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*University of Central Florida*



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AN ANALYSIS OF THE EFFECT OF INVOLUNTARY MOBILITY ON STUDENT  
ACHIEVEMENT AS MEASURED BY THE FLORIDA COMPREHENSIVE  
ASSESSMENT TEST

by

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A dissertation submitted in partial fulfillment of the requirements  
for the degree of Doctor of Education  
in the Department of Educational Research, Technology, and Leadership  
in the College of Education  
at the University of Central Florida  
Orlando, Florida

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2011

Major Professor: Barbara A. Murray

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## **ABSTRACT**

This study examined the impact of involuntary mobility on the academic achievement of tenth grade students in a Central Florida school district. Students of involuntary mobility were selected as the result of new attendance boundaries due to new high school construction. Students were compared against non-mobile peers at schools of like demographics (i.e. poverty level and ethnicity). Mobility status (involuntary or no mobility) was the independent variable. The dependent variable, academic achievement, was measured by students' tenth grade developmental scale scores in reading and mathematics on the Florida Comprehensive Assessment Test. Students' ninth grade test scores were used as a covariate to control for students' prior achievement and isolate the impact of mobility. Additional subgroups (minority and poverty) were compared to determine if involuntary mobility had a more significant impact on these groups. Finally, a hierarchical linear regression was used to determine if a model for reading and mathematics could be used to predict future academic performance for students of involuntary mobility.

Findings showed consistently there was no statistically significant difference in the achievement performance among groups or subgroups and the subject tests of reading and/or mathematics with one exception. There was a statistically significant difference in mathematics achievement in the all students group when comparing those students of involuntary mobility with students of stability. Students of mobility actually indicated a modest level of higher achievement than non-mobile peers. The hierarchical linear model

was found to be marginally significant for predicting achievement among involuntary mobility students in the area of mathematics, but not necessarily in reading.

Future research recommendations include broadening the research to additional grade-levels. This research only considered the impact of achievement on high school students. Future research should consider similar impact on students at both the elementary and/or middle school levels. Qualitative measures would provide additional information, particularly the perceptions and experiences that stakeholders have throughout the involuntary mobility process. Other at-risk subgroups, particularly those of residential mobility and/or previous retention, provide additional considerations that would add to this body of research. Finally, involuntary mobility as the result of school closings would provide additional insight as this factor often has public negative perceptions.

## ACKNOWLEDGMENTS

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## CHAPTER ONE: INTRODUCTION

The United States has been identified as “a nation of movers” based on U.S. Department of Commerce (1998) reports that indicate 15 – 20 percent of the nation’s population relocates annually (Scanlon & Devine, 2001, pg. 119). This move rate exceeds both Europe and Japan, resulting in U.S. students having the highest residential and school mobility rate of any industrialized country (Long, 1992). Expansion and mobility has also increased for immigrant families during the last decade. Prior to the 1990s, a preponderance of immigrants settled in one of six states (FL, CA, IL, NY, NJ, and TX); today immigrants make over 20 states their final destination spanning across the Rocky Mountain, Midwest and Southeast regions (Fix, Passel & De Velasco, 2004).

As families experience increased mobility, educators are challenged to ensure that all students succeed, regardless of when or where they start and finish any given school year. According to Rumberger and Larson (1998), 50 percent of all school-age children in the U.S. moved at least twice before completing high school and 10 percent moved at least six times during their educational career. Research more carefully analyzing the effect mobility may have on student’s educational success and/or academic achievement is increasing. The findings of several studies reviewed indicate the high school dropout rate is profoundly higher among mobile students than their stable peers. A meta-analysis conducted by Reynolds, Chen and Herbers (2009) found “that children who moved 3 or more times had rates of school dropout that were nearly one-third of a standard deviation higher than those who were school stable net of prior achievement other factors” (pg. 1). A meta-analysis conducted by Mehana and Reynolds (2004) of twenty-six studies over

twenty years, determined that mobile students demonstrated a three to four month learning deficiency when compared to stable peers. To further compound the challenges students of mobility face in education, the majority of mobile students are from low socio-economic, black and/or Hispanic families. Not surprisingly, low income and minority students are over-represented within the subgroup of families categorized as frequent movers.

Not all researchers agree that mobility is on the rise or that it is a direct cause of decreased student achievement. In fact, when some studies control for student background (i.e. socio-economic status, ethnicity, and family structure) the effects of mobility, specifically changing schools, is reduced substantially. This circumstance suggests that mobility is a symptom, rather than a cause of compromised student achievement. Fischer, sociology professor at the University of California (Berkeley), upon a review of Census Bureau data over the last one hundred years, concludes that mobility has actually decreased, particularly since 1950. Fischer (2002) suggests that what has increased in the U.S. is the rate of divorce, unwed mothers, sexual initiation and mothers participating in the workforce. He argues that these factors are the likely indicators contributing to mobility, thus diminished student achievement. Therefore, declined achievement is the result of these other factors and not necessarily that of mobility. Fischer (2002) does identify that mobility has increased for specific subgroup populations including one parent and extended households, older people who rent, service workers and the least educated (Fischer, 2002). One challenge to evaluating Fisher's research against other researchers is an inconsistent use of the term mobility.

Another form of mobility that has existed, becoming even more prevalent over the last decade, is involuntary mobility. Involuntary mobility is the result of a student(s) attending a new or different school for factors beyond their control, such as boundary changes, new construction and/or the elimination of an existing school. Involuntary mobility is receiving more attention and consideration, in part as a result of the last decade's economic fluctuations. In the early 2000s, economic prosperity and increased real estate values prompted new school construction. Conversely, many states today face dire economic hardship; schools are facing closure. As schools open and close, students become the victims of involuntary mobility in the name of economic necessity. Student educational instability and the potential detachment that can result is a new undeniable dimension that educators can no longer claim is outside their control.

#### Purpose of Study

The overall purpose of this study was to consider the impacts of involuntary mobility on the student achievement of high school students in Brevard County as measured by the Florida Comprehensive Assessment Test. The study compared the achievement performance of students who were required to attend a newly constructed school versus their stable peers, or those who remained at their anticipated neighborhood school.

The impact of mobility on student success is not a new consideration in the arena of academia. In the case of schools with high mobility rates, it consistently is seen that schools with higher mobility rates also have lower school-wide performance on academic

achievement tests than schools with lower mobility rates (Kerbow, 1996). Some researchers attribute the mobility factor as a cause agent to achievement, while other researchers state that high mobility is simply a symptom, rather than a cause of diminished academic achievement (Rumberger, 2003). It is argued that high mobility is more prevalent among students of low socio-economic status (SES); therefore SES is more likely the cause of lower student achievement than the mobility itself (Scanlan & Devine, 2001). By comparing whole school populations of involuntary mobility versus populations of stability, other impacting factors such as SES are minimized.

#### Problem Statement

To date, this researcher has not found any studies which have explicitly addressed the impact that involuntary mobility has on students' academic performance. Coupled with the current economic condition facing many school districts and with declining enrollment projections, school boards are resorting to closing schools and imposing boundary changes that affect large constituents of students and families. As students are required to attend newly constructed schools or change schools due to closings, involuntary mobility is on the rise. The most concerning impact is upon students who must make new connections at a school that may never have been an anticipated place of attendance. Current research continues to emphasize the importance of schoolhouse relationships, both between students and adults, as a critical component to reaching high levels of academic achievement (Daggett, 2004).

Rigor and relevance without a sound foundation of meaningful relationships will be stifled and students will not reach their potentials. “Relationships are important because students are more likely to engage in rigorous learning when they know that teachers, parents and other students actually care how well they do (Daggett, 2004, p. 5).” Meaningful relationships are built on guiding principles such as trustworthiness, loyalty and respect. These qualities require time and experience to nurture authentic relationships. As students are increasingly experiencing moves from one school to another, often with little notice, a student’s relational framework is compromised. As this critical component to academic success is challenged, so is a student’s academic potential.

#### Definition of Terms

The definitions presented within are offered to ensure understanding of the terms used in the study of student mobility.

*Developmental Scale Score*: an FCAT score that was introduced in 2002 to track student progress over time and across grade levels to indicate student “growth,” or “learning gains” in reading and/or math only. FCAT developmental scale scores allow parents to monitor their student’s academic progress from one grade to the next. By comparing a student’s scores in the same FCAT subject for two or more years with the associated mean scores (or with the various Achievement Levels) for those years, it is possible to identify whether a student’s performance improved, declined, or remained consistent (Florida Department of Education, n.d.).



*Florida Comprehensive Assessment Test (FCAT):* an assessment administered to students in Grades 3-11, consisting of criterion-referenced tests (CRT) in mathematics, reading, science, and writing, which measure student progress toward meeting the Sunshine State Standards (SSS) benchmarks (Florida Department of Education, n.d.).

*Free and Reduced Lunch (FRL):* a federally subsidized food service program for eligible students. Eligibility guidelines are based on the Federal income poverty guidelines and are stated by household size (United States Department of Agriculture – Food and Nutrition Service, 2011).

*Involuntary Mobility:* a change in a student’s school attendance as the result of a district initiative, restructuring, construction of new school, etc. The change of school attendance is not the consequence of any family or parental factor or decision.

*Residential Mobility:* a change in a student’s residence; however it does not necessarily translate into a change in school enrollment (Larsen, 2008).

*School Mobility:* a calculation that typically refers to the number of students that both enroll and withdraw after the beginning of the school year (Kerbow, 1996).

*Specific Learning Disability:* “a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations” (U.S. Department of Education, n.d.).

*Stability:* students who maintain continuous enrollment (Rhodes 2005).

*Standardized Test:* an assessment that “is administered under standardized or controlled conditions that specify where, when, how, and for how long children may respond to the questions” (North Central Regional Educational Laboratory, n.d.).

*Structural Mobility:* students who change schools due to promotion to a grade that is not available at current school, for example when a student changes from elementary to middle or from middle to high school (Larsen, 2008).

*Student Mobility:* is generally recognized as changes in school enrollment at non-promotional or school structural times (Rumberger, 2003).

*Voluntary Mobility:* a change in a student’s educational placement when the current or next grade is available at the current school (Larsen, 2008).

### Conceptual Framework

There are several theoretical foundations that consider the basis by which mobility may affect one student and not another. “Social constructivist theory posits that learning requires a functional, social environment” (Rhodes, 2005, p. 9). In Maslow’s hierarchy of needs pyramid, the deficiency needs of physiological, safety and belongingness must be met before the growth needs are achieved (Huitt, 2004). Maslow’s lower growth needs are relational based; if left unaddressed students will not experience the higher growth needs of self-actualization and self-transcendence. Another contemporary framework is that of Daggett who states, “Strong relationships are critical to academic success for students” (2004, p. 5). He continues to present a relational framework indicating that a student progresses to higher levels of relational affluence,

increased levels of cognitive engagement ensue. As standardized test experiences are requiring higher cognitive thinking, students of mobility will struggle from a lack of engagement throughout the year at this cognitive level. However, the common element that holds true within these theories is the fundamental importance of meaningful relationships between students and the other stakeholders in the educational setting.

Although there is a common relational thread amidst these several cognition constructs toward higher order thinking and reasoning, it is also in the absence of any explainable reasons why relationships are so critical to this process. Curiously, educators seem to have come to consensus that relationships are one of the critical new “Rs” in education today otherwise identified as rigor, relevance and relationships. However, these same educators also struggle to justify why relationships are so critical. Twentieth century social theorist, Bourdieu (1980), provides an extensively studied social framework based on the idea of social capital. Social capital describes how a student matures within diverse social networks to realize different opportunities. Daggett’s relationship framework reinforces Bourdieu’s theory through the educational lens. The relationships that a student is able to form with adults in a school setting become the conceptual framework through which this research will be considered. A comprehensive presentation of both Daggett and Bourdieu’s work will be detailed in a subsequent chapter that further suggests not only the impact of relationships on academic achievement, but also the reasons for this impact.

## Research Questions and Hypotheses

The researcher developed the following guiding research questions regarding involuntary student mobility:

1. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics between all students who experience involuntary mobility versus all students who did not?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics between students who experience involuntary mobility versus students who did not.

2. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics when considering both minority status and whether students experienced involuntary mobility?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics when considering both minority status and whether students experienced involuntary mobility.

3. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics when considering students of poverty as defined by FRL and whether these students experienced involuntary mobility?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics when considering

both students of poverty (FRL) and whether students experienced involuntary mobility.

4. To what extent can a statistical model predict academic achievement as measured by the FCAT in Reading and Mathematics for students who experience involuntary mobility?

### Research Methodology

Brevard Public Schools (BPS) in the state of Florida opened two newly constructed high schools between the years of 2006 and 2009. These schools began their inaugural school year with 9<sup>th</sup> and 10<sup>th</sup> grade students. Two additional schools have been identified with a similar demographic with each of the newly opened schools. First, students in the 9<sup>th</sup> and 10<sup>th</sup> grade were compared between schools that were newly opened versus existing schools to determine if a statistically significant difference existed between these group's achievement as measure on the FCAT in both reading and math. Second, the Developmental Scale Scores (DSS) for reading and math of each group was used to create a line of prediction that was tested against actual achievement for the year of involuntary mobility. The actual group mean was then compared against the predicted mean to determine if these students performed as expected on the FCAT. This analysis was conducted using SPSS statistical procedures and data obtained from the school district's student data system. In addition, descriptive statistics for all schools and students involved was provided as means for comparison.

### Significance of Study

Considerable research has been conducted to study residential mobility and its impact on student achievement. More specifically, research has been conducted that shows causation of decreased student achievement for students of increased mobility. However, in many of these studies, when controlling for other factors such as SES and/or family structure, the impact of mobility is diminished. Of equal importance is an increased awareness for students to have meaningful relationships and connections within the schoolhouse which will mitigate dropping out and promote increased achievement.

The significance of this study was ultimately two-fold. First, it specifically studied a more recent form of mobility identified as involuntary mobility. In fact, no research has been discovered that explicitly explores the impact of involuntary mobility on academic achievement. Little empirical research has been conducted within this parameter; therefore the results of this study provide an introduction, and set the foundation for future like research. To further raise interest in this type of study is the realization that school districts are currently facing the opposing challenge of school growth from a decade ago. Amidst current economic hardships confronting most school districts, schools are being closed, resulting in compounding mobility factors that challenge all educational stakeholders – student, parent, educator and school boards. This study provides input for school boards and educators when confronted with involuntary mobility factors and the additional considerations that should be evaluated for the benefit of the student.

Second, this study indirectly provides insight to the impact of mobility on all students, regardless of socio-economic status, family structure, ethnicity, etc. In other words, it sets to more clearly determine the singular impact of mobility on student achievement. As this study compares students who are directly affected by involuntary mobility against students of stability, information provides evidence to be used in the residential mobility debate. This researcher suggests where a final statistical analysis suggests a strong correlation that all students impacted by involuntary mobility fail to academically perform with their stable peers, then it would suggest that mobility is more than a symptom of SES or some other factor. This outcome would suggest that mobility is a factor that would impact a student's potential academic achievement and would necessitate educators' attention in an effort to mitigate compromised achievement. Conversely, where the outcomes do not show any diminished academic achievement by students of involuntary mobility, then new questions arise within the mobility quandary.

### Delimitations

1. The study is delimited to Brevard Public School District in Florida.
2. The study is delimited to secondary schools newly constructed in a central Florida school district between the years of 2006 and 2009.
3. The study is delimited to students who took the FCAT during the first year of attendance at the newly constructed high schools.

4. The study is delimited to students in 9<sup>th</sup> and/or 10<sup>th</sup> grade who have a minimum of four prior years of FCAT criterion-referenced data in reading and/or math.
5. The study is delimited to considering students who experienced only involuntary mobility and not other mobility factors such as change of residence, family structure, etc.
6. The study is delimited to the closest (although not exact) demographic comparison possible within the same central Florida school district. The two schools affected by involuntary mobility were most closely matched with schools of like demographic within the same school district.

### Limitations

The following limitations may or may not restrict the results of this study:

1. Results of the study are limited by the accuracy of the data obtained from the BPS's student data system.
2. The study is limited to comparison of students and schools that are designed to service traditional neighborhood students (not charter, magnet or schools of choice).
3. The study is limited to schools of like demographic (free and reduced lunch rate; ethnicity) and courses of study or equivalent academic programs offerings (i.e. Advanced Placement, Dual Enrollment, etc.).



## Organization of the Study

Chapter 1 provides background information related to mobility factors facing America and its schools, an introduction to the problem facing schools, research questions, definitions of terms involved in this study, research methodology, delimitations, limitations and assumptions of the study. Chapter 2 provides a thorough review of literature related to the impact of mobility on the well-being and achievement potential of students in K-12 education. Chapter 3 details the study's methods and procedures for measuring the impact of involuntary mobility on students in two central Florida high schools. Chapter 4 includes the results of the data analysis and a detailed narrative of the outcomes. Chapter 5 provides conclusions, implications of findings and recommendations for future research related to student achievement and the impacts of mobility on students' academic success.

## CHAPTER TWO: LITERATURE REVIEW

Since the days of the founding fathers, immigrants have sought to find their fortune in the rich and vast corners of America. However, to pursue dreams and new opportunities it may require one to move to regions of this vast country where aspirations can become reality. Perhaps this is compounded in a country that is known to have one of the largest inhabitable land masses in the world. Consequently, the United States is also identified as a nation of movers (Scanlan & Devine, 2001). Whether moving is the result of the pursuit of opportunity or out of necessity, today's students can become casualties. Before further considering the impact of mobility on student achievement, it becomes necessary to better understand residential mobility rates both historically within the United States, as well as compared against other developed countries.

### Domestic Mobility

Alvin Toffler (1970) suggests that, "We are building a new race of nomads, and few suspect quite how massive, widespread, and significant their migrations are" (p. 75). However, early in America's history, the notion of mobility was often viewed as the result of a young nation holding endless opportunity for its new immigrants. Once land exploration would reach exhaustion, citizens would settle and mobility would begin to decline – especially as the twenty first century approached. This was speculation since mobility tracking factors were not considered nationally until 1920 and not added to the national census until 1940 (Shumaker & Stokol, 1982). As early as the 1800s, America was believed to have a minimum mobility rate of 20%. Today, census findings support an

ongoing mobility rate to exceed 20%, despite the prospect of more home based businesses facilitated by the expansion of the internet.

Some researchers suggest that there exists a hypersensitivity to the idea of excessive American mobility, particularly as it may negatively impact student performance (Wright, 1999). It is argued that census data demonstrates that mobility in the United States has remained constant since the dates of early America (Shumaker & Stokols, 1982). Fischer (2002) proposes that due to the lack of dependable data, as well as a lack of recognition, local moves are not accounted as mobility; early estimations of mobility are significantly underestimated. Further, since the collection of mobility data, via the bicentennial census, movement has steadily declined in America since 1950. Fischer (2002) presents evidence from Bureau of the Census data: “as affluence and government subsidies encouraged home ownership to expand from 47 percent in 1900 to 55 percent in 1950 and 67 percent of households in 2000, it in all likelihood contributed to stability” (p. 183). Fischer also gives careful consideration to the mobility patterns of different groups of society. His research demonstrates that total mobility declines since 1950, which is also applicable to all age groups with one exception for 18 – to – 24 year olds. This is not surprisingly the case as both domestic and international college attendance has become increasingly accessible for high school graduates. Further, this age group includes undergraduate completers who typically begin their first significant job search. Perhaps the other most notable finding in Fischer’s research is the mobility type impact between the college-educated versus high school-educated individuals. “Crudely summarized, better-educated people move some distance in response to career

opportunities and less-educated people move locally in response to housing situations or difficulties” (Fischer, 2002, p. 184).

The national mobility rate discussion does not take into account two additional social phenomena, especially as the effects that mobility has on education and academic achievement are considered. These two are immigration and single-parent rates. “In 1970 only six percent of students in U.S. schools were the children of immigrants” (Fix et al., 2004, p. 2). Over the last twenty-five years, this percentage has increased to over twenty percent of all school age children as the child of an immigrant parent. This rate is expected to continue to rise to 30 percent by the year 2015 (Fix et al., 2004). The significance of this impact has been further legitimized by recent federal legislation that monitors and holds states accountable for the achievement of limited English proficient (LEP) students. Accountability through the No Child Left Behind Act of 2001 requires states to consider the performance of several student subgroups that include LEP students. Sanctions for underperformance include funding implications, comprehensive school restructuring, as well as district-funded school choice options. Although a couple decades ago immigration seemed to be limited to six states, immigrants are now expanding residence across the country to include significant settlement within 22 different states (Fix et al., 2004). Therefore, fewer states can ignore the reality of this changing demographic on their student populations.

Fix et al. (2004) suggests at first consideration, immigration may appear to be a separate social or demographic consideration, than rather one of mobility. As the number of LEP students continues to grow significantly, it raises the interesting reality that these

same students also become a subgroup of mobility students. Not only are LEP students often subjected to higher residential mobility rates but arguably the most profound kind of residential change. The LEP student is confronted with at least the cultural and social impacts of mobility from one country to another. In addition, the LEP student is challenged with learning a new language, in any hopes to realize educational success. Consequently, mobility discussions and the educational ramifications, with increasing numbers of LEP students, must acknowledge this reality.

A second social and demographic change over the last few decades across the U.S. is that of family structure. Specifically, there is a significant increase in the number of single-parent families since 1960 (Hobbs & Lippman, 1990). “Relatively little attention was given to the information until the proportion of all families with children under 18 that were maintained by only one parent began to rise substantially” (Glick, 1988, p. 867). The proportion of one-parent families increased from 12% in 1960 to 22% in 1986. Earlier, one-parent families often occurred as the result of death; however as the divorce rate has increased so has the percentage of one-parent families. At first glance, this social issue would not seem appropriate to enter into the discussion on mobility. When compared internationally, almost 25% of children in the United States live with one parent; nearly double the rate of countries considered (Hobbs & Lippman, 1990).

“Children who grow up with both of their parents are more successful in school than children who live with only one parent at some point during childhood” (Astone & McLanahan, 1994, p. 575). It has long been acknowledged that generally, the emotional pain for children associated with marital discord is significant, at least in the short term

(Bumpass & Rindfuss, 1979). The stress of parental divorce is even more significant among younger children or those of school-age, than older children (Longfellow, 1979). Further impact on students of marital dissolution is significant decline of financial support, resulting in reduced resources for the student. (Bumpass & Rindfuss, 1979). Glick (1988) presents that more than half of single-parent families live in poverty. Not only is lower educational achievement a consequence for students in single-parent circumstances, but these same students also experience more residential mobility than their two-parent peers (Astone & McLanahan, 1994). Academic achievement of students from single-parent families is challenged as a result of both higher rates of mobility and by virtue of decreased economic affluence.

#### International Mobility Comparison

There is evidence that the U.S. has one of the highest mobility rates compared to other countries. A comparison among six countries (New Zealand, United States, Great Britain, Japan, Belgium and Ireland) identified the percentage of population that changed usual residence in one year. It was clearly shown that New Zealand and the United States had the two highest percentages of residential mobility (Long, 1992). The U.S. had a mobility rate of 17.6%, just slightly lower than New Zealand (19.4%). However the United States was still considerably higher, almost twice, than the next highest country, Great Britain (9.5%) (Long, 1992).

Long (1992) further considers two factors that could influence results and compromise the analysis. First, he considered “the possibility that a disproportionate

amount of mobility can be attributed to a few persons who move repeatedly...” (p. 863). Second, Long (1992) presents the potential for a few geographic areas with extremely high mobility rates to overwhelmingly affect the national rate. However, in both instances, Long found that neither was the case. Therefore, the data as it is presented best depicts a reasonable mobility rate of those countries studied.

### Defining Mobility versus Stability

A significant challenge to the discussion of mobility and/or stability is the lack of common definitions for either term. It is noteworthy to consider the ambiguity that exists and the affect that it has on research. Further confronting mobility considerations is the fact that although the United States has been collecting consistent data (at least since 1950), other countries do not keep longitudinal mobility data (Shumaker & Stokols, 1982). When other nations do keep mobility statistics, inconsistent definitions compromise comparisons. The U.S. has consistently used the mobility definition as “based on any change of residence within a specified time period” (Shumaker & Stokols, 1982, p. 5). Studies seem to give greatest consideration to either a one year or five year interval. As anticipated, these intervals result in diverse outcomes with the U.S. having a one year rate of 18.6% and a five year rate of approximately 45% (Shumaker & Stokols, 1982).

Larry Long (1992), with the U.S. Bureau of the Census, discusses several other compromising factors to this most common definition of mobility. The collection of mobility data in this case does not effectively take into consideration households that may

hold multiple residences, for example those with summer and winter homes. Another deciphering factor is whether to include migrants in the classification of all movers. Long (1991) suggests that it seems “justified” to consider all movers with migrants. However, this may misrepresent rates for mobility discussions depending on the perspectives by which it is addressed. Finally, a third compromising factor (Long, 1991) are those persons who move and do not make a significant address changes, for example within the same multi-unit dwelling, or moves between residences (perhaps due to lack of sale). Although these facets may seem minor, they raise question about the authenticity and interpretive strength of international mobility statistics.

Even when studying mobility from a domestic perspective, particularly when considering the impact on the education of students, inconsistent mobility definitions present significant problems. The Journal of Negro Education published a compendium of articles titled, “Student Mobility: How Some Children Get Left Behind,” each confronting different elements of the social impacts of residential mobility on education. Opening authors, Hartman and Franke (2003), presented the following specific need for further research:

A clearer definition of mobility is needed. At present, there is no single formula used to calculate mobility nationally, so the various data sets often are describing different phenomena. A uniformly accepted measure is needed, one that takes into account, while making necessary distinctions between, interschool year and intraschool year mobility, and discontinuous periods of attendance within the school year (p. 4).

The reality of definitional ambiguity seems to be confronting researchers when considering either international or domestic U.S. comparisons. Until a more universal



definition is identified, accepted and consistently used –presenting rates of mobility in general or in specificity will be suspect at best.

“One of the most elusive statistics in education today is student mobility” (Ligon & Paredes, 1992, p. 1). These researchers conducted a study that collected 54 formulas or definitions that had been used across the United States to calculate student mobility. Ligon and Paredes (1992) classified the diverse responses into four categories titled: Stability Indices, Turbulence Indices, Mobility Indices, and Mobility Counts. After applying the several different formulas to a consistent set of data from an Austin, Texas school district, the range in mobility rate was 8.0% to 44.8% (Ligon & Paredes, 1992). Such a range devalues any global comparisons that could be done. It raises further questions about whether or not local districts are accurately considering the legitimate impacts of mobility on their school systems depending on the formula and results applied to their students. Although calculating mobility or stability was not the intent of this researcher, it is potentially valuable for future researchers to note that Ligon and Paredes define what they identify as the most appropriate and accurate methods for measuring and comparing both mobility and stability factors, specifically across school systems. In fact, two indices and preferably three are needed for such comparisons as follows:

- Index of student stability – communicates the proportion of students with whom the school has had contact over a significant amount of time.
- Index of student mobility – identifies family uprootedness that impacts the continuity of a student’s education.
- Index of school turbulence – describes the amount of time and effort that changes in student’s status causes a school’s staff to expend (p. 8-9).

David Kerbow (1996) also recognizes the complex inconsistencies of mobility, particularly when considering a school's attractiveness to incoming students. Kerbow's research of Chicago elementary schools identified that mobility was more accurately defined as the percentage of enrollment by summing the total number of students who withdraw and enroll after the start of school, divided by total enrollment. Kerbow's (1996) mobility measurements distinguish between entry and exit frequency at a given school with his three "interrelated statistics" (p. 3). "In-mobility" is the percent of new students to a given school after the school begins; "out-mobility" is the percentage of students that withdraw; and "stability" is the percentage of students who remain in the school one year to the next (p. 3). Although mentioned researchers attempt to define mobility with some minor differences, there is a common thread among these and others. Most researchers concede that mobility rates cannot be simplified to one definition. Further, stability is more complex than simply as the reciprocal of the mobility rate.

### Reasons for Mobility

Residential mobility has been defined as a change in a student's residence; however it does not necessarily translate into a change in school enrollment (Larsen, 2008). It is very possible that students change residence within a small geographical distance of the current school and therefore remain at their existing school. Rumberger and Larson (1998) identify the diverse life circumstances or antecedents to mobility that confronts families as family-based mobility factors, including ethnicity, socio-economic (SES) level and family structure. Sorin and Iloste's (2003) conclude that student mobility

then negatively impacts academic achievement and all elements of a student's development, including behavior, social and general health. Also presented in Sorin and Iloste's (2003) research, lifestyle-related transitions can be perceived as relatively positive when a family moves to reside in a larger home to accommodate more children or negatively perceived when a family moves due to financial difficulty, divorce, death and/or dysfunctional relationships. Martin and Bumpass (1989) state, "Among the most profound of these changes has been the sharp reduction in marital stability, affecting markedly the life course of individuals, the nature of family life, and the household compositions of populations" (p. 37). Sorin and Iloste's (2003) research on the reasons and effects of mobility in an Australian regional city (Carins) found additional supporting evidence. Their study identified significant reasons for mobility that include: compromise to the family unit, negative student conduct, as well as various cultural reasons.

Other research further supports that family income is a significant factor in mobility. Skandera and Sousa (2002) found that low income families and those in inner cities have the highest school change rate compared to high socio-economic families and groups. Minority groups also experience higher rates of mobility (Sorin & Iloste, 2006). In consideration of factors that educators may be able to impact, family-based antecedents are relatively beyond the control of the school system and certainly the teacher. However, Rumberger and Larson (1998) suggest there are growing school-based factors that contribute at least to school mobility and can even cause residential mobility.

Rumberger and Larson (1998) reference Kerbow's 1996 research of Chicago schools that determined "40 percent of elementary students who transferred school in Chicago between 1992 and 1993 did not change residences" (p. 2). Other national research conducted by Lee and Burkam (1992) indicated that 40 percent of reasons for student transfers were not due to residential changes. As Rumberger and Larson suggest, this information would demonstrate that educators share some of the responsibility of student mobility. "School issues such as social adaptability, engagement in curricula, academic difficulty, and safety may all lead to mobility in the student population" (Sorin & Iloste, 2006, p. 229).

Although not necessarily school-based factors, increased educational options for parents and students are an additional factors prompting mobility. Mary Anne Raywid (1981) determined that the number of public alternative schools has increased 100 times since 1970 to more than 10,000 today. The forms of public school alternatives include private schools, vouchers, charter schools, magnet schools and home school. More recently, with the proliferation of the internet, school alternatives are taking on many new forms. Correspondence course options, even for K-12 education, are becoming more prevalent and virtual schools are becoming increasingly popular. It was estimated that 40-50 thousand students were enrolled in K-12 virtual school education in 2001 (Clark, 2001). Less than five years later it was estimated that there were over 300 thousand virtual school students enrolled across the United States (Setzer & Lewis, 2005). As the public education sector is forced to recognize diverse educational alternatives for parents and students, student mobility is clearly becoming a school-based issue.

Student mobility has expanded within the last decade from a rather new and subtle perspective, primarily as the result of contrasting economic circumstances over the last decade, identified as involuntary mobility. Halle Stockton, of the Herald Tribune, determined that school districts are spending millions of dollars as a result of the real estate boom. In one eight-year period in the early 2000s, Manatee and Sarasota school districts spent roughly \$390 million in taxpayer dollars to build 19 schools (Stockton, 2010). Subsequent to new school construction are attendance boundary adjustments affecting students. When a new school opens, students are transferred from various surrounding overcrowded schools to inhabit the new school. Although beyond parental control, this form of involuntary mobility confronts students with transitions that may not be anticipated. To complicate matters further, with the most recent economic downturn, districts are facing school closures that again require new attendance boundaries, potentially affecting the same students that faced involuntary mobility just a few years earlier. This evidence certainly raises support of Rumberger and Larson's (1998) notion that schools share responsibility of student mobility and should be making efforts to solve the problem.

### Quantitative Mobility Research

There exists a rather diverse collection of research attempting to determine the impact of mobility on academic achievement and general student well-being (Scanlan & Devine, 2001). Studies continue to strive to capture the impact that both residential and/or school mobility has on students' social and emotional well-being, academic

achievement, and educational attainment. Although the impacts could be viewed as inconclusive, there is widespread recognition that mobility does have a negative effect of varying degrees on students and schools (Rumberger, 2003).

Rumberger and Larson (1998) conducted a study using data from the National Education Longitudinal Survey of 1988 (NELS: 88). Prompting their research was a suggestion that few studies provided empirical research centered on student mobility (Rumberger & Larson, 1998). Therefore, Rumberger and Larson sought to add to a limited body of empirical research on the causes and consequences of mobility on students. The data set from NELS: 88 was selected to provide longitudinal information, as well as a variety of background information about respondents with N=11,671. Variables for this study consisted of mobility and high school completion status. The researcher's conceptual framework builds first upon Wehlage and Rutter's model of educational engagement as predictors of high school completion. A second conceptual model, Tinto's model of bi-dimensional factors leading to institutional departure, was also utilized (Rumberger & Larson, 1998). Rumberger and Larson (1998) anticipate cause of mobility to dropping out of high school as a result from disengagement and then school departure.

Rumberger and Larson's (1998) research indicates that mobility has a statistically significant impact on a student reaching high school graduation; even one move between eighth and twelfth grades reduces the likelihood of a student completing high school. Although a causal connection could not be delineated, mobility could be named as a risk factor to high school completion. Consistent with the theoretical models considered, the

results support student engagement as a factor to high school completion. Rumberger and Larson (1998) make an additional emphatic call to educators to attack the at-risk factor of mobility from a dual approach based on their conceptual framework. Schools must “increase the student’s sense of membership (i.e. affiliation) and increase the student’s engagement (i.e., social and academic)” to combat the negative effects of mobility (p. 31).

A more recent meta-analysis of mobility conducted by Reynolds, Chen and Herbers (2009) identified sixteen studies for review. The studies included outcome measures for reading and math achievement or high school dropout (or both achievement and dropout in one case) between the years of 1990 and 2008. These researchers were specifically interested in looking at studies that, “reported estimates controlling for pre-mobility school achievement or performance either through covariance adjustment, regression, matching, or other techniques” (p. 6). These researchers recognized that pre-mobility achievement actually significantly predicts students’ propensity for future mobility. Research studies included in this meta-analysis comprise national probability samples, large urban districts, as well as several longitudinal studies. This meta-analysis was primarily focused on school mobility versus residential mobility, so only those studies that addressed both were included. Finally, the treatment was identified as the mobile group, while the stable group was identified as the comparison group.

Findings support that mobility does negatively affect students’ achievement and raise the probability of high school dropout (Reynolds et al., 2009). Both reading and math findings indicate decreased achievement as at least moderately significant among

the more mobile student. Across the sixteen studies analyzed, student mobility was not only associated with decreased academic achievement, but also increased rates of dropout. Typically, the effect size of mobility on student achievement increased as a student experienced more than three moves. Impacts of mobility appeared to be greatest among elementary and high school students; middle school mobile students did not indicate any significant achievement impact. However, the impact of effect size was substantially diminished when prior achievement and family and child factors were included in analysis as controls. Reynolds et al. (2009) suggest that two considerations can be drawn from this fact. First, mobility is more prevalent among students with marginal academic achievement and negatively perceived family factors. Second and perhaps more important is that these students are confronted with compounding risks of school failure. Between the factors of low SES, family defragmentation, and poor achievement the students in this circumstance have very poor odds of overcoming situations beyond their control.

After a more thorough analysis of the 2005 Chicago Longitudinal Study (CLS), these same researchers, Reynolds et al. (2009) present further findings. The original CLS focused on minority students from low-income families that attended early childhood programs (Reynolds et al., 2009). The study measured school mobility between kindergarten to eighth grade through three interval models that included a sum of total school moves to another model determining the number of moves during a specified time frame (Reynolds' et al., 2009). Grade 8 reading achievement and further education by age 25 was measured using hierarchal regression analysis with each of the three mobility



measurement models. In summary, all three models demonstrate reduced reading achievement based on the impact of mobility on the student. In some cases, there was a “robust relationship” between these considerations (Reynolds et al., 2009, p. 15). Another model suggests that moves during intermediate and middle school years show more significant effects on reading achievement. The final model indicated that moves in excess of three times during a child’s kindergarten to grade 8 years show significant lower reading achievement. Additionally, Reynolds et al. (2009) found that increased mobility had a negative correlation to educational attainment. These researchers emphasize findings of the other affects mobility, although indirect, has on an individual’s personal attainments. Personal attainment examples include aspects of well-being from school-based success to adult accomplishment (Reynolds et al., 2009).

### Qualitative Mobility Research

To complement the diverse quantitative attempts to understand the impact of mobility on learning, qualitative studies have emerged more recently. One such study was conducted by Lash and Kirkpatrick (1990), which consisted of interviewing 21 teachers of an elementary school in a medium-sized California city. The school was identified as having a high mobility rate, although not necessarily as the result of migrant workers. At the school studied, it was estimated that “half of the students were enrolled for the full school year...” (p. 176). Somewhat unique to this qualitative study, the researchers interviewed the teachers to capture “what it was like to teach a class that changed composition during the year” (Lash & Kirkpatrick, 1990, p. 179). Approximately 26

questions were posed to each of the 21 teachers that were categorized as “Experience with Mobility,” “Classroom Strategies”, and “Teacher Preparation” (p. 190).

Lash and Kirkpatrick’s (1990) interviews revealed that as new students randomly entered the school throughout the year, teachers were most concerned with students learning the rules and routines of the classroom. Second, students needed to be provided materials related to the work at hand, otherwise identified as curriculum. Last, students needed to be guided to promptly begin working within the curriculum. Teachers did express concern over their own unpreparedness to assist these mobile students and the impact that the disruption contributed to both the individual student, as well as class-wide instruction. Interestingly, the researchers posed a question to teachers in reference to the potentially positive elements of mobility for students and/or the classroom. By in large, respondents were surprised by the question and typically no response emerged beyond it allowed students to meet new peers. It does seem apparent that teachers were not compelled to consider the relational impact of mobility on students. It certainly rises to question whether teachers’ predominant attitudes toward the negative impacts of student mobility in the classroom may contribute to the mobile student’s ability to successfully transition into the new environment.

Lash and Kirkpatrick (1990) offer two recommendations to assist teachers in schools of mobility. First, due to varying definitions of mobility across the country, schools should not wait for concerning rates of mobility to dictate the need to “establish policies and procedures” (p. 188). Schools should tackle the prospect of mobility from the perspective of individual school impact, not district reported data. Nuances of

mobility that affect different schools must be taken into account to establish an effective plan for helping mobile students transition successfully. Second, teacher training should overtly address the factors of mobility and the most effective instructional strategies for responding to mobile students. Further, the researchers offer strategies for teachers with schools of mobility that include: frequent and ongoing presentations of classroom expectations, training and support in various curricula, use of flexible and diverse instructional strategies, and use of portfolio and/or alternative demonstrations of student work (Lash & Kirkpatrick, 1990). The underlying message of the researchers is acknowledgement of the reality of mobility in a given school and responding in a deliberate and purposeful way. Although teachers in this study expressed every desire to help unstable students acclimate to the classroom, their intentions were often reactive rather than proactive. Finally, this research promotes that educators must accept the responsibility to make a positive difference in the lives of those students of transition.

Another qualitative research study published more recently, consists of interviews conducted with the students of mobility. Virginia L. Rhodes' (2008) study interviewed and taped eight students identified from a subgroup of 37 highly mobile students. Students were identified within Henley Central High School during the 2000-2001 school year. The school demonstrated higher academic achievement, but did consist primarily of lower income and working class families. Student interviews consisted of open-ended questions that addressed "social, emotional, and academic data, in addition to a host of processes that the students described" (Rhodes, 2008, p. 123). The results of Rhodes' research clearly identifies students most significant concern's related to school transition

as that of social and emotional issues. In fact, 82% of the student responses centered on social and/or emotional concerns; whereas, 18% centered upon academic issues. This is in further contrast to the school's adult responses that predominately focused on academic concerns. Rhodes (2008) references Maslow's hierarchy of needs that holds confounding truth that individuals must first feel safe and secure before being able to focus on higher needs/interests like academics. Of particular interest to the proposed research within this study involving involuntary mobility, Rhodes (2008) makes the following statement: "Students whose changes have been involuntary, unexpected, or unwanted recounted the most negative experiences" (p. 123). This study is intended to provide additional considerations within this mobility element, particularly this newer aspect of involuntary mobility.

### Conceptual Framework

There are several conceptual frameworks that consider the reasons behind the impact that mobility has on youth. A common thread amidst different theories is the social development of the individual. "Social constructivist theory posits that learning requires a functional, social environment" (Rhodes, 2005, p. 9). As a student interacts with his/her environment, security is established and a healthy foundation is formulated. Constructivists propose that a student, who has a healthy environmental foundation, can engage in learning in a more meaningful and enriching manner. In Maslow's hierarchy of needs pyramid, the deficiency needs of physiological, safety and belongingness must be met before the growth needs are achieved (Huitt, 2004). Maslow's lower growth needs

include: to belong, know, understand and make order of things. Maslow's higher growth needs include self-actualization and self-transcendence. These higher growth categories facilitate a student to operate and function at the highest levels of cognitive reasoning. Before a student can engage in higher-order thinking, well established deficiency needs must be met.

The idea of social capital was first introduced by contemporary sociologist Pierre Bourdieu in his original work titled, "Le capital social: notes provisoires" published in 1980. Bourdieu's theory was later translated into English in 1985 and then began to receive increased attention in the sociology world. Portes (1998) presents Bourdieu's definition of the idea of social capital as, "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (Portes, 1998, p. 3). Portes (1998) clearly interprets Bourdieu's concept of social capital as an ongoing process by which individuals or actors acquire "direct access to economic resources" (p. 4). The scope and value of the economic resources are dictated by the accessibility of resources with which relationships are made, as well as the quantity and quality of identified resources through acquaintances or ongoing associations.

Through the increased attention given to Bourdieu's original presentation, sociologists have since devised their own expansions of social capital concept. Two such researchers include James S. Coleman and Robert D. Putnam, both of whom make either direct correlation of social capital to the educational setting and/or the relational

connections of today's students. Coleman presents a conceptual definition of social capital as follows:

Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common. They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure (Coleman, 1990, p. 302).

Putman presents social capital as "...features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (Putnam, 1995, p. 67). Although there are many definitions, and the number is growing, of social capital, Alejandro Portes (1998) suggests there is a consensus toward the common definition stated as, "social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or other social structures" (p. 6). For sake of this discussion, the primary actors consist of students and the expanse of "membership in social networks or other social structures" is, in part, determined by the networks and structures available and accessible within a student's given school community or communities (Portes, 1998, p. 6).

Adler and Kwon (2002) present three significant benefits of social capital as information, influence (or control and power) and solidarity. The benefit of information seems subtly intuitive. "...for the focal actor, social capital facilitates access to broader sources of information and improves information's quality, relevance and timeliness" (Adler & Kwon, 2002, p. 29). A second benefit identifies influence, or control and power, as potential assets that come from social capital. This benefit is best illustrated in Coleman's (1988) example where certain politicians are able to influence other politicians to support their effort or initiative because of a set of obligations have been

accrued. The third benefit of social capital Adler and Kwon (2002) identify as solidarity seems less intuitive than the former two, but equally valuable, especially for those in the extended social network. “Strong social norms and beliefs, associated with a high degree of closure of the social network, encourage compliance with local rules and customs and reduce the need for formal controls” (p. 30). Refined levels of solidarity within groups provide benefits that extend beyond even the benefits of individual solidarity, although this holds merit as well.

Adler and Kwon (2002) continue to present several facets of social capital that provide clarification, particularly in understanding its dynamics against other forms of capital like human, cultural or economic. Characteristics specifically applicable to this body of research suggest that social capital can also be utilized for the acquisition of other kinds of capital. An actor can use friendships to gain access to otherwise unattainable experiences, perhaps a concert or introduction to an influential community member. Another characteristic presented is how social capital requires “maintenance” (p. 22). “Social bonds have to be periodically renewed and reconfirmed or else they lose efficacy” (p. 22). Fundamental to social capital is trust, which grows and develops with attention, nurturing and time. The last characteristic to be considered for this discussion is the realization that social capital is based in existing relationships, not actually with the actor himself. Adler and Kwon (2002) present that social capital will cease to be possible when either the actor or association severs the relationship. The maturation of a relationship is dependent upon the mutual effort of all parties; however, it can come to an end abruptly by just one of the actors in the relationship.

Coleman (1987), originally connecting social capital to educational applications, presented family relationships as important in the social capital development of youth that can be seen manifest in educational attainment. Coleman (1988) argued that social capital, evident in relationships throughout a students' educational career, can yield economic benefit. He identified three useful capital resources within social relationships, not dissimilar to Adler and Kwon (2002). Coleman (1988) presented these as obligations, expectations, and trustworthiness of structures; information channels; and norms and effective sanctions. The first is dependent on two elements: trustworthiness and the complexity of the obligations that are obtained. Credit slips are exchanged in reciprocal relationships that can be collected and/or redeemed when advantageous to the holder. However, when trust is compromised, then cashing in on a credit slip is also compromised. In addition, the depth of the obligation(s) obtained determine the extent to which they can be redeemed and/or hold value. Information channels, similar to Adler and Kwon, provide a vehicle by which action can be taken. Coleman (1988) suggested that information provides additionally beneficial means for an individual to capitalize on credit slips. Finally, norms and effective sanctions provide powerful resources that can dictate the actions and reactions of others in all relational frameworks, from within the family or in the greater societal sense.

Coleman (1988) makes a substantial claim that it is not only the social networks that are important in social capital, but also social structure. Closure of social networks provides more profound accountability in the social relationships. In a more closed social network, the extended relationships of any one source are connected in some form of a



social relationship. These connected extended social relationships provide potential alliance that combine for collection sanction in the third capital resource described previously. Social network closure in a school application would include when parents know the teachers of their child and interact both inside and outside the school environment. In this case, the collective ability to hold the student accountable to family norms and expectations is enhanced. As mentioned earlier, Coleman emphasized the necessity of the “trustworthiness of social structures” that makes possible the influence of obligations and expectations (p. 107).

Coleman (1988) conducted research of his theory as it relates to educational attainment of students based on social capital in the family. He compared dropout rates of students whose families differ in social capital. Family social capital differences were defined as: parents’ presence (single or two parents in home), number of siblings, number parents and children (parent – child ratio), mother’s expectations for child’s education and the combination of number siblings, parent-child ratio and expectations for child’s education. In each case, the dropout percentage increased as social capital decreased. In other words, as a student’s opportunity for adult engagement decreases, via single parent setting or increase in siblings in the home, the percentage for dropout increased. Interestingly, of three groups (public, Catholic and private school) of students included in the study – Catholic students had a drastically lower percentage dropout rate than either the public or private students. Coleman suggests that this is in part true to the closure of the social structure typical of Catholic school students and families. The families of Catholic school students consistently attend the affiliated Catholic Church, therefore

providing a more closed social structure and greater social capital. Even when controlling for religiosity, as well as for financial, human and social capital differences only affect the results minimally. Coleman's study supports the importance of familial social capital in the educational development of students.

Further, James S. Coleman (1987) suggests that profound changes in the family structure and simultaneously the institutionalization of mass education have impacted students' healthy social development. The changes in family structure began as men pursued work opportunities beyond the traditional agricultural foundation of 18<sup>th</sup> century society. Previously, men worked either on or near their land with the primary purpose of meeting the families' basic needs. "The whole structure of social and economic organization had as its basic building block the family (Coleman, 1987, p. 32)." Simultaneously, either by coincidence or necessity began the creation of the formal schoolhouse. Consequently, society and particularly children experienced two significant changes in their social capital formulation. The first change came when the father began working away from the home and no longer provided the depth of daily interaction with his children. The second significant change came with the introduction of a new formal social structure, the schoolhouse, which also introduced a new set of social norms, expectations and ground rules. Over the next several decades the family would experience many other changes that further compromised the impact of family on the social capital development for the youngest members of society.

Another significant change in family structure was the introduction of women in the workforce (Coleman, 1987). Consequently, as both parent's scope of responsibility

shifted away from the home, the need for additional services to meet the needs in the home were required. These services include childcare, elderly care and welfare. The idea of the need for childcare seems relatively intuitive. As parents choose to work away from the home, then childcare to varying degrees was necessary. Less obvious is the suggestion of the evolution of elderly care and welfare. Coleman (1987) argues that both of these societal facets were predominantly managed in the home, particularly prior to the introduction of women in the workforce. Typically families cared for older generations and even for the down and out within their respective families. Again, these changes in the social structure of the family ultimately impact the family and social dynamic in the home.

Other indicators Coleman (1987) presented that suggested a significant change in the traditional family order and increased parental inattentiveness included increased youth substance abuse and a rise in teen suicide. More recently witnessed is a move in the parent-child relationship to one of friendship. He suggested this development raises social capital concerns as modern Western society does not provide age-appropriate leisure pursuits that nurture diverse social capital development. Coleman's explanation of the compromise to what could be identified as traditional American family social capital is not necessarily intended as a condemnation of a societal shift. Rather Coleman presented that this societal shift has resulted in the elimination of essential social capital inputs that are not only unique to intimate familial relationships, but also the unique inputs that are not provided through formal educational social structures. The inputs that formal institutions, like schools, provide include "opportunities, demands, and rewards"

(Coleman, 1987, p. 35). However the social capital inputs that can only be provided by more intimate relationships within “persisting environments” include “attitudes, effort, and conception of self” (Coleman, 1987, p. 35). Of greatest concern is the observance that the youth of today are evermore experiencing one-dimensional social capital maturation. The absence of meaningful and intimate adult relationships within the home and/or extended family is germane to the evident social challenges confronting today’s youth.

Robert D. Putnam, a political scientist and student of sociology, has done considerable research on the civic involvement of America’s citizens over the years. Putnam authored a rather popular book titled *Bowling Alone: America’s Declining Social Capital* in addition to several articles on the same topic. Putnam conducted a study using a variety of data sources that included the General Social Survey, National Opinion Research Center and a Gallop poll to determine the frequency of American citizens’ involvement in civic, political and/or voluntary associations over the last several decades. Putnam (1996) found that the highest levels of “civic engagement and social trust” occurred in the 1930s (p. 34). However, in the years to follow, the same levels begin to fall and continue to decline into the 1980s. Research determined that involvement does increase as a person matures and then plateaus. From a generational perspective, even with children whose parents and/or grandparents had relatively high levels of participation, there was no evidence that would suggest that the younger generation would match the grandparent’s higher levels of civic engagement (Putnam, 1996). Ultimately, each successive generation since the 1940s has been less engaged in

community affairs than the generation prior. Further, it was speculated that there were no signs that this trend would reverse in the future.

Certainly of concern is the evidence that society is becoming an increasingly isolated community. Consequently, Putnam (1996) continued to research phenomenon to attempt to determine the culprit behind the decline in this dimension of social capital. Although many and diverse considerations were pursued, only one, seemingly simple, factor emerged with profound substantiation. Putnam presents the introduction of television as the primary culprit that has compromised society's civic engagement. The introduction of the television in the 1940s only begins to set the stage for the technological avalanche that would ensue. In 1950 only 10 percent of American homes had a television set; in 1959 it is estimated that 90 percent of homes grew to own a television. Since that time, viewing habits have grown almost exponentially to a 50 percent increase from 1950 to 1995 per household. It is estimated that today's youth spend nearly 40 hours per week on average viewing television. This does not take into account the most recent decade's video gaming and internet-based activities that are commandeering many hours of today's young and old alike. Putnam (1996) states, "television privatizes our leisure time" (p. 6). Essentially, time that was previously spent socializing through any array of community associations is now replaced with viewing television, video gaming or internet activities; less social trust and less group membership is the result (Putnam, 1996).

If social capital is a valid presentation of the social development throughout society, then equally valid concerns exist over the transformation this facet of life has

experienced over the last century. Even Coleman (1987) recognizes the necessity to not simply accept the reality of the situation and fail to respond. In fact, Coleman suggests that acknowledgement and understanding of the circumstances provide promise for a positive response. He explains that institutions must begin to supplement the social capital contributions that were once found in the home. Coleman cautioned society to look beyond the school place, at least in its present form, as the potentially most attractive social structure to fill this void. Coleman reminded that individuals benefit from the contributions unique to intimate family relationships that are not easily substituted in a traditional educational setting. Simply by providing more school-like resources that produce opportunities, demands and rewards can never provide an equivalent exchange of resources that produce attitudes, efforts, and conception of self. However, Coleman did suggest that an institution, even the schoolhouse which may commit to childrearing efforts can begin to more effectively provide reinforcement of the fading sources of social capital, particularly those that are founded upon meaningful adult to child relationships (1987). “They must be institutions that induce the kinds of attitudes, effort, and conception of self that children and youth need to succeed in school and as adults” (Coleman, 1987, p. 38).

The common thread of the significant frameworks presented thus far center on the social foundation of a student toward ensuring the highest levels of educational success. One of the most contemporary relational frameworks is that of Daggett as presented in the new three Rs of education – rigor, relevance and relationships. Researchers with the International Center for Leadership in Education worked with 30 model high schools

throughout the United States as part of a 2004 project called “Bringing Best Practices to Scale” (Daggett, 2004). Work with these schools determined that three consecutive stages were essential to ensure achievement toward “high academic standards for all students” (p. 1). Three stages of progress that were common among these schools in pursuit of continuous improvement and ensuring student preparation to be 21<sup>st</sup> Century competitive are “convincing all stakeholders *why* change was needed, effectively and clearly determining *what* needed to be changed, and establishing a course of action that support *how* to make the changes identified” (Daggett, 2004, p. 1).

Within the second stage, what needs to change, determining a school-wide shared stakeholder vision is foundational to then changing the mind-set of the educators themselves. “The goal is to teach students how to think – not simply what to know” (Daggett, 2004, p. 3). With the vision of life-long learning and thinking as the goal, then required is the pursuit of academic rigor and relevance. The high performing schools demonstrate a relentless pursuit to “help students apply high levels of cognitive knowledge to real-world unpredictable situations” (p. 3). This pursuit is founded on the International Center’s Rigor/Relevance Framework. The framework optimizes the integration of both knowledge and application toward the highest form of cognitive engagement in what is identified as Quadrant D – Adaptation. However, it is clearly observed that rigor and relevance in the absence of relationships will prove futile. “Rigor has a tendency to increase as the degree of relevance and the quality of relationships improves” (p. 5). Daggett explains that students are more inclined to authentically engage in rigorous learning when meaningful relationships are established between students,

teachers and parents. “They are willing to continue to try hard when they are connected, encouraged, supported and assisted” (p. 5). Relationship building is observed to be built upon commonly ascribed values such as respect, loyalty, trustworthiness and honesty. These qualities often take time and a deliberate effort to nurture to ensure that genuine relationships are developed, rather than fabricated attempts to connect with students.

Finally, determining how to change begins with an additional foundation that is built upon trust and safety; which is subsequently relational dependent. An environment that is surrounded by a safe culture by which all stakeholders can question current practices and/or procedures is what is required to truly foster a commitment to continuous improvement. The steps involved in how to create change include creating a plan and then managing change. The high-performing schools understood the importance of developing a plan built on the strengths of the faculty, versus trying to figure out how to compensate for the weaknesses. Managing change becomes the school leadership’s primary responsibility – playing it safe and avoiding risks places schools at greater risk than not attempting change at all.

Daggett’s (2004) relationship framework, shown in Table 1, is the most significant element in consideration to mobility and the impacts that it can have on student achievement.

Strong relationships are critical to academic success for students. Relationships are important because students are more likely to engage in rigorous learning when they know that teachers, parents and other students actually care how well they do. They are willing to continue to try hard when they are connected, encouraged, supported and assisted – much the same way that a personal trainer might work with an exerciser. (p. 5)



Table 1

*Daggett's Relational Framework*

Descriptor	Learning Relationship Support for Students
0 - Isolated	Students feel significant isolation from teachers, peers, or even parents. Students lack any emotional, social connection to peers and teachers.
1 - Known	Students are known by others, frequently called by name. Teachers know students and their families, interests, aspirations, and challenges. Students are known by peers that they interact with in school.
2 - Receptive	Students have contact with peers, parents and teachers in multiple settings. Teachers exhibit positive behaviors of "being there" that show genuine interest and concern.
3 - Reactive	Teachers, parents and peers provide help to students when requested, but support may be sporadic and inconsistent among support groups.
4 - Proactive	Others take an active interest in a student's success. Teachers take initiative to show interest and provide support. Students and others express verbal commitment for ongoing support and validate this commitment with their actions.
5 - Sustained	There is extensive, ongoing, pervasive, and balanced support from teachers, parents and peers that is consistent and sustained over time.
6 - Mutually Beneficial	Positive relationships are everywhere and commonplace among the way that students, teachers, and parents interact and support the student as learner.

*Note.* Adapted from "Reforming American High Schools - Why, What, and How," by W. R. Daggett, 2004. Retrieved from <http://www.leadered.com>

Although high performing schools maintained significant attention on the relational and relevance aspect of the schoolhouse and learning, they also did not compromise high expectations for all students. An equal commitment was made to maintaining the primary goal of continuously improving and raising the academic achievement of all students. This relational framework presents the importance of relationships and connection to the highest levels of cognitive engagement in the hopes of creating a more rigorous learning environment. To commit to continuous improvement, Daggett argues, requires the tenacious commitment of all educators to foster relationships to realize a rigorous and relevant curriculum. If these relationships are compromised then student's academic performance will suffer.

#### Social Capital in Educational Research and Connection to Mobility

Since the introduction of social capital, first by Bourdieu and later by Coleman, the educational arena's interest in this theoretical framework has gained increased attention. This was confirmed in Dika and Singh's (2002) study of the use of social capital within educational research. They discovered that after fifteen years of Bourdieu's introduction of social capital theory, education related articles increased from less than twenty to over 160 articles by 2001. It is recognized that Bourdieu and Coleman's theories to do not completely align; however, they both have potential education-oriented connections. Dika and Singh (2002) suggest that Bourdieu's social capital theory provides explanations for "unequal academic achievement to skill deficit" (p. 34). Coleman's reference to education is more explicit through research which indicated that

increased social capital led to fewer incidences of high school dropout. In both cases, parents were identified as the primary actor impacting the student and thus their educational outcomes.

As researchers continued to consider social capital theory, they explored indicators of social capital such as family structure, parent-child interaction, and parent's level of education (Dika & Singh, 2002). Particular interest was given to minority families and/or students. Dika and Singh (2002) categorized research studies into three categories to answer if social capital is positively linked to education as follows: educational attainment, educational achievement, and education-related psychosocial factors. It was determined that social capital indicated a positive link to all three educational aspects considered. It was also indicated that the linkage was not always explicit and further research and/or clarification about the direction and nature of the relationship between variables was recommended. A recommendation made by Dika and Singh (2002) was that the data used was not typically intended to be used for measuring social capital; therefore results needed to be accepted with reasonable caution.

One research study conducted by Pribesh and Downey (1999) specifically considered social capital as the explanation for the negative association between mobility and school performance. The study's premise was that "moving negatively affects schools performance because with-in family ties are stressed and within-community ties with teachers, administrators, and other community members are often lost" (Pribesh & Downey, 1999, p. 522). This study is one of few that considered the student as the actor as it relates to social capital, as compared to the parents as the "actor" bestowing social

capital on the child. Since previous research failed to provide compelling evidence of social capital as a theoretical framework, Pribesh and Downey's research was designed to address this issue. Their study addressed three main questions as follows:

1. Do residential moves (residential-only, school-only, and combined moves) result in declines in social capital?
2. Do changes in social capital predict changes in educational performance?
3. Do changes in social capital mediate the negative effect of moving on educational performance, independent of other life stressors? (p. 523)

Data was collected from the National Education Longitudinal Study of 1988 (NELS: 88) and the subsequent survey in 1992.

Pribesh and Downey's study (1999) concluded for the first question, that all three types of moves contribute to declines in social capital, therefore supporting that social ties are compromised. Results also indicated that moving leads to reduced educational performance, which is "partly a function of the loss of social capital" (Pribesh & Downey, 1999, p. 527). Finally, after rigorous changes to the model in efforts to gain meaningful results in relation to the third question, "the effects of social capital and life stressors appear small" (Pribesh & Downey, 1999, p. 527). This study indicated that students who experience moves perform poorer than their more stable peers.

Additionally, other disadvantages that confront the more mobile family were significantly compounded and contributed to compromised achievement. Low socio-economic and single-parent families are over-represented in groups of students who are categorized as high movers. When controlling for prior achievement, school-only moves did not have the same negative effect on either reading or math achievement. However, no group was identified to have benefited from moving. Pribesh and Downey (1999) acknowledged

that although social capital is identified to have declined for students of mobility, resulting in declined academic achievement, there is still much to consider in relation to this theoretical framework.

In another study conducted by Morgan and Sorensen (1999), Coleman's social capital theory was tested among private and public attending high school students and their mathematics learning. Morgan and Sorensen's study design was built around Coleman's earliest work. Coleman suggested that Catholic high school attending students learn more than public peers due to "the ideology of the Catholic church and intergenerational social closure" (Morgan & Sorensen, 1999, p. 662). Morgan and Sorensen challenged Coleman's suggested empirical findings to support the notion of social capital as an explanation of student learning. Their research findings suggested that social closure cannot explain changes in student learning; however, findings did indicate that "the density of student friendship networks increases mathematics learning while the network of parental networks decreases it" (Morgan & Sorensen, 1999, p. 674). This statement is not inconsistent with Pribesh and Downey's findings that social ties do influence social capital and then lead to affecting educational achievement.

Research conducted by South, Haynie and Bose (2007), acknowledged little affirmation of the theoretical framework behind mobility and educational achievement. These researchers summarized the four most common theories considered in the mobility discussion as follows: parent-child relationship characteristics, peer social networks, academic performance and school engagement, and psychological well-being (South et al., 2007, p. 70). Parent-child relationship characteristics are built explicitly upon

Coleman's presentation of social capital. The second theory, peer social networks, is loosely connected to social capital, but focuses on adolescent role models among mobile and stable students. South et al. (2007) state that this peer-child social capital, "emphasizes positive and supportive relations between mobile and non-mobile students in the types of adolescents who are positioned to serve as role models for educational success or failure" (p. 5). The last two theories are not necessarily connected to social capital theories. South, Haynie and Bose's research sought to determine the strongest explanation of the four theories when comparing mobility and student achievement.

Results first indicated students of mobility are more likely to drop out of school than their stable peers (South et al., 2007). Little evidence exists for parent-child relationships to be the explanation behind increased likelihood of dropout among students of mobility. However a strong correlation exists to explain the increased drop out risk among mobile students because of the compromise that mobility poses to students' friendship networks. This peer social network factor provides the strongest correlation of the four theories considered. Although loosely connected to original social capital theories, the importance of student relationships is evident in conclusion of this research.

## **CHAPTER THREE: METHODOLOGY**

### Introduction

The purpose of this chapter is to describe the methods and procedures used in the collection and analysis of data for this study. The sections of this chapter are organized as follows: problem statement, research questions, hypotheses, population and databases, analytical procedures and summary.

### Problem Statement

To date, this researcher has not found any studies which have explicitly addressed the impact that involuntary mobility has on a student's academic performance. Coupled with the current difficult economic condition facing many school districts and with declining enrollment projections, school boards are resorting to closing schools and imposing boundary changes that affect large constituents of students and families. As students are required to attend newly constructed schools or change schools due to closings, involuntary mobility is on the rise. The main problem facing educators is the impact involuntary mobility is having upon students who must make new connections at a school that may never have been an anticipated place of attendance. Current research continues to emphasize the importance of schoolhouse relationships, both between students and adults, as a critical component to reaching high levels of academic achievement (Daggett, 2004).

Rigor and relevance without a sound foundation of meaningful relationships will be stifled and students will not reach their potentials. "Relationships are important

because students are more likely to engage in rigorous learning when they know that teachers, parents and other students actually care how well they do” (Daggett, 2004, p. 5). Meaningful relationships are built on guiding principles such as trustworthiness, loyalty and respect. These qualities require time and experience to nurture authentic relationships. As students are increasingly experiencing moves from one school to another, often with little notice, a student’s relational framework is compromised. As this critical component to academic success is challenged, so is a student’s academic potential.

Although student mobility, often discussed as residential mobility, is not a new topic to the education arena as a contributing factor affecting student achievement, the idea of involuntary mobility is beginning to raise questions in this ongoing discussion. This study contributes to the growing body of research studying the impacts of mobility on student achievement. The analysis design of this study specifically compares one year of achievement for students during their first year at a newly constructed school against like stable peers in a school that are without any involuntary mobility factor. In other words, the students of involuntary mobility and their academic achievement will be compared to students who did not experience involuntary mobility of a similar demographic existing school. Academic achievement will be measured by performance on the Florida Comprehensive Assessment Test in the areas of reading and mathematics.



## Research Questions and Hypotheses

The researcher developed the following guiding research questions regarding involuntary student mobility:

1. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics between all students who experience involuntary mobility versus all students who did not?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics between students who experience involuntary mobility versus students who did not.

2. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics when considering both minority status and whether students experienced involuntary mobility?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics when considering both minority status and whether students experienced involuntary mobility.

3. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics when considering students of poverty as defined by FRL and whether these students experienced involuntary mobility?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics when considering both students of poverty (FRL) and whether students experienced involuntary mobility.

4. To what extent can a statistical model predict academic achievement as measured by the FCAT in Reading and Mathematics for students who experience involuntary mobility?

## Population and Databases

Four Space Coast Florida high schools, all located in the same identified school district, were used in the analysis of the research questions stated previously. Student database information was provided upon request via public records request to the

respective school district. Two high schools were recently constructed and opened within the last five years, otherwise identified as the experimental group. Two additional high schools were selected to serve as the comparison group, or control group, against the newly constructed high schools. The two existing high schools had to meet several considerations to preserve reliability. First, the comparison schools could not have their populations affected by the newly constructed high schools. Second, all high schools had to be selected within the same county to ensure that common curriculum and program offerings were consistent. Selected schools could not have been affected by any recent boundary changes. Last, comparison schools were selected which best represented the demographics of the newly constructed high schools given the aforementioned parameters.

The first newly constructed high school identified, to be named High School “A” (HSA), opened with 9<sup>th</sup> and 10<sup>th</sup> grade students at the start of the 2006-07 school year with approximately 870 students, 389 of whom were in 10<sup>th</sup> grade. Table 2 contains disaggregated population information for the 10<sup>th</sup> grade students, the focus of the current study. These students either attended or would have attended any one of at least three other high schools if HSA would not have been constructed. These 10<sup>th</sup> grade students moved after the 9<sup>th</sup> grade year and/or first year in high school; they attended a different high school for 9<sup>th</sup> grade. The 10<sup>th</sup> grade students of involuntary mobility from HSA were analyzed against 10<sup>th</sup> grade students of a comparable school, to be named High School “B” (HSB) that experienced no involuntary mobility. HSB, at the time of comparison, had approximately 1165 students in 9<sup>th</sup> and 10<sup>th</sup> grade, 594 of whom were in 10<sup>th</sup> grade.

Table 2

*2006-07 Grade 10 Demographics for High Schools A and B*

Demographic	School A ( <i>n</i> = 389)		School B ( <i>n</i> = 594)	
	#	%	#	%
FRL	19	4.9	78	13.1
Male	193	49.6	304	51.2
Female	196	50.4	290	48.8
Minority	90	23.1	136	22.9

*Note.* FRL = Free or Reduced Lunch

The second high school recently constructed, to be named High School “C” (HSC), opened with 9<sup>th</sup> and 10<sup>th</sup> grade students at the start of the 2009-10 school year with approximately 863 students, 331 of whom were in 10<sup>th</sup> grade. Table 3 contains disaggregated population information for the 10<sup>th</sup> grade students, the focus of the current study. These students primarily either attended or would have attended any one of two other local high schools if HSC would not have been constructed. The 10<sup>th</sup> grade students of involuntary mobility at HSC were compared against the 10<sup>th</sup> grade students at another local high school, to be named High School “D” (HSD), which had an approximate enrollment in 9<sup>th</sup> and 10<sup>th</sup> grade at the time of the analysis of 620 students, 229 of whom were in 10<sup>th</sup> grade.

Table 3

*2009-10 Grade 10 Demographics for High Schools C and D*

Demographic	School C ( <i>n</i> = 331)		School D ( <i>n</i> = 229)	
	#	%	#	%
FRL	167	50.5	127	55.5
Male	157	47.4	118	51.5
Female	174	52.6	111	48.5
Minority	154	46.5	113	49.3

*Note.* FRL = Free or Reduced Lunch

The student database provided included unidentified students with fields that provide categorical information per student as follows: gender and SES (as determined by Free and Reduced Lunch classification). In addition to categorical information, student achievement was identified as measured by the Florida Comprehensive Assessment Test in the areas of reading and mathematics based on the Developmental Scale Score. Student achievement data utilized for research questions 1 – 3 include the Developmental Scale Score for students in the year of mobility (i.e. school year 2006-07 for HSA and HSB; school year 2009-10 for HSC and HSD) in both reading and mathematics.

#### Analytical Procedures

All data was analyzed using SPSS for Windows version 18.0. For research questions one through three, an analysis of covariance (ANCOVA) was performed to

compare the mean academic achievement scores between the comparison schools for different groups of 10<sup>th</sup> grade students as measured by the FCAT in reading and mathematics while controlling for 9<sup>th</sup> grade FCAT performance. All three research questions involved comparisons among 10<sup>th</sup> grade students between students of stability and students of involuntary mobility. FCAT Developmental Scale Score in reading and mathematics served as the separate dependent quantitative response variables for all three analyses. All independent variables—mobility status (yes or no), minority status (white or non-white), and socio-economic status (FRL or non-FRL)—nominal categorical, are binary in nature. In Research Question 1, mobility status served as the independent variable for all students. For Research Question 2, the interaction between mobility status and ethnicity (minority or majority) served as the focus. Research Question 3 involved an examination of the interaction between mobility status and socio-economic status based on FRL (economically disadvantaged or not disadvantaged). The covariate, or control variable, was students' prior academic achievement as measured on the FCAT (9<sup>th</sup> grade) in reading and math. The covariate allowed the researcher to remove the effects of students' prior academic achievement as measured on the FCAT. All tests were conducted at the  $\alpha = .05$  level of significance.

Research question 4 was designed to determine the relevance of building a model to predict student achievement differences based on mobility situations by utilizing the availability of common data for students confronted with similar mobility circumstances at two distinct periods in time (one population in 2006-07 and the second in 2009-10). A hierarchal linear model was formulated from achievement data in reading and

mathematics for students who experienced involuntary mobility in the 2006-07 school year. The statistical model was then validated by determining the accuracy of its prediction for students who experienced involuntary mobility during the 2009-10 school year. The independent variables included academic achievement for prior years (5<sup>th</sup> through 9<sup>th</sup> grades) as measured by FCAT Developmental Scale Scores, demographic descriptors, and mobility status; academic achievement as measured by 10<sup>th</sup> grade FCAT Developmental Scale Score served as the dependent variable. Separate models were run for reading and mathematics. All statistical analyses provided outcome measures that were used to evaluate the research questions and/or validate the hypotheses presented.

### Summary

Chapter 3 described the general statistical approach, demographics of the schools and students utilized in the study and the analytical procedures that were implemented. This study considered the achievement of students confronted with involuntary mobility as the result of a newly constructed high school against their stable peers. Achievement comparisons utilized data collected from the FCAT in the areas of reading and mathematics. The study incorporated the data gleaned from two recently constructed high schools compared against two similar schools that remained stable. A total of four traditional, grades 9 – 12, high schools were utilized for this study and analysis.

Chapter 4 and 5 contain the findings of the data analysis, a presentation of the quantitative data gathered, and the implications of the results of this study for future research.

## CHAPTER FOUR: FINDINGS

### Introduction

The purpose of this study was to investigate the academic achievement performance differences between students who faced involuntary mobility prior to entering their 10<sup>th</sup> grade year in high school compared to students who did not face involuntary mobility. Specifically, it was to determine if a statistically significant difference in achievement on the FCAT in the areas of reading and mathematics occurred between involuntary mobility and stable student groups. For the purposes of this study, academic achievement was defined as the developmental scale score for students in reading and mathematics on the Florida Comprehensive Assessment Test (FCAT). Further, subgroups of the grade-level population were compared to make a similar determination.

Data sources for the present study came from district reported FCAT scores in reading and mathematics for four schools, two of which provide for involuntary mobility datasets and two which provide for stable (non-mobility) student datasets. The two schools impacted by involuntary mobility were identified and selected as a result of new construction. These two newly constructed schools received students from any one of several other local schools, thereby necessitating an involuntary mobility circumstance for the entering 9<sup>th</sup> and 10<sup>th</sup> grade students. These involuntary mobility students were compared against students from schools of like demographic. Students in 10<sup>th</sup> grade were selected for the study because they started their high school careers at a different school

in at least 9<sup>th</sup> grade prior to being required to attend the new high school as 10<sup>th</sup> grade students.

Two statistical tests, analysis of covariance (ANCOVA) and analysis of variance (ANOVA), were used in this analysis as appropriate. The dependent variable was individual student 10<sup>th</sup> grade FCAT developmental scale scores (DSS) in the areas of reading and mathematics. The independent variables, for the purpose of this study, were mobility, ethnicity (minority or non-minority), and poverty (determined by free and reduced lunch status). The covariate used in the ANCOVA analysis was 9<sup>th</sup> grade achievement, measured by 9<sup>th</sup> grade FCAT DSS in reading or math (depending on analysis).

### Findings

The problem statement for this study is summarized by the question, “To what extent does the reading and mathematics achievement of 10<sup>th</sup> grade students differ between students in the first year of involuntary mobility versus those students who did not experience involuntary mobility? The study was guided by a set of research questions and hypotheses.

#### Research Question and Hypothesis #1

*To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics between all students who experience involuntary mobility versus all students who did not?*



*H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics between students who experience involuntary mobility versus students who did not.*

A one-way analysis of covariance (ANCOVA) was conducted, one for reading and another for mathematics, to address this research question. The ANCOVA allowed for detecting differences in academic achievement between the mobility and non-mobility groups while controlling for prior year achievement. The continuous variable of developmental scale score (DSS) served as the dependent variable in the analysis. The independent variable, a binary variable, was identified as mobility (yes) and non-mobility (no); students' 9<sup>th</sup> grade DSS, a continuous variable, served as the covariate. The covariate was used to reduce error variance, thus reducing its bias on the dependent variable by serving as a statistical control. In other words, the covariate was utilized in an effort to isolate the genuine impact of mobility on students' achievement.

Multicollinearity assumptions were tested prior to the analysis. It was found that the interaction between the covariate and the independent variable was not significant for either reading,  $F(1, 1,328) = 0.05, p = 0.82$ , or for mathematics,  $F(1, 1,324) = 1.12, p = 0.29$ . Therefore, 9<sup>th</sup> grade DSS remained as the stated covariate for the ANCOVA. Upon further examination of skewness and kurtosis statistics, all values suggest that the dependent variables follow a sufficiently normal distribution for reading and mathematics. Levene's test of homogeneity was applied and indicated a non-significant result for both reading ( $p = .12$ ) and mathematics ( $p = .43$ ), thereby confirming the ANCOVA assumptions to be satisfied.

Using ANCOVA on the data set there was no significant difference,  $F(1, 1,329) = 1.83, p = 0.78$ , in 10<sup>th</sup> grade reading DSS between students who faced mobility and those who did not, when controlling for 9<sup>th</sup> grade DSS. The partial-  $\eta^2$  value of .001 indicates that less than one percent of the variability in the 10<sup>th</sup> grade reading DSS could be accounted for by mobility status. Consequently, in addition to lack of statistical significance there was also a lack of practical significance. Table 4 displays ANCOVA results for reading. Descriptive statistics, provided in Table 5, indicate that while controlling for 9<sup>th</sup> grade DSS, those students of involuntary mobility performed at a slightly higher level in reading ( $M = 2,038.21, SE = 6.70$ ) than students of non-mobility ( $M = 2,025.72, SE = 6.34$ ).

Table 4

*Analysis of Covariance Results, Mobility Effect on Reading Achievement (N = 1,332)*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Mobility	1	1.83	.001	.78
Grade 9 DSS	1	2,202.95**	.62	< .001
<i>S</i> within-group error	1,329	(28,204)		

*Note.* Value enclosed in parentheses represents mean square error. *S* = subjects.

\* $p < .05$ . \*\* $p < .01$ .

Table 5

*Descriptive Statistics, Mobility Effect on Reading Achievement (N = 1,332)*

Status	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Non-Mobility ( <i>n</i> = 703)	2,025.72	6.34	2,013.28	2,038.15
Mobility ( <i>n</i> = 629)	2,038.21	6.70	2,025.07	2,051.36

*Note.* Covariate evaluated at Grade 9 DSS = 1,996.09.

Using ANCOVA on the data set there was a significant difference,  $F(1, 1,325) = 6.05, p = .01$ , in 10<sup>th</sup> grade mathematics DSS between students who faced mobility and those who did not, when controlling for 9<sup>th</sup> grade DSS. The partial- $\eta^2$  value of .005 indicates that less than one percent of the variability in 10<sup>th</sup> grade mathematics DSS could be accounted for by mobility status. This result indicates despite the statistical significance indicated; there was no indication of practical significance. Table 6 displays ANCOVA results for mathematics. Descriptive statistics indicate that while controlling for 9<sup>th</sup> grade DSS, those students of involuntary mobility performed at a significantly higher level in mathematics ( $M = 2,045.10, SE=2.52$ ) than students of non-mobility ( $M = 2,036.55, SE = 2.39$ ). Table 7 displays descriptive statistics results for mathematics.

Table 6

*Analysis of Covariance Results, Mobility Effect on Mathematics Achievement (N = 1,328)*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Mobility	1	6.05*	.01	.01
Grade 9 DSS	1	3,337.18**	.72	< .001
<i>S</i> within-group error	1,325	(3,994)		

*Note.* Value enclosed in parentheses represents mean square error. *S* = subjects.

\**p* < .05. \*\**p* < .01.

Table 7

*Descriptive Statistics, Mobility Effect on Reading Achievement (N = 1,328)*

Status	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Non-Mobility ( <i>n</i> = 700)	2,036.55	2.39	2,031.86	2,041.24
Mobility ( <i>n</i> = 628)	2,045.10	2.52	2,040.15	2,050.05

*Note.* Covariate evaluated at Grade 9 DSS = 1,993.73.

### Research Question and Hypothesis #2

*To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics when considering both minority status and whether students experienced involuntary mobility?*

*H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics when considering both minority status and whether students experienced involuntary mobility.*

Two separate two-way analysis of covariance (ANCOVA) tests were utilized, one for reading and another for mathematics, to address this research question. With this analysis, differences in academic achievement could be detected between the mobility and non-mobility groups, minority and non-minority groups, and within the interaction between these two factors, while still controlling for prior year academic achievement. The continuous variable of developmental scale score (DSS) served as the dependent variable in the analysis. The independent variables included the binary variables representing mobility (yes or no) and minority (White or Non-White); students' 9<sup>th</sup> grade DSS, a continuous variable, served as the covariate. The covariate was used to reduce error variance, thus reducing its bias on the dependent variable by serving as a statistical control.

In testing for multicollinearity risks, the interaction between the covariate and the independent variable of mobility was found to not be significant for both reading,  $F(1, 1,326) = 0.09, p = .76$ , and mathematics,  $F(1, 1,322) = 0.78, p = .38$ . However, multicollinearity risks were found to be significant with the minority variable in respect to reading, which suggested that minority would not serve as an appropriate covariate for the reading analysis. Analysis for reading was separated for the two ethnicity groups and new tests for multicollinearity were conducted. Results for the non-minority group were found to not be significant,  $F(1, 908) = 1.39, p = .24$ . Although results for the minority group were found to be marginally significant,  $F(1, 413) = 5.19, p = .02$ , the ANCOVA

was deemed acceptable to run since the results were not highly significant. Results of multicollinearity tests between mathematics and minority were found not to be statistically significant,  $F(1, 1,322) = 0.33, p = .57$ . Levene's test of homogeneity was conducted and indicated non-significant results for reading in both the non-minority ( $p = .26$ ) and minority groups ( $p = .43$ ). Non-significant results were also found for mathematics ( $p = .23$ ). Two-way ANCOVA assumptions were satisfied.

In using the two-way ANCOVA with respect to non-minority students, there was no significant difference when comparing non-minority students,  $F(1, 909) = 0.62, p = .43$ , in 10<sup>th</sup> grade reading DSS between students who faced mobility and those who did not, while controlling for 9<sup>th</sup> grade DSS. The partial- $\eta^2$  value of .001 indicates that less than one percent of the variability in the 10<sup>th</sup> grade reading DSS could be accounted for by mobility status. Consequently, in addition to lack of statistical significance there is also a lack of practical significance. Table 8 displays ANCOVA results for mobility effect on reading achievement for the non-minority group. Descriptive statistics indicate that while controlling for 9<sup>th</sup> grade DSS, those students of involuntary mobility performed at a slightly higher level in reading ( $M = 2,078.26, SE = 8.10$ ) than students of non-mobility ( $M = 2069.61, SE = 7.35$ ). Table 9 displays the descriptive statistics results of mobility effect on reading achievement for the non-minority group.

Table 8

*Analysis of Covariance Results, Mobility Effect on Reading Achievement, Non-Minority Group (N = 912)*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Mobility	1	0.62	.001	.43
Grade 9 DSS	1	1,434.82**	.61	< .001
<i>S</i> within-group error	909	(27,009)		

*Note.* Value enclosed in parentheses represents mean square error. *S* = subjects.

\**p* < .05. \*\**p* < .01.

Table 9

*Descriptive Statistics, Mobility Effect on Reading Achievement, Non-Minority Group (N = 912)*

Status	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Non-Mobility ( <i>n</i> = 500)	2,069.61	7.35	2,055.19	2,084.04
Mobility ( <i>n</i> = 412)	2,078.26	8.10	2,062.36	2,094.15

*Note.* Covariate evaluated at Grade 9 DSS = 2,032.57.

With respect to the minority group and using the two-way ANCOVA on the data set, there was no significant difference when comparing minority students,  $F(1, 417) = 3.12, p = .08$ , in 10<sup>th</sup> grade reading DSS between students who faced mobility and those who did not, while controlling for 9<sup>th</sup> grade DSS. The partial- $\eta^2$  value of .007 indicates that less than one percent of the variability in the 10<sup>th</sup> grade reading DSS could be

accounted for by mobility status. This result indicates a lack of practical significance. Table 10 displays ANCOVA results for mobility effect on reading achievement for the minority group. Descriptive statistics indicate that while controlling for 9<sup>th</sup> grade DSS, those students of involuntary mobility performed at a slightly higher level in reading ( $M = 1,955.18, SE = 11.79$ ) than students of non-mobility ( $M = 1,925.09, SE = 12.19$ ). Non-minority students consistently performed at higher levels than their minority counterparts. Table 11 displays the descriptive statistics results of mobility effect on reading achievement for the minority group. Although neither the non-minority nor minority group indicated any significant difference in 10<sup>th</sup> grade reading performance between students of involuntary mobility and those of non-mobile groups, there is a noticeable discrepancy between overall performance among minority and non-minority groups.

Table 10

*Analysis of Covariance Results, Mobility Effect on Reading Achievement, Minority Group (N= 420)*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Mobility	1	3.12	.01	.08
Grade 9 DSS	1	611.29**	.59	< .001
<i>S</i> within-group error	417	(29,895)		

*Note.* Value enclosed in parentheses represents mean square error. *S* = subjects.

\* $p < .05$ . \*\* $p < .01$ .



Table 11

*Descriptive Statistics, Mobility Effect on Reading Achievement, Minority Group (N = 420)*

Status	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Non-Mobility ( <i>n</i> = 203)	1,925.09	12.19	1,901.12	1,949.06
Mobility ( <i>n</i> = 217)	1,955.18	11.79	1,932.00	1,978.35

*Note.* Covariate evaluated at Grade 9 DSS = 1,916.88.

A two-way ANCOVA was utilized to determine academic achievement differences in mathematics between the aforementioned groups for Research Question #2. Consistent with Research Question #1, there was a statistically significant difference,  $F(1, 1,323) = 6.38, p = .01$ , in 10<sup>th</sup> grade mathematics DSS between students who faced mobility and non-mobility students, when controlling for 9<sup>th</sup> grade mathematics DSS. Due to a partial- $\eta^2$  value of .005, there is no indication of practical significance. Table 12 displays mathematics ANCOVA results for mobility (alone). Those students of involuntary mobility performed at a significantly higher level ( $M = 2,043.83, SE = 2.64$ ) than students who did not experience involuntary mobility ( $M = 2034.36, SE = 2.66$ ). Table 13 displays descriptive statistics results for mobility and minority effect on mathematics achievement.

Table 12

*Analysis of Covariance Results, Mobility and Minority Effect on Math Achievement (N = 1,328)*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Mobility	1	6.38*	.01	.01
Minority	1	5.99*	.01	.02
Mobility x Minority	1	0.03	—	.86
Grade 9 DSS	1	3,167.36**	.71	< .001
<i>S</i> within-group error	1,323	(3,982.85)		

*Note.* Value enclosed in parentheses represents mean square error. *S* = subjects.

\**p* < .05. \*\**p* < .01.

While considering the mathematics academic achievement of the ethnic group (alone), there was a statistically significant difference,  $F(1, 1,323) = 5.99$ ,  $p = .02$ , in 10<sup>th</sup> grade mathematics DSS between minority and non-minority students, when controlling for 9<sup>th</sup> grade DSS. Although there was a significant difference between ethnic group's mathematics achievements, due to a partial- $\eta^2$  value of .005, there is no indication of practical significance. Mathematics ANCOVA results for minority (alone) can be found in Table 12. While controlling for 9<sup>th</sup> grade DSS, non-minority students performed at a significantly higher level ( $M = 2,043.75$ ,  $SE = 2.11$ ) than minority students ( $M = 2,034.44$ ,  $SE = 3.13$ ). Descriptive statistics results for mobility and minority effect on mathematics achievement are located in Table 13.

Table 13

*One-Way Descriptive Statistics, Mobility and Minority Effect on Math Achievement (N = 1,328)*

Status	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Mobility Status				
Non-Mobility ( <i>n</i> = 700)	2,034.36	2.66	2,029.15	2,039.57
Mobility ( <i>n</i> = 628)	2,043.83	2.64	2,038.65	2,049.01
Minority Status				
Non-Minority ( <i>n</i> = 910)	2,043.75	2.11	2,039.60	2,047.90
Mobility ( <i>n</i> = 418)	2,034.44	3.13	2,028.30	2,040.58

*Note.* Covariate evaluated at Grade 9 DSS = 1,993.73

More applicable for consideration to this study is the interaction between mobility and minority status (ethnicity); in this case with respect to 10<sup>th</sup> grade FCAT mathematics achievement. There was no significant difference,  $F(1, 1,323) = 0.03, p = .86$ , in 10<sup>th</sup> grade mathematics DSS with comparison between mobility and minority while controlling for 9<sup>th</sup> grade DSS. The partial- $\eta^2$  value less than .001 suggests that no variability in 10<sup>th</sup> grade mathematics DSS could be accounted for by the interaction between mobility and minority statuses. Again, lack of practical significance is also apparent. ANCOVA results for the interaction between mobility and minority can be found in Table 12.

Patterns between the estimated marginal means when controlling for 9<sup>th</sup> grade mathematics DSS indicate that trends in 10<sup>th</sup> grade mathematics DSS are consistent within the mobility and non-mobility groups while considering minority status. With the non-mobility group, minority students performed at a lower level ( $M = 2,029.37$ ,  $SE = 4.54$ ) than non-minority students in the non-mobility group ( $M = 2,039.95$ ,  $SE = 2.83$ ). For the mobility group, students in each minority group performed better than their counterparts in the non-mobility groups. There was also a similar gap in performance between the minority groups. Minority students performed at a lower achievement level ( $M = 2,039.51$ ,  $SE = 4.27$ ) than non-minority students ( $M = 2,048.15$ ,  $SE = 3.13$ ). Table 14 displays the descriptive statistics for mathematics achievement between these groups.

Table 14

*Interaction Descriptive Statistics, Mobility and Minority Effect on Math Achievement (N = 1,328)*

Mobility	Minority	$M$	$SE$	95% Conf Interval	
				Lower	Upper
Non-Mobility	Non-Minority ( $n = 501$ )	2,039.35	2.83	2,033.81	2,044.90
	Minority ( $n = 199$ )	2,029.37	4.54	2,020.47	2,038.26
Mobility	Non-Minority ( $n = 409$ )	2,048.15	3.13	2,042.01	2,054.29
	Minority ( $n = 219$ )	2,039.51	4.27	2,031.14	2,047.89

*Note.* Covariate evaluated at Grade 9 DSS = 1,993.73

### Research Question and Hypothesis #3

*To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics when considering both poverty status (FRL) and whether students experienced involuntary mobility?*

*H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics when considering both poverty status (FRL) and whether students experienced involuntary mobility.*

Two separate two-way analysis of covariance (ANCOVA) tests were conducted, one for reading and another for mathematics, to evaluate the difference in academic achievement between mobility and non-mobility groups, poverty (FRL) and non-poverty (non-FRL), and the interaction between these two factors, while controlling for prior year's academic achievement. The continuous dependent variable, previously identified as DSS, was used for analysis. The independent variables included the binary variables representing mobility (yes or no) and poverty (FRL or non-FRL). The continuous variable of 9<sup>th</sup> grade DSS served as the covariate.

No multicollinearity was detected with respect to reading between the covariate (9<sup>th</sup> grade DSS) and mobility,  $F(1, 1,326) = 0.01, p = .98$ , or FRL status,  $F(1, 1,326) = 4.03, p = .05$ . Therefore, 9<sup>th</sup> grade DSS will remain as the covariate in the analysis for reading. However, multicollinearity risks were evident with respect to mathematics between the covariate and FRL,  $F(1, 1,322) = 14.12, p < .001$ , but not between the covariate and mobility,  $F(1, 1,322) = 1.82, p = .17$ . Due to multicollinearity risks with the FRL variable, the analysis for math was separated for the two FRL groups and new multicollinearity tests were run. Results for the non-FRL group,  $F(1, 987) = 22.24, p < .001$ , and for the FRL group,  $F(1, 333) = 7.86, p = .005$ , continued to demonstrate

significant interaction between the covariate and the mobility variable. Therefore, the covariate was not used and the analysis was revised to a two-way factorial ANOVA. Levene's test of homogeneity was conducted and indicated non-significant results for reading ( $p = .12$ ) and for mathematics ( $p = .15$ ). The assumptions for the reading ANCOVA and mathematics ANOVA tests were satisfied.

Using the two-way ANCOVA on the data set for reading, there was a significant difference in 10<sup>th</sup> grade reading DSS,  $F(1, 1,327) = 4.69, p = .03$ , between students who faced mobility (alone) and those who did not, while controlling for 9<sup>th</sup> grade DSS. The partial- $\eta^2$  value of .004 indicated negligible variability in 10<sup>th</sup> grade DSS that could be attributed to mobility status. Lack of practical significance was evident. Table 15 displays ANCOVA results for the effect of mobility on reading achievement. Descriptive statistics indicate that while controlling for prior year's achievement, those students who faced involuntary mobility performed at a significantly higher level ( $M = 2,036.25, SE = 7.59$ ) than those students who did not face involuntary mobility ( $M = 2,013.31, SE = 7.41$ ). Table 16 displays the descriptive statistics for reading achievement between these groups.

Again, using the two-way ANCOVA on the data set for reading, there was a significant difference in 10<sup>th</sup> grade reading DSS,  $F(1, 1,327) = 6.92, p = .01$ , between those identified as FRL and non-FRL students, while controlling for 9<sup>th</sup> grade DSS. The partial- $\eta^2$  value of .005 indicates negligible variability in 10<sup>th</sup> grade DSS that could be attributed to FRL status. Lack of practical significance was evident. Table 15 displays ANCOVA results for FRL effect on reading achievement. Descriptive statistics indicate that while controlling for prior year's achievement, those non-FRL students performed at

a significantly higher level ( $M = 2,038.95$ ,  $SE = 5.34$ ) than FRL students ( $M = 2,010.61$ ,  $SE = 9.27$ ). Table 16 displays the descriptive statistics for reading achievement between these groups.

The interaction between mobility and FRL (or poverty) indicate no significant difference,  $F(1, 1,327) = 3.39$ ,  $p = .07$ , in this case with respect to 10<sup>th</sup> grade FCAT reading achievement, while controlling for 9<sup>th</sup> grade DSS. The partial- $\eta^2$  value of .003 indicates that no variability in 10<sup>th</sup> grade reading DSS could be accounted for by the interaction between mobility and FRL statuses. Lack of practical significance is also apparent. Table 15 displays reading ANCOVA results for the interaction between mobility and FRL.

Table 15

*Analysis of Covariance Results, Mobility and FRL Effect on Reading Achievement (N = 1,332)*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Mobility	1	4.69*	—	.03
FRL	1	6.92**	.01	.01
Mobility x FRL	1	3.39	.01	.07
Grade 9 DSS	1	2,079.75**	.61	< .001
<i>S</i> within-group error	1,327	(28,024.40)		

*Note.* Value enclosed in parentheses represents mean square error. *S* = subjects.

\* $p < .05$ . \*\* $p < .01$ .

Table 16

*One-Way Descriptive Statistics, Mobility and FRL Effect on Reading Achievement (N = 1,332)*

Status	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Mobility Status				
Non-Mobility ( <i>n</i> = 703)	2,013.31	7.41	1,998.78	2,027.84
Mobility ( <i>n</i> = 629)	2,036.25	7.59	2,021.37	2,051.14
FRL Status				
Non-FRL ( <i>n</i> = 996)	2,038.95	5.34	2,028.47	2,049.44
FRL ( <i>n</i> = 336)	2,010.61	9.27	1,992.44	2,028.79

*Note.* Covariate evaluated at Grade 9 DSS = 1,996.09

Patterns between the estimated marginal means when controlling for 9<sup>th</sup> grade reading DSS indicate that trends in 10<sup>th</sup> grade reading DSS are consistent within the mobility and non-mobility groups while considering FRL status. With the non-mobility group, FRL students performed at a lower level ( $M = 1,989.42$ ,  $SE = 12.96$ ) than non-FRL students in the non-mobility group ( $M = 2,037.21$ ,  $SE = 7.27$ ). For the mobility group, students in each FRL group performed better than their counterparts in the non-mobility groups. There was a similar gap in performance between the FRL groups. FRL students performed at a lower achievement level ( $M = 2,031.81$ ,  $SE = 4.2713.08$ ) than non-FRL students ( $M = 2,040.70$ ,  $SE = 7.81$ ). Table 17 displays the descriptive statistics for reading achievement between these groups.



Table 17

*Interaction Descriptive Statistics, Mobility and FRL Effect on Reading Achievement (N = 1,332)*

Mobility	FRL	<i>M</i>	<i>SE</i>	95% Conf Interval	
				Lower	Upper
Non-Mobility	Non-FRL ( <i>n</i> = 532)	2,037.21	7.27	2,022.95	2,051.46
	FRL ( <i>n</i> = 171)	1,989.42	12.96	1,964.00	2,014.84
Mobility	Non-FRL ( <i>n</i> = 464)	2,040.70	7.81	2,025.38	2,056.02
	FRL ( <i>n</i> = 165)	2,031.81	13.08	2,006.15	2,057.47

*Note.* Covariate evaluated at Grade 9 DSS = 1,996.09

Using the two-way factorial ANOVA on the data set for mathematics, there was a significant difference in 10<sup>th</sup> grade mathematics DSS,  $F(1, 1,326) = 5.29, p = .02$ , between students who faced mobility (alone) and those who did not. The partial- $\eta^2$  value of .004 indicates negligible variability in 10<sup>th</sup> grade DSS that could be attributed to mobility status. Lack of practical significance was evident. Table 18 displays ANOVA results for mobility effect on mathematics achievement. Descriptive statistics indicate those students who faced involuntary mobility performed at a significantly higher level ( $M = 2035.57, SE = 5.23$ ) than those students who did not face involuntary mobility ( $M = 2018.75, SE = 5.11$ ). Table 19 displays the descriptive statistics for mathematics achievement between these groups.

Again, using the two-way factorial ANOVA on the data set for mathematics, there was a significant difference in 10<sup>th</sup> grade mathematics DSS,  $F(1, 1,326) = 59.75, p < .001$ ,

between those identified as FRL and non-FRL students. The partial- $\eta^2$  value of .043 suggests that 4.3% of variability in 10<sup>th</sup> grade DSS could be the result of FRL status. This result further suggests the possibility of FRL status accounting for a small amount of variability in 10<sup>th</sup> math DSS. Note that the covariate relating prior achievement has been eliminated for this portion of the analysis, so this variability percentage may be slightly inflated. Table 18 displays ANOVA results for FRL effect on mathematics achievement. Descriptive statistics indicate non-FRL students performed at a significantly higher level ( $M = 2,055.40, SE = 3.69$ ) than FRL students ( $M = 1,998.92, SE = 6.31$ ). Table 19 displays the descriptive statistics for mathematics achievement between these groups.

When considering the interaction between mobility and FRL (or poverty), there was no significant difference,  $F(1, 1,323) = 0.21, p = .65$ , in the case of 10<sup>th</sup> grade FCAT mathematics achievement. The partial- $\eta^2$  value of  $<.001$  indicates that no variability in 10<sup>th</sup> grade mathematics DSS could be accounted for by the interaction between mobility and FRL statuses. Lack of practical significance was apparent. Table 18 displays reading ANOVA results for the interaction between mobility and minority.

Table 18

*Analysis of Variance Results, Mobility and FRL Effect on Math Achievement (N = 1,330)*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Mobility	1	5.29*	—	.02
FRL	1	59.75**	.04	< .001
Mobility x FRL	1	0.21	—	.65
<i>S</i> within-group error	1,326	(13,446)		

*Note.* Value enclosed in parentheses represents mean square error. *S* = subjects.

\**p* < .05. \*\**p* < .01.

Table 19

*One-Way Descriptive Statistics, Mobility and FRL Effect on Mathematics Achievement (N = 1,330)*

Status	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Mobility Status				
Non-Mobility ( <i>n</i> = 701)	2,018.75	5.11	2,008.73	2,028.78
Mobility ( <i>n</i> = 629)	2,035.57	5.23	2,025.32	2,045.82
FRL Status				
Non-FRL ( <i>n</i> = 992)	2,055.40	3.69	2,048.16	2,062.64
FRL ( <i>n</i> = 338)	1,998.92	6.31	1,986.54	2,011.29

Patterns between means indicate that trends in 10<sup>th</sup> grade reading DSS are consistent within the mobility and non-mobility groups while considering FRL status. With the non-mobility group, FRL students performed at a lower level ( $M = 1,992.17$ ,  $SE = 8.89$ ) than non-FRL students in the non-mobility group ( $M = 2,045.34$ ,  $SE = 5.03$ ). For the mobility group, students in each FRL group performed better than their counterparts in the non-mobility groups. There was a similar gap in performance between the FRL groups. FRL students performed at a lower achievement level ( $M = 2,005.66$ ,  $SE = 8.95$ ) than non-FRL students ( $M = 2,065.47$ ,  $SE = 5.40$ ). Table 20 displays the interaction descriptive statistics for mathematics achievement between these groups.

Table 20

*Interaction Descriptive Statistics, Mobility and FRL Effect on Mathematics Achievement (N = 1,330)*

Mobility	Minority	<i>M</i>	<i>SE</i>	95% Conf Interval	
				Lower	Upper
Non-Mobility	Non-FRL ( $n = 531$ )	2,045.34	5.03	2,035.46	2,055.21
	FRL ( $n = 170$ )	1,992.17	8.89	1,974.72	2,009.62
Mobility	Non-FRL ( $n = 461$ )	2,065.47	5.40	2,054.88	2,076.07
	FRL ( $n = 168$ )	2,005.66	8.95	1,988.11	2,023.21

#### Research Question and Hypothesis #4

*To what extent can a statistical model predict academic achievement as measured by the FCAT in Reading and Mathematics for additional students who experience involuntary mobility?*

This analysis is facilitated by the fact that two distinct data sets within the sample exist. One data set consists of a pair of schools (one non-mobile and one of involuntary mobility) that were compared when the newly constructed school opened for the 2006-07 academic year. The second data set consisted of a pair of schools, again one non-mobile and one of involuntary mobility, that were compared when the newly constructed school was opened for the 2009-10 academic year. A hierarchical linear model was developed using the 2006-07 school results to determine if the relationship between mobility and performance could be replicated in separate instance or if the results appear to be unique. The resulting model built upon the 2006-07 data was then fitted to the 2009-10 data. A separate model was tested for both reading and mathematics.

A model for reading was considered first by checking for assumptions. When checking for multicollinearity, all prior year DSS variables indicated very large degrees of multicollinearity. Consequently, starting with the oldest year of achievement data (5<sup>th</sup> grade), annual DSS variables were removed until only the previous year's data remained (9<sup>th</sup> grade). Indices reflected scores that suggested it reasonable to continue with the analysis. While testing for normality, three observations were identified as extreme outliers based upon the graphical representation of the unstandardized and standardized residuals and were removed. Having examined the skewness and kurtosis statistics and based on no further indication of non-normality indicated by the histograms, Q-Q plots or

boxplots, normality of the distribution was assumed. Cook's distance was also used as a measure to determine that outliers were not an issue. Additionally, the linearity assumption was met, independence of the distribution was assumed and homogeneity of variance was assumed based on applicable statistical tests.

The independent variables were inserted into the reading performance model in blocks so that the change in significance and variability due to the addition of each new variable could be better measured. The first block contained the descriptive demographics of FRL and minority status. The second block accounted for prior student performance by adding 9<sup>th</sup> grade DSS. The final block was represented by mobility status.

Table 21 displays the summary of hierarchical regression analysis for variables for reading performance. The first block yielded an initial model that was statistically significant,  $F(2, 836) = 19.66, p < .001$ . A minor amount of variation in 10th grade DSS was explained,  $R^2 = .045$  (4.5% variability explained). The addition of 9th grade DSS in the second block yielded a significant addition,  $\Delta F(1, 835) = 1,289.40, p < .001$ . Likewise, a very high amount of additional variability was explained with this variable, such that  $\Delta R^2 = .58$  (58% variability explained). However, the addition of mobility in the third block did not represent a significant addition to the model,  $\Delta F(1, 834) = 0.42, p = .52$ ; in addition, no more variability was explained. Despite the lack of statistical and practical significance, this term was retained in the model for completeness. The final model with respect to reading achievement with respect to the school opened for the 2006-07 academic year is indicated by Equation 1.

Table 21

*Summary of Hierarchical Regression Analysis for Variables Predicting Reading Performance (N = 839)*

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Constant	2104.74	10.23		202.03	53.38		201.99	53.39	
Minority	-95.92	21.61	-.15**	-10.93	13.76	-.02	-11.62	13.81	-.02
FRL	-106.66	30.68	-.12**	-33.67	19.35	-.04	-32.00	19.53	-.04
Gr 9 DSS				0.92	0.03	.78**	0.92	0.03	.78**
Mobility							7.43	11.49	.01
$R^2$		.05			.63			.63	
<i>F for <math>\Delta</math> in <math>R^2</math></i>		19.66**			1,289.40**			0.42	

\* $p < .05$ . \*\* $p < .01$ .

$$\text{Equation 1: Grade 10 Reading DSS} = 201.99 - 11.62 (\text{Minority}) - 32.00(\text{FRL}) + 0.92(\text{Grade 9 Reading DSS}) + 7.43 (\text{Mobility}) \quad (1)$$

Once the reading model was defined, the 2009-10 data set was tested against this model. The 95% confidence interval for percentage accuracy in having the previously stated model fit for 2009-10 observations was (0.23%, 1.92%), with a mean of  $M = 1.08\%$  and a standard deviation of  $SD = 9.51\%$ . Most observations fell between  $\pm 10\%$ ; therefore, most predictions for 2009-10 were between 10% under-predicted and 10% over-predicted. Nearly all observations fell within  $\pm 20\%$  of their actual value. Conclusions about this model will be made after the mathematics model is shared.

A model for mathematics was subsequently defined after checking for assumptions. When checking for multicollinearity, as with reading, all prior year DSS variables indicated very large degrees of multicollinearity. Consequently, starting with the oldest year of achievement data (5<sup>th</sup> grade), annual DSS variables were removed until only the previous year's data remained (9<sup>th</sup> grade). Indices reflected scores that suggested it reasonable to continue with the analysis. While testing for normality, six observations were identified as extreme outliers based upon the graphical representation of the unstandardized and standardized residuals and were removed. Having examined the skewness and kurtosis statistics and based on no further indication of non-normality indicated by the histograms, Q-Q plots or boxplots, normality of the distribution was assumed. Cook's distance was also used as a measure to determine that outliers were not an apparent issue. Additionally, the linearity assumption was met, independence of the



distribution was assumed and homogeneity of variance was assumed based on applicable statistical tests.

The independent variables were inserted into the mathematics performance model in blocks so that the change in significance and variability due to the addition of each new variable could be better measured. The first block contained the descriptive demographics of FRL and minority status. The second block accounted for prior student performance by adding 9<sup>th</sup> grade DSS. The final block contained mobility status.

Table 22 displays the summary of hierarchical regression analysis for variables for mathematics performance. The first block yielded a model that was statistically significant,  $F(2, 828) = 11.76, p < .001$ . A minor amount of variation in 10<sup>th</sup> grade DSS was explained,  $R^2 = .028$  (2.8% variability explained). The addition of 9<sup>th</sup> grade DSS in the second block yielded a significant addition,  $\Delta F(1, 827) = 2,628.08, p < .001$ . A very high amount of additional variability was explained with this variable, such that  $\Delta R^2 = .74$  (74% variability explained). Finally, the addition of mobility did represent an addition that was statistically significant,  $\Delta F(1, 826) = 18.60, p < .001$ , but not yielding in much more explanation of practical variability,  $\Delta R^2 = .005$  (less than 1% additional variability explained). The final model with respect to mathematics achievement with respect to the school opened for the 2006-07 academic year is indicated by Equation 2.

$$\begin{aligned} \text{Grade 10 Mathematics DSS} = & 595.82 - 4.37 (\text{Minority}) - 2.23(\text{FRL}) + \\ & 0.72(\text{Grade 9 Reading DSS}) + 17.37 (\text{Mobility}) \end{aligned} \quad (2)$$

Table 22

Summary of Hierarchical Regression Analysis for Variables Predicting Math Performance ( $N = 831$ )

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Constant	2065.32	4.64		595.27	28.77		595.82	28.46	
Minority	-27.58	9.81	-.10**	-2.75	4.83	-.01	-4.37	4.79	-.02
FRL	-47.09	14.00	-.12**	-6.33	6.90	-.02	-2.24	6.89	-.01
Gr 9 DSS				0.73	0.01	.87**	0.72	0.01	.87**
Mobility							17.37	4.03	.07**
$R^2$		.03			.77			.77	
<i>F for <math>\Delta</math> in <math>R^2</math></i>		11.76**			2,628.08**			18.60**	

\* $p < .05$ . \*\* $p < .01$ .

Once the mathematics model was defined, the 2009-10 data set was tested against this model. The 95% confidence interval for percentage accuracy in having the previously stated model fit for 2009-10 observations was (-0.13%, 0.50%), with a mean of  $M = 0.19\%$  and a standard deviation of  $SD = 3.59\%$ . Most observations fell between  $\pm 8\%$ ; therefore, most predictions for 2009-10 were between 8% under-predicted and 8% over-predicted.

The two models, reading and mathematics, differed somewhat in performance. For utilization in practice, the mathematics model could be referenced comfortably with other data sets regarding performance among similar populations as most observations were predicted within a rather acceptable margin of error (0.5%) for a variable such as DSS. Additionally, it should be noted that mobility acted as a significant predictor in this model. For reading, on the other hand, mobility was not a significant predictor, which provides little utility in future studies regarding mobility of students in this population. The confidence interval and accuracy of all predicted values was wider as well, which means that this model may hold utility as a rough estimator of performance with other factors including demographics and prior performance, but is not especially helpful for specific studies regarding student mobility.

Chapter 5 presents the summary, conclusions, implications and recommendations for further research.

## **CHAPTER FIVE: CONCLUSION**

The purpose of this study was to determine whether involuntary mobility, by virtue of students attending a newly constructed school, had an impact on student academic achievement for students in grade 10, specifically in reading and mathematics. This information as it relates to the growing discussion on the effects of mobility on student achievement and overall academic success may prove useful to educational leaders, law-makers and other community decision-makers, particularly as involuntary mobility becomes increasingly common.

This researcher found no studies which explicitly addressed the impact that involuntary mobility has on student's academic performance. Coupled with the current economic condition facing many school districts and with declining enrollment projections, school boards are resorting to closing schools and imposing boundary changes that affect large constituents of students and families. As students are required to attend newly constructed schools or change schools due to closings, involuntary mobility is on the rise. The most concerning impact is upon students who must make new connections at a school that may never have been an anticipated place of attendance. Daggett's (2004) research continues to emphasize the importance of schoolhouse relationships, both between students and adults as a critical component of reaching high levels of academic achievement.

The problem posed in the study was whether or not students who were required to attend a newly constructed high school (involuntary mobility), demonstrated significantly different, potentially diminished, academic achievement on the FCAT in reading and/or

mathematics. Academic achievement was measured by students' developmental scale score on the Florida Comprehensive Assessment Test, administered to students in grade

10.

### Research Questions and Hypotheses

1. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics between all students who experience involuntary mobility versus all students who did not?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics between students who experience involuntary mobility versus students who did not.

2. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics when considering both minority status and whether students experienced involuntary mobility?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics when considering both minority status and whether students experienced involuntary mobility.

3. To what extent is there an academic achievement difference as measured by the FCAT in Reading and Mathematics when considering both poverty status (FRL) and whether students experienced involuntary mobility?

H<sub>0</sub>: There is no statistically significant academic achievement difference as measured by the FCAT in Reading and/or Mathematics when considering both poverty status (FRL) and whether students experienced involuntary mobility.

4. To what extent can a statistical model predict academic achievement as measured by the FCAT in Reading and Mathematics for additional students who experience involuntary mobility?

### Summary of Hypotheses Results

Findings of this study focused on determining if the null hypothesis for each research question was rejected or failed to be rejected. Such determination indicates

whether involuntary mobility did or did not have a statistically significant impact on student's achievement. Effect size was identified by assessing statistical significance, measured by  $p$ , and measuring practical significance by partial- $\eta^2$ .

Null Hypothesis #1 – Failed to be rejected for reading: There is no statistically significant academic achievement difference as measured by the FCAT in Reading between students who experience involuntary mobility versus students who did not.

As a result of no significant interaction between prior achievement and mobility, the ANCOVA test was run for both reading and mathematics. The ANCOVA for reading determined there was no statistically significant difference between 10<sup>th</sup> grade student achievement on FCAT in reading between the mobile and stable groups. There was no statistical significance at either the .01 level or the .05 level. This suggests that the students groups of involuntary mobility when compared with those of non-involuntary mobility had comparable achievement when controlling for prior year's achievement on the FCAT. Of further interest and to the surprise of this researcher, the mean DSS of the mobile student group was actually slightly higher than stable group in reading. This suggests that the students who faced involuntary mobility actually performed better as a whole than their stable counterparts.

Null Hypothesis #1 – Rejected for mathematics: A statistically significant academic achievement difference does exist as measured by the FCAT in mathematics between students who experience involuntary mobility versus students who did not.

The ANCOVA test for mathematics determined there was a statistically significant difference in the achievement between the involuntary mobility group and the stable group, at the .01 significance level. However, the difference in achievement is

contrary to the actual anticipated result which is that the mobile students, like with reading, performed higher than their stable counterparts. However, when evaluating practical significance using partial- $\eta^2$ , less than one percent of variability in the 10<sup>th</sup> grade math DSS could be accounted for by mobility status. This result further suggests there is no indication of practical significance.

Null Hypothesis #2 - Failed to be rejected for Reading: There is no statistically significant academic achievement difference as measured by the FCAT in Reading when considering both minority status and whether students experienced involuntary mobility.

As a result of a significant interaction effect determined between minority status and the covariate, the minority variable was separated into two groups for reading. Once separated, new tests for multicollinearity were run again indicating no concerns related to the non-minority group; while the minority group indicated some evidence of significance. Because it was determined to be marginally significant, the ANCOVA was utilized. No statistically significant difference was found with either the non-minority or minority groups between students who faced mobility and those who did not, while controlling for 9<sup>th</sup> grade DSS. Consistent with the former research question, the mean DSS of the mobility group was slightly higher in reading than their stable counterparts. Also notable is that there was a discrepancy between overall performance between minority and non-minority groups. Non-minority groups performed at a higher level than their minority peers.

Null Hypothesis #2 – Failed to be rejected for Mathematics: There is no statistically significant academic achievement difference as measured by the FCAT in Mathematics

when considering both minority status and whether students experienced involuntary mobility.

No significant interaction was detected for both the mobility or ethnicity status and 9<sup>th</sup> grade DSS scores; therefore, prior achievement remained as the covariate and an ANCOVA test was run. When considering both mobility alone and ethnicity alone, both variables indicated a statistically significant difference in 10<sup>th</sup> grade mathematics DSS achievement on the FCAT, when controlling for 9<sup>th</sup> grade DSS or prior achievement. However, in each case less than one percent of the variability in 10<sup>th</sup> grade mathematics DSS could be explained by either the mobility or ethnicity statuses of student groups. This result also supports a lack of practical significance.

However, there was no statistical significance when testing the interaction between mobility and ethnicity and 10<sup>th</sup> grade FCAT achievement in mathematics while controlling for prior year's achievement. Consistent with the former research questions and tests, both minority and non-minority students in the mobility group performed slightly better than their non-mobile counterparts. There was a similar gap in performance between the minority and non-minority groups within each mobile and non-mobile category. Students of minority performed at a lower level than their non-minority peers within the same school.

Null Hypothesis #3 - Failed to be rejected for Reading: There is no statistically significant academic achievement difference as measured by the FCAT in Reading when considering both poverty status (FRL) and whether students experienced involuntary mobility.



No significant interaction was detected for both the mobility or poverty status and 9<sup>th</sup> grade DSS scores; therefore, prior achievement remained as the covariate and an ANCOVA test was run. When considering both mobility alone and poverty (FRL) status alone, both variables indicated a statistically significant difference in 10<sup>th</sup> grade reading DSS achievement on the FCAT, when controlling for 9<sup>th</sup> grade DSS or prior achievement. However, in each case less than one percent of the variability in 10<sup>th</sup> grade reading DSS could be explained by either the mobility or poverty (FRL) statuses of student groups. This result also supports a lack of practical significance.

However, there was no statistical significance when testing the interaction between mobility and poverty (FRL) and 10<sup>th</sup> grade FCAT achievement in reading, while controlling for prior year's achievement. Again, consistent with the previous research questions and tests, both poverty and non-poverty students in the mobility group performed slightly better than their non-mobile counterparts in this area of reading. There was a similar gap in performance between the poverty and non-poverty groups within each mobile and non-mobile category. Students of poverty performed at a lower level in 10<sup>th</sup> grade reading on FCAT than their non-poverty peers within the same school.

Null Hypothesis #3 – Failed to be rejected for Mathematics: There is no statistically significant academic achievement difference as measured by the FCAT in Mathematics when considering both poverty (FRL) status and whether students experienced involuntary mobility.

Because significant interaction was detected between the FRL variable and the suggested covariate of 9<sup>th</sup> grade mathematics DSS, the covariate was not used. The

analysis was revised to utilize two separate two-way factorial ANOVA tests. When considering both mobility alone and FRL alone, both variables indicated a statistically significant difference in 10<sup>th</sup> grade mathematics DSS achievement on the FCAT. In the case of mobility alone, less than one percent of the variability in 10<sup>th</sup> grade mathematics DSS could be explained for by mobility status of student groups. This result also supports a lack of practical significance. However in the case of FRL alone, 4.3% of the variability in 10<sup>th</sup> grade mathematics DSS could be accounted for by FRL status. This result suggests the possibility of FRL status accounting for a small amount of variability in 10<sup>th</sup> grade mathematics DSS. It must be noted that the covariate relating prior achievement has been eliminated for this portion of the analysis.

More specifically in response to the null hypothesis, there was no statistical significance when testing the interaction between mobility and FRL and 10<sup>th</sup> grade FCAT achievement in mathematics. Consistent with the former research questions and tests, both poverty and non-poverty students in the mobility group performed slightly better than their non-mobile counterparts. There was a similar gap in performance between the poverty and non-poverty groups within each mobile and non-mobile category. Students of poverty performed at a lower level than their non-poverty peers within the same school.

## Summary of Results

### Research Questions #1 - 3

It is difficult to compare this research to other studies, due to the uniqueness of this study in relation to involuntary mobility. As previously indicated, no studies have been found that specifically present the impact of involuntary (specifically) mobility on student achievement. There remains an ongoing debate of the legitimate impact that traditional, residential mobility has on student achievement. It has been presented that mobility is simply a symptom of other factors, such as poverty. In some cases of residential mobility, there may also be positive factors related to the mobility (i.e. increased socio-economic status); therefore not contributing to compromised achievement. One of the intentions of this study was to provide an alternative perspective on mobility in hopes of offering some additional considerations to the mobility debate. By controlling for prior achievement, it was hoped that the impact of involuntary mobility could be more isolated for comparing student achievement in the first year that students in the new school faced the mobility.

Nearly each null hypothesis failed to be rejected; thereby suggesting that there was not a significant achievement difference between students of involuntary mobility and non-mobility, even among at-risk subgroups. The only exception was related to research question one with mathematics where there was a statistically significant difference in achievement between students of mobility and non-mobility. Counter to the anticipated result, students of mobility had a statistically significant higher mean DSS in mathematics than their non-mobile counterparts. In the case of research question three,

when the covariate had to be removed for the analysis related to mathematics, there still was no significant difference in achievement among poverty and mobility. Even without statistical significance, in every instance, students of mobility scored at least a slightly higher mean DSS in both reading and mathematics than their non-mobile peers.

#### Research Question #4 - Hierarchical Regression

Research question #4 was intended to determine if there might be some way to predict the academic performance of students who experience involuntary mobility. This was essentially feasible due to two acceptable and distinct sets of data for students who faced involuntary mobility, albeit three years apart. The hierarchal linear model was built using 2006-07 results and tested against 2009-10 data. This allowed for determining whether the relationships between mobility and achievement could be applied in separate instances or if the results were unique to a particular school.

In preparation for building the reading achievement model, all assumptions were tested and determined to have been met. When testing for multicollinearity, condition index values of less than 15 were pursued with values greater than 30 determined unacceptable. With access to prior year DSSs as far back as 5<sup>th</sup> grade, these values were tested and found to have very large degrees of multicollinearity. It was not until all prior year's DSSs were removed with the exception of 9<sup>th</sup> grade, that an acceptable condition index of 23.17 was achieved and facilitated proceeding with the analysis. The same was found to be true when building the mathematics model. The best condition index value achieved was 35.43 while retaining 9<sup>th</sup> grade DSSs.

There is no particular rule to determine whether either model is a sound fit for the 2009 observations. In the case of the reading model, most observations fell between +/- 10% and all observations fell within +/- 20%. This suggests that the model generally predicts within 10% under-predicted and 10% over-predicted scores. Due to the somewhat large standard deviation (9.51%) this is an average model. In the case of the mathematics model, values were narrowed and yielded a stronger model. Most observations fell between 8% under-predicted and 8% over-predicted with a smaller standard deviation (SD= 3.59%). The mathematics model has a much more promising degree of accuracy when fitted with data from a different school a few years later. Of course, further validation of these models may be done as involuntary mobility is considered through future studies.

#### Recommendations for Future Research

Since the nature of this study is rather new when compared to the vastly researched aspect of mobility, there are several potential extensions for future research related to involuntary mobility. The research of this study was delimited to the student achievement at newly constructed high schools in one Central Florida school district. A larger sample size would add to the depth of consideration and provide an expanded application of the findings. It was presented that at least throughout Florida there was rapid school construction over the last several years that would facilitate this type of future research. In addition, it would be extremely beneficial to consider the impact of involuntary mobility on other grade levels. For example, both elementary and middle

school analysis could be done that would expand the considerations of this study. Research conducted by Swanson and Schneider (1999) suggests residential and/or educational mobility has little to no effect on achievement within in the first two years of high school. However, the same study determined that school mobility in the final high school years indicated adverse academic achievement in at least mathematics scores (Swanson & Schneider, 1999). Considering involuntary mobility on lower grade students through the creation of newly constructed elementary and/or middle schools would add to the body of research.

Future studies could look at not only additional quantitative measures of student achievement, but also qualitative considerations of the subjects impacted by involuntary mobility. Attitudinal surveys, particularly if administered at the beginning of the transitional year and again at the end, could provide perspectives from the students, parents, teachers and administrators. Qualitative research, via interviews, could take into consideration not only those stakeholders who involuntarily moved, but also consider those students who remained at the school(s) from which students were taken to attend the new school. As was presented in the review of social capital, the impact of mobility also affects the emotional well-being of stakeholders. Interviews and surveys could be used to capture stakeholder perceptions of the involuntary mobility process. Probing into perceptions on the impact of involuntary mobility could be tied to grade-point average, other achievement scores (i.e. SAT, ACT), graduation and/or drop-out rate. A qualitative research approach could potentially capture and measure intentional and/or unintentional

intervention programs that aided in the successful transition of students to the new school.

Future research could also take into consideration several other potential risk factors which may be compounded by involuntary mobility. Additional subgroup categories could include: previously retained, level of parent education, gender and level of residential/student mobility. Other considerations for future research include analyzing student discipline issues, attendance and dropout rates of students who experienced involuntary mobility versus those students of stability. Additional research for the high school could include the academic performance of second year 9<sup>th</sup> grade students who are confronted with involuntary mobility. This study only considered 10<sup>th</sup> grade students and did not include in the analysis the performance of retained students. A subgroup of retained student achievement may provide insightful information related to this significant at-risk student group. As Swanson and Schneider's (1999) research suggested, mobility in the later high school years does negatively impact achievement. Additional research on students' late high school accomplishments would add to the body of research.

Approaching involuntary mobility from the perspective of school closings would provide another perspective to the discussion. As society is currently faced with severe economic hardships, school districts are confronted with closing schools due to declining enrollment and/or as costing saving measures. This research could be applied across all school configurations and levels. As school closings typically initiate a negative reception from students and parents, it would provide another perspective of involuntary mobility.

### Implications for Policy and Practice

The potential that school leaders will be confronted with either new school construction or school closings is virtually inevitable. The impact of this type of mobility, involuntary in nature, has on students and academic achievement has yet to be fully determined. There should be some comfort in the preliminary results in this study that suggest that high school students' achievement may be minimally impacted when required to transfer to a new high school, even after starting high school elsewhere. School leaders, as well as sociologists, continue to present impacting factors such as: relationships in the schoolhouse, connectedness to the school community and identification with a group leading to positive social development and acquisition of a healthy level of social capital. Student mobility, in any form, is likely to continue to gain attention from researchers and practitioners in an effort to more clearly define its impact on student success. Educational leaders and decision/policy makers should follow this debate closely in an effort to support students. Perhaps the best way to do this at the current time is to understand the interventions that may assist educators in mitigating negative effects of mobility. Although most intervention efforts and/or suggestions have evolved from the residential/student mobility arena, some lessons can be learned and applied within the context of involuntary mobility.

### Interventions in Response to Mobility

In Rumberger's (2003) research on student mobility, he presents several suggestions for schools to consider in efforts to minimize the potentially negative effects



of mobility on student success. Efforts suggested for school-based staff, from teachers to administrators, include: provide interesting and student-friendly orientation packets, encourage students to join extra-curricular activities, provide mentor programs and “learning packets” (Rumberger, 2003, p. 16). The most important and consistent emphasis is on interventions that focus on efforts that are proactive and purposeful. Rumberger (2003) emphasizes that the best strategy for mitigating the negative impacts of mobility is to ensure the overall quality of the school. This begins with preparations in advance to assist incoming transfer students, as well as establishing a “culture of caring” for new student enrollment (p. 17).

Another effort, consistent with the notion of being proactive, includes curriculum considerations. In response to the student mobility challenge, but also applicable to the involuntary mobility discussion, is argument for a well-developed core curriculum, one with a coordinated vertical and horizontal sequence (Skandera & Souza, 2002). A coordinated sequence provides for schools to ensure that time is not lost revisiting concepts or standards unnecessarily. Whether it is students moving among schools voluntarily or students being reassigned to a school involuntarily, established standards and coordinated sequencing provide for maximizing instructional time. Further, students are set up for success when there is a seamless transition from one school or one grade-level to the next.

Daggett’s (2004) work on *Reforming American High Schools – Why, What, and How* validates the necessity to plan for student success. Daggett emphasizes that rigor and relevance without relationships will not yield the greatest impact of any of these

factors. When a school plans for opportunities for the adults to develop meaningful and connected relationships to rigorous learning, students will become increasingly engaged. Daggett suggests this happens “much in the same way that a personal trainer might work with an exerciser” (Daggett, 2004, p. 5). Daggett (2004) suggests that as a high school promotes and foster relationships at the “sustained” and “mutually beneficial” levels, without compromising high academic standards and expectations, students are able to reach their highest potential of student achievement (p. 5).

### Conclusion

This study, based on the established design, does not provide strong results to suggest that involuntary mobility has a negative effect on student achievement. This study measured the student achievement of 10<sup>th</sup> grade students during their inaugural year of attending a newly constructed high school. Achievement was measured by students’ performance on the Florida Comprehensive Assessment Test administered to 10<sup>th</sup> grade students in the areas of reading and mathematics. Students’ developmental scale scores in each area were used as the dependent variable, while 9<sup>th</sup> grade scores were used as the covariate to control for its effect on student achievement. The findings indicated that there was no significant difference in achievement between mobility and non-mobility groups. Further, when comparing subgroups of students based on ethnicity and poverty level, no significant differences in achievement existed between mobility and non-mobility groups.

This study was unique in its exploration of an aspect of mobility that has received little attention so far. Traditional mobility as it has been often considered includes factors such as families relocating and students changing schools. It is typically recognized that schools have little control over these factors, regardless of the reasons a student arrives at a new school at any time throughout the year or during the student's educational career. However, involuntary mobility is an element of mobility that the school, or at least the school district, does control and direct. Therefore education systems should begin to consider the impact involuntary mobility may have on student success, especially since it can control the variability in which it occurs.

It is essential to note that the conceptual framework upon which this study has been considered may only be loosely connected to the tenets of involuntary mobility. Research does support the suggestion that students perform better when they have meaningful relationships and a sense of connectedness within the schoolhouse. The theory of social capital posits that individuals benefit in many respects when healthy social structures exist within their surrounding communities. It seems to reason that the school place would be a significant and impacting community in a student's life since they spend a considerable amount of time in this setting. Therefore, students benefit when healthy social structures exist within their school experience; included are not only peer, but also adult social structures. Daggett (2004) advocates, although outside the formal acknowledgment of social capital theory, that relationships in the school environment are essential to maximizing student's academic potential. Rigorous and relevant curricula are

important, but meaningful relationships provide a foundation upon which students strive to take full advantage of learning opportunities.

This study set out to determine if student relationships, connectedness or essentially social capital development was compromised by virtue of involuntary mobility. The quantitative results would suggest that at least student's academic achievement was not compromised in this circumstance. However, it could also be the case that school leaders, either intentionally or accidentally, addressed the aspect of student relationships and/or social capital effectively. It is likely that students could have been rather excited to be among those first attending a brand new school. With this circumstance came opportunity to shape the school culture, select the mascot and tout the distinct privilege of being the first graduating class and so on. These school culture building events likely fostered school connectedness, school pride and foster camaraderie.

In summary, two explanations surface in response to the quantitative results of no statistical significant difference between the mobility and non-mobility groups. First, if social capital holds legitimacy as a conceptual framework in consideration of involuntary mobility as an adverse factor in its development, then school staff was successful in mitigating any adverse academic impacts. Consequently, it suggests that administrators, teachers and staff did create meaningful relationships with students that manifested in sustained academic achievement. Second, as previously presented, the interventions to mobility the schools utilized were proactive and intentional at their inception. Therefore the combination of the of the school intentionally planning interventions to assist students

during transition, while also investing in quality relationships ensured students' academic continuity and success. Daggett's (2004) relational framework would suggest that the teachers engaged with students at the higher relational levels to realize these results.

As a recommended for future research, school closings that lead to involuntary mobility, due to ensuing attendance boundary changes, will provide another perspective to the mobility debate. With the elimination of the school-culture-building elements described previously and unique to a newly constructed school, it may be that students' attitudes would be different due to school closings. Nevertheless, measuring the academic impacts amidst school closings may also present considerable challenges as school leaders and districts would likely strive to aggressively minimize negative impacts particularly through relationship building efforts. Again, it may be difficult to capture the true impact without considerable qualitative data elements.

Although this study suggests that involuntary mobility did not adversely affect student achievement, it does provide a platform to launch further research for consideration. Through the review of literature, it connects theories of social capital and the contemporary educational literature around schoolhouse relationships. School leaders are likely to continue to be confronted with the impacts of mobility. Whether mobility is identified as involuntary or otherwise, impacts on students' social and academic development may be challenged. Although some forms of mobility appear to be beyond the control of school leaders, research on involuntary mobility should continue and translate into applicable practice that minimizes any negative impact on students.

**APPENDIX  
IRB REVIEW**



University of Central Florida Institutional Review Board  
Office of Research & Commercialization  
12201 Research Parkway, Suite 501  
Orlando, Florida 32826-3246  
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276  
[www.research.ucf.edu/compliance/irb.html](http://www.research.ucf.edu/compliance/irb.html)

From : **UCF Institutional Review Board #1  
FWA00000351, IRB00001138**  
To : **Mark W. Mullins**  
Date : **September 16, 2010**

Dear Researcher:

On 9/16/2010, the IRB determined that the following proposed activity is not human research as defined by DHHS regulations at 45 CFR 46 or FDA regulations at 21 CFR 50/56:

Type of Review: Not Human Research Determination  
Project Title: AN ANALYSIS OF THE AFFECT OF INVOLUNTARY  
MOBILITY ON STUDENT ACHIEVEMENT AS  
MEASURED BY THE FLORIDA COMPREHENSIVE  
ASSESSMENT TEST  
Investigator: Mark W Mullins  
IRB ID: SBE-10-07117  
Funding Agency:  
Grant Title:  
Research ID: N/A

University of Central Florida IRB review and approval is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are to be made and there are questions about whether these activities are research involving human subjects, please contact the IRB office to discuss the proposed changes.

On behalf of the IRB Chair, Joseph Bielitzki, DVM, this letter is signed by:

Signature applied by Joanne Muratori on 09/16/2010 10:50:01 AM EDT

A handwritten signature in black ink that reads "Joanne Muratori".

IRB Coordinator

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