AN ANALYSIS OF THE IMPACT OF STUDENT MOBILITY ON MIDDLE SCHOOL STUDENTS IN ONE SCHOOL DISTRICT IN TENNESSEE

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ABSTRACT

This study examined the effect of middle school student mobility on standardized test achievement in mathematics and reading. The variables of gender and poverty were also examined in the context of their relationship to a student's mobility. The data set consisted of the mathematics and reading scores of 9,083 middle school students in a large Tennessee school system of approximately 42,000 students.

The first research question asked if there were any differences between mobile and non-mobile students on the mathematics and reading sections of Tennessee Comprehensive Achievement Program Achievement Test (TCAP). Utilizing independent samples *t* tests for the mathematics and the reading data, the findings demonstrated a significant difference between the scores of mobile and non-mobile students with non-mobile students scoring higher.

The second research question asked if there were differences between mobile and non-mobile male and female students on the mathematics and reading sections of TCAP. To answer this question, two-way ANOVAs were conducted with the mathematics and then the reading scores. Significant differences were found between the scores of both boys and girls when compared by mobility (mobile boys versus non-mobile boys and mobile girls versus non-mobile girls), with non-mobile students scoring higher. This significant difference, however, did not exist between boys and girls when they were both mobile (mobile boys versus mobile girls).

The third question asked if there were any differences between mobile and non-mobile students on the mathematics and reading sections of TCAP for students who were socio-economically disadvantaged (SED) and for students who were not socio-economically disadvantaged. Two-way ANOVAs were conducted on both the mathematics and reading scores. The findings were that both non-mobile and non-SED students scored significantly higher in both mathematics and reading.

The final research question asked if there were any differences between mobile and non-mobile male and female students on the mathematics and reading sections of TCAP for students who were socio-economically disadvantaged and who were not socio-economically disadvantaged. Three-way ANOVAs were conducted on both the mathematics and reading scores. The findings supported the two-way ANOVA findings. Additionally, girls' reading was more negatively affected by mobility than boys' reading.

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CHAPTER 1

INTRODUCTION

Overview of the Study

We live in a highly mobile society. People change residences for many different reasons. Some see movement as a way of improving their situation by finding a better job, neighborhood or school for their children. Others move because they have no choice when they can no longer meet the obligations of their mortgage or lease. Often, employers require relocation as a condition for continued employment. The reasons for family moves are understandably varied but for whatever reason, elementary and secondary students too often change schools when these family moves occur. According to the United States Census Bureau (2011, May), 37,540,000 people changed residences in the United States between 2009 and 2010. Of these movers 9,031,000 were children under 16 years of age.

The freedom to be mobile is an important right that is commonly exercised in the United States. Mobility is reflective of the freedom to choose a new path. However, moves can also be indicative of less positive circumstances and have negative effects on student learning. The problem is a complicated one as student mobility can affect both the student and the school into which the move occurs (Hanushek, Kain, & Rivkin; 2004).

Some students may benefit from moves. Sorin and Lloste (2006) indicated that some principals reported a benefit when mobile students bring richer experiences from different communities, in which they have lived, to the classroom. These researchers also noted that some

students benefited from leaving a set of friends that had influenced them poorly. Logic dictates, however, that changing schools, especially during the school year, can have a negative effect on a student's achievement. When students become mobile they must develop new social networks at the same time that they are learning about the new school's academic procedures. There is also the likelihood that a new school will cover academic topics in a different sequence than the previous school (Titus, 2007). This would potentially place the mobile student at a disadvantage because of important missed topics. In some cases, a new school may be advanced in pace so that whole subjects are missed by the incoming student who did not have "that course" offered in his grade level at the previous school (Bradshaw, Sudhinaraset, Mmari, & Blum, 2010). Schools with high mobility rates have cumulative effects from the large numbers of mobile students. The larger effect is felt by the students who move, but the entire school feels the effects of the larger group's lower achievement gain (Hanushek, et al., 2004).

On a deeper level, however, many studies (Schaller, 1976; see also Schafft, 2005; Strand & Demie, 2007) pointed to the very complicated nature of the problem; suggesting that pre-existing conditions such as poverty level and gender created confounding effects that had to be controlled. In these studies researchers were asking whether another co-existing factor may have been the culprit in the decline in a mobile student's academic achievement. Other researchers have demonstrated the complicated nature of social concerns on academic achievement when children changed schools and left their support networks behind (Kingery, Erdley, & Marshall, 2011; Rhodes, 2008).

The current effort will be a causal-comparative study comparing the achievement scores of mobile and non-mobile students. Statistical measures will be used to control for the effect of gender and poverty. It is hoped that the findings of this research will deepen the understanding

of this complicated subject and, thus, be used to motivate change on the local level, and beyond, to better address the needs of our mobile students.

The Background to the Problem

The problem of students changing schools, both during the school year and between school years, has been demonstrated in research literature for many years. The problem has existed in varying levels depending on the community. The literature on the subject noted that poorer communities saw greater levels of student mobility between schools than did wealthier communities (Schafft, 2005). Nationally a trend of removing public housing in inner city areas was demonstrated (Baylor, 2003). In some urban areas, revitalization of the city's "inner core" began making suburban housing a less expensive option for the poor (Freeman, 2010). Hirsch (2003) also reported this phenomenon adding the motivating factor of increased employment opportunities in service sector jobs in suburban areas. The result has been a geographical dispersion of poverty, and thus the student mobility problem, across school systems. School systems which, in the past, had been able to focus on the mobility problem in a smaller number of schools, found themselves having to contend with the issue across a much larger number of schools (Hirsch, 2003). Today this places additional urgency on the problems associated with school mobility. If the problem continues to spread outward, becoming less focused, care must be taken to keep the support systems that are in place from becoming less effective as they are forced to support additional schools.

A prevailing theme in education today is school accountability and schools are being challenged to look at each subgroup to identify ways to reach each student's needs. Each ethnic and racial group, as well as special education, English language learners, and various

economically disadvantaged groups are being used independently to gauge a school's success. Disaggregation of composite scores is now expected in reporting school performance and the performance of each of these subgroups is clearly linked to the issue of student mobility. Under the No Child Left Behind Act of 2001 the failure of any single subgroup to make "Annual Yearly Progress" can result in school sanctions. In the present school accountability environment, schools are going to need valid information to focus on the needs of each of their students. This factor was an important one motivating this study.

Statement of the Problem

Student mobility is a significant issue in today's schools. The level of mobility may differ from school to school but all schools share the basic problem. When students change schools those students may miss important topics. Teachers at the receiving schools take time to fill these gaps for the incoming students. As this occurs, the potential for slowing the academic pace of the classroom becomes a problem. In schools with greater levels of mobility this pacing problem can affect the learning of all students.

As will be detailed in the related literature, teachers seemed to agree that student mobility is a problem. Various studies will also be referenced that point out both the negative impact of student mobility and how complicated the problem is (Schafft & Prins, 2009; Wright, 1999). Pre-existing conditions such as poverty may need to be considered in interpreting the findings of any research on the topic. In addition, social issues come into play as students find new friends who may or may not support their need to do well academically. The challenge to a student who changes schools, and to the new school, is a difficult and important one.

Purpose of the Study

The purpose of this study was to determine if the mobile middle school students in a southeastern school system demonstrated less academic achievement than did the non-mobile middle school students after controlling for the potential impact of poverty and gender. The findings will be used to encourage and direct future research on the topic and to initiate the discussion of potential remedies to any problems that are found.

Research Questions and Hypotheses

1. Are there differences between mobile and non-mobile students on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP)?

   Null Hypothesis 1: There are no differences between mobile and non-mobile students on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP).

2. Are there differences between mobile and non-mobile students by gender on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP)?

   Null Hypothesis 2: There are no differences between mobile and non-mobile students by gender on the mathematics and reading sections of the Tennessee Comprehensive Achievement Program (TCAP).

3. Are there differences between mobile and non-mobile students on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP)

for students who are Socio-economically disadvantaged (SED) and for students who are not SED?

Null Hypothesis 3: There are no differences between mobile and non-mobile students on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP) for students who are Socio-economically disadvantaged (SED) and for students who are not SED.

4. Are there differences between students by gender who are socio-economically disadvantaged (SED) and not socio-economically disadvantaged on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP) for students who are mobile and who are not mobile?

   Null Hypothesis 4: There are no differences between students by gender who are socio-economically disadvantaged (SED) and not socio-economically disadvantaged on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP) for students who are mobile and who are not mobile.

Conceptual Framework

The concept of social capital will be more fully discussed in the literature review section of this study. Social capital's growing importance in the literature is linked to a seeming ability to explain why student mobility hurts some students academically while other students are unharmed. The concept of social capital is begun here to motivate consideration of social capital as a conceptual framework for understanding the academic impact of student mobility.

The idea of social capital was first noted in educational literature by James Coleman (1988). Coleman identified three forms of capital that existed as a resource, in varying amounts, within all families: financial capital, human capital and social capital. These were each resources that families could draw upon to increase their children's chances of success. For example, financial capital could be used to purchase dedicated study space and study materials. Human capital, in the form of parent education and expectations, was a motivator of students. Social capital was a network of social support that existed because a child was known by his parents, the adults and students in his school, and the adults in the community outside the school. When a student changed schools social capital network loss occurred (Coleman, 1988).

Though the concept was almost uniformly agreed to be an important factor, measurement of the concept was not precisely understood or agreed upon (Hutchinson et al., 2004). As such, social capital maintained a very broad application in the literature. The current effort did not seek to measure or apply social capital. That was left to future research. Instead, social capital was acknowledged here as an important framework upon which the academic harm caused by student mobility could be better understood. In the current research study, Coleman's approach demonstrated the complicated nature of the issue of student mobility.

Rationale of the Study

Students in the school district that is hosting the current study, often change schools. Many of these changes occur within the school district. The current research study could be used to motivate changes in the way that student transfers are handled. Changes such as curriculum alignment between schools or the use of a county-wide assessment tool to give receiving schools an understanding of the needs of the new student might be considered. The current research

study could also motivate a statewide (or regional) student transfer protocol, benefiting a larger group of students.

Significance of the Study

School accountability is a contemporary concern. The importance of student achievement, as measured by standardized tests, is growing and meeting the educational needs of each individual student has become significant. The current research study may help inform the way that the impact of student mobility is dealt with in the school accountability process. In addition, the current research may help inform the way that schools, and school systems, work with mobile students.

A unique aspect to the current study is the focus on middle school students. Middle school students are extraordinary in two ways. First, hormonal changes occurring among middle school students have been documented as a unique challenge for that age group (Meyer, 2011). Second, the middle school student's need for peer acceptance has been shown to be a primary motivator for young adolescents (Bellmore, Villarreal, & Ho, 2010). Since much of the current work on the impact of student mobility is being done among high school and elementary school students, the focus on middle school students, and their unique manifestations, could lend significance to this study (Galvan, Spatzier, & Juvonen, 2011).

An important asset to be provided by this study was its population. The population was unique in that it had broad racial and socio-economic representation. The population consisted of the middle school students within a county in the southeastern region of the United States. This county had a moderately large city containing a number of schools with a near-one hundred percent free and reduced lunch rate. In addition to this urban core, the county also had both

suburban and rural areas. The region's manufacturing and service industries attracted a diverse immigrant population lending itself to the overall diversity of the population used in the current study. This diversity was thought to be an asset to this research in that it may have made the population more reflective of the nation as a whole. This study also had the advantage of a large population. The achievement scores of all county middle school students were utilized in this research study. This population consisted of 9,082 sets of student scores. The diversity and size of the population were thought to enhance the significance of the findings of this study.

Definitions and Terms

The *Tennessee Comprehensive Assessment Program* (TCAP) achievement test was a standardized test given to students in the public schools of Tennessee each year in grades three through eight. The test was administered in the spring of each year. The TCAP was a timed, multiple choice and criterion-referenced assessment. This test sought to measure student achievement in mathematics, reading, science and social studies. The results were reported, by individual student, to schools and parents. School and system-wide results were available to the public and were published on the Tennessee Department of Education (2012) report card website.

Middle School was identified as grades 6 through 8 in the research study. This was considered to be an important note in that, nationally, middle schools were often made up of different grade configurations.

Social Capital was a theoretical concept introduced to education by James Coleman (1988). The term referred to the "capital" available to some students because of their family and social network of support. The term referred to both student associations, and parent

associations. These associations were in both the neighborhood and the school. They formed a web of support for students. When a student changed schools, especially when the school change involved a neighborhood change, the social capital available to the student was lessened.

Mobile student referred to students who changed schools. Mobile students may or may not have changed residences. A residence change could be across school zones, within a school district, or across district lines. Each of these changes could have reflected a different level of mobility that could affect a student differently. Other applications of the term required the inclusion of homelessness and migrancy. The terms transient student and transiency were utilized in some studies to refer to mobile student and student mobility.

No Child Left Behind Act of 2001 was the short title of the Elementary and Secondary Education Act, PL 107-110, self-described as "An Act to close the achievement gap with accountability, flexibility, and choice so that no child is left behind" (p. 1425). The law provided urgency to schools and school systems to take measures to close achievement gaps between subgroups of race, poverty, special education and English Language Learners.

Reactive mobility referred to family moves that were reactions to negative situations that may arise. Examples of these types of situations were loss of a house or apartment, death of a parent, or divorce. The residential moves, that these situations may have forced, tended to be less planned, and therefore reactive.

Strategic mobility referred to family moves that tended to be planned and that were undertaken to improve the family situation. Common examples of this type of move were moves motivated by a parent's new job or to secure housing in a better neighborhood.

SED (Students who are economically disadvantaged) referred to students who receive free or reduced-price lunch due to their family's lower income. Some literature sources referred to a student's low *SES*, or socio-economic status. The term, SES, was of primary use in the literature to refer to a person's income status. For the purposes of this study, SED was used because economically disadvantaged was the term being used by the current school accountability laws. Economically disadvantaged was also the term used on the Tennessee Schools Report Card (Tennessee Department of Education, 2012, report card). SED was a more specific term because it referred directly to the student's free or reduced lunch status (No Child Left Behind Act of 2001). SES was a more general term with differing methods of definition.

Delimitations of the Study

The problem of student mobility was a very complicated one. Presumably students miss important topics when they changed schools, but other previously existing factors had to be considered as well. SED and race, for example were often found to be correlates of each other in research attempting to find links to low (or high) achievement (Rumberger, 2003; Xu, Hannaway, & D'Souza, 2009). Though the study attempted to control for SED, the reasons that may have existed for these potential links were not considered in this study. In addition, the complicated nature of individual student situations defied a definitive answer.

The study was delimited to middle school students in a single southeastern school system in the United States. The population utilized in this study was not a national sample. However, the population represented a particularly broad demographic cross-section.

The study was also delimited to analyses of the impact of student mobility on mathematics and reading test scores. It was not considered directly relevant to look at science

and social studies scores since achievement in science and social studies seemed to rely heavily on reading and mathematics. Another factor considered here is that current school accountability measures examined mathematics and reading most heavily. Perhaps it should also be stated that the classroom performance of students was not assessed. This may be a worthy area to investigate, but the scope of the study would have then been too broad.

This research study sought to control for the impact of gender and SED. Clearly, other factors could have been influential on the test scores of the students in this school system. Based on the literature review, it was thought that these factors would be the ones most in need of inclusion.

Limitations of the Study

There were anticipated limitations to the application of this research. There may have been a higher representation of special education students among the SED and high mobile population. The literature on the subject of student mobility identified a potential link between these three factors (Xu et al., 2009). If such a link existed among this study's population then that connection might have had an impact on the achievement outcomes of that group in this study. This was thought to be a possible limitation in that the study did not attempt to address it.

Within the research findings in the related literature, "mobility" could have meant either (or both) residential or school mobility. In these studies the assumption was that residential mobility of students, most often, results in school mobility for students. In the case of this study, school mobility was measured—but not residential mobility. The potential limitation was that students who changed schools during the study might not have changed residences. If there was an effect resulting from residential change only, that was not addressed in this study.

When seeking to apply the findings of this research, readers should also note a limitation within the definition of mobility as the definition was used in this study. Defining a student as "mobile" because of his move after the twentieth day of school was understood to be a definition of convenience. That is because the No Child Left Behind Act of 2001 required that the school system use the twentieth day as a point of discrimination in determining whether a student's test score would count toward a school's accountability record. Thus, the twentieth day point was chosen for this study simply because that data point was maintained within the test score record. Perhaps an earlier or later point would have led to different results. The research literature did not indicate a better point in the year to gauge the impact of school mobility.

The study was done using the achievement test scores of a group of middle school students in a school system in the southeastern portion of the United States. The data set included students from suburban and urban settings. In spite of this the findings may not be transferable to other urban settings in that the term "urban" is a broad one. A very large urban environment, in Detroit or Chicago for example, might be difficult to compare to a more moderate urban environment as was used in this study.

Assumptions

When student's test scores are being evaluated certain assumptions must be made. This study made the assumption that students were doing their best on the achievement test in both the mobile and non-mobile groups. This assumption was also made for gender and SED groups.

It was also assumed that school resources were relatively equalized among all groups (gender, SED and mobility). Though local tax dollar funding formulas were similar from one middle school to another in the same school system, factors such as teacher turnover and

additional sources of revenue might not have been. For example, Title I funding existed for schools with higher poverty but not for schools with lower poverty. Alternatively, these schools that did not receive Title I money were assumed to have more parent and community resources. For the purposes of this research, an assumption was made that the district's local tax dollar and Title I funding formula was adequate to address differences that may have existed between the schools differing resources.

Summary and Dissertation Outline

In this study, Chapter One provided a brief introduction to the background of the problem, indicating how students who changed schools during the school year, too often, suffered academic harm. The level of the problem was discussed in that the number of residential and school moves that were made was delineated. In addition, the chapter noted the study's purpose, rationale, research questions and hypotheses. The conceptual framework was given significance in that the concept of social capital was introduced as an idea that drove much of the, then, current research on the subject. Finally, Chapter One discussed important considerations of delimitation, limitation and assumptions. Chapter Two provided a review of the academic literature on student mobility. This chapter directed the reader to current understandings of the problem and the directions being taken in current research for the purpose of demonstrating the context in which the current study should be understood. In Chapter Three, specific methodological steps were revealed to answer the research questions. The findings of the research were reported in Chapter Four. The final chapter, Five, offered a summary of the study and discussion of the results. Chapter Five also offered implications for the application of the findings and recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

Magnitude of the Mobility Problem

We live in a highly mobile society. The United States General Accounting Office (1994) indicated that 16.9 % of third graders had attended three or more schools since the first grade. The percentage of those who had attended at least two schools in that time was 24.4%, Rumberger (2003) found that a national cohort of eighth graders had a majority of members who had made at least one "nonpromotional" school change prior to grade eight. More specifically, Rumberger (2003) found that 34% of fourth graders, 21% of eighth graders, and 10% of twelfth graders had changed schools at least once in the previous two years. The United States Census Bureau noted that between 2008 and 2009, 37.1 million United States citizens reported having made a residential change. Of that number, 67.3% moved within the same county, 17.2% moved within the same state. Another 12.6% moved between states (Ihrke, Faber, & Koerber, 2011).

In the literature, the mobility levels of students appeared to be an issue across both grade levels and regions. Hanushek et al. (2004) identified a one-third mobility rate among students in Texas between grades 4-7. Kerbow, Azcoitis, and Buell (2003) reported that among Chicago students, 50% moved within a 3 year period. Beesley, Moore, and Gopalani (2010) demonstrated that in Missouri, though there was a distinct difference in the urban and rural districts, both demographics had a significant problem with mobility. Beesley et al. found that mobility among urban residents was 42.1% while the rural rate was 23.8% for the 2007-08

school year. Offenberg (2004) found similar results in Philadelphia schools in that 40.2% of first graders changed schools by the time they had completed the fourth grade. Heinlein and Shinn (2000) found that fewer students changed schools after the third grade. Ingersoll, Scamman and Eckerling (1989) found that mobility decreased as grade levels increased across all grade levels. Neither Heinlein and Shinn nor Ingersoll et al. suggested reasons for this phenomenon. Heinlein and Shinn indicated that the lower grades' mobility did have the cumulative effect of increasing academic harm to the students when they came to middle school.

The mobility of students was a national concern. Regionally, however, there did seem to be a greater incidence in the South. In a report of migration within the United states, the United States Census Bureau (Perry, 2006) noted that among the top ten migratory states, six were in the Southeast (Florida, Georgia, North Carolina, Virginia, South Carolina, and Tennessee). Inversely, the ten states with the lowest migration included only one Southeastern state, Louisiana (Perry, 2006). The study at hand was focusing on student mobility in a Tennessee school system that included transfers from many other Southeastern states.

The reasons for this high level of mobility in the South were unclear. Poverty rates have been linked to mobility, creating a possible explanation (De la Torre & Gwynne, 2009). In 1994, the U. S. General Accounting Office reported that mobile students were three times as likely to be from low income families. Poverty seems to be more common in the Southeastern states. Of the Southeastern states listed as "top ten migratory states" in an earlier paragraph, only Florida and Virginia were not listed by the United States Census Bureau as states with the highest percentage of people living below the poverty line. All but Virginia were listed as being below the national average for income (Bishaw & Macartney, 2010).

Currently exacerbating the problem are an increasing number of children experiencing school changes due to mortgage foreclosures. In 2008 Lovell and Isaacs (2008) estimated that 35,300 children were directly impacted by a mortgage foreclosure in Tennessee. Nationally, the estimate was nearly two million (Lovell & Isaacs, 2008).

The importance of gaining insight, and hopefully control, of the student mobility problem was made clearer by Rhodes (2007). Rhodes pointed out at least two factors that made grappling with this problem a worthy effort. First, as much of the literature concluded, the education of children was at stake. Second, valuable resources were being wasted as schools, under pressure from accountability efforts, moved forward with expensive reform efforts that, too often, ignored the real problem—student mobility.

The problem of student mobility presented a great challenge to students, their families and their schools. The review of the literature on this subject attempted to provide an understanding of both the problem and the problem's complicated nature. A simple outline was to first demonstrate the link between mobility and academic achievement. This was followed by a discussion of the potentially complicating issues related to student mobility. An aspect of these "complicating issues" was to demonstrate the unique nature of the middle school student in general, and middle school gender differences in particular. Finally, the literature was used to clarify the purpose and potential of the current study.

The Academic Problems Posed by Student Mobility

Direct academic harm. The idea that a student's learning can be disrupted by changing schools is not commonly debated in the literature. When giving initial thought to the problem, educators generally pointed out that missed learning topics and a lack of continuity were the

primary concerns when a student moved (Sanderson, 2004). As was pointed out in the statement of the problem, a mobile student's new school was unlikely to order their curriculum in the same way as the student's previous school. Even schools that offered the same grade level coursework moved at different speeds and generally covered topics in a different order. The danger for a student when changing schools was the educational disruption (Bradshaw et al., 2010). Walls (2003) noted that mobile students tended to have greater absenteeism than their non-mobile fellow students. This, of course made the problem of educational disruption even greater.

Many studies have pointed to potential associations between student mobility and lower achievement. Sanderson (2004) compared the achievement test scores of mobile students, in a highly transient population in Philadelphia, to the achievement test scores of Philadelphia's non-mobile population. Sanderson found that as mobility increased, achievement decreased. Lesisko and Wright (2009) found the same thing to be true in a rural Pennsylvania district. In comparing the achievement test scores of incoming students to those that had been in the school for three years, Lesisko and Wright found the mobile students to have a significantly lower achievement. Engec (2006) demonstrated this difference with students in Louisiana and Kerbow et al. (2003) saw a similar effect in urban Chicago.

Dunn, Kadane, and Garrow (2003) pointed to the challenge presented by mobile student's missed class work. The authors sought to demonstrate that an uninterrupted curriculum and in-school instruction had a positive relationship with academic achievement. The research approach was to quantify the damage done by a single school change by associating the change with the number of days a student would have to be absent in order to see the same level of academic harm. The results were mixed in that in one year Dunn et al. found that a student who changed schools saw the same academic impact as if fourteen days of school had been missed that year.

In the second year that Dunn et al. evaluated student mobility, a move was found to have the same impact as missing thirty-two days of school. Dunn et al. also indicated that one move in a three-year period resulted in an average 2.5% lower score on achievement tests.

When a student changes residences there is often a forced change of schools. This disruption of neighborhood social networks is a potentially powerful detractor from a student's academic performance. Kirshner, Gaertner, and Pozzoponi (2010) evaluated the effect of a school closure on a cohort of high school students that was forced to change schools without having moved residences. The result for these students was a decline in academic performance in spite of the fact that they maintained their neighborhood and social connections. Another significant point is that these students moved to a higher performing school with lower poverty. The authors related a feeling of intrusion and non-acceptance on the part of the new students at the new school (Kirshner et al., 2010).

Students that changed schools were found to have an impact on the other students in the school that they join (Lash & Kirkpatrick, 1990). When a new student came into a classroom the teacher assessed the placement of the new arrival. If the new student did not have knowledge of the current topic of study, the teacher was forced to review. If enough new students came into the classroom, the new student had a detrimental effect on the curricular pacing. In a qualitative analysis of the impact of mobility on an urban school in California with high student mobility, Lash and Kirkpatrick (1990) found that teachers reported having to slow down their instruction in order to bring new students along. Sanderson (2003) made this point in relation to the effect on whole-school instruction. Hanushek et al. (2004) found similar results when evaluating the types of moves undertaken in which parents were seeking better school quality for their children. These researchers demonstrated that at schools with a great deal of instability due to mobility, all

students were negatively impacted. Kerbow et al. (2003) reported that a pacing gap was evident by the second grade between Chicago's highly mobile versus less mobile schools. Kerbow et al. also found that by the fifth grade, students in Chicago schools with greater student mobility were learning mathematics that was one grade level below the Chicago schools without high mobility.

High school students can lose credits when changing schools because of a different set of course offerings and requirements at the new school (Rumberger, Larson, Ream, & Palardy, 1999). Rumberger et al. (1999) pointed to the impact that this made on the high school drop out problem and the inability of the former school's curriculum and requirements to match those of the new school. Ninety-three percent of students who remained in a single high school graduated while only 76% of students who changed schools once and 59% of students who changed schools more than once graduated with a regular high school diploma (Rumberger et al., 1999).

In this section the researcher has detailed how the literature pointed to the direct academic harm of student mobility as a great challenge. Students who missed school seemed to fall behind in their academic development. In addition, the schools where there was a great deal of mobility seemed to have a pacing problem that resulted in lower attainment for all students in the school. There were other indirect problems caused by student mobility, most affecting achievement, which were a concern for student outcomes.

Indirect academic harm. Multiple studies pointed to the connection between student mobility and discipline issues (Engec, 2006; Hoglund & Leadbeater, 2004). Engec reported that students in Louisiana had a 9.7% suspension rate if they were enrolled one time during the school year (non-mobile students). Students with two enrollments saw a suspension rate of 17.51% and students with three enrollments had a suspension rate of 21.7%. This study

examined secondary school student mobility. Hoglund and Leadbeater (2004) evaluated similar issues among first grade students in Canada when evaluating a large number of factors, including household moves, and their impact on factors including student behavioral and emotional problems. When controlling for school-entry behaviors, gender, mother's education, and school-level indicators; household moves were a predictor of children's emotional and behavioral problems. Hoglund and Leadbeater also found that socially withdrawn children were negatively impacted the most by household moves.

Engec (2006) found a larger disciplinary effect with boys than with girls. Girls who changed schools once were suspended at a rate of 6.22%. Girls who changed schools more than five times had a suspension rate of 13.08% reflecting an increase of 104%. Boys who changed schools once were suspended at a rate of 12.66%. Boys who changed schools more than five times had a suspension rate of 31.62% reflecting a 150% increase. Gruman, Harachi, Abbott, Catalano and Fleming (2008) found that boys have a more difficult time keeping mobility related issues from affecting their school work: "Being male predicted declines in positive attitude toward school and classroom participation" (p. 1844). Similarly, Parente and Mahoney (2009) found that boys were more affected than girls in that mobile boys became more aggressive if they moved into a neighborhood with high crime. Girls moving into the same neighborhoods were not so affected.

South, Haynie, and Bose (2005) documented a greater likelihood of mobile students to engage in risky behavior. This was linked to a greater likelihood to begin associating with other students, in the new school, that participated in risky behavior. An explanation that seemed to find support in South et al. was that mobile students' peer networks placed little emphasis on prestige and tended not to view newcomers as rivals. Higher status peer networks were thought

to shun newcomers. The result was often membership in a peer network that engaged in various risky behaviors, specifically sexual activity, at an earlier stage than their non-mobile peers. Chen (2008) found higher levels of crime in schools with higher levels of student mobility, also linking student mobility to increased levels of student classroom misbehavior.

In a related fashion, Anil, Jordan, and Zahirovic-Herbert (2011) studied the link between "housing uncertainty" and student levels of patience. The contention of Anil et al. was that when students suffer from housing instability, specifically from evictions and foreclosures, they developed a greater tendency to make temporal decisions as related to their education. In other words, education tended to be a long-range benefit and began to become less important to the student faced with residential instability. Anil et al. conducted a study, based on the results of a survey, to see how various factors would predict temporal decision making. The two factors with the clearest predictive value of temporal decision making were family size (more than five in household) and whether an eviction had occurred in the respondent's housing situation. The tendency of students from these homes was to make decisions that produced negative educational outcomes, such as dropping out or poor achievement (Anil et al., 2011).

The value of the Anil et al. (2011) research to this current study is two-fold. First, Anil et al. provided one logical reason for the link between mobility and academic harm. Much of the research on this subject, though clearly inferential of the problem of mobility, did not seek to demonstrate a reason. Anil et al. took a different direction in not starting with mobility and identifying related problems. Rather, these researchers started with the problem (lack of motivation to make non-temporal decisions) and identified potential causes, coming up with a link to residential mobility. A second value of this research to the current study was in how the authors demonstrated the complicated nature of the problem. The previous comments have

demonstrated the "straightforward" nature of the link between mobility and academic achievement. The complicated nature of the relationship will be examined in the next section of the literature review.

The Complicated Nature of the Student Mobility Problem

Student mobility categories. Rumberger et al. (1999) pointed out that all student mobility was not equal. Some moves occurred during the summer. Some moves were motivated by the desire to give children greater opportunities. Some moves were caused by job changes. Job changes could have involved a promotion or be a response to the loss of a job. Some moves were because of a residential eviction. Family emergencies could have necessitated moves as well, thus moves could be "reactive" or "strategic," strategic moves being more planned and often positive. Wright (1999) found that family moves across district lines could be linked to increased achievement, while reactive moves were, by definition, less planned and, perhaps often, strenuous for families. The literature has begun to separate these two types of moves with the reactive type becoming the focus for the research on academic harm. Parente and Mahoney (2009) indicated that 30% of moves, as judged by surveyed parents, were due to financial emergencies. Schafft and Prins (2009) have described this type of situation,

> …frequent, short distance, residential movement among resource-limited families within, into, and across already distressed communities and neighborhoods is often unplanned and unpredictable, the consequence of a precipitating crisis such as a family breakup, inability to pay rent, or movement away from unsafe, unaffordable, or otherwise unacceptable living conditions (p. 3).

Mantzicopoulos and Knutson (2000) found that the majority of moves in a study of students involved in Head Start programs were for distances of less than five miles.

More recently, Xu et al. (2009) have noted the differences in the way some ethnicities were affected by mobility. This study found that the tendency was for White and Hispanic students to make "strategic" moves and Black students to make "reactive" moves. In this research, White and Hispanic students tended to go to higher quality schools after a move. Black students tended to go to a lesser quality school after a move. Hanushek et al. (2004) saw the same problem for minority, English language learners, and special education students; indicating that their moves tended to be reactive, and thus more damaging to their academic achievement.

Schafft and Prins (2009) agreed with the perspective that different types of moves could have different results for students. This study used a similar method of identifying these differences. These researchers identified moves within jurisdictional lines as being less positive for students and moves across jurisdictional lines as being more positive—or strategic. A number of researchers have used this as a way of measuring the nature of a move (Hanushek et al., 2004; Tucker, Marx & Long, 1998). In these studies if a family changed residences, without going far, the assumption was made that this move was more likely to be reactive in some way. A move to create opportunity was more likely to be a move of some distance. Tucker et al. (1998) indicated that "a longer-distance move actually reduces the odds of having a poor school life" (p. 122). Hanushek et al. (2004) also saw this effect when noting that short moves were characteristic of the children that were seeing the greatest negative impact from the school change. Engec (2006) found different results. In his analysis of Louisiana students who changed schools Engec found that school changes were detrimental to a student, even if the student moved during the summer when the move was more likely to have been planned. Engec (2006) also demonstrated that students who made promotional changes into a new school also saw declines in academic performance. Engec demonstrated that if a student made a

promotional change into a new school, that student typically did so with peers from his previous school. This lessened the impact of social issues related to residential moves, and seemed to further indicate the complicated nature of the school mobility issue.

Confounding factors. The studies that attempted to show the impact of student mobility often identified the need to take previously existing conditions into account. Schaller (1976) was credited as being the first student mobility researcher to point out what was called an "ex post facto" consideration in evaluating student mobility research. That is, students who were mobile often had lower achievement *before* becoming mobile. Schaller, thus, opened the door to the possibility that the finding of lower achievement in relation to mobility could be an effect of other causes. Since that time, research on this topic has, often, sought to control for confounding factors.

Researchers have attempted to control for various factors with varying results. Strand and Demie (2007) carried out two studies with conflicting findings. When examining secondary student mobility, and controlling for poverty, significant association between secondary level achievement and mobility was found. But in an earlier study, Strand and Demie (2006) found no significant correlation between *elementary* school student achievement and student mobility once contributing factors such as poverty, gender, race and fluency of language were controlled. Strand and Demie (2007) suggested that the difference in findings might be due to the fact that fewer students transferred schools in the secondary years and that these secondary findings represented a more "hard core" group of mobile students.

Rumberger and Thomas (2000) found that ethnicity, but not poverty, was a powerful predictor of mobility. Ingersoll et al. (1989) controlled for poverty and still found a "stable"

effect from mobility. Ingersoll et al. also found that the impact of poverty increased with grade level. Strand (2002) noted that the academic impact of mobility was significant but reduced when free meals, English language learners, special education, and high absence rates were controlled.

Gruman et al. (2008) found that, among elementary students, the impact of mobility between schools had a significant impact on student achievement. Gruman et al. attempted to control for any effects of gender, low income, antisocial behavior, family stress, and shyness. Each of these was found to have a negative impact on student performance. However, even when these other factors were controlled, student mobility maintained a "robust" effect on a student's academic performance (p. 1846). Foorman, Petscher, Lefsky, and Toste (2010), after controlling for student poverty, reported a significant impact on student gains in a Florida *Reading First* program. That is, students who moved during the period between first through third grade saw significantly lower gains than students who did not move. Mantzicopoulos and Knutson (2000) found that prekindergarten moves were predictive of poor academic performance as well. This finding occurred in spite of controls for the effect of poverty.

Schafft (2005) noted the complicated link between poverty and mobility and that, in addition to being a co-factor with mobility, poverty itself was linked to mobility. Schafft indicated that most of the students involved in mid-school year moves were from households below the poverty line. Nationally, this was also true. The U.S Census found that in 2008-2009 26.5% of people living below the poverty line moved. That same year only 11.7% of people living 150% above the poverty line moved (Ihrke et al., 2011). Wright (1999) found that mobility within a school district was strongly associated with poverty and that poverty was

linked more strongly to lower achievement than mobility. In the literature, poverty remains the primary confounding factor in determining the level of impact of student mobility.

There were other factors influencing academic attainment that also may be tied to student mobility. Xu et al. (2009) reported that disadvantaged, minority and low income students were more often mobile. The study demonstrated that the effect of mobility was three times as large for disabled students. Hanushek et al. (2004) indicated that the effects of mobility were most pronounced among poor and minority students.

School effects. Another complicating factor in understanding the impact of mobility was that schools with a larger mobility problem were more likely to have lower test scores (Offenberg, 2004). When a school had an issue with both high mobility and lower academic achievement, the task of determining which factor had a greater impact on a student's individual achievement was made more difficult. As previously indicated, Offenberg (2004) found that the larger number of transfers (mean of 43.8% of the student body in schools "to be reformed" versus 33.6% in other schools) were occurring in Philadelphia schools that were later identified by the state as in need of reform. The data used for his findings were taken four to seven years prior to school reform decisions such as privatization or reconstitution. Offenberg also found that schools with higher mobility rates were more commonly found to have variables associated with the need for school improvement (lower grade point averages and poverty). Thus, the students having the greatest challenge were attending schools that were also having the greatest challenges. Whipple, Evans, Berry, and Maxwell (2010) found a similar problem in New York. A significant negative correlation ($-.431$ $p < .05$) was found between the percentage of students changing schools and that school's performance on state standardized tests. Xu et al. (2009)

disclosed that in the schools of North Carolina low income families tended to move to schools, identified by the state, as lower quality schools.

Finch, Lapsley, and Baker-Boudissa (2009), in a study of Indiana charter schools found high student mobility rates were linked to lower levels of teacher experience. Schools with lower mobility rates had less teacher turnover. Finch et al. demonstrated that each year of a school's average teacher experience could be linked to a seven percent drop in student mobility at that school. That is, schools with higher teacher experience saw lower student mobility.

Social considerations. The impact of mobility has, to this point, been discussed, primarily, as an academic issue that schools must negotiate. An understanding of the academic impact of student mobility required the consideration of social issues as well. Rhodes (2008) found that students reported social issues far more often than academic ones when questioned about mobility related problems. When changing schools these students commonly reported that finding friends was "…their first priority, more important initially than any academic needs" (Rhodes, 2008, p. 123). Rhodes further found that students expressed an inability to focus on academic concerns until social needs were met. Kingery et al. (2011) noted a strong relationship between peer variables and academic achievement for middle school students linking the association of peer rejection with poor academic performance. The place of social considerations in the discussion of the academic performance of middle school students seemed to be an important one that needed to be better understood. In the case of student mobility this became an even bigger issue since making new friends is a challenge for new students in a school.

Social capital. A tool that has become common in student mobility research to help explain the impact of social issues on academics is the concept of *social capital.* Bordieu (1986) had begun using the idea to explain how people use help and support to obtain "credit" that can, then, be drawn upon later. An individual's network of social support was, to Bordieu, a mechanism of purposeful exchange that would provide a store of social capital that could be drawn upon as needed (Lee, 2010).

To Bordieu, the idea was not specifically isolated as an educational explanation. The idea was a social concept that explained human social behavior—the exchange of a commodity (Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011). James Coleman (1988) began using the concept to explain educational outcomes. Coleman saw social capital as a powerful background effect not purposely under the control of the one being affected. When discussing this issue he used social capital to explain why many mobile students did not finish high school. His theory suggested that when students moved to a new neighborhood or school they were removed from the support systems that would have allowed for academic success. He described the concept as follows:

> Just as physical capital and human capital facilitate productive activity, social capital does as well. For example, a group within which there is extensive trustworthiness and extensive trust is able to accomplish much more than a comparable group without that trustworthiness and trust. (Coleman, 1988, p S101)

Coleman (1988) saw the impact of social capital existing on two fronts, the family and the community. He found that students received support from these sources. Coleman cited the value of two parent families, families where both parents were not working full time, and families with close local connections to other relatives such as grandparents. When students moved, the potential to upset these connections was great. If a student's mobility was caused by

family decomposition, such as divorce or the death of a parent, the impact on a child's social capital was even greater. Community strength, as applied to a student's social capital, was seen most commonly at the school itself. Students who remained in one school for many years were known to the school community. The parents were known at the school as well, increasing social capital. Coleman suggested that in the exchange of capital (gestures of friendliness, favors, etc.) students with more social capital were better equipped to see success. Students who changed schools were less likely to have the social capital supplied by the community. This was thought by Coleman to explain the lessened academic success seen by mobile students.

Among researchers, the concept of social capital has become a commonly used tool to explain the impact of student mobility. Hutchinson, et al. (2004), for example, described social capital as an attractive tool, an "easy beauty." Here Hutchinson et al. were evoking the thoughts of John Dewey in describing concepts that appeared very attractive to educators, but which needed to be evaluated carefully. The reason for his concern was a combination of the popularity of the concept of social capital combined with a lack of clear definition. Many studies pointed to this lack of precision by which social capital was described and applied among researchers (Guillen, Golomina & Saris, 2010; Lee, 2010; Morrow, 1999). Hutchinson et al. referred to social capital's "circus tent quality" (p. 151), referring to the many applications sociologists have found for the concept. The general application of the concept was, at least in part, due to the concept's inability to be quantified well (Guillen, et al., 2010; Lee, 2010; Morrow, 1999). Attempts to define and measure the concept have been successful but have taken different directions. These different interpretations and applications of social capital have tended to demonstrate both the concept's accepted validity on a general level and the concept's accepted lack of precision on a specific level. Ream and Palardy (2008) used measures of

parents helping students, parents visiting schools, PTA involvement, and parental view of their influence at the school. Guillen et al. (2011) created a measure of social capital using membership in religious, social, sports political party, and cultural organizations as a gauge. Ditka and Singh (2002) conducted a synthesis of studies on the subject, finding varied measures such as the number of siblings, one or two parent family structure, mother's expectation for college, parental involvement at school, involvement in community, family encouragement, level of status of adults in student's life, SES, and parents knowing the parents of the student's friends.

In spite of the lack of definitional precision, many studies have demonstrated the value of social capital in trying to explain the academic impact of student mobility. Drewry, Burge, and Driscoll (2010) identified a direct link between student mobility and a loss of social capital resulting in a lessening level of achievement and eventual dropping out of school. Parent involvement was considered a key factor in this study as a means of building social capital that was able to strengthen a student's level of achievement. The study also indicated that the lack of social networking within the community was a major factor in the loss of social capital (Drewry et al., 2010).

Pribesh and Downey (1999) created a longitudinal design to allow them to examine social factors related to the academic attainment of mobile students. The longitudinal design also allowed them to examine pre-existing conditions. Pribesh and Downey demonstrated significant support for the impact of the loss of a student's social capital when changing schools, demonstrating that when controlling for prior educational performance, the impact of the loss of social capital became less of a factor, though still significant. Pribesh and Downey's findings agreed with previously cited studies that the conditions that caused low social capital (fewer community ties) were more likely to motivate families to move. Using community ties as an

indicator of social capital, the findings of Pribesh and Downey were a reminder that prior conditions must be taken into account when evaluating the effect of social capital.

Tucker et al. (1998) used the number of parents living with a student as a way of indicating social capital. Tucker et al. found that students from two parent families experienced no effect from changing schools while students without two parents at home did see significant problems at school. The evidence was noted by Tucker et al. to lend credence to Coleman's theory.

Our final consideration of the role of social capital connected less to student mobility. Rather, the point is to demonstrate the ways the current literature is using the concept of social capital to help explain racial and ethnic achievement gaps. This was included to broaden the reader's consideration and understanding of social capital. As an example, Oseguera, Conchas, and Mosquedo (2011) evaluated the preconditions necessary to the formation of social capital, finding that ethnic groups created different types of social networks with varying levels of effect. Asian families, for example, were often identified as having very effective family networks. This was seen as a powerful motivator for these students. African American and Hispanic families, though often having strong family relationships, did not as often access the kinds of social capital networking that pushed students to academic success. Rios-Aguilar et al. (2011) also pointed to the way that different cultural groups activated social capital. The study took the position that the existence of social capital within cultural groups may not be debatable, but the activation of this capital by different cultural groups may have existed on different levels. Rios-Aguilar et al. suggested that some minority cultures in the United States were not utilizing social capital as well as others. This suggestion was part of an attempt to explain inequities in the educational system. Ream (2005) made the connection between social capital and mobility in

trying to account for the lower achievement of Mexican-American students. Ream pointed to the increased rates of mobility that existed within that group and linked this directly to a lower level of social capital.

Ream and Palardy (2008) related social capital, as it affected student achievement, to a family's level of wealth and ethnicity. Students living in poverty were found to be "poor" in social capital as well as financial capital. The inverse was found to be true for more wealthy students. Hutchinson et al. (2004) found that social networks among the poor were less powerful. The neighborhoods of the poor were determined to be less helpful to those that lived in them. Menahem (2011) found that negative educational effects, in general, were associated with the lack of social capital in poorer neighborhoods that were homogeneous and "inward looking." This research was carried out in Israel where the cultural dynamics may be very different than those in the southeastern United States. However, if the point of homogeneity is the driving concept, some of the poorer neighborhoods represented in this study might be characterized as "inward looking."

The inability of social and educational researchers to agree on a way to define, apply, or quantify social capital can be seen as a limitation. In spite of this, the literature on the subject pointed to social capital as an important factor in student achievement in general and student mobility in particular. In fact, the literature seemed to commonly intertwine student levels of social capital, achievement and mobility. A working understanding of the way the current literature is viewing the concept seemed important.

General social factors. Some studies have evaluated the impact of student mobility on social considerations, not linked to social capital (Kirshner et al., 2010; South & Haynie, 2004).

South and Haynie (2004) measured the impact of moves on the social networks of students in a qualitative study that used surveys to gauge the effect of moves on these social networks four and six years after the move. An important finding was that students who changed schools were less likely to report having a friend at school, even four years later, and that they were also less likely to have another student list them as a friend. Mobile student's parents were also found to be less likely to know the parents of their child's friends. South and Haynie noted that mobile students were less popular within their schools. Interestingly, the findings did not apply to "normative" movers (non-residential movers). If a student changed schools but not residences, the effect on the social network did not exist. South and Haynie also indicated that schools with higher levels of mobility had lower levels of social networks at work within them.

Kirshner et al. (2010) evaluated the effects of a school closure on the academic achievement of a cohort of students. This closure forced the mobility of the entire school. Kirshner et al. found the dropout rate increased from 7% (the closed school's previous rate) to 15% among the cohort that had to complete their education at a new school. Kirshner et al. also identified a decline in overall cohort achievement. Kirshner et al. also reported that 40% of the students in this group reported a loss of relationships between students and between teachers. Along this same line, 40% indicated weaker relationships at the new school. A feeling of being unwelcome at the new school was also indicated.

Middle school social factors. The idea that middle school students had the tendency to approach social acceptance in a different way than elementary school students was indicated in the literature (Bowker, Rubin, Bushkirk-Cohen, Rose Krasner, & Booth-Laforce, 2010; Ryan & Shim, 2008). When the increased need for socialization of this age group was viewed alongside

the earlier evidence of de-socialization of mobile students (for example, Rhodes, 2008; South & Haynie, 2004) the impact of mobility on middle school students could be much greater than for other academic, or grade, levels.

Galvan et al. (2011) demonstrated that middle school students seemed to begin this transition almost immediately upon entering middle school in grade 6. Galvan et al. surveyed students in both elementary and middle schools asking these students to nominate who the "coolest" kids in their classes were and to nominate students who fit into three categories: academically engaged, disengaged and anti-social. The questions used to obtain nominations were:

> "Who participates in class and tries to do well in school?" (academic engagement), "Who does not care about doing well in school?" (disengagement), and "Who makes fun of others or says mean things about other kids?"(antisocial). Students were also asked to nominate the "cool" students in the class ("Who are the coolest kids in you class?"). (Galvin et al., 2011, p. 348).

The survey was done in both the fall and spring semesters. In the fifth grade, the primary quality correlated with "being cool" was academic engagement. The correlation between "being cool" and academic engagement was $r = .55$ ($p < .05$) among fifth graders. In the first semester of sixth grade the primary quality associated with "coolness" was antisocial behavior. The correlation between antisocial behavior and "coolness" in the fall was $r = .23$ ($p < .05$). By the second semester of sixth grade, antisocial behavior was correlated to "coolness" at $r = .68$ ($p <$ 01). Antisocial behavior became less important by seventh grade when its correlation was $r =$ .33 ($p < .01$) in the spring and $r = .44$ ($p < .01$) in the fall. In the seventh grade, academic disengagement was associated most positively with "coolness" ($r = .62$, $p < .01$ [fall] and $r = .67$ $p < .01$ [spring]). Academic achievement was negatively correlated to "coolness" by the second semester of sixth grade and during both semesters of seventh grade (Galvin et al., 2011).

Ryan and Shim (2008) found that early adolescents (sixth grade) who sought popularity displayed more aggressive, less helpful behavior toward each other. Theriot and Drupper (2010) indicated that sixth grade students had an increased number of discipline referrals (especially fights). Tu, Erath, and Flanagan (2011) demonstrated that middle school friendship networks provided a buffer from these aggressive effects.

The current research study analyzed the impact of mobility on middle school students. The primary literature to date on the mobility problem has not examined the impact of mobility on middle school students, as a unique group. The middle school student's unique need for approval (Galvin et al., 2011) and peer networking (Tu et al., 2011), when considered alongside the impact of mobility on social capital (Coleman, 1988), seemed to demonstrate the need for discussion of this topic.

Social factors related to Gender. Within the middle school, social needs seemed to drive boys and girls differently (Sandstrom & Cillesson, 2006). Sandstrom and Cillesson (2006) demonstrated that in the transition to middle school, girls were more driven by the need for friends; to the point that they were buffered from depression and anxiety by having friends. Bowker et al. (2010) found that boys were able to gain popularity by displaying arrogance and that girls who tried this were more often labeled as "stuck up" or "snobby" (p. 131). Girls were able to find popularity, more often, by displaying aggressive behavior (Bowker et al., 2010). Ryan and Shim (2008) had similar findings, noting that the aggressive behavior of girls involved gossiping and rumor spreading. Ryan and Shim found that boys were more aggressive, but less often for social acceptance. Sandstrom and Cillesson found differently, connecting boy's more overt aggression to a need for social acceptance.

Some researchers have connected middle school boy's and girl's social needs, more directly, with academic attainment (Tu et al., 2011; Veronneau & Dishion, 2011). Veronneau and Dishion (2011) indicated that there was an association between the poor behavior of a friend and a student's academic achievement. The effect was found to be more pronounced among girls (Veronneau & Dishion, 2011). Tu et al. (2011) demonstrated that middle school students utilize friends for academic help, noting that this was also more pronounced among girls.

Student mobility has been shown to have an impact on student socialization (Pribesh & Downey, 1999). Socialization seemed to effect academic attainment (Gruman et al., 2008). Gruman et al. (2008) indicated that gender was a significant predictor of classroom participation, attitude toward school and academic performance. Boys were negatively correlated with each of these factors. The point of the Gruman et al. study was to show how these factors worked together to effect student mobility.

Summary

This study examined the impact of mobility on student achievement. There appeared to be clear links between mobility and declines in achievement. These links were clouded, however, by the possibility that previously existing conditions may have affected the interpretation of the magnitude of the problem. Also affecting our ability to make "clean" analyses of the data were the social concerns of mobile students. Social capital appeared to be a major factor that needed to be understood by researchers, but lack of agreed upon definition made social capital a difficult concept to measure. Finally, we noted the potentially confounding effect of social issues in general. Students who changed schools had a struggle in both the social and academic realms. Students who had a pattern of mobility seemed to have a profound

struggle. The struggle of middle school students, specifically, was understood to be unique. Various studies indicated that boys and girls were affected differently by the need for socialization, lending support to their inclusion as a factor in an analysis of the impact of student mobility. The subject of student mobility and how it affected academic achievement was understood to be a complicated one that merited continued analysis.

Some research concluded that strategic family moves did not hurt students. Other research indicated that any school move, including normal promotional moves, had a detrimental effect. Most research pointed to other complicating factors such as the impact of pre-existing conditions related to both the student and the school. Poverty, for example, was often cited as a factor affecting the most mobile students. But pre-existing conditions at schools that received many mobile students, such as lower school-wide test scores or teachers of lower quality, may have had an effect on the mobile student's attainment as well.

It seemed that the current understanding of this topic lent to the need for further research. The related literature has established a significant understanding of the problem and it has provided a platform from which to seek to gain a greater appreciation for the challenges of mobile students, perhaps finding ways to make their transitions easier. The research project at hand sought to add to this body of knowledge in the hope that a future set of solutions would be developed to this end.

CHAPTER 3

METHODOLOGY

This chapter will seek to discuss the methods used to evaluate the impact of student mobility on middle school student achievement. This chapter describes the research questions, research design, population, instrumentation and data collection procedures, and data analysis. The purpose of the study was to demonstrate the level of academic impact of school mobility while considering the potentially confounding factors of gender and SED.

Research Questions

As stated in Chapter One, the research questions for this study were:

1. Are there differences between mobile and non-mobile students on the mathematics and reading scores of Tennessee Comprehensive Achievement Program (TCAP)?
2. Are there differences between mobile and non-mobile students by gender on the mathematics and reading scores of the TCAP?
3. Are there differences between mobile and non-mobile students on the mathematics and reading scores of the TCAP for students who are socio-economically disadvantaged (SED) and for students who are not SED?
4. Is there a difference between mobile and non-mobile students by gender on the mathematics and reading scores of the TCAP for students who are socio-economically disadvantaged (SED) and who are not SED?

Institutional Review Board Approval

The data collection process required approval from the Institutional Review Board of the University of Tennessee at Chattanooga (UTC-IRB) as well as the Director of Schools in the school system being evaluated. Based on the guidelines of UTC's IRB, the research qualified for and received expedited, exempt status. Once UTC's IRB approval was granted, the researcher was given approval from the school system's director to use the district's available data. No data were collected until both approvals had been obtained from both institutions.

The data used in this study were collected from the school system in a file containing only the information requested. No names were attached to these data. The file consisted of student test scores connected to requested information: enrollment by the twentieth day, gender, and SED. The data were collected for this research by the school system's Director of Accountability and Testing. Only data specifically related to this study were collected.

Description of the Research Design

This study employed a causal-comparative, quantitative design (Patten, 2005). As such the study examined existing test scores of students from the 2011 administration of the TCAP in one Tennessee school system. An experimental design was not indicated because a random sample of students was not selected from each category being examined. In addition, the difference in sample sizes of the categories based on the mobility factor was considered a cause for concern in an experimental study.

Description of the Population

The students whose test scores were used in this study were the middle school students (grades 6-8) in one Tennessee public school system. This system served all of the public school

students in the county. The system was moderately large with about 42,000 students. Of that number 9,082 were middle school students. The system had twenty schools with middle school students. The configurations of these schools differed. Thirteen of these schools served grades six through eight. One school served grades kindergarten through twelve. One school served kindergarten through eight. Five schools served grades six through twelve.

The school system had urban, suburban and rural areas. There were ten cities of varying size within the county. The largest of these cities had a population of 155,000. The remaining cities were significantly smaller with the next smaller in size having a population of 20,000. The smallest had 389 residents.

The database of test scores was maintained by the county school system for the purpose of required reporting to the state. The data provided to the researcher consisted of each student's mathematics and reading scores, a poverty and gender designation and an indicator of whether the student enrolled prior to the twentieth day of school. The poverty indicator used was enrollment in the federal free and reduced school lunch program. The mobility indicator was the twentieth day enrollment point. Students that were not enrolled prior to the twentieth day of school were considered mobile students. Students enrolled by the twentieth day were designated as non-mobile students.

Procedure of Study

Data collection. The data used in this study was not generated as a part of the study. The data being used for this research was housed in the county department of education. After obtaining the clearance to proceed from the Institutional Review Board, the data were collected and analyzed using statistical software. The data collected were provided to the researcher with

anonymous TCAP scores for each middle school student in the county school system chosen for this study. The data set included the TCAP reading and mathematics scores of each student along with each student's gender, and an indicator of whether the student was financially qualified to receive free or reduced lunch. A final variable indicated whether the student was enrolled by the twentieth day of school. There were 9,004 reading scores and 9,027 mathematics scores in the data set.

The scores that came from the state's reporting agency were scale scores. Using scale scores would only have allowed comparison of TCAP reading and mathematics scores across the same grade levels. For this reason, the scores were converted into normal curve equivalents (NCEs). The conversion to NCEs provided a normalized score that could be used compare all grade levels on the same subject test.

Instruments. The instrument used to determine student achievement was the Tennessee Comprehensive Assessment Program (TCAP) achievement test. This was the standardized test used in all Tennessee public schools to assess achievement as reported on the state report card. The TCAP achievement test has been used by Tennessee since the early 1990s as a way of assessing the achievement levels of the students in grades three through eight. The test was inaugurated as a norm referenced test, becoming criterion referenced in 2003. In 2010 the grading scales were changed to be "…more reflective of nationals and international student performance in the 21st century" (Tennessee Department of Education, 2010, Report Card) This test measured student achievement in mathematics, reading, social studies, and science. Only the TCAP mathematics and reading scores were utilized in this study. The TCAP achievement test followed a multiple choice format. The TCAP was a proprietary test created

for Tennessee by the Educational Measurement Group of Pearson. Reliability and validity information were not made available by the Tennessee Department of Education.

The TCAP was given over the course of four days with one day dedicated to each of the four subjects. The first testing day was for Language Arts. The test was given in two parts. In the part, with 42 multiple choice questions, the students were given 76 minutes. In the second part, the students were given 74 minutes to answer 40 questions. The mathematics test was given on the second day of testing. It consisted of two parts. Part one allowed 47 minutes to answer 35 questions. Part two allowed 46 minutes to answer 33 questions (Tennessee Department of Education, 2012, Test Manual).

The testing was led in each school building by a testing coordinator. This coordinator was either the principal or a certified teacher working with the principal (Tennessee Department of Education, 2012, Test Manual). The classroom testing administrators were also certified teachers.

Special Education students were qualified to take the Modified Academic Achievement Standards test. This was a simplified TCAP achievement test. It offered only three answer choices (the regular TCAP offered four). It had shorter reading passages, simplified language, simplified charts, tables and graphs, and fewer items on each page. English Language Learners were qualified to take the English Linguistically Simplified Assessment. This test simplified the language by decreasing wordiness, using the most simple verb forms, and avoided words with multiple meanings. In addition, sentence structure and context were simplified. Both of these tests were available with extended time (Tennessee Department of Education, 2012, Test Manual).

Data analysis. The first research question asked if there were any differences between mobile and non-mobile students on the mathematics and reading sections of the TCAP. To evaluate the differences between these means, an independent samples *t* test was conducted with the mathematics scores of all students as the dependent variable and with mobility (yes or no) as the independent variable. A second independent samples *t* test was conducted with the reading scores of all students as the dependent variable and mobility (yes or no) as the independent variable. "Yes" indicated that the student transferred into the school after the twentieth day of the school year (mobile students). "No" indicated that the student had been enrolled by the twentieth day of the school year (non-mobile students).

The second research question asked if there were any differences between mobile and non-mobile students by gender on the mathematics and reading sections of the TCAP. To evaluate the differences between these means, a two-way ANOVA was conducted with the mathematics scores of all students as the dependent variable. The independent variables were gender and mobility. A second two-way ANOVA was conducted using gender and mobility as the independent variables and with reading scores of all students as the dependent variable.

The third research question asked if there were any differences between mobile and non-mobile students on the mathematics and reading sections of the TCAP for students who were SED and for students who were not SED. To evaluate the differences between these means, a two-way ANOVA was conducted with the mathematics scores of all students as the dependent variable. The independent variables were SED and mobility. A second two-way ANOVA was conducted using SED and mobility as the independent variables with the reading scores of all students as the dependent variable.

The fourth research question was, “Are there differences between students by gender who are SED and not SED on the mathematics and reading sections of the TCAP for students who are mobile and non-mobile?” To answer this question a three-way ANOVA was conducted for each of the mathematics and reading scores as the dependent variables. In each test the independent variables were gender, SED, and mobility.

Conclusion

The expectation was that the methods chosen in carrying out this research would result in findings that could be relied upon to inform practice and future research. Care was taken to this end. The methods were chosen with the understanding that each middle school student represented in the study represented a commitment from the County Department of Education to provide a high quality education for that student. It is hoped that the methods chosen for this study reflected this commitment.

CHAPTER 4

RESEARCH QUESTIONS AND DATA ANALYSIS

Research Question 1

Research Question 1: Are there differences between mobile and non-mobile students on the mathematics and reading sections of the TCAP?

Null Hypotheses 1: There were no differences between mobile and non-mobile students on the mathematics and reading sections of the TCAP.

To evaluate the significance of the differences between these means, an independent samples *t* test was conducted with the mathematics scores of all students as the dependent variable and with mobility (yes or no) as the independent variable (see Table 1). Levene's Test for Equality of Variances was first run to determine if the variances of the population of mobile and non-mobile student's scores could be assumed to be homogeneous. The test results allowed

Table 1

Descriptive Information for *t* Test TCAP Mathematics and Reading

Test	Group	N	Mean	Std. Dev.
Math	Mobile	466	39.31	18.30
Math	Non-Mobile	8561	50.87	19.56
Reading	Mobile	461	42.33	20.07
Reading	Non-Mobile	8543	50.59	20.19

for the assumption of homogeneity. The non-mobile students saw a significantly higher mean TCAP mathematics score (M = 50.87, SD = 19.56) than the mobile students (M = 39.31, SD = .18.30). The difference of mathematics means between mobile and non-mobile students was significant [$t(9025) = -12.47$, $p < .001$]. See Table 2 for results.

Table 2

Results of *t* Tests for TCAP Mathematics and Reading Scores Between Mobile and Non-mobile

Test	*t*	df	Sig.	*M* Diff.
Math	-12.47	9025	<.001	-11.56
Reading	-8.55	9002	<.001	-8.26

Note: M Diff. = Mean Difference

A second independent samples t test was conducted with the reading scores of all students as the dependent variable and mobility (yes or no) as the independent variable. Levene's Test for Equality of Variances was examined to determine if the means of the population of mobile and non-mobile students could be assumed to be homogeneous. The test results allowed for the assumption of homogeneity. The mean score of the non-mobile students was significantly higher (M = 50.59, SD = 20.19) than the mobile students (M = 42.33, SD = 20.07). The difference of the reading means was significant [$t(9002) = -8.55$, $p < .001$].

The null hypotheses for research question one, reading and mathematics, were rejected. There were significant differences found for the mathematics and reading scores between the mobile and non-mobile students. The mobile students, included within this study, scored

significantly lower than the non-mobile students on both the TCAP mathematics and reading tests, 11.56 and 8.26 NCE points respectively.

Research Question 2

Research Question 2: Are there differences considering the effects of mobility and gender students on the mathematics and reading scores of the TCAP?

Null Hypotheses 2: There were no differences between considering the effects of mobility and gender on the mathematics and reading scores of the TCAP.

To evaluate the significance of the difference between the TCAP mathematics means of mobile and non-mobile boys and girls, a two-way ANOVA was conducted. First, Levene's Test of Equality of Variances was examined. This test did not allow the assumption of homogeneity of variance. Because the assumption of equal variances was not supported, the significance interpretation alpha threshold of the two-way ANOVA was lowered to $p = .001$ to counter the slight non homogeneity of the data. The interaction of gender on mobile and non-mobile boys and girls was not significant $F(1, 9023) = .093$, $p = .336$ (See Tables 3 and 4). The main effect of gender was not found to be significant $F(1, 9023) = 5.06$, $p = .025$ using the lowered alpha value (See Tables 3 and 4). An analysis of the confidence intervals, however, demonstrated that there were significant differences ($p < .001$) between the mathematics scores of mobile boys [33.82 to 41.99] and non-mobile boys [49.31 to 51.25]. Significant differences ($p < .001$) were also reported between the mathematics scores of mobile girls [36.55 to 45.22] and non-mobile girls [50.49 to 52.47].

Table 3

Descriptive Statistics for ANOVA: Gender and Mobility (TCAP Mathematics)

Variable	Mean	Std. Deviation	N
Mobile Boys	37.91	18.65	247
Mobile Girls	40.89	17.81	219
Non-mobile Boys	50.29	20.27	4364
Non-mobile Girls	51.48	18.79	4197

Table 4

ANOVA for TCAP Mathematics Scores by Mobility and Gender

Source	*SS*	*df*	*MS*	*F*	*P*
Mobility	58097.74	1	58097.74	152.91	<.001
Gender	1922.28	1	1922.28	5.06	.025
Mobility x Gender	351.75	1	351.75	0.93	.336
Error	3428191.15	9023	379.94		
Total	3488562.92	9026			

The research question also asked if mobility affected the genders differently. The confidence intervals (p = .001) for mobile boys [33.82 to 41.99] and mobile girls [36.55 to 45.22] had intersecting values (Table 5). We cannot say that the difference in the means of the TCAP mathematics mobile student's scores by gender were significant. The null hypothesis stating that there is no difference on main effects between mobile and non-mobile boys and girls

Table 5

Estimated Marginal Means (TCAP Mathematics)

Variable	Lower Limit (99.9)	Upper Limit (99.9)
Mobile Boys	33.82	41.99
Non-Mobile Boys	49.31	51.25
Mobile Girls	36.55	45.22
Non-Mobile Girls	50.49	52.47

on the TCAP mathematics test could not be rejected. There were significant differences between the scores of mobile students and their non-mobile counterparts on TCAP mathematics. There were not significant differences, however, between the mobile boys and mobile girls. It could not be said that boys and girls were impacted differently on the TCAP mathematics by their mobility.

To evaluate the significance of the difference between the TCAP reading means of mobile and non-mobile boys and girls, a two-way ANOVA was conducted. First, Levene's Test of Equality of Variances was examined. This test did not allow the assumption of homogeneity of variance. Because the assumption of equal variances was not supported, the significance interpretation alpha threshold of the two-way ANOVA was lowered to $p = .001$. The interaction of gender on mobile and non-mobile boys and girls was not significant $F(1, 9000) = 5.05$, $p = .025$ (See Tables 6 and 7). The main effect of gender was found to be significant $F(1, 9000) = 35.05$, $p = .000$ (See Tables 6 and 7). An analysis of the confidence intervals (Table 8) demonstrated that there were significant differences ($p < .001$) between the reading scores of mobile boys [34.40 to 42.87] and non-mobile boys [47.86 to 49.86]. Significant differences ($p <$

.001) were also reported between the reading scores of mobile girls [42.00 to 50.98] and non-mobile girls [51.37 to 53.41].

The confidence intervals did not show significantly ($p < .001$) different means between mobile boys [34.40 to 42.87] and mobile girls [42.00 to 50.98]. The confidence intervals did show significantly ($p < .001$) different means between non-mobile boys [47.86 to 49.86] and non-mobile girls [51.37 to 53.41]. The null hypothesis stating that there were no differences between mobile and non-mobile boys and girls on the TCAP reading test could not be rejected. As with Mathematics, though there were significant differences between mobile boys and girls and their Non-Mobile counterparts, there was no significant difference between boys and girls that were Mobile.

Table 6

Descriptive Statistics for ANOVA: Gender and Mobility (TCAP Reading)

Variable	Mean	Std. Deviation	N
Mobile Boys	38.63	20.77	244
Mobile Girls	46.49	18.44	217
Non-mobile Boys	48.86	20.52	4358
Non-mobile Girls	52.39	19.68	4185
Total Boys	48.31	20.66	4602
Total Girls	52.10	19.66	4402
Total	50.17	20.26	9004

Table 7

ANOVA for TCAP Reading by Mobility and Gender

Source	*SS*	*df*	*MS*	*F*	*P*
Mobility	28317.30	1	28317.30	70.15	<.001
Gender	14147.62	1	14147.62	35.05	<.001
Mobility x Gender	2040.16	1	2040.16	5.05	.025
Error	3633170.28	9000	403.69		
Total	3677675.36	9003			

Table 8

Estimated Marginal Means (TCAP Reading)

Variable	Lower Limit (99.9)	Upper Limit (99.9)
Mobile Boys	34.40	42.87
Non-Mobile Boys	47.86	49.86
Mobile Girls	42.00	50.98
Non-Mobile Girls	51.37	53.41

Research Question 3

Research Question 3: Are there differences between mobile and non-mobile students on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP) for students who are socio-economically disadvantaged (SED) and who are not SED?

Null Hypotheses 3: There were no differences between mobile and non-mobile students on the mathematics and reading sections of Tennessee Comprehensive Achievement Program (TCAP) for students who are socio-economically disadvantaged (SED) and who are not SED.

A two-way ANOVA was conducted to evaluate the significance of the difference in the mathematics means of mobile and non-mobile students who were SED. See Table 9 for descriptive statistics. Prior to this, Levene's Test of Equality of Variances was examined. The test did not allow for an assumption of equality of variances. Because the assumption of equal variances was not supported, the significance interpretation alpha threshold of the two-way ANOVA was lowered to $p = .001$.

Table 9

Descriptive Statistics for ANOVA: SED and Mobility (TCAP Mathematics)

Variable	Mean	Std. Deviation	N
Mobile Non-SED	42.23	18.65	205
Mobile SED	37.01	17.72	261
Non-mobile Non-SED	58.54	17.43	3755
Non-mobile SED	44.88	19.04	4896
Total Non-SED	57.70	17.87	3960
Total SED	44.47	19.05	5067
Total	50.27	19.67	9027

Using this $p = .001$ threshold, the difference between the mathematics scores of SED mobile ($M = 37.01$, $SD = 17.72$) and SED non-mobile ($M = 44.88$, $SD = 19.04$) students were significantly

different $F(1, 9023) = 23.06$, $p < .001$. The mathematics scores of non-SED mobile students ($M = 42.24$, SD 18.65) were significantly different from the mathematics scores of non-SED, non-mobile students ($M = 58.54$, $SD = 17.43$). See Table 10 for ANOVA data. The mathematics confidence intervals (See Table 11) of SED mobile students [33.27 to 40.75] did not intersect with the mathematics confidence interval of SED non-mobile students [44.01 to 45.75]. The mathematics confidence intervals for non-SED mobile students [38.02 to 46.45] did not intersect with the mathematics confidence intervals for non-SED, non-mobile students [57.56 to 59.53].

Table 10

ANOVA for TCAP Mathematics Scores by Mobility and SED

Source	*SS*	*df*	*MS*	*F*	*P*
Mobility	63644.29	1	63644.29	189.18	<.001
SED	38858.53	1	38858.53	115.51	<.001
Mobility x SED	7757.36	1	7757.36	23.06	<.001
Error	3035471.82	9023	336.41		
Total	26307399.80	9027			

In the case of TCAP reading scores, as indicated in Table 12, SED mobile students ($M = 38.85$, $SD = 19.22$) scored significantly lower ($p < .001$) than SED non-mobile students ($M = 43.77$, $SD = 19.10$) (See Table 13). Non-SED mobile students ($M = 46.84$, $SD = 20.30$) scored significantly lower than non-SED, non-mobile students ($M = 59.34$, $SD = 18.06$). Table 14

Table 11

Estimated Marginal Means (TCAP Mathematics)

Variable	Lower Limit (99.9)	Upper Limit (99.9)
Mobile	36.81	42.44
Non-Mobile	51.05	52.37
Non-SED	48.22	52.55
SED	39.03	42.86
Mobile Non-SED	38.02	46.45
Mobile SED	33.27	40.75
Non-Mobile, Non-SED	57.56	59.53
Non-Mobile, SED	44.01	45.75

Table 12

Descriptive Statistics for ANOVA: SED and Mobility (TCAP Reading)

Variable	Mean	Std. Deviation	N
Mobile Non-SED	46.84	20.30	201
Mobile SED	38.85	19.22	260
Non-mobile Non-SED	59.34	18.06	3740
Non-mobile SED	43.77	19.10	4803
Total Non-SED	58.71	18.39	3941
Total SED	43.52	19.14	5063
Total	50.17	20.26	9004

Table 13

ANOVA for TCAP Reading by Mobility and SED

Source	*SS*	*df*	*MS*	*F*	*P*
Mobility	32651.63	1	32651.63	93.30	<.001
SED	59721.53	1	59721.53	170.65	<.001
Mobility x SED	6188.24	1	6188.24	17.68	<.001
Error	3149675.49	9000	349.96		
Total	26355548.89	9004			

Table 14

Estimated Marginal Means (TCAP Reading)

Variable	Lower Limit (99.9)	Upper Limit (99.9)
Mobile	39.95	45.73
Non-Mobile	50.89	52.23
SED	39.35	43.27
Non-SED	50.86	55.32
Mobile, Non-SED	42.50	51.18
Mobile, SED	35.03	42.67
Non-Mobile, Non-SED	58.34	60.35
Non-Mobile, SED	42.88	44.66

indicates that the reading test confidence intervals of the SED mobile students [35.03 to 42.67] and the SED non-mobile [42.88 to 44.66] did not intersect. The reading test confidence intervals

of the non-SED mobile students [42.50 to 51.18] and the non-SED non-mobile students [58.34 to 60.35] did not intersect. The null hypothesis was rejected. There were significant differences found between the scores of the mobile and non-mobile, SED and non-SED students on the TCAP reading scores.

Research Question 4

Research Question 4: Are there differences between mobile and non-mobile students by gender on the mathematics and reading scores of Tennessee Comprehensive Achievement Program (TCAP) for students who are Socio-economically disadvantaged (SED) and for students who are not SED?

Null Hypothesis 4: There were no differences between mobile and non-mobile students by gender on the mathematics and reading scores of Tennessee Comprehensive Achievement Program (TCAP) for students who are Socio-economically disadvantaged (SED) and for students who are not SED.

A three-way fixed effects between-subjects factorial analysis of variance was performed on the data. The interaction and main effects of mobility, gender, and SED were examined with mathematics as the dependent variable (see Table 15). The interaction of mobility, gender, and SED was not significant with the TCAP mathematics scores as the dependent variable. The two-way interactions of Mobility x Gender and Gender x SED were not statistically significant. The Mobility x SED interaction was found to be statistically significant $F(1, 9019) = 21.11$, $p < .001$. The *eta-squared* for the interaction Mobility x SED interaction was significant but accounted for only approximately 0.2% effect on the variance on the dependent variable.

Table 15 also reveals the main effects of the model. The impact of mobility on the dependent variable, TCAP mathematics, was found to be statistically significant $F(1, 9019) = 182.97$, $p < .001$. SED also had a statistically significant effect $F(1,9019)= 118.95$, $p< .001$. An analysis of confidence intervals (see Table 16) found that non-mobile boys performed significantly ($p < .001$) better than mobile boys [boys non-mobile: 50.22 to 52.06; boys mobile: 34.17 to 41.87] on the TCAP mathematics test. Non-mobile girls performed significantly ($p < .001$) better than mobile girls [girls non-mobile: 51.37 to 53.24; girls mobile: 37.44 to 45.72] on the TCAP mathematics test. When examining the confidence intervals of gender and income there were significant ($p < .001$) differences for boys between the two levels of income [boys non-SED: 45.87 to 51.69; boys SED: 37.69 to 43.06]; significant differences ($p < .001$) for girls were also found for girls at the different levels of Income [girls non-SED: 49.11 to 55.59; girls SED: 38.80 to 44.27].

An examination of the confidence intervals (table 16) did not reveal significant ($p < .001$) differences between mobile boys [34.17 to 41.87] and mobile girls [37.44 to 45.72] on TCAP mathematics. There was no significant ($p < .001$) difference found between SED boys [37.69 to 43.06] and SED girls [38.80 to 44.27] on TCAP mathematics. Students who were mobile and SED [33.28 to 40.75] did not have significant ($p < .001$) differences from students who were mobile and non-SED [38.34 to 46.82] on TCAP mathematics.

The null hypotheses that there were no differences between mobile and non-mobile male and female students on the mathematics section of the TCAP for students who are SED and for students who are not SED was partially rejected. For the interaction between mobility and SED on the TCAP mathematics, the null hypothesis cannot be rejected. For mathematics, significant differences existed for the main effects of SED and non-SED students who were mobile. The

differences for the main effect of mobility and gender were not significant. The differences for the main effect of gender and SED were not significant.

Table 15

ANOVA for TCAP Mathematics by Mobility, Gender, and SED

Source	*SS*	*df*	*MS*	*F*	*P*	*Eta-Squared*
Mobility	61475.35	1	61475.35	182.97	<.001	.020
Gender	2419.20	1	2419.20	7.20	.007	.001
SED	39966.27	1	39966.27	118.95	<.001	.013
Mobility x Gender	619.21	1	619.21	1.84	.175	.000
Mobility x SED	7091.77	1	7091.77	21.11	<.001	.002
Gender x SED	628.26	1	628.26	1.87	.172	.000
Mobility x Gender x SED	870.78	1	870.78	2.59	. 107	.000
Error	3030328.53	9019	335.99			
Total	26307399.80	9027				

Table 16

Estimated Marginal Means for Two-Way Interactions (TCAP Mathematics) by Confidence Intervals

Variable	Lower Limit (99.9)	Upper Limit (99.9)
Mobile, Non SED	38.34	46.82
Mobile, SED	33.28	40.75
Non Mobile, Non SED	57.57	59.54
Non-Mobile, SED	44.02	45.76
Mobile, Boys	34.17	41.87
Mobile, Girls	37.44	45.72
Non-Mobile, Boys	50.22	52.06
Non-Mobile, Girls	51.37	53.24
Boys, Non-SED	45.87	51.69
Boys, SED	37.69	43.06
Girls, Non-SED	49.11	55.59
Girls, SED	38.80	44.27

Table 17

Estimated Marginal Means for Three-Way Interactions (TCAP Mathematics) by Confidence Intervals

Variables	Lower Limit (99.9)	Upper Limit (99.9)
Boys, Mobile, Non-SED	33.84	45.14
Boys, Mobile, SED	31.32	41.78
Boys, Non-Mobile, Non-SED	56.70	59.45
Boys, Non-Mobile, SED	42.98	45.42
Girls, Mobile, Non-SED	39.35	52.00
Girls, Mobile, SED	32.15	42.82
Girls, Non-Mobile, Non-SED	57.62	60.44
Girls, Non-Mobile, SED	44.34	46.83

A three-way fixed effects between-subjects factorial ANOVA was performed on the TCAP data with reading as the dependent variable. The results are shown in Table 18. The three-way interaction of Mobility x Gender by SED was found not to be statistically significant. The two-way interactions of Mobility x Gender, Mobility x SED, and Gender x SED were also tested. The Mobility x SED interaction was found to be statistically significant $F(1, 8996) = 15.77$, $p = .006$. Eta-squared for the Mobility x SED interaction was computed to be .002. This meant that the Mobility x SED interaction explained 0.2% of the variance in the dependent variable. This interaction was very small and found to have a small effect on the mobility and income variables. A significant main effect was found for factor mobility $F(1, 8996) = 88.03$, $p < .001$, gender $F(1, 8996) = 44.48$, $p < .001$, and SED $F(1,8996) = 178.03$, $p < .001$. The null

hypotheses that there were no differences between mobile and non-mobile male and female students on the mathematics and reading sections of the TCAP for students who are SED and for students who are not SED was partially rejected. For the three-way interaction between mobility, gender, and SED, the null hypothesis cannot be rejected. For the two-way interaction between mobility and SED on the TCAP reading, the null hypothesis was rejected, though the effect was small. For the two-way Mobility x Gender and Gender x SED interactions the null hypotheses were rejected. For reading, significant differences existed for the main effects of SED, gender and mobility.

An examination of the confidence intervals (table 19) revealed significant ($p < .001$) differences between mobile boys [34.98 to 42.86] and mobile girls [43.18 to 51.60] on TCAP reading. There were also significant ($p < .001$) differences between non-mobile boys [48.90 to 50.77] and non-mobile girls [52.40 to 54.31] on TCAP reading. There was no significant ($p < .001$) difference found between SED boys [36.31 to 41.74] and SED girls [40.92 to 46.53] on TCAP reading, though non-SED girls had significantly higher reading scores than boys who were non-SED [non-SED girls: 53.73 to 60.31; non-SED boys: 46.72 to 52.73]. Students who were mobile and SED [35.14 to 42.74] had significant ($p < .001$) differences from students who were mobile and non-SED [43.03 to 51.71] on TCAP reading. Students who were mobile and SED [35.14 to 42.74] had significant ($p < .001$) differences from students who were non-mobile and SED [42.92 to 44.69] on TCAP reading.

Table 18

ANOVA for TCAP Reading by Mobility, Gender, and SED

Source	*SS*	*df*	*MS*	*F*	*P*	*Eta-Squared*
Mobility	30478.26	1	30478.26	88.03	<.001	.010
Gender	15401.21	1	15401.21	44.48	<.001	.005
SED	61637.46	1	61637.46	178.03	<.001	.019
Mobility x Gender	2626.64	1	2626.64	7.59	.006	.001
Mobility x SED	5460.39	1	5460.39	15.77	<.001	.002
Gender x SED	722.10	1	722.10	2.09	.149	.000
Mobility x Gender x SED	842.77	1	842.77	2.43	.119	.000
Error	3114597.77	8996	346.22			
Total	26355548.89	9004				

Table 19

Estimated Marginal Means for Two-Way Interactions (Reading) by Confidence Intervals

Variable	Lower Limit (99.9)	Upper Limit (99.9)
Mobile, Non SED	43.03	51.71
Mobile, SED	35.14	42.74
Non Mobile, Non SED	58.38	60.38
Non-Mobile, SED	42.92	44.69
Mobile, Boys	34.98	42.86
Mobile, Girls	43.18	51.60
Non-Mobile Boys	48.90	50.77
Non-Mobile, Girls	52.40	54.31
Boys, Non-SED	46.72	52.73
Boys, SED	36.31	41.74
Girls, Non-SED	53.73	60.31
Girls, SED	40.92	46.52

Table 20

Estimated Marginal Means for Three-Way Interactions (Reading) by Confidence Intervals

Variables	Lower Limit (99.9)	Upper Limit (99.9)
Boys, Mobile, Non-SED	35.94	47.62
Boys, Mobile, SED	30.76	41.34
Boys, Non-Mobile, Non-SED	56.27	59.07
Boys, Non-Mobile, SED	40.76	43.23
Girls, Mobile, Non-SED	46.54	59.38
Girls, Mobile, SED	36.37	47.28
Girls, Non-Mobile, Non-SED	59.66	62.52
Girls, Non-Mobile, SED	44.36	46.89

Conclusion

In general, the findings demonstrated a pattern of significant differences between the TCAP mathematics and reading scores of middle school students who were mobile versus those that were not mobile on both subject tests with mobile students demonstrating lower achievement. Two findings were particularly interesting in light of the review of related literature. First, the mobility factor often seemed to have a greater impact than the SED factor. SED was a primary factor related to negative student achievement. SED and mobility were often combined to significantly lower student achievement. However, it was somewhat unexpected to see mobility demonstrating such a singularly damaging effect. An analysis of the range of the mathematics confidence intervals on tables 11 and 16 demonstrated this interesting finding. Here, regardless of whether a student was SED on non-SED there were significant differences

between the mathematics test scores of mobile and non-mobile students. When examining the range of the confidence intervals of mobile and non-mobile students, SED accounted for significant differences only among the non-mobile students. These findings seemed to demonstrate a negative effect of mobility on middle school students that was separate, and even potentially stronger, than the effect of poverty. An analysis of the range of the reading confidence intervals on tables 14 and 19 demonstrated similar findings. These confidence intervals demonstrated a significant negative impact of mobility on middle school reading ability regardless of a student's SED or non-SED status. The three-way ANOVA did demonstrate a reading effect of SED, separate from mobility, among mobile middle school students.

In addition, the findings demonstrated an interesting relationship between mobility and gender. Gender was significant in reading score differences, but not mathematics. A particularly interesting finding was that non-mobile girls outscored non-mobile boys significantly in reading until they became mobile. The advantage that middle school girls had in reading disappeared when they became mobile. An analysis of the confidence interval ranges of the three-way interactions on tables 17 and 20 revealed important information related to middle school gender differences on mathematics versus reading. In mathematics there were no significant differences between boys and girls whether they were mobile, non-mobile, SED, or non-SED. In reading, however, there were significant differences between boys and girls in each case where they were mobile. These differences were not demonstrated between non-mobile boys and girls. This significant difference was observed whether the student was SED or non-SED.

Middle school students who changed schools were impacted by these moves. The possibility that many of them were mobile because of their SED status presents a confounding factor. The findings of this research provided some thought provoking information related to

this confounding relationship. In addition, the findings demonstrated a difference in the ways that middle school boys and girls were affected by school changes. The next chapter will seek to discuss these findings, among others, in greater detail and to make recommendations for future research.

CHAPTER 5

SUMMARY AND DISCUSSION

Chapter Five will present a summary of this study. The chapter will revisit the problem statement, purpose, significance, literature overview, and methodology of the study. Chapter Five will conclude with a summary of the limitations, discussion of results, implications for schools, and recommendations for future research.

Statement of the Problem

Student mobility has continued to be a significant problem in today's schools (Sanderson, 2004). There was a concern for the educational topics that students miss when they moved. In addition there was a concern for the academic pacing of the classroom when many of the students were mobile.

The problem was a complicated one to sort out. The impact of the mobility itself was not clearly understood since there were so many potential confounding issues (Rumberger et al., 1999). Mobility was more often associated with poverty. Students from poor families were often forced to move in reaction to housing circumstances (Hanushek et al., 2004). The moves made by the families of wealthier students were often moves to improve school situations (Hanushek et al., 2004). The actual impact of the mobility itself was difficult to determine.

In addition the way students interacted socially complicated the effects of mobility (Kingery et al., 2011). Middle school students had a great need for social interaction. For them the desire to be accepted was an important motivator (Kingery et al., 2011). It was unclear how

much this motivator interacted with mobility to create challenges for mobile middle school students.

Purpose of the Study

The purpose of this study was to determine if the mobile middle school students in a southeastern school system demonstrated less academic achievement than the non-mobile students. The interacting effects of SED and gender were examined.

Significance

School accountability is a contemporary concern. The importance of student achievement, as measured by standardized tests, is growing and meeting the educational needs of each individual student has become significant. The current research study may help inform the discussion of the manner in which mobile students are handled in the school accountability process. In addition, the current research may help inform the way that schools, and school systems, work with middle school students who are mobile.

The study is also significant in that it is examining the impact of mobility on middle school students. These students have been shown to be a unique challenge among academic levels (Meyer, 2011). Since much of the current work on the impact of student mobility is being done among high school and elementary school students, the focus on middle school students, and their unique manifestations, could lend significance to this study.

Literature Overview

The current literature demonstrated the magnitude of the mobility problem. Rumberger (2003) found that 34% of fourth graders, 21% of eighth graders, and 10% of twelfth graders had

changed schools at least once in the previous two years. The United States Census Bureau noted that between 2008 and 2009, 40.1 million United States citizens reported having made a residential change. Of that number, 67.3% moved within the same county, 17.2% moved within the same state. Another 12.6% moved between states (Ihrke et al., 2011).

The problem resulted in clear academic harm toward students as they missed academic topics (Lesisko & Wright, 2009). In comparing the achievement test scores of incoming students to those that had been in the school for three years, Lesisko and Wright (2009) found a significant negative difference in achievement. Engec (2006) demonstrated this mobility difference with students in Louisiana and Kerbow et al. (2003) saw a similar effect in urban Chicago.

Students that changed schools were found to have an impact on the other students in the school that they join (Lash & Kirkpatrick, 1990). They found that when new students came into classrooms lacking knowledge of the current topic of study, teachers were forced to review. Schools with higher levels of mobility were forced to slow down the academic pacing for all students (Lash & Kirkpatrick, 1990). Hanushek et al. (2004) found similar results when evaluating the types of moves undertaken in which parents were seeking better school quality for their children. These researchers demonstrated that at schools with a great deal of instability due to mobility, all students were negatively impacted.

Multiple studies pointed to the connection between student mobility and discipline issues (Engec, 2006; Hoglund & Leadbeater, 2004). Engec reported that students in Louisiana had a 9.7% suspension rate if they were enrolled one time during the school year (non-mobile students). Students with two enrollments saw a suspension rate of 17.51% and students with three enrollments had a suspension rate of 21.7%. This study examined secondary school

student mobility. South et al. (2005) documented a greater likelihood of mobile students to engage in risky behavior. This was linked to a greater likelihood to begin associating with other students, in the new school, that participated in risky behavior. An explanation that seemed to find support in South et al. was that mobile student's peer networks placed little emphasis on prestige and tended not to view newcomers as rivals. Higher status peer networks were thought to shun newcomers. The result was often membership in a peer network that engaged in various risky behaviors, specifically sexual activity, at an earlier stage than their non-mobile peers.

Rumberger et al. (1999) pointed out that all student mobility was not equal. Some moves occurred during the summer. Some moves were motivated by the desire to give children greater opportunities. Some moves were caused by job changes. Job changes could have involved a promotion or be a response to the loss of a job. Some moves were because of a residential eviction. Family emergencies could have necessitated moves as well, thus moves could be "reactive" or "strategic," strategic moves being more planned and often positive.

Schafft (2005) noted the complicated link between poverty and mobility and that, in addition to being a co-factor with mobility, poverty itself was linked to mobility. Schafft indicated that most of the students involved in mid-school year moves were from households below the poverty line. Nationally, this was also true. The U.S Census found that in 2008-2009 26.5% of people living below the poverty line moved. That same year only 11.7% of people living 150% above the poverty line moved (Ihrke et al., 2011). Wright (1999) found that mobility within a school district was strongly associated with poverty and that poverty was linked more strongly to lower achievement than mobility. In the literature, poverty remains the primary confounding factor in determining the level of impact of student mobility.

An understanding of the academic impact of student mobility required the consideration of social issues as well. Rhodes (2008) found that students reported social issues far more often than academic ones when questioned about mobility related problems. When changing schools these students commonly reported that finding friends was "…their first priority, more important initially than any academic needs" (Rhodes, 2008, p. 123). Rhodes further found that students expressed an inability to focus on academic concerns until social needs were met. James Coleman (1988) provided a means of demonstrating how this social need created academic challenges for mobile students when he applied the idea of social capital as a resource that some students and their families have in greater and lesser amounts. Coleman demonstrated that students had community and family support systems that provided an impetus for student success. When students moved, the potential to upset these connections was great. If a student's mobility was caused by family decomposition, such as divorce or the death of a parent, the impact on a child's social capital was even greater. Coleman suggested that in the school students with more social capital were better equipped to see success. Students who changed schools were less likely to have the social capital supplied by the community. This was thought by Coleman to explain the lessened academic success seen by mobile students.

The idea that middle school students had the tendency to approach social acceptance in a different way than other grade-level students was indicated in the literature (Bowker et al., 2010; Ryan & Shim, 2008). When the increased need for socialization of the middle school age group was viewed alongside the earlier evidence of de-socialization of mobile students (for example, Rhodes, 2008; South & Haynie, 2004); the impact of mobility on middle school students could be much greater than for other academic, or grade, levels.

Within the middle school, social needs seem to drive boys and girls differently (Sandstrom & Cillesson, 2006). Sandstrom and Cillesson (2006) demonstrated that in the transition to middle school, girls were more driven by the need for friends than were boys. Other researchers have indicated the importance of middle school student socialization to their academic attainment (Tu et al., 2011; Veronneau & Dishion, 2011). This was found to be more significant among girls (Veronneau & Dishion, 2011). Tu et al. (2011) demonstrated that middle school students utilized friends for academic help, noting that this was also more pronounced among girls.

Methodology

This study employed a causal-comparative, quantitative design. As such the study examined existing test scores of students from the 2011 administration of the TCAP in one Tennessee school system. It compared the means of mobile and non-mobile students, seeking significant mean differences using, as appropriate, a *t* test, two-way and three-way ANOVAs. The variables were mobility status, gender and SED. The main effects of each were examined along with interactions between the main effects.

Discussion of the Findings

Discussion of research question 1. In the first research question the means of the mobile and non-mobile students were compared. On both the reading and the mathematics portions of the test, non-mobile students significantly ($p < .001$) outscored mobile students. On the mathematics test the mean difference was 11.56 NCE points. On the reading test the mobile students were outscored by a mean of 8.25 NCE points.

This result was not unexpected based on the literature review. Mobility had a strong effect on student achievement in both mathematics and reading. Middle school students who missed the continuity offered by having the same teachers all year suffered academically when they changed schools. The related literature had indicated that mobile students did not perform as well as their non-mobile counterparts (Lesisko & Wright 2009). The *t* test employed to answer the research question did demonstrate that mobile middle school students were at a disadvantage when compared to non-mobile students. It could not, however, address the potentially confounding effect of poverty. The need to account for the effect of poverty was commonly found in the related literature (Schafft, 2005; Schaller, 1976; Wright, 1999). The fact that students who changed schools were at a disadvantage did not demonstrate whether some students were at a greater disadvantage. The remaining research questions will attempt to clarify how, and to whom, school mobility is harmful.

Discussion of research question 2. Research question 2 asked if boys and girls were affected differently by their mobility on the TCAP mathematics and reading tests. Answering this question required looking at it in two ways. First, did either gender have any significantly different TCAP score because of their mobility? This compared mobile boys to non-mobile boys and mobile girls to non-mobile girls. Second, were the mobile boys and girls TCAP scores significantly different from each other?

Mathematics and gender. An analysis of the confidence intervals that were used due to a slight interaction on the two-way ANOVA showed that mobile boys did not have a significantly different mean on the TCAP mathematics from mobile girls. The confidence intervals did demonstrate a significant difference between both mobile boys versus non-mobile boys and

mobile girls versus non-mobile girls. Both middle school boys and girls seemed to be e impacted negatively by their mobility.

The difference between mobile boys and mobile girls was not significant in mathematics. The confidence intervals for the means of mobile boys versus mobile girls did not demonstrate significance differences. This seemed to be an important consideration leading this researcher to believe that both middle school boys' and girls' mathematics achievement is similarly impacted by mobility.

Reading and gender. The interaction between gender and mobility from a two-way ANOVA did not show significance. The main effect of gender did demonstrate significance. As with mathematics, the confidence intervals of the mobile versus non-mobile boys and girls demonstrated significant differences between their means. Middle school boys and girls who were non-mobile did significantly better on the TCAP reading than middle school boys and girls that were mobile. This was demonstrated by the confidence intervals as well. In the analysis between boys that were mobile versus girls that were mobile, there was no significant difference. As in mathematics, this seemed to be an important point. Boys and girls, when comparing within mobile and non-mobile groups, were not affected differently by mobility on the TCAP reading.

However, comparisons were also made between mobile and non-mobile gender groups. An interesting point should be noted here. Non-mobile girls performed significantly better than non-mobile boys on the TCAP reading. Yet the mobile girls did not have significantly higher TCAP reading scores versus the mobile boys. This difference may have indicated that mobility had a greater impact on middle school girl's reading ability than on middle school boy's reading.

This point was a very significant one. Sandrom and Cillesson (2006) indicated that girls and boys have different needs in the transition to middle school with girls found to have greater socialization needs. While it was not possible to make a causative link to the mobile girls' loss of reading superiority over boys, this link was a consideration that the literature offers. This outcome should give greater urgency to school leaders for intervening in the socialization of transfer middle school students. It is also hoped that this will motivate further research on this potentially confounding factor.

The null hypothesis was partially rejected. Mobile boys and girls did not have significantly different mathematics or reading scores from each other. Non-mobile boys and girls did not have significantly different mathematics or reading scores from each other. However, both mobile boys and girls scored significantly lower than non-mobile boys and girls in both mathematics and reading. In addition, a reading superiority of non-mobile girls over non-mobile boys did not exist between mobile students.

Discussion of research question 3. Research question 3 asked if there was a difference between mobile and non-mobile students on the mathematics and reading sections of the TCAP for students who were SED and were not SED

Mathematics and mobility. Using, again, a two-way ANOVA and examining confidence intervals for means, Table 11 displays that the estimated means of the TCAP mathematics mobile students who were SED were significantly lower than those of non-mobile students who were SED. The estimated means of the mobile, non-SED were significantly lower than the non-mobile, non-SED students. These findings suggested that mobility has a primary effect on SED students' TCAP mathematics achievement. Middle school students who changed schools during

the school year seemed to have a harder time with mathematics than middle school students who remained in the same school all year.

Mathematics and SED. As demonstrated in Table 10, the interaction between mobility and SED was significant ($p < .001$). Following the use of a two-way ANOVA, confidence intervals were examined. The confidence intervals found in Table 11 demonstrated the differences. First the impact of SED was evaluated. There was an interaction of the estimated means of the TCAP mathematics scores between mobile, SED and mobile, non-SED. SED did not make a significant difference in the mathematics scores of the students who changed schools. This finding was significant as the literature on the subject suggested that the confounding effect of poverty needed to be considered before evaluating the affect of mobility (Schaller, 1976). These findings demonstrated that students who were mobile and SED did score lower on their TCAP mathematics test than the non-SED mobile students, but not significantly lower. However, students who were mobile but not SED had significantly lower TCAP mathematics scores than students who were not mobile and not SED.

Among non-mobile students who were SED and non-mobile students who were non-SED there was no intersection of their TCAP mathematics estimated marginal means. SED appeared to impact students who were not mobile. The reasons for the different effect of SED on mobile and non-mobile middle school students are not fully understood. It seemed important, however to point out that in mathematics, the effect of mobility was clearly significant. In combination with poverty, mobility had an even more significant impact. Interestingly, however, mobility seemed to have a greater effect than poverty on middle school mathematics achievement.

Reading and SED. Results from a two-way ANOVA and examination of confidence intervals for means showed that the mobile students who were SED did not have estimated mean scores that were significantly different than the mobile students who were non-SED (See Table 14). It may be worth noting that the overlap of the two mean ranges is small. This interaction did not allow for a finding of significant impact from SED among mobile students on TCAP reading. The interaction is close enough, however, to warrant attention for future research. Among non-mobile students, the finding was different. Here, the difference between the estimates of TCAP reading was significant between SED and non-SED, non-mobile students. It appeared that the reading achievement of the non-mobile students was affected more by SED than the reading achievement of the mobile students was for SED.

This lack of SED impact on mobile students may demonstrate the impact of mobility. The students who were non-mobile saw the impact of poverty on their test scores. This impact of poverty was commonly found in the literature (Schafft, 2005; Wright, 1999). The lack of SED impact among mobile students would seem to demonstrate that mobility was very damaging to student reading ability. This would seem to have important implications for practitioners as measures are considered to help mobile students.

Reading and mobility. Similar to the previous data analyses techniques, there was shown to be a significant impact by mobility on the TCAP reading scores of the population. The students who were mobile and SED saw significant differences in their scores from the students who were non-mobile and SED. Students who were mobile and non-SED saw significantly lower reading scores from students who were non-mobile and non-SED. It appeared that

regardless of the student's SED designation, the student's mobility status was significant in determining his TCAP reading achievement level.

Conclusions for research question 3. The literature review had mixed results in explaining the confounding effect of poverty on school mobility research (Schaller, 1976; see also Strand & Demie, 2006; Strand & Demie, 2007; Wright, 1999). The results of the current study's findings for research question 3 seemed to demonstrate a more clear impact of mobility. Among the non-mobile students, SED had a significant impact on both TCAP mathematics and reading. Among mobile students, there was no significant difference in either TCAP mathematics or reading regardless of their SED designation. This could be interpreted to demonstrate that mobility was so detrimental to students that the impact of SED was not as observable. This finding seemed very important in demonstrating the singular impact of students changing schools.

The findings for the impact of mobility on TCAP mathematics and reading achievement were not surprising. Students who were mobile saw lower scores in TCAP mathematics and reading whether they were designated SED or not. The review of literature led this researcher to expect less clarity in the results (Schaller, 1976; see also Strand & Demie, 2006; Strand & Demie, 2007; Wright, 1999). It would seem that middle school students were significantly affected by changing schools during the school year. Mobility appeared to have the primary effect and that SED had a secondary effect.

Discussion of research question 4. Research Question 4 asked whether there were differences between mobile and non-mobile male and female students on the mathematics and reading sections of the TCAP for students who are SED and for students who are not SED. The

results of the three-way ANOVAs that were performed on the TCAP mathematics and reading data were analyzed to provide an increased understanding of the way mobility interacts with gender and SED to affect achievement.

Mathematics. The three-way ANOVA that measured the TCAP mathematics interactions between gender, mobility and SED did not find the differences between these means to be significant (Table 15). The interaction between mobility and gender was not significant ($p = .175$). The interaction between gender and SED was not significant ($p = .172$). The interaction between mobility and SED was significant ($p < .001$). This finding was similar to the previous findings from the two-way ANOVA that was conducted to answer research question 3, adding evidence to the contention that SED had less of an impact on middle school student's mathematics scores than mobility or mobility combined with SED.

An examination of the two-way interactions by confidence intervals from Table 16 was similar to the two-way findings from research question 3. Mobile students scored significantly lower than their non-mobile counterparts whether they were SED or non-SED. SED demonstrated a significant effect only among students who were not mobile. These findings demonstrated the strength of the mobility factor in affecting student TCAP mathematics achievement.

Table 17 provides the estimated marginal means for the three-way mathematics interactions by confidence intervals. Gender did not have any significant impact on TCAP mathematics achievement. Among mobile middle school students' confidence intervals, SED had no significant interaction but among SED middle school students' confidence intervals, mobility had a significant interaction in each case.

Reading. The three-way ANOVA measuring the interaction of gender, mobility, and SED on TCAP reading did not find significant effects ($p < .001$) among the interactions. The two-way interactions of mobility by gender and gender by SED were also found to be insignificant ($p < .001$). Only the two-way interaction of mobility by SED was significant.

In the two-way measure of the interaction of the confidence intervals of mobile boys and mobile girls, the interaction was not significant (table 8). When reported earlier, the interaction indicated an effect of mobility on girl's reading achievement. When the effect of SED was controlled by the three-way test, the difference between the mobile boys' and mobile girls' TCAP reading scores (table 19) were significant ($p < .001$). This disparity was recognized. However, the confidence intervals from the three-way test (table 20) demonstrated support for the finding from research question 2. In reading, boys and girls who were mobile and SED did not score significantly different from each other. Boys and girls that were mobile and non-SED did not score significantly different from each other. When the mobility status was changed there was a significant difference in both cases. Boys and girls that were non-mobile and SED did score significantly different, with girls outscoring boys. Girls that were non-mobile and non-SED also outscored the non-mobile, non-SED boys. These findings supported the findings from research question 2 demonstrating that mobility, over poverty, had an impact on girls' reading. Girls who were mobile, SED or not, lost their reading superiority over boys.

A second finding was indicated by the three-way ANOVA that was different from the two-way ANOVA performed for research question 3 dealing with SED. In the two-way interaction that was detected for research question 3, mobile students that were non-SED did not score significantly ($p < .001$) different than mobile students that were SED in reading. The

three-way test, controlling for the effect of gender, found that the non-SED mobile students scored significantly higher than the SED, mobile students on TCAP reading. This disparity was clarified, though not explained, by looking at the three-way results (table 20). Mobile, SED boys did not score significantly different from non-mobile, SED boys. Mobile, SED girls did not score significantly different from non-mobile, SED girls. Clearly, SED maintained a powerful effect. Mobility had a strong effect as well. The nature of this relationship remains open to further research.

Main Effects. With TCAP mathematics, the main effects of mobility and SED had differences that showed significance at the $p < .001$ level. Reading demonstrated the same significance between mobility and SED. This was not surprising as the findings of this research study and the findings of previous research studies (Ingersoll et al., 1989; Sanderson, 2004) have demonstrated the effects of student mobility and poverty. This also helps to explain how poverty is thought of as a "confounding" factor in so many studies (Schaller, 1976).

Summary discussion. The first research question was answered affirmatively. Mobility did have an effect on middle school student's achievement in both mathematics and reading. This section did not clarify how poverty or gender may have affected the impact of mobility on achievement.

The findings of this research study seemed to support the position that mobility, during the school year, had a significant negative effect on middle school student achievement in both mathematics and reading. In the analysis of the two-way effects, as interpreted from the confidence intervals, mobility had a primary effect in all cases where gender was the other factor. When the three-way analyses were done, the effect was less clear, though mobility

seemed to maintain the greater significance. The literature review demonstrated an ongoing conversation about the confounding factors of poverty and "strategic" mobility (Rumberger et al., 1999; Schaller, 1976). The effect of both mobility and SED were identified in this research study. Clearly SED had a powerful effect in this research study, but among mobile middle school students, its effect was often muted by the effect of the mobility.

In general, student mobility was demonstrated as a negative influence more often in mathematics than in reading. When SED demonstrated a greater effect, that effect was in reading. While it could be argued that mobility had a greater overall impact, the damage of SED to a middle school student was clear, especially in reading. Perhaps this speaks to the greater need of instructional continuity in mathematics and the value of books in the home to a student's ability to read. Books have to be purchased by someone. This could be a challenge to a family living in poverty.

Gender was found to be most affected in reading. The middle school girls in this research study were harmed by mobility in that they lost their "edge" over the boys in reading. This may be one of the most important findings of this study. Practitioners and researchers need to find ways to compensate for this loss in the lives of middle school girls.

Implications for Schools and School Systems

The successful education of mobile middle school students is a challenge to schools and school systems. In the data set evaluated by this research study, 5.3% of the middle school students changed schools at least once during the school year between the twentieth day and the day the TCAP was given. This group of students had significant challenges in achieving as well

as the students who did not change schools. If some schools had larger portions of this mobile group, then the challenge may have been even greater for these students and those schools.

The difficulty shared by mobile middle school students seemed to be two-fold. First, they missed the benefit of the same teacher's scope and sequencing of the curriculum (Sanderson, 2004). This included more than missed topics, mobile students also missed the foundations that an individual teacher presented to prepare students for that teacher's approach to the curriculum. Second, this student may have had the effect of slowing down the achievement of the school as a whole (Hanushek et al., 2004). If this student attended a school with a large number of other mobile students then all the students in this middle school may have experienced a slower paced curriculum (Hanushek et al., 2004).

The recommendation is for the school system to create system-wide pacing plans for each primary course of study. If this were done, students could transfer between the schools in the school system and not miss important topics. In addition, the recommendation is for the schools to assess incoming students to see if gaps exist in their understanding of current academic topics. This assessment should then motivate remediation that would allow the mobile student to "catch up" while allowing the classroom instruction to proceed at the recommended pace. The school system should provide schools, with higher levels of student mobility, additional funding to help meet the student mobility challenge. The schools could use this funding to purchase technology and software designed to identify and "fill in" educational gaps. These schools need funding to purchase books that students will want to read. These books should be available for use at school and at home. The funding should allow for a steady stream of these books to "disappear" into student's homes. In addition, schools should provide book clubs, especially for

the girls. This would help with the socialization needs identified by Veronneau and Dishion (2011) while providing the girls with reading opportunities.

James Coleman identified social capital as an advantage often missing from the lives of mobile students (Coleman, 1988). These students lose the social connections that help less mobile students succeed. Schools should be aware of this need and seek to involve these parents and families in the school. By providing these parents and families with a sense of welcome and a means of communication, these family support systems may be more functional. In addition, within the school the teachers and staff must be aware of the need to "connect" with these potentially "disconnected" students. These layers of support may help these needy students.

To help mobile middle school students with the student-level social challenge that mobility presents, a school "buddy" program could be initiated. This program would attach new students to pre-identified, successful students to help bridge the gap of making friends and feeling accepted. This would also help fight the tendency for mobile students to find friends among students who exhibited greater behavior problems (South et al., 2005). If this "buddy" program was done in a school-wide fashion it would be an accepted part of the overall program, motivating students to willingly participate. Teachers could also help encourage this process by checking up on the "buddies" and by positively reinforcing the students who participate.

The problems that mobility causes for students can persist for years (South et al., 2005). These problems can be both social and academic. The student who is forced to endure a change to a new middle school deserves the support of the school in helping make the transition a successful one. Too often these transitions are combined with other home and family challenges that the student must endure. Schools are at their best when they are taking care of children.

Suggestions for Future Research

The topic of student mobility offers a number of directions into which researchers may choose to venture. Perhaps most logical, based on the findings of this study, would be to do more extended research on how mobility affects middle school students. There is a great deal of mobility research on younger and older students but little on middle school students. The uniqueness of that age group would seem to motivate further study.

Another suggestion for future research is to investigate the way mobility and gender interact. A surprising finding of this research study was the way gender interacted differently with mobility in reading. Non-mobile girls significantly outpaced boys in reading. The middle school girls that were mobile did not have significantly better reading scores that the middle school boys on the two-way ANOVA that evaluated the effect of mobility and gender on reading. The two-way analysis included in the three-way test of mobility, gender, and SED did show a significant difference between mobile middle school boys and girls. If mobility is having an effect on reading that is being hinted at in these findings, further research is merited. The clear differences in the way students learn to read and learn mathematics adds an impetus to this need for further research.

Most of the research that has been done on the topic of student mobility has identified mobile students as those who moved into a new school at any point during the school year. This has, therefore, included a large number of students who transferred during normal periods of grade-level promotion (summer). This research study has focused on the middle school students who moved during the school year. Continued research using this definition of mobility is recommended. The particular challenges of a mid-school year move need to be better understood.

The impact of multiple student moves may need to be researched more intensively. Students who move often may be affected differently by their mobility than the students included in this study. This pattern of mobility may interact with other variables to provide rich insight into the student mobility problem and the ways schools may need to react.

Differences in the way mid-year mobility affects middle school student behavior merits further research. Anil et al. (2011) demonstrated that risky behavior that often accompanies student mobility. The impact of these changes on behavior was not considered in this study. Mid-year changes would seem to be more stressful, affecting middle school student character choices. Research on this topic would be helpful to expand our understanding of the effect of student mobility.

One of the "confounding" effects identified in the literature review was the motivation for a student's mobility: "strategic" versus "reactive" mobility (Wright, 1999). "Strategic" moves were identified by Rumberger et al. (1999) as often occurring in the summer. The way that this research study defined "mobile student" kept this type of mobility from being considered. This study analyzed mid-year mobility. The impact of changing schools for other reasons—normal grade-level promotion, strategic mobility, or even school closure—was not a part of this study. Identifying the way gender and poverty interact with these different types of moves would be a worthy research project.

The need to take poverty into account was a common theme in the literature (Schaller, 1976; see also Schafft, 2005; Strand & Demie, 2007). The researcher of the current study was motivated by its results to suggest future research looking at the way poverty and mobility interact. Poverty and mobility, each analyzed alone, seemed to be causes of academic stress for

a student. The findings of this study suggested that in combination, poverty and mobility were even more difficult for a student.

Finally, it seems that special education students and English language learners could be benefited by specific research. It would benefit schools and school systems to know how mobility affects special need groups. This would enable them to tailor programs to meet these individual needs.

Conclusion

The education of children is one of the noblest agendas of a democratic society. It is through education that we provide children of all classes with the tools that we hope will give them the ability to do well. In addition to this "equalizing" hope, there is also the desire for the society to improve itself through the education of its children. If the poverty rolls decrease, then the schools have accomplished the most important, of their many, roles. If these ideas are not normally verbalized it may because we fear that it is too much for which to hope.

Student mobility is one of these great challenges. This research study has identified some of the manifestations of the problem. It is hoped that by identifying them, they will be more understood and easier to solve. Poverty has been thought, by many, to be more of a singular confounding problem in the discussions about student mobility. The resources of our world have not been able to solve the problem of poverty. Mobility, however, may be easier. We can focus on the student, identify particular challenges, and intercede. Perhaps, by separating mobility and poverty, more students can be helped to succeed in school.

We have many challenges in the endeavor to educate all children. A list of these challenges would be long and to an educator potentially embittering. One of these that we may

be able to control is student mobility. If the intricacies of this challenge are better exposed by research then perhaps we can find ways to solve the challenge. Then, all that remains is the will to solve it.

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