statistical test to examine the relationship between mobility and semester mathematics grades was conducted twice. Only matched mathematics data was utilized the first time the ANOVA was conducted. Matched mathematics data was defined as semester mathematics grades that both the mobile and non-mobile students in each cohort had earned. The second time the ANOVA was conducted, all mathematics grades for the students in the study were utilized. The reason for the difference between the two sets of data was that while all of the mobile students' semester mathematics grades were utilized, the non-mobile students possessed mathematics grades for semesters in which the mobile students were not in attendance.

Descriptive statistics for the matched mathematics data of the mobile and non-mobile students for semester one and semester two mathematics grades are reported in Table 1. The mean scores indicated that the non-mobile students achieved higher mathematics percentage grades for semester one (M = 72.23) than the mobile students (M = 63.49). The non-mobile students achieved a C average compared to a D average for the mobile students when the mean scores were converted from percentage grades to letter grades. The non-mobile students also achieved higher mathematics percentage grades for

semester two (M = 61.63) than the mobile students (M = 61.10), although the difference was minimal. Both groups of students achieved D averages when the mean scores were converted from percentage grades to letter grades.

Table 1

Matched Mathematics Data Statistics for Semester 1 and Semester 2 Grades

Semester	Mobility	*n*	*M*	*SD*
1	Mobile	35	63.49	17.11
	Non-mobile	35	72.23	12.89
2	Mobile	49	61.10	19.54
	Non-mobile	49	61.63	19.57

When semester mathematics grades that both the mobile and non-mobile students in each cohort had earned (matched mathematics data) were considered, the results of the 2 x 2 One-Within-One-Between Subjects ANOVA showed a significant main effect for semester, $F(1, 52) = 11.18$, $p < .05$, partial $\eta^2 = .18$, but no significant main effect for mobility, $F(1, 52) = .04$, $p > .05$, partial $\eta^2 = .00$. The results of the ANOVA indicated that there was a difference between the two semesters, but not between the two levels of mobility. There was a significant semester x mobility interaction, $F(1, 52) = 6.03$, $p < .05$, partial $\eta^2 = .10$. The results of the ANOVA indicated that there was an interaction between the two variables.

A simple effects analysis was conducted for mobility for each semester because there was a significant semester x mobility interaction. According to Yockey (2011), each test should be conducted at an alpha level of .025 so that the total alpha for the two tests does not exceed .05. The results of the independent samples *t*-test indicated that there was

a significant difference between mobile and non-mobile students' mathematics grades for semester one, $t(68) = -2.42$, $p < .025$. However, there was not a significant difference between mobile and non-mobile students' mathematics grades for semester two, $t(96) = -.13$, $p > .025$.

The researcher then examined the all mathematics data. Descriptive statistics for the all mathematics data of the mobile and non-mobile students for semester one and semester two mathematics grades are reported in Table 2. The mean scores indicated that the non-mobile students achieved higher mathematics percentage grades for semester one ($M = 72.41$) than the mobile students ($M = 64.68$). The non-mobile students achieved a C average compared to a D average for the mobile students when the mean scores were converted from percentage grades to letter grades. The non-mobile students also achieved higher mathematics percentage grades for semester two ($M = 63.06$) than the mobile students ($M = 61.10$), although the difference diminished from the semester one comparison. Both groups of students achieved D averages when the mean scores were converted from percentage grades to letter grades.

Table 2

All Mathematics Data Statistics for Semester 1 and Semester 2 Grades

Semester	Mobility	*n*	*M*	*SD*
1	Mobile	34	64.68	15.82
	Non-mobile	63	72.41	11.47
2	Mobile	49	61.10	19.54
	Non-mobile	63	63.06	16.34

When the all mathematics data between students was considered, the results of the 2 x 2 One-Between-One-Within Subjects ANOVA showed a significant main effect for semester, $F(1, 87) = 15.46$, $p < .05$, partial $\eta^2 = .15$, but no significant main effect for mobility, $F(1, 87) = .32$, $p > .05$, partial $\eta^2 = .00$. The results of the ANOVA indicated that there was a difference between the two semesters but not between the two levels of mobility. There was a significant semester x mobility interaction, $F(1, 87) = 7.41$, $p < .05$, partial $\eta^2 = .08$. The results of the ANOVA indicated that there was an interaction between the two variables.

A simple effects analysis was conducted for mobility for each semester because there was a significant semester x mobility interaction. Each independent samples *t*-test was conducted at an alpha level of .025. The results of the independent samples *t*-test indicated that there was a significant difference between mobile and non-mobile students' mathematics grades for semester one, $t(95) = -2.77$, $p < .025$. However, there was not a significant difference between mobile and non-mobile students' mathematics grades for semester two, $t(110) = -.58$, $p > .025$.

Research Question Two

The second research question was, What is the relationship between mobility and high school students' semester English grades? The statistical analysis for research question two was the same test that was utilized for research question one. To answer research question two, a 2 x 2 One-Between-One-Within Subjects ANOVA was utilized to determine any statistical significance between the semester English grades of the students in the current study. The test was conducted with mobility (mobile, non-mobile) as the between subjects factor and semester (semester one, semester two) as the within

subjects factor. The statistical test to examine the relationship between mobility and semester English grades was conducted twice. Only matched English data was utilized the first time the ANOVA was conducted. Matched English data was defined as semester English grades that both the mobile and non-mobile students in each cohort had earned. The second time the ANOVA was conducted all English grades for the students in the study were utilized.

Descriptive statistics for the matched English data of the mobile and non-mobile students for semester one and semester two English grades are reported in Table 3. The mean scores indicated that the non-mobile students achieved higher English percentage grades for semester one (M = 73.11) than the mobile students (M = 64.24). The non-mobile students achieved a C average compared to a D average for the mobile students when the mean scores were converted from percentage grades to letter grades. The non-mobile students also achieved higher English percentage grades for semester two (M = 71.33) than the mobile students (M = 66.82), although the difference declined. Again, the non-mobile students achieved a C average compared to a D average for the mobile students when the mean scores were converted from percentage grades to letter grades.

Table 3

Matched English Data Statistics for Semester 1 and Semester 2 Grades

Semester	Mobility	*n*	*M*	*SD*
1	Mobile	37	64.24	12.90
	Non-mobile	37	73.11	12.22
2	Mobile	57	66.82	16.42
	Non-mobile	57	71.33	13.32

When semester English grades that both the mobile and non-mobile students in each cohort had earned (matched English data) were considered, the results of the 2 x 2 One-Between-One-Within Subjects ANOVA showed a significant main effect for mobility, $F(1, 56) = 7.10$, $p < .05$, partial $\eta^2 = .11$, but no significant main effect for semester, $F(1, 56) = 1.18$, $p > .05$, partial $\eta^2 = .02$. The results of the ANOVA indicated that there was a difference between the two levels of mobility but not between the two semesters. Technically, there was not a significant semester x mobility interaction, $F(1, 56) = 3.90$, $p = .053$, partial $\eta^2 = .07$.

While technically there was not a significant semester x mobility interaction, the significance level was so close to being significant, $p = .053$, that the researcher did conduct a simple effects analysis for mobility for each semester. Each independent samples *t*-test was conducted at an alpha level of .025. The results of the independent samples *t*-test indicated that there was a significant difference between mobile and non-mobile students' English grades for semester one, $t(72) = -3.03$, $p < .025$. However, there was not a significant difference between mobile and non-mobile students' English grades for semester two, $t(112) = -1.61$, $p > .025$.

The researcher then examined the all English data. Descriptive statistics for the all English data of the mobile and non-mobile students for semester one and semester two English grades are reported in Table 4. The mean scores indicated that the non-mobile students achieved higher English percentage grades for semester one ($M = 73.86$) than the mobile students ($M = 64.24$). The non-mobile students achieved a C average compared to a D average for the mobile students when the mean scores were converted from percentage grades to letter grades. The non-mobile students also achieved higher English

percentage grades for semester two (M = 68.91) than the mobile students (M = 66.63), although the difference diminished from the semester one comparison. Both groups of students achieved D averages when the mean scores were converted from percentage grades to letter grades.

Table 4

All English Data Statistics for Semester 1 and Semester 2 Grades

Semester	Mobility	*n*	*M*	*SD*
1	Mobile	37	64.24	12.90
	Non-mobile	65	73.86	11.25
2	Mobile	59	66.63	16.21
	Non-mobile	65	68.91	17.16

When the all English data between students was considered, the results of the 2 x 2 One-Between-One-Within Subjects ANOVA showed a significant main effect for mobility, $F(1, 92) = 7.20$, $p < .05$, partial $\eta^2 = .07$, but no significant main effect for semester, $F(1, 92) = 1.58$, $p > .05$, partial $\eta^2 = .02$. The results of the ANOVA indicated that there was a difference between the two levels of mobility but not between the two semesters. There was a significant semester x mobility interaction, $F(1, 92) = 4.13$, $p < .05$, partial $\eta^2 = .04$. The results of the ANOVA indicated that there was an interaction between the two variables.

A simple effects analysis was conducted for mobility for each semester because there was a significant semester x mobility interaction. Each independent samples *t*-test was conducted at an alpha level of .025. The results of the independent samples *t*-test indicated that there was a significant difference between mobile and non-mobile students'

English grades for semester one, $t(99) = -4.51$, $p < .025$. However, there was not a significant difference between mobile and non-mobile students' English grades for semester two, $t(117) = -.86$, $p > .025$.

Research Question Three

The third and final research question was, What is the relationship between mobility and high school students' Prairie State Achievement Examinations scores? To answer research question three, a Multivariate Analysis of Variance (MANOVA) was utilized to determine any statistical significance between the raw scores on the mathematics and reading portions of the Prairie State Achievement Examinations of the students in the current study. The statistical test to examine the relationship between mobility and Prairie State Achievement Examination scores was conducted twice for mathematics raw scores and twice for reading raw scores. Only matched data was utilized in the initial MANOVA. Matched data was defined as semester grades that both the mobile and non-mobile students in each cohort had earned. The initial MANOVA utilized matched mathematics semester grades and raw scores on the mathematics portion of the Prairie State Achievement Examinations. In addition, matched English semester grades and raw scores on the reading portion of the Prairie State Achievement Examinations were also used in the initial MANOVA. All data was utilized in the second MANOVA. The second MANOVA utilized all mathematics semester grades and raw scores on the mathematics portion of the Prairie State Achievement Examinations. In addition, all English semester grades and raw scores on the reading portion of the Prairie State Achievement Examinations were also used in the second MANOVA. The reason for the difference between the two sets of data was that while all of the mobile students' semester grades

were utilized, the non-mobile students possessed grades for semesters in which the mobile students were not in attendance.

The descriptive statistics for the mathematics scores on the Prairie State Achievement Examination are reported in Table 5. The mean scores indicated that the mobile students scored higher on the mathematics portion of the Prairie State Achievement Examination (M = 148.56) than the non-mobile students (M = 144.67).

Table 5

Raw Scores for Mathematics on the Prairie State Achievement Examination

Mobility	*n*	*M*	*SD*
Mobile	9	148.56	9.93
Non-mobile	9	144.67	8.19

The descriptive statistics for the reading scores on the Prairie State Achievement Examination are reported in Table 6. The mean scores indicated that the mobile students scored higher on the reading portion of the Prairie State Achievement Examination (M = 146.11) than the non-mobile students (M = 145.00).

Table 6

Raw Scores for Reading on the Prairie State Achievement Examination

Mobility	*n*	*M*	*SD*
Mobile	9	146.11	10.49
Non-mobile	9	145.00	8.79

When the semester mathematics grades that both the mobile and non-mobile students in each cohort had earned (matched mathematics data) were considered, results of the

MANOVA showed no significance for mobility on the raw scores of the mathematics portion of the Prairie State Achievement Examination, Wilks' $\lambda = .66$, $F(3, 12) = 2.02$, $p > .05$, partial $\eta^2 = .34$. When the semester English grades that both the mobile and non-mobile students in each cohort had earned (matched English data) were considered, the results of the MANOVA were similar to the mathematics results in that there was no significance for mobility on the raw scores of the reading portion of the Prairie State Achievement Examination, Wilks' $\lambda = .82$, $F(3, 10) = .76$, $p > .05$, partial $\eta^2 = .19$.

When the all mathematics data between students was considered, the results of the MANOVA showed no significance for mobility on the raw scores of the mathematics portion of the Prairie State Achievement Examination, Wilks' $\lambda = .73$, $F(3, 13) = 1.61$, $p > .05$, partial $\eta^2 = .27$. When the all English data was utilized, the results of the MANOVA were again similar to the mathematics results in that there was no significance for mobility on the raw scores of the reading portion of the Prairie State Achievement Examination, Wilks' $\lambda = .89$, $F(3, 12) = .49$, $p > .05$, partial $\eta^2 = .11$.

Conclusions

The evidence from previous studies indicated that there could be a negative relationship between mobility and academic achievement (Heinlein & Shinn, 2000; Kerbow, 1996; Kerbow et al. 2003; Schulz & Rubel, 2011). However, other researchers provided evidence that mobility does not always have an adverse effect on the academic progress of mobile students (Popp et al., 2011; Smrekar & Owens, 2003). The current study produced some mixed and surprising results.

Research question one examined the relationship between mobility and high school students' semester mathematics grades. For research question one, the findings provided new information that the researcher was unable to locate in any other study.

A 2 x 2 One-Within-One Between Subjects ANOVA and an independent samples *t*-test were utilized to determine if there was any statistical significance between the semester mathematics grades of the two groups of students in the study. The results indicated that there was a statistical significance between the first semester mathematics grades of the mobile and non-mobile students. Statistically, the non-mobile students earned grades that were significantly higher than the mobile students during the first semester. The results of the statistical tests were the same for both sets of first semester data. The two sets of data were the matched mathematics data and the all mathematics data. When examining the matched mathematics data for the first semester, the difference between the non-mobile students' mean grade and the mobile students' mean grade was almost nine percentage points, 8.74. The results indicated a difference of a full letter grade. The all mathematics data for the first semester produced similar results to the matched mathematics data. When examining the all mathematics data, the difference between the non-mobile students' mean grade and the mobile students' mean grade was almost eight percentage points, 7.73. The results of the first semester all mathematics data comparison also indicated a difference of a full letter grade. However, there was not a significant difference between the mobile and non-mobile students' second semester mathematics grades. The results were similar for both the second semester matched mathematics data and the all mathematics data. The difference was only 0.53 and 1.96 percentage points respectfully. The researcher was unable to find any studies that

examined the relationship between mobility and academic achievement by semester grades.

When asking research question one, What is the relationship between mobility and high school students' semester mathematics grades?, the answer is predicated on which semester is being examined. In the current study, there was found to be a statistical significance only for semester one. Time could be a possible explanation as to why there was a statistical significance for semester one and not semester two. Students go through an acclimation period when they transfer into a new school. Mobile students who transfer during the first semester must adjust to a variety of changes. The changes would include new teachers, classmates, rules, and, more than likely, a new curriculum (Engec, 2006; Gibson & Hidalgo, 2009; Schultz & Rabel, 2011). It might be possible that by the time mobile students are in the second semester of the school year, they have adjusted to most of the nuances of their new school. The acclimation to their new school could be aided by the academic support provided from their teachers and tutors. In the school of the current study, there is a 35 minute period almost every week in which students can receive additional help from any teacher. There are also adult and student tutors available during the school day to help students when they need academic support. In addition, because the school in the current study is a Title I school, free tutoring is also available to all students outside of school hours. The free tutoring is available in both face-to-face and internet-based formats.

Another possible reason that there was a statistical significance for only the first semester mathematics data could be in how the mobile students' grades were determined. Semester one grades of the mobile students could have been a combination of the

student's grades in progress from the school they transferred from and the grades they earned at the school in the current study. The second semester mathematics grades would have only been derived from their classwork from one school, the school in this study.

In addition to acclimating to the new school, students also have to adjust to their new homes and neighborhoods. The acclimation that mobile students have to make might cause stress that could negatively influence the mobile students' academic progress. However, by the time mobile students enter the second semester, they may have acclimated enough to their new school and homes so that they have caught up academically to the students who began the year in the school in which the current study was conducted. All of these reasons could provide an explanation as to why the difference in the mean mathematics grades was only statistically significant for the first semester and not the second semester.

Research question two examined the relationship between mobility and high school students' semester English grades. In the same manner as research question one, the findings for research question two provided new information that the researcher was unable to locate in any other study.

A 2 x 2 One-Within-One Between Subjects ANOVA and an independent samples *t*-test were utilized to determine if there was any statistical significance between the semester English grades of the two groups of students in the current study. The results were similar to the findings of research question one. There was a statistical significance between the mobile and non-mobile students' first semester English grades. Statistically, the non-mobile students earned grades that were significantly higher than the mobile students during the first semester. The results of the statistical tests were the same for

both sets of first semester data. The two sets of data were the matched English data and the all English data. When examining the matched English data for the first semester, the difference between the non-mobile students' mean grade and the mobile students' mean grade was almost nine percentage points, 8.87. The results indicated a difference of a full letter grade. The all English data for the first semester was even more pronounced than the matched English data. When examining the all English data, the difference between the non-mobile students' mean grade and the mobile students' mean grade was over nine percentage points, 9.62. The results of the first semester all English data comparison also indicated a difference of a full letter grade. However, there was not a significant difference between the mobile and non-mobile students' second semester English grades. The results were similar for both the second semester matched English data and the all English data. The difference was 4.51 percentage points for the matched English data and 2.28 percentage points for the all English data. The researcher was unable to find any studies that examined the relationship between mobility and academic achievement by semester grades. The possible explanations as to why there was a statistical significance for only semester one English grades and not semester two English grades are similar to the reasons postulated for research question one.

Research question three examined the relationship between mobility and high school students' Prairie State Achievement Examination scores. Unlike research questions one and two, the findings for research question three failed to provide any statistically significant results. However, the results of research question three did provide some surprising outcomes.

A MANOVA was utilized to determine if there was any statistical significance between the raw scores on the mathematics and reading portions of the Prairie State Achievement Examination of the two groups of students in the current study. The results indicated that there was no statistical significance between the mobile and non-mobile students' raw scores on either of the two assessments, mathematics or reading. The findings were the same for both matched and all data sets. When examining the raw scores of the mathematics portion of the assessment, the difference between the non-mobile students' mean score and the mobile students' mean score was almost four points, 3.89. However, the mobile students had a higher mean score on the mathematics assessment than the non-mobile students. It should be noted that the score range on each of the assessments of the Prairie State Achievement Examination is 80 points, from 120 to 200. It should also be noted that while the non-mobile students had a lower mean score on the mathematics assessment, the non-mobile students had higher mean grades in their mathematics classes for both semesters. When examining the raw scores of the reading portion of the assessment, the difference between the non-mobile students' mean score and the mobile students' mean score was just over one percentage point, 1.11. Again, the mobile students had a slightly higher mean score on the reading assessment than the non-mobile students. However, as in the results of the mathematics assessment, the non-mobile students had higher mean grades in their English classes for both semesters.

The most obvious explanation for the results found for research question three would be sample size. The Prairie State Achievement Examination is typically only given to Illinois students who are of 11^{th} grade status. The grade level requirement greatly reduced the potential number of mobile students who were eligible to have taken the

assessment. There were only nine mobile students who sat for the Prairie State Achievement Examination during the current study. The implication being that the data only compared nine mobile to nine non-mobile students' results on the mathematics and reading assessments. According to Salkind (2012), 30 is the desired number of participants that should be in each group of a study.

Another possible reason for the results found for research question three could be the time of year in which the assessment was given. The Prairie State Achievement Examination was given late during the second semester of the school year. Specifically, the assessment was administered during the fourth week of April in the year of the study. The mobile students could have become acclimated to the new school by the time the assessment was administered. The small sample size and the timing of the assessment could have both contributed to the results and the lack of statistical significance for research question three.

Implications and Recommendations

Rumberger (2003) found that student mobility in the United States is widespread and could be considered typical for the majority of students at some point in their school careers. Some researchers have (O'Gara & Kanellis, 2008, 2010, 2011; Smrekar & Owens, 2003) presented findings that mobility does not necessitate a negative relationship with academic achievement. However, the majority of the research does indicate an adverse relationship on the academic performance of mobile students (Engec, 2006; Kerbow, 1996; Kerbow et al. 2003; Parke & Kanyongo, 2012; Rumberger & Larson, 1998; Sanderson, 2003a; Sanderson, 2003b; Schulz & Rubel, 2011). Because we

live in a mobile society, educators must identify their mobile students and determine how best to address their academic needs.

The findings of the current study provided valuable information concerning the relationship between mobility and student achievement to the stakeholders of the high school located in the south suburbs of a large Midwestern metropolitan city. The stakeholders of the high school included the building administrators, district administrators, teachers, and the Board of Education. The main implication resulting from the findings of the current study was that educators must address the academic needs of mobile students early in their transition into their new school. Early support for mobile students can have a major impact on their mathematics and English grades. While the study only addressed semester grades in mathematics and English, it could be presumed that similar results may have been obtained in the students' other classes. The sooner educators provide assistance to mobile students, the better. Support should also be extended to assist students in preparing for the state's achievement examination, even though the comparison of raw scores on the Prairie State Achievement Examination was not statistically significant. It is important to note that in the state this study was conducted, schools are heavily judged on how their students perform on standardized state assessments. The findings from the current study were from a single high school with specific demographics. The researcher would caution against the generalizability across all high schools until further studies are conducted.

The following are three recommendations for future study. First, future researchers should conduct a longitudinal study of the relationship between mobility and academic achievement for high school students. The current study could serve as the

baseline for comparing the results of future cohorts of mobile and non-mobile students. In conjunction with a longitudinal study, an evaluation of the various supports provided for the mobile students could be conducted. The longitudinal study could provide valuable information to the stakeholders of the high school concerning the effectiveness of the strategies educators utilize to support their mobile students. In addition, a longitudinal study could also expand the scope of the study to include graduation rate comparisons between students who are mobile and students who spend their entire school career in the school of the current study.

Second, future researchers should increase the sample size of the population. The school in the current study is one of four high schools in the district. Increasing the sample size could be accomplished by utilizing data from all four schools. Utilizing the entire population of the high school district would increase the sample size and make the demographics of the students more general to the entire population of high school students. Increasing both the sample size and demographics would allow for a greater generalizability across all high schools.

Third, future researchers should consider examining the relationship between mobility and results on the Partnership for Assessment of Readiness for College and Careers (PARCC). In the spring of 2014, the Prairie State Achievement Examination was retired. The PARCC will be administered beginning with the 2014-15 school year. The new assessment will evaluate student performance in mathematics and English Language Arts/Literacy. The researcher would propose two advantages in examining the PARCC versus the Prairie State Achievement Examination. One, the PARCC is not limited to students who are of 11th grade status. Instead, the PARCC is given to students in all high

school grade levels. The PARCC would provide not only more data from assessing more students, but would also include student data in all high school grade levels. Two, the PARCC is given twice in the spring of the school year. The first administration is given in March and the second administration is given in May. Not only are more students being assessed, there will be twice as much academic data generated for each student than was previously obtained from the Prairie State Achievement Examination.

Rumberger (2003) found that mobility is common among most students sometime during their school career. Students are going to transfer from one school to another because of no fault of their own. Changes in family circumstances contribute to student mobility. Knowing that students are going to be mobile, educators must develop and implement academic support systems for mobile students to quickly acclimate into their new school. The findings of the current study indicated that mobile students can achieve at the same level as their non-mobile classmates when they adjust to their new surroundings. The quicker the acclimation takes place, the better mobile students will perform academically.

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