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A Family and Community Variable Prediction Model for NJ ASK Mathematics Sixth and Seventh Grade Assessments Results: The Impact on School Evaluation

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ABSTRACT

This study examined the predictive accuracy of family and community demographic variables found in the U.S. Census data on the percentage of students at the school level who scored Proficient or above on the NJ ASK 6 and 7 Mathematics section when controlling for teacher mobility and level of teacher education. Analysis included simultaneous multiple linear regression and hierarchical linear regression. This study looked at 100% of the New Jersey school districts with complete sets of 2010 NJ ASK 6 and 7 data and 2010 census data and tested at least 25 students in each grade level. Only schools servicing Grades 6 and 7 students from their hometown were included to maintain clean demographic data. The results of this study revealed that 67% of school level 2010 NJ ASK 6 Math scores could be predicted within 10 points by looking solely at three out-of-school community variables. The results of this study also revealed that 72% of school level 2010 NJ ASK 7 Math scores could be predicted within 10 points by looking solely at three out-of-school community variables. This research study contributes to the limited but growing body of knowledge indicating inadequacy of the use of state standardized assessments as the sole measure of student achievement.

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DEDICATION

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CHAPTER I

INTRODUCTION

The responsibility of determining school effectiveness and teacher quality was always within the authority of each individual state Department of Education. Local governments and locally elected school boards of education had some degree of freedom to determine which aspects of school practice best reflected the needs of the children and communities they serve. Over the past century, state and federal legislatures have expanded their power and control over educational policy (Firestone, Fuhrman, & Kirst, 1989). Multiple federal interventions paved the way for federal influence over our public schools. *Brown v. Board of Education* in 1954, federal support for the military, and the passage of the National Defense Education Act as a reaction to the Russian launch of *Sputnik* are all historical examples of federal education policies. Just over a decade later the federal government implemented the Elementary and Secondary Education Act of 1965. The ESEA provided money through Title I funding mechanisms to individual schools and opened the doors to many programs designed to move students away from poverty and to limit the economic achievement gap (Elementary and Secondary Education Act, 1965: Kirp, 1977).

The education reform practice of using standardized test results to determine student academic achievement and hold teachers accountable for student learning gained major drive from two national initiatives on educational reform; namely, *A Nation at Risk* (1983) and America 2000 (1991) (Tanner & Tanner, 2007). The National Commission on Excellence in Education focused its attention on the need for greater accountability standards. *A Nation at Risk: the Imperative for Educational Reform* (1983) was a report published by President Reagan's National Commission on Excellence in Education. *A Nation at Risk: The Imperative* *for Educational Reform* (1983) heavily influenced the country's perspective that American schools were failing and that massive local, state, and federal reforms were needed (Tanner & Tanner, 2007). The main premise of *A Nation at Risk* was that public schools were to blame for the alleged decline of the U.S. control over global industrial markets, resulting in the economic rise of Japan and Germany during the early 1980s (Tanner & Tanner, 2007).

The standardized accountability movement grew after several national reports about America's public education system were published in the early 1980s. The most significant of these reports was *A Nation at Risk*. Soon after publication of *A Nation at Risk*, standardized assessments took aim at increasing the rigor of the classroom experience. Through the 1980s and 1990s a series of federal policy initiatives typified the arrival of standards-based reform culminating in the Goals 2000: Educate America Act. These tests were to be made available nationally and were used to determine progress toward achieving the national educational goals by the year 2000 (Tanner & Tanner, 2007).

The most recent of the national influences over educational policy was the 2002 reauthorization of ESEA, known as the NCLB Act. In 2002 President George W. Bush signed into law the No Child Left Behind Act of 2001 (NCLB), which required all states to establish students' adequate yearly progress targets (AYPTs) toward proficiency on state-mandated standardized tests by 2014. The law called for 100% proficiency on statewide tests in Grades 3 through 8 and one year in high school in Language Arts, Mathematics, and in some grades science (Tienken & Orlich, 2013).

Nichols and Berliner (2008) offer five reasons as to why high-stakes testing has become an acceptable part of the American education system. The first reason is connected with the idea that success or failure on these tests will identify the lazy teachers and the lazy students. The second reason is linked with the historical connection to *Sputnik I* and *A Nation at Risk.* This was the emerging perception by both business and government at the time: that the future economy would depend on a highly educated work force. High-stakes tests emerged as the method for measuring our competitiveness in a global marketplace. The third reason is based upon the changing demographic makeup of United States. Older Americans are taking a more dominant role in the educational political decision process. They do not want to waste resources on youth that will not sustain a solid economy. With this reason, high-stakes testing creates a dual system by separating the deserving and the undeserving. The fourth reason looks at socio-economic classes and the problems associated with a lower income population. Lower income classes, from a political perspective, will be more affected by the sanctions connected with high-stake testing. The Jeffersonian view of education, or an equitable view of public schooling, is threatened. Poor results on state-mandated standardized tests leads to a loss of school funding and enhances a system of segregation (Tienken & Orlich, 2013). High-stakes testing can continue as long as it does not affect the middle and upper classes or the ruling class. The fifth and final perceived reason presented by Nichols and Berliner rests on the culture of the American fascination with competitive sports. Schools can compete and communities can be proud of their testing performance reputation (Nichols & Berliner, 2008).

National and state mandates have prioritized standardized assessments and placed them at the top of education reform. In New Jersey, The Elementary School Proficiency Assessment (ESPA) was administered at Grade 4 from 1997 through 2002 to provide an early indication of student progress toward achieving the knowledge and skills identified in the Core Curriculum Content Standards (CCCS). In spring 2003, the New Jersey Department of Education replaced the ESPA with the New Jersey Assessment of Skills and Knowledge (NJ ASK), a comprehensive, multi-grade assessment program. Bureaucrats at the New Jersey Department of Education mandated that school personnel in each New Jersey school administer the New Jersey Assessment of Skills and Knowledge (NJ ASK) in Grades 3-8, which was designed to give indications of student progress toward mastery in the knowledge and skills described in New Jersey's Core Curriculum Content Standards. School report cards and results from assessment data, such as those coming from the former NJ ASK and now the Partnership for Assessment of Readiness for College and Careers (PARCC), are utilized by the government to analyze student performance. There is a reliance on these data to identify learning gaps and implement reform policies. The potential for creating a predictive model for student achievement on the NJ ASK provides an opportunity for educational leaders to better implement sound evaluation practices they hope will identify certain factors that improve or hinder student performance on the NJ ASK.

Statement of the Problem

The problem that currently exists in New Jersey is that there are limited empirical results from quantitative studies on whether certain aspects of each school district's report card can be used to predict student proficiency on middle school New Jersey ASK Mathematics and Language Arts results when including the demographic makeup of the community and families of students that attend the school. A current model does not exist where educational leaders can observe the degree to which school, student, and community characteristics predict student achievement as measured by the NJ ASK test results.

There is a need for a quantitative analysis to determine the predictive accuracy of family and community variables found in the US Census data on the percentage of students who score Proficient or above at the school level on the NJ ASK 6 and 7 Math test results when controlling for teacher mobility and level of teacher education.

There is a problem when administrators use data assembled from high-stakes standardized assessments to implement an evaluation procedure to determine the effectiveness of a school district. It cannot be assumed that high-stakes data collected from standardized assessments truthfully measure the effectiveness of a school district without controlling for external school variables existing in each district's socioeconomic data. With this said, superintendents and principals might be making evaluation decisions under the assumption that proficient results on high-stakes standardized assessments accurately identify superiority and success at the school level. These same district administrators may be rewarding or punishing teachers based on a faulty model by using high-stakes test data to identify achievement or failure in different school districts. They are doing this without taking into account specific socio-economic variables shown to influence results on standardized tests assessments.

Maylone (2002) correlated school district socioeconomic data with Michigan Educational Assessment Program (MEAP) results from high school and found three socioeconomic factors combined to predict a school district’s composite MEAP scores. He did this through the use of a multiple regression analysis. Jones (2008) also found a predictive equation for New Jersey high school performance on the High School Proficiency Assessment (HSPA) using district and school demographic data published in the annual New Jersey School Report Card. Turnamian & Tienken (2013) also examined the strength of the relationship between 2009 NJ ASK 3 Language Arts and Mathematics scores and three specific district social and demographic data. They used multiple, simultaneous, and hierarchical linear regressions to predict the percentage of students at the district level who scored Proficient or above on the NJ ASK 3 in Language Arts and Mathematics. They predicted 60% of school district 2009 NJ ASK 3 Math proficiency percentages accurately by looking at only three exterior district community variables. Using the same regressions, they were able to show 52% of school district 2009 NJ ASK 3 Language Arts scores could be predicted within 10 points by looking only at the same three exterior district community variables. These studies all demonstrated through the use of multiple regression that a reliable predictive formula for student achievement can be created for district high-stakes standardized test data and district socioeconomic data. Exterior school variables such as family income, lone-parent family, and level of parental education to name a few have been proven to significantly influence students' success on standardized high-stakes assessments (Baker & Johnston, 2010b; Beckman, Messersmith, Shepard, & Cates, 2012; Berends, Lucas, & Peñaloza, 2008; Chamberlin, 2007; Hilliard, 2000; Kohn, 2000).

Purpose of the Study

My purpose for this study was to determine the predictive accuracy of family and community demographic variables found in the U.S. Census data on the percentage of students at the school level who scored Proficient or above on the NJ ASK 6 and 7 Mathematics section when controlling for teacher mobility and level of teacher education. The value of using district test scores to measure the quality of in-school variables may be in question. Where Turnamian and Tienken (2013) analyzed the predictive validity of school district socioeconomic data correlated with high-stakes New Jersey elementary school standardized assessment data, this study focused on a more fine-grained analysis of the results from NJ ASK 6 and 7 within one testing year at the school level.

New Jersey Teacher Evaluation Policy

New Jersey was one of the first 10 states granted NCLB waivers by the United States Department of Education. On August 6, 2012, Governor Christie signed into law the TEACHNJ

Act. This act mandated the implementation of a new teacher evaluation system beginning in the 2013-2014 school year and links tenure decisions to evaluation ratings. The new state evaluation program is called AchieveNJ and is designed to recognize those who excel and identify those who need additional support. AchieveNJ relies primarily on two aspects of educational performance, teacher practice and student achievement.

My work here focused on the concerns surrounding student achievement measurements; however, I briefly describe the teacher practice portion of the policy. Teacher practice is measured by performance on a state-approved practice instrument such as The Danielson Groups' Framework for Teaching or The Marzano Teacher Evaluation Model. Non-tenured teachers will have two long classroom observations and one short observation in the first two years of employment and one long and two short observations in their third and fourth years of employment. Tenured teachers must have three short observations each year. Short observations are twenty minutes in length and long observations are forty minutes in length. The results from these observations account for 55% of a teacher's summative rating.

AchieveNJ also has a student performance component built into the program. Student Growth Percentiles (SGPs) are one of the measures used to assess educators whose students are in Grades 4-8 and take the New Jersey Assessment of Skills and Knowledge (NJ ASK) Math and Language Arts tests. The SGP score is found by comparing a student's growth on the NJ ASK to the growth made by that student's academic peers. This process is described in greater detail in the next section of this chapter. Qualifying teachers are assigned the median SGP (mSGP) score of all of that teacher's qualifying students based on student rosters submitted by the district. Median SGPs account for 30% of a teacher's overall rating. Principals are accountable for schoolwide SGP data if enough tested grades and subjects are taught in their school. The

TEACHNJ Act connects the earning and retention of tenure to the results of a teacher or principal's annual summative evaluation. If any teacher, principal, or assistant principal is rated ineffective or partially ineffective in two consecutive years, the employee may be charged with inefficiency and result in loss of tenure.

Student Growth Percentiles

Described in the New Jersey Department of Education's report on Achieve NJ, the Student Growth Percentiles (SGPs) are a central piece of AchieveNJ. The state is devoted to developing measures of student growth as required under the TEACHNJ Act signed into law in August 2012. New Jersey is using a growth methodology to calculate student outcomes based on the concept that students enter each grade level at varying starting points. New Jersey measures growth for an individual student by comparing the change in his or her NJ ASK achievement from one year to the next. This is done by comparing the change to other students in the state who had similar historical test results.

The achievement levels are reported as a Student Growth Percentile (SGP) and indicate on a scale from 1 to 99 how an individual student's growth compares to that of his/her academic peers. To determine the mSGP for an individual teacher, district course roster data is used to create an ascending list of SGPs of the qualifying students who were assigned to the teacher by the district. SGPs are one of several measures used to examine the work of educators under AchieveNJ in 2013-14 and account for 30% of a teacher's overall rating. The rest is based on classroom observations and Student Growth Objectives (SGOs), which are goals set for a teacher's students at the start of the year. To calculate a teacher's final evaluation rating, 2013-2014 mSGPs are converted to a 1.0 - 4.0 score, then weighted at 30% and included along with the teacher practice score and SGO score.

Schools and Leadership

Improving principal evaluations is also a primary aspect of this new policy. The NJ DOE states that improving principal practice through the use of student achievement embedded within this policy will ensure that New Jersey schools are taking a comprehensive approach to raising achievement. AchieveNJ is intended to distinguish those who excel and detect those who need additional support to assist all principals become great school leaders. AchieveNJ relies on multiple measures of performance to evaluate principals. As with the evaluation of teachers, these measures include components of student achievement and principal practice.

Principals in Grades 4 through 8 have schoolwide SGP data. The SGP scores are used to measure a principal's ability to help increase student achievement on the NJ ASK. For multi-grade SGP principals, this measure counts for 30% of their summative rating. For single-grade SGP principals, this measure counts for 20%. Student achievement scores based on SGPs are expected to provide school leaders with an increased number of opportunities to engage in high-quality professional conversations. These SGP data are expected to give them a more accurate idea of their impact. Essentially, all information and data that are gathered through the new system at both the educator and student levels are anticipated to help school leaders modify professional development to improve their own practice, as well as to better meet their staff's needs.

Any principal, assistant principal, or vice principal who is rated Ineffective or Partially Effective on his or her evaluation will receive additional support through a Corrective Action Plan (CAP). The CAP includes timelines for corrective action and describes responsibilities of the principal and the district in implementing the plan. This overall evaluation score combines the multiple measures of principal practice with student growth and achievement included. The student achievement score is a result of the SGP calculated for each student under the leadership of the principal. All New Jersey principals earn one of four ratings: Highly Effective, Effective, Partially Effective, or Ineffective. To maintain tenure, all principals (regardless of hire date) have to continue to earn a rating of Effective or Highly Effective.

District superintendents also have many new responsibilities when evaluating the AchieveNJ results of his/her teachers and principals. SGPs are a significant factor in this final evaluation rating. Superintendents must make changes in the district plan and uphold new requirements to assure district compliance with AchieveNJ regulations. The superintendent is responsible for creating and evaluating district-level professional development initiatives based on the data collected in both teacher and principal evaluation results. Superintendents are required to maintain local professional development committees, utilize and lead district evaluation advisory committees or create new structures to oversee professional development at district level. These professional development decisions are made partially as a result of student achievement or lack of achievement evidenced in district SGPs. Ultimately, as required in the TEACHNJ Act, a superintendent has discretion to file a charge of inefficiency (tenure charge) against any tenured teaching staff member and/or principal who is rated Ineffective or Partially Effective for two consecutive years.

Study Design and Methodology

This correlational, cross-sectional explanatory study used NJ ASK 6 and 7 Mathematics results from 2010 and five-year estimates from U.S. Census data to determine how well community demographic and school-level factors can predict the percentage of students at the school level who scored Proficient or above. The grade levels of student achievement examined were Grades 6 and 7 because these are stable middle school testing grades. Two different grade levels of data were analyzed to show if different aspects of community and family variables influence achievement with different groups on the NJ ASK 6 and 7.

Research Questions

This study began by examining four main research questions:

1. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
2. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJASK 6 Math section when controlling for teacher mobility and level of teacher education?
3. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?
4. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling teacher mobility and level of teacher education?

Null Hypotheses

Null Hypothesis 1: No statistically significant relationship exists between the 2010 NJ ASK 6 percentage of students scoring Proficient and Advanced Proficient in Mathematics at the school level and community variables when controlling for teacher mobility and level of teacher education.

Null Hypothesis 2: No statistically significant relationship exists between the 2010 NJ ASK 7 percentage of students scoring Proficient and Advanced Proficient in mathematics at the school level and community variables when controlling for teacher mobility and level of teacher education.

The unit of analysis for this study was the school. The study built upon the independent variables of Maylone (2002) and Turnamian (2012) and included additional independent variables based on review of relevant literature.

Theoretical Framework

The line of inquiry for this study sought to establish a research base for a new policy context to better explain which community and family demographics are predictably impacting the percentage of students Proficient and Advanced Proficient in Grades 6 and 7 for New Jersey schools.

I drew upon the structural theory of poverty (Rank, Hirschl, & Yoon, 2003). Empirical research on American poverty has largely focused on individual characteristics of people to explain why poverty is so pervasive. The focus on individual attributes as the cause of poverty misses the underlying dynamic of American poverty. U.S. poverty is a result of structural failings at the economic, political, and social levels. The theory is built upon three lines of evidence: (1) the inability of the U.S. labor market to provide enough decent paying jobs; (2) the ineffectiveness of American social policy to reduce poverty through the use of governmental social safety net programs; and (3) the fact that the majority of the population will experience poverty indicating the systemic nature of U.S. poverty (Rank, Hirschl, & Yoon, 2003).

NCLB has frustrated many sociologists and educators because it ignores a fundamental sociological insight that surfaced more than 40 years ago in the Coleman Report (Coleman et al., 1966). Differences in students' family backgrounds, such as community factors, create achievement gaps with greater influence than do inequalities within and between schools themselves (Condron, 2009). The theory explains that while deficiencies in human characteristics help to explain who in the population is at risk of encountering poverty, this is not the issue. The theory rests on the fact that poverty exists in the first place and is not a consequence of individual human characteristics. By focusing only on individual characteristics, such as education, we simply shuffle people around, knowing somebody will lose out due to the lack of decent job opportunities and supports in society (Roscigno, Tomaskovic-Devey, & Crowley, 2006). Changes in social supports and safety nets must become available to families in order to make a difference in regard to how households avoid poverty.

The recognition of poverty in the United States has nothing to do with Americans being less motivated or unskilled but more that our economy has been producing low-wage jobs and that our social policies have done very little to support families. Research into the dynamics of poverty has shown that many households will re-experience poverty in the future. Annual estimates of poverty were gathered from PSID data; Stevens (1994) calculated that of all persons who managed to get themselves out of poverty, more than half would return to poverty within five years (Rank, 2001). Individuals and households tend to move in and out of poverty depending on the occurrence or nonoccurence of specific unfavorable events (e.g., job loss, family disruption, and ill health). The structure of the American economy, combined with weak social safety nets and policies, ensures that a certain percentage of the American population will experience impoverishment or poverty over the course of a lifetime. Three quarters of Americans will experience poverty or near poverty during their adulthoods. This is illustrative of our social systems' structural failings (Rank, Hirschl, &Yoon, 2003).

Variables

Independent Variables

The independent variables for this study were 18 variables found in the U.S. Census data and three found in each school's individual report card.

- Percentage of people employed
- Percentage of households making under $25,000
- Percentage of households making under $35,000
- Percentage of households making more than $200,000
- Percentage of families making less than $25,000
- Percentage of families making less than $35,000
- Percentage of families making more than $200,000
- Percentage of families in poverty for 12 months
- Percentage of female households in poverty
- Percent of all people under poverty
- Percentage of male-only households, no females
- Percentage of female-only households, no males
- Percentage of lone-parent households (total)
- Percentage of population with less than 9^{th} grade education
- Percentage of population with no high school diploma
- Percentage of population with some college
- Percentage of population with a bachelor's degree
- Percentage of population with an advanced degree
- Percentage of teachers within a school that hold a bachelor's degree

- Percentage of teachers within a school that hold a master's degree
- Percentage of faculty within a school who entered or left the school during the school year

Teacher mobility and teacher level of advanced degree were also evaluated as school-level independent variables. Although the greater focus of the research is on the out-of-school variables, I added two school-level variables found in the extant literature that impacted student achievement as measured by the percentage of students who scored Proficient and above on standardized test scores.

Dependent Variables

The dependent variables for this study were the percentage of students scoring Proficient or above at the school level on the 2010 NJ ASK 6 and 7 Mathematics section.

Significance of the Study

Results from previous studies suggest that out-of-school variables impact student achievement measured by high-stakes assessments (Baker & Johnston, 2010a; Berends et al., 2008; Brennan, Kim, Wenz-Gross, & Siperstein, 2001; LINN, 2000; Lynn, Pugh, & Williams, 2012; Martin, 2012; Toutkoushian & Taylor, 2005). Empirical data are needed to determine the predictive strength of community and family demographic characteristics on the percentage of students scoring Proficient or above on high-stakes standardized assessments. There have been many studies on the influence of poverty factors on grade point average, report card grades, and high-stakes tests. Many studies focus on students' eligibility for free and reduced lunch, parental education levels, occupation status of parents, and academic resources in the household. The influence of these factors is researched individually and as a group to determine the influence on academic achievement (Gottfried, 1985; Hart & Risley, 1998; Hauser & Warren, 1997).

My study pushes the analysis further by including two grade levels, sixth and seventh, and three buckets of variables made up of 18 SES factors at two levels: community and family. I go beyond the use of the free and reduced lunch variable and the tripartite concept defined by Duncan, Featherman, and Duncan (1972) to provide a multidimensional and multilevel exploration. Furthermore, my unit of analysis is at the school level, closer to the individual student than previous studies conducted at the district level. My results provide a more focused analysis of the predictive accuracy of individual variables when mediated by other SES factors and certain school-level variables over two separate school years.

Delimitations

The data for this study were gathered from two sources, the 2010 NJ ASK 6 and 7 and the U.S. Census Bureau American FactFinder. The 2010 NJ ASK 6 and 7 data was taken from each school districts' annual School Report Card along with the percentage of economically disadvantaged families. District community and family variable data was organized from the U.S. Census Bureau American Factfinder. All data were analyzed at the district level; individual school aggregate data were not analyzed. Analysis of family and community variables was delimited to those used for the family and community variables in Tienken (2013) and variables identified from review of the literature. The source of student achievement for this study was the 2010 NJ ASK 6 and 7 because it is the only high-stakes standardized assessment given in all New Jersey school districts.

The results of the study cannot be applied to school districts outside of New Jersey since the study specifically looked at New Jersey school district data. The findings of the study have been delimited to the district level and therefore cannot be assigned to individual schools, teachers, or student populations beyond district Grades 6 and 7. Additionally, sweeping statements about the findings at the district level cannot be assigned to grade levels other than Grades 6 and 7 at the district level.

Limitations

There is one area that threatens reliability of the linear regression models, and that is the impact of multicollinearity on the independent variables. Multicollinearity can cause individual coefficient estimates to change unpredictably. This can negatively impact calculations about the predictive power of individual school districts. Two different methods were employed to ensure multicollinearity did not threaten the results of the multiple regression models generated for each dependent variable. First, a regression model was used for each dependent variable and all the independent variables. This method categorizes variables based on F-tests and tolerance levels to build models with the greatest R^2 values and lowest multicollinearity levels. After this, the theoretical structure established through review of the existing literature was applied to build a series of simultaneous and hierarchical regression models for each dependent variable. The use of the theoretical framework to predict variables was based on two conditions. The first was that one variable from each construct must be used primarily (household income, lone-parent household, level of parental education), and the second was that the variance inflation factor (VIF) for all three variables must be less than 2. The model that had the highest R^2 while also meeting the two conditions mentioned was recognized as the best model.

The study was not an experimental design, and therefore it cannot determine cause. The sample size for this study was the entire population with at least 25 students enrolled in the seventh grade. Hence, estimates made about specific characteristics of all New Jersey school districts are made with a high degree of dependability, and the probability of the results being chance were near zero. Also, any errors resulting from self-reporting of data or data entry could not be determined. The results of the research apply only to data gathered from the NJ ASK 6 and 7 Mathematics percentages of Proficient and Advanced Proficient and family and community variable data from specific districts in New Jersey.

Definition of Terms

High-Stakes: "Three conditions must be present for a test or testing program to be considered high-stakes: (a) a significant consequence related to individual student's performance, (b) the test results must be the basis for the evaluation of quality and success of school districts, and (c) the test results must be the basis for the evaluation of quality and success of individual teachers" (Tienken & Rodriguez, 2010).

District Factor Group: These groupings of school districts in New Jersey began in 1975. The purpose of these groupings is to allow student performance on state standardized tests to be compared to student performance from communities with comparatively similar socioeconomic status.

Standard Error of Measurement: The standard error of measurement (SEM) is an estimate of the amount of error or lack of precision one must consider when interpreting a test score (Tienken & Rodriguez, 2010).

Predictive Validity: Predictive validity is the extent to which a score on a scale or test predicts scores on some criterion measure (Cronbach & Meehl, 1955).

Adequate Yearly Progress (AYP): NCLB established the goal of 100% of achieving proficiency at each grade level in Language Arts and Mathematics. AYP targets are established for the years prior to 2014 to identify which districts are on track to achieve the 100% mark. Districts are required to publish their AYP results annually.

New Jersey Assessment of Knowledge and Skills (NJ ASK): The assessment used by New

Jersey in Grades 3 to 8 to determine if districts are meeting AYP targets in Language Arts and Mathematics. Science is administered in Grade 4 and Grade 8. It is administered during the spring of each school year. It was first administered in the spring of 2004.

No Child Left Behind (NCLB): President George W. Bush signed this legislation into law on January 8, 2002. NCLB mandates that states meet the goal of 100% proficiency for all students by the year 2014.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

This literature review examines research, studies, and articles relevant to high-stakes public education standardized assessments and the history of its use in evaluating the American public education system. Literature relating to the implementation of high-stakes testing policies, such as AchieveNJ, and the influence of district community demographic data gets particular consideration. Both historical and contemporary theorists' work is cited throughout this literature review to offer the reader an extensive framework of the evaluation policies impacting communities serviced through public education. The literature review is organized into the following sections: Evaluation in Education, Student Growth Percentiles, High-Stakes Policies in New Jersey; NJ ASK and AchieveNJ, The Influence of Teacher Evaluation on School Administration, and The Impact of Community Variables on Student Learning.

Evaluation in Education

Overview of American Education Evaluation

This section seeks to gain perspective as to where teacher evaluation in the American education system has been as a way to grasp some understanding of where it is going. This section examines relevant literature from the 1800s to the 21st century. In the early 1800s Thomas Jefferson viewed the role of education as one of equity, progress, and change. His vision was grounded in the ideals of a public education system that would level the playing field for the privileged and the poor. James Carter continued this vision after Jefferson's presidency. He advocated for formal teacher training and professionalizing teaching with support at the state level (Tanner & Tanner, 2007). Carter's biggest contribution was his idea that the state should oversee and help direct the public school system to a more equitable situation rather than relying exclusively on local control of education. He brought the notion of local control with state regulation to the policy conversation (Tienken and Orlich, 2013).

Horace Mann of Massachusetts and Henry Bernard of Connecticut next pioneered the improvement of public schools. They informed the public about school conditions and made suggestions about improving practice and service. Bernard was said to travel up and down the state performing the first school surveys. He focused on instructional procedures, curriculum, and safety. Bernard and Mann made annual reports to the Massachusetts Board of Education (1837-1848) about the promise of the educational future. Mann also focused on instructional approaches and argued that teaching children in heterogeneous groups is essential in order to meet the goals of a unifying and socializing in a common school. Together they founded institutions which provided some of the original teacher education and in-service professional development vehicles (Tanner & Tanner, 2007). The work of our public school “pioneers” shows that the creation and sustainability of the public school system is heavily dependent on the ability to monitor, evaluate, and offer professional development for teachers. The methodology for evaluating education and specifically teachers has always been an important part of the history of our education system.

A Business Model

The pursuit for efficiency in education has always existed. The literature proves that business practices and ideas often influence the direction of educational institutions. Joseph Lancaster and The Lancasterian method soon introduced monitorial instruction. This method originated in London, England, but was quickly brought to the United States. Large numbers of students were placed into each class, and teachers were asked to follow scripted drill lessons.

Teachers would move from classroom to classroom and the method rested on the benefits of cost efficiency (Tienken & Orlich, 2013). School quality, in the form of evaluation, and efficiency have been at odds since the 1800s and continued into the 1900s.

Fredrick Taylor's scientific management attempted to make education more efficient, like business. Frederick Taylor, the father of scientific management, felt work should be divided into simple tasks, where workers are more robotic than they are thinkers. Taylor did not consider workers as individuals, but rather pieces of a much larger machine, scientifically selected and trained rather than left to passively train themselves. He argued that scientific study could determine the proper method of doing every job (Spring, 2008). Principals initially modeled the corporate world and evaluated teachers much as business managers evaluate their subordinate employees. Management assumed more duties by diminishing workers' need for decision making. This concept led to standardization in education. More specifically, standardization in schools resulted in standard curriculum, standard hiring practices, standard teacher training procedures, standard student assessment, and most relevant here, standardized teacher evaluations.

In the United States, educational administration entered into an environment that rested heavily on hierarchical and simplistic business models (Callahan, 1962). When applied to public schools, the business model explored by the "cult of efficiency" effectively marginalized the diversity in early twentieth-century U.S. schools by promoting standardization and regimentation of grade levels, teaching materials, and curriculum (Callahan, 1962). Ellwood P. Cubberly, one of the leading pioneers in school administration, is credited with introducing the formal study of school administration. He wrote of the importance of the scientific management movement for school administration and supervision (Cubberly, 1916). Cubberly believed that the implementation of scientific management in the schools would create a necessary shift for school administration. He wrote that it would change from guesswork to scientific accuracy, and the changing of school supervision from a political job which needed little technical preparation to that of a highly skilled piece of professional social engineering. Cubberly suggested that the scientific movement in the schools would demand the creation of standards of measurement which would define the efficiency of the work being done (Fine, 1997). Cubberly paralleled the management of schools with that of business:

> Every manufacturing establishment that turns out a standard product or series of products of any kind maintains a force of efficiency experts to study methods of procedure and to measure and test the output of its works . . . our schools are, in a sense, factories in which the raw products (children) are to be shaped and fashioned into products to meet the various demands of life. The specifications for manufacturing come from the demands of twentieth century civilization and it is the business of the school to build its pupils according to the specifications laid down (Cubberly. p.338).

Cubberly's (1916) use of the factory metaphor created a set of principles for school administrators that focused on measurement and analysis of data to ensure that teachers and schools were productive (Marzano, 2011). This laid the foundation for teachers to receive grades such as letter grades from an A-F scale to indicate their performance for a variety of criteria. This factory-style approach has been altered and re-altered in many ways but remains the model of twenty-first century education in the United States.

Top-down management demonstrated by businesses and factories used in education can lead to evaluator biases and ultimately poor teacher evaluations. Principals are the managers in the service of public education. School staffs and teacher unions across the United States have worked hard for decades to research and offer alternatives to the top-down management structure. Decision making structures have been created to include teacher input and share major decisions with the administration. Scientific management promised to replace the unsystematic actions of workers with a planned and controlled work environment (Spring, 2008). When looking at teacher evaluations, the notion of the "top down" autocratic principal-facilitated evaluations is rooted in a tradition sculpted after the American business model of the 20th century. This model is still supported by the work of educational leaders such as Frederick W. Taylor and Ellwood Cubberley. The basis of principals evaluating teachers is entrenched in the current models of teacher evaluation.

Historical Influences on Teacher Evaluations

A crucial influence on education policy was a 1996 report from the National Commission on Teaching and America's Future (NCTAF), titled *What Matters Most: Teaching for America's Future*. The Commission identified teacher quality as the key to improving American education. The Commission states that the proficiency of the teacher has the strongest effect on student learning and that "recruiting, preparing, and retaining" quality teachers is the most important way to improve education (What Matters Most, 1996). The NCTAF believed that education reformers must provide the support and conditions essential for teachers to teach effectively. The report charted a plan for providing every child with high quality teaching by attracting, developing, and supporting excellent teachers. The report was led by North Carolina Governor James B. Hunt and Linda Darling-Hammond, and set a goal for all students to have high quality teachers by 2006. A group of states dedicated to improving teacher quality was formed in 1996 with the hope of advancing the Commission's work. Acknowledgement of this report is important because it can be identified as a precursor for the more intense teacher evaluation reform that would take place a decade later.

The 1983 National Commission on Excellence in Education drafted a report titled *A Nation at Risk.* This report is said to have inspired the George W. Bush administration's passing of the No Child Left Behind Act of 2001. *A Nation at Risk* underlines the inferior skills evidenced by test scores in American youth. Among the other findings in the report were that school curriculum lacked purpose, use of classroom time was ineffective, the profession of teaching was not attracting quality candidates, and that teacher preparation programs needed substantial improvement. The main focus of the report was to highlight the need for better evaluation policies and more concrete improvement strategies for teaching in America.

Accountability for teachers and schools was the foundation of the No Child Left Behind Act of 2001. The legislation requires students to pass yearly standardized tests to measure progress. Governmental financial support was directly tied into these measures. Simply put, schools face declined funding if requirements are not met. As far as teachers are concerned, the No Child Left Behind Act requires states to provide highly qualified teachers to all students. Each state is charged with creating a framework to determine what counts as highly qualified.

No Child Left Behind faced heavy resistance from the educational community. Criticisms centered on unfunded mandates, where there was not enough support to match such high expectations. The No Child Left Behind Act was viewed by many as an attack on teachers, principals, and unions. Civil Rights groups continue to challenge the large achievement gap among minority students. *Waiting for Superman* and *Won't Back Down* are examples of movies highlighting the inequities within the policy. Teachers and principals unfortunately became casualty victims of this act as the public searched for scapegoats for the public school system. For example, the film *Won't Back Down* is about the struggles a mother goes through with her dyslexic daughter in a failing school. The villains of the movie are clock-punching teachers, apathetic parents, change-resistant union officials, and unreachable administrators (Gerson, 2012).

The American Recovery and Reinvestment Act (ARRA) in 2009 provided monetary incentives for positive educational growth. The Obama administration provided $4.35 billion in competitive grants to better improve educational practices at the state and local level. The American Recovery and Reinvestment Act (ARRA) concentrated on improvement in four areas. The first focused on new standards and rigorous assessments that would better prepare students for college and the workforce. The second area of attention was the utilization of student growth data systems meant to foster success by informing principals and teachers how they can reflect on and improve instruction. Recruitment, development, reward systems, and retention of the best teachers and principals was the third initiative. The last reform goal was to effectively support and ultimately revive low-achieving school districts.

The Obama administration's Race to the Top (RTTT) competitive grant program has been said to revolutionize the federal role in education and change state school reform efforts (McGuinn, 2012). RTTT supports only those states that have demonstrated key stakeholder commitment to the reform of teacher evaluation. One example is the willingness to erode the tenure structure within the school system. RTTT has thus shifted the focus of federal policy to only those states willing to comply with the specific reform model. Race to the Top uses competitive grant processes and relies on incentives instead of sanctions to drive state reform (McGuinn, 2012).

Student Growth Percentiles

Evolution of Student Growth Percentile (SGP) Model

People are judged and evaluated in almost all capacities of society. Evaluation aims to assess and quantify what a person brings to an organization or institution in regard to their value. Different organizations have various evaluation methods and are generally inconsistent in the approach. The public school system is no different, and as a result teachers have experienced inconsistent evaluation practices. The concept of evaluation is closely linked to accountability. Evaluation of an individual or group is performed to make sure that those being evaluated are accountable to established standards detailing what the individual ought to be doing (Thomas, Holdaway, & Ward, 2000).

Over the years, ideas have come and gone in regard to defining sound teacher evaluation methods. Teachers have been trained, hired, and rarely fired according to the outdated teaching evaluation systems. Serious administrative observations of teachers with strong feedback have been minimal and are usually done to comply with state laws. Teachers generally have earned a satisfactory or unsatisfactory review. This is all changing. State legislatures have passed bills requiring school districts to use a multi-level tier rating system instead of the old satisfactory/unsatisfactory system. Within the past four to five years, new models encourage more teaching goals and student measurements to coincide with the increased observation of the teacher by the principal. Changes in teacher evaluations fall in line with extensive changes taking place in education policy throughout the United States, particularly over the past 20 years. One significant aspect of these changes has been the use of Student Growth Percentiles (SGPs).

What are Student Growth Percentiles?

Student Growth Percentiles (Betebenner, 2009) have been adopted for use in evaluation systems in several states. The student growth percentiles (SGPs) framework avoids all controls for student variables and other factors related to schooling environments. SGPs are student-level conditional performance percentiles relative to a peer group (Ehlert, Koedel, Parsons, & Podgursky, 2013). The developers of the SGP approach maintain that SGPs are descriptive measures designed to stimulate further investigation or discussion and do not advocate their use for identifying causal effects (Betebenner, 2009). SGPs are designed to identify growth percentile curves for student test scores that are similar to height and weight charts for children.

Here is a situation from pediatrics which can make the concept of SGP clearer. Often parents are interested in measuring the height and weight of children over time. The scales on which height and weight are measured have aspects that educational assessment scales seek to mirror. For example, an infant male toddler is measured at two and three years of age and is shown to have grown four inches. The degree of increase, four inches, is a simple value that any parent can understand and measure at home using a tape measure. The limitation of this information is that parents only know how much their child has grown and would like to know how this compares with other similar children (Betebenner, 2011a).

Betebenner (2011a) parallels this previous example of children’s growth with that of a similar scale used in education. If the scales allowed for the calculation of absolute measures of annual academic growth for students, then the parent would only receive an absolute score of how much better their child did from a previous year. This would be a number of scale score points and would leave most parents wondering whether the number of points is good or bad. As in pediatrics, the search for a description regarding changes in achievement over time compared to similar students (i.e., growth) is best aided by allowing for a norm-referenced quantification of student growth. This is student growth percentile (Betebenner, 2009, 2011a, 2012).

A student's growth percentile describes how different or typical a student's growth is by exploring his or her current achievement compared to the student's academic peers. Academic peer groups are defined by those students beginning at the same place. If the state assessment data were infinite in size, then one could open this infinite data set and select students with the exact same prior scores and compare how the student in question did this year compared to the current year scores of those students with the exact same prior year's scores. These students would be the academic peers. If the student's current year score exceeded the scores of the majority of his or her academic peers, normatively, they have done well. If the student's current year score was less than the scores of their academic peers, normatively the student has not done as well (Betebenner, 2011b).

Obviously an infinite number of state test data is not available for analysis. Students in lower grades would have less testing data to work from. To better understand the SGP framework in the academic environment, an example of fourth and fifth grade test scores is simply explained. Imagine a scatter diagram with Grade 5 scores on the y-axis and Grade 4 scores on the x-axis. For a student with Grade 4 and Grade 5 scores, the chart would identify the percentile of the Grade 5 score conditional on the student's Grade 4 outcome. Here, an SGP of 67 would indicate that the student's Grade 5 score is in the 67th percentile among his peers with the same Grade 4 scale score. For students in higher grades, the SGP framework is more comprehensive to account for longer test-score histories. This determines students' comparison peer groups across a longer statistical foundation but requires the use of same-subject score histories. SGPs, when reported, are median percentiles for all of the students assigned to the district, school, or teacher (Ehlert et al., 2013). Short of infinite test data, the number of years of student-level data used to calculate median SGPs will vary as described above.

Weaknesses of SGP

Numerous methods of VAM (value-added model) have been developed and studies that compare estimates derived from different models have found substantial variability across methods (McCaffrey et al., 2004). Concerns remain that our understanding of these models is inadequate and that incentives built around them may do more harm to teachers and schools. Teachers' unions are extremely disinclined to allow their constituents to be judged on the basis of measures such as SGP, which are potentially biased or imprecise (Guarino, Reckase, & Wooldridge, 2014). A central issue involved in the weakness of measures based on VAMs is whether VAMs effectively isolate the actual contribution of teachers and schools to student achievement growth. SGPs and other VAMs may instead confuse these contributions with the effects of other factors that may or may not be within the control of teachers and schools. Since neither students nor teachers are randomly assigned to schools and students are not randomly assigned to teachers within schools, separating the causal effects of schooling from other factors influencing achievement is far from direct. The few studies that have attempted to validate VAMs have drawn different conclusions (e.g., Kane & Staiger, 2008; Rothstein, 2010), and questions about the validity of VAMs linger. No one method is guaranteed to accurately capture true teacher effects in all contexts, even under somewhat idealized conditions, although some are more robust than others. Both the teacher assignment mechanism and the nature of the dynamic relationship between current and past achievement play important roles in determining how well the estimators function.

Saps statistically adjust for differences in the prior academic achievement of students in any teacher's classroom. As a summary indicator of growth, a MeanGP is the reasonable basis for comparing teachers. However, while a MeanGP does adjust for differences in students' prior achievement, there are many things it does not adjust for. This is a weakness which may mistake the explanation of a MeanGP as an indicator of teacher effectiveness. MeanGP may not separate the effectiveness of a teacher from circumstantial reasons such as proportion of students in a classroom who are in poverty, are English Language Learners, are receiving special education services, and are new to the school.

High-Stakes Policy in New Jersey

AchieveNJ

New Jersey was one of 10 states granted NCLB waivers by the United States Department of Education. On August 6, 2012, Governor Christie signed into law the TEACHNJ Act. This act mandated the implementation of a new teacher evaluation system beginning in the 2013-2014 school year and links tenure decisions to evaluation ratings. The new state evaluation program is called AchieveNJ and is designed to recognize those who excel and identify those who need additional support. AchieveNJ relies primarily on two aspects of educational performance, teacher practice and student achievement.

My work here is focused on the concerns surrounding student achievement measurements; however, I briefly describe the teacher practice portion of the policy. Teacher practice is measured by performance on a state-approved practice instrument such as the Danielson Groups' Framework for Teaching or the Marzano Teacher Evaluation Model. Non-tenured teachers will have two long classroom observations and one short observation in the first two years of employment and one long and two short observations in their third and fourth years of employment. Tenured teachers must have three short observations each year. Short observations are twenty minutes in length and long observations are forty minutes in length. The results from these observations account for 55% of a teacher's summative rating.

AchieveNJ also has a student performance component built into the program. Student growth percentiles (SGPs) are one of the measures used to assess educators whose students are in Grades 4-8 and take the New Jersey Assessment of Skills and Knowledge (NJ ASK) Math and Language Arts tests. The SGP score is found by comparing a student's growth on the NJ ASK to the growth made by that student's academic peers. This process has been described in greater detail earlier in this chapter. Qualifying teachers are assigned the median SGP (mSGP) score of all of that teacher's qualifying students based on student rosters submitted by the district. Median SGPs account for 30% of a teacher's overall rating. Principals are accountable for schoolwide SGP data if enough tested grades and subjects are taught in their school. The TEACHNJ Act connects the earning and retention of tenure to the results of a teacher or principal's annual summative evaluation. If any teacher, principal, or assistant principal is rated ineffective or partially ineffective in two consecutive years, the employee may be charged with inefficiency and result in loss of tenure.

Characteristics of NJ ASK Mathematics

The NJ ASK 6 and 7 were first administered in spring 2003 to all students in the 5th, 6th, and 7th grades. Standardized test results are usually categorized into one of two categories, criterion-referenced scores or norm-referenced scores. Norm-referenced scores compare students to other students in a peer group and criterion-referenced scores base student scores against a set of predetermined standards. The NJ ASK assesses both Language Arts and Mathematics and is a criterion-referenced standardized assessment.

According to the *2008 New Jersey Assessment of Skills and Knowledge Technical Report*, the NJ ASK is designed to give an early indication of the progress students are making in mastering the knowledge and skills described in New Jersey's Core Curriculum Content

Standards (CCCS). In addition, these assessments fulfill the requirements under the 2001 No Child Left Behind Act. Testing is conducted in the spring of each year to allow school staff and students the greatest opportunity to achieve the goal of proficiency.

The NJ ASK test results are used by schools and districts to identify strengths and weaknesses in their programs. It is anticipated that this process will lead to improved instruction and better alignment with the CCCS. The results may also be used, along with other indicators of student progress, to identify those students who may need instructional support in any of the content areas. Students are identified based on specific levels identified by their individual NJ ASK test results. NJ ASK has scale scores for each student organized into three levels: 100-199 is Partially Proficient, 200-249 is Proficient, and 250-300 is Advanced Proficient.

According to the *2009 NJ ASK Score Interpretation Manuel for Grades 3-8* the Mathematics test measures students' ability to solve problems by applying mathematical concepts. The Mathematics component measures knowledge and skills in four clusters:

- Number and Numerical Operations
- Geometry and Measurement
- Patterns and Algebra
- Data Analysis, Probability, and Discrete Mathematics

The Mathematics sections contain both multiple-choice and constructed-response items. There are two types of constructed-response items: extended constructed-response (previously known as open-ended) and short constructed-response. The extended constructed-response items require students to solve a problem as well as explain their solution. The short constructed-response items require only an answer, not an explanation. Some mathematics items are also classified and reported as problem-solving, which means that the items require problem-solving skills in applying mathematical concepts.

Test items for the NJ ASK include multiple choice, written response, and open ended. Since 2007, open-ended test items are scored by one scorer. A Bookmark procedure was completed to determine appropriate cut-off scores for Proficient and Advanced Proficient levels. As described in the *2008 New Jersey Assessment of Skills and Knowledge Technical Report,* panelists were asked to review a booklet of test items organized from "easiest" to "hardest." Panelists placed two bookmarks in the booklet, one bookmark at the page where they believed a Proficient student had no better than a 2/3 chance of answering the questions correctly and another where they believed an Advanced Proficient student had no better than a 2/3 chance of answering the questions correctly. Associating each page number with a theta value and then averaging all the responses determined the new cut-off standard for Proficient and Advanced Proficient levels.

The Influence of Teacher Evaluation Policy on School Administration

The School District Level

The role of the superintendent has been transformed from a manager to an educational leader, who knows curriculum and instruction in conjunction with how to use data to improve student achievement (Dillon, 2010). The implementation of the mandates mapped out in NCLB led directly to the superintendent. Appointed by the board of education, the superintendent is the designated leader of the school district and is accountable for student achievement. This achievement is measured by annual state standardized tests in ELA and Mathematics and by graduation rates of all students. The ultimate responsibility for reducing the achievement gap and improving student achievement lies with the superintendent. With this said, superintendents must have a comprehensive understanding of data in order to lead conversations on effective instructional practices, better aligned curriculum to standards, and sound assessment practices (Decman et al., 2010). Superintendents of low-performing public schools are faced with the possibility of schools being closed and re-opened as charter schools (DuFour & Marzano, 2011; Ravitch, 2010).

After the recession in 2008, President Obama and Congress approved the American Reinvestment and Recovery Act (ARRA) of 2009, which provided $100 billion over two years for education, including $4.35 billion for competitive Race to the Top (RTTT) funds and an additional $10 billion in August of 2010 through the Education Jobs Fund (EJF) Act. Although the federal government intervened with this stimulus money, the financial impact to school districts was unavoidable. Superintendents were forced to construct budgets that included cuts to programs and staff. For the 2012-13 school year, superintendents needed to develop school budgets that no longer included ARRA and EJF monies. The loss of these funds, coupled with inequities in state funding, tasked superintendents to make difficult decisions to produce a school budget that would be supported by taxpayers who have been affected by the lingering recession.

The Common Core State Standards (CCSS) and a new teacher/principal evaluation system that incorporates student achievement on state tests were provisions of the Race to the Top (RTTT) funding. This added another level of responsibility to school district superintendents. School districts, through the leadership of their superintendents, are expected to implement state and federal mandates, continue to improve student achievement, and thrive with fewer financial and personnel resources. This new accountability was defined as increasing student achievement on annual state assessments in English Language Arts (ELA) and Mathematics and narrowing achievement gaps of minority students, economically disadvantaged students, and students with disabilities. The superintendent must assume responsibility for curriculum, instruction, and assessment; delegate these responsibilities to remaining administrators; or hire outside education agencies and/or consultants.

Politicians, superintendents, educators, and others quickly realized that not all students are going to be Proficient by 2013-14. Since Congress had not reauthorized ESEA to change this deadline, Arne Duncan, U.S. Secretary of Education, allowed states to apply for an ESEA waiver. Each state interested in the ESEA waiver must complete an application based upon specific criteria dictated by the U.S. Department of Education. States applied for the ESEA waiver needed to provide plans that addressed how the educational system would prepare students to meet college and career readiness standards, provide school districts with competent and effective teachers and leaders, provide rigorous and equitable opportunities for all students to learn and achieve college and career ready standards, raise the level of expectations for all students to achieve post-secondary educational opportunities in K-12 education, and develop innovative programs to address persistent achievement gap issues through competitive funding opportunities and community collaboration (USDOE, 2012). As the educational leader designated by the board of education for the school district, the accountability and responsibility for implementing the demands of the ESEA waiver fell upon the superintendent.

Superintendents are under great pressure to ensure student learning and achievement to meet the rigors and demands set forth by NCLB, RTTT, and the ESEA waiver. Over time, with increasing district size, the role of superintendent has changed many times, reflecting the needs of the society during that particular time period (Kowalski, 1999; Sharp & Walter, 1997). Oliff and Leachman (2011) estimated that 229,000 positions have been eliminated in school districts across the country since 2008. The remaining teachers and administrators have been expected to take on the responsibilities of those who were eliminated. Superintendents must provide the leadership in curriculum, instruction, and assessment necessary to raise student achievement while finding new ways to support both district and school level administrators with fewer resources (Ravitch, 2010).

Furman (2013) hoped to identify the structures and approaches that superintendents implement in order to support student learning and achievement while facing fiscal limitations in the current educational landscape. The intent of his mixed method study was to explore the ways in which budget limitations impacted the functions of school superintendents and chief education officers in school districts from Connecticut, Massachusetts, New Jersey, New York, Pennsylvania, and Vermont.

This study examined five overarching research questions:

1. Due to budget limitations, will the superintendent take greater responsibility for curriculum, instruction, and assessment or will these responsibilities be given to other district personnel and/or outside agencies?
2. In what ways do superintendents perceive the responsibilities of personnel within the district for the implementation and evaluation of curricula, instruction, and assessment?
3. How would anticipated budget limitations affect the superintendents planning for the use of district personnel to implement and evaluate the effectiveness of curricula, instruction, and assessment?
4. What resources do superintendents perceive are necessary to support district personnel for the implementation and evaluation of curricula, instruction, and assessment?
5. What are the similarities and differences by superintendents among various states

in their decision-making pertaining to curriculum, instruction, and assessment when facing budget limitations?

Furman (2013) used a survey which was designed to analyze data to delineate various decisions of superintendents based on their budget situation, demographics, and support structures. A total of 2,296 superintendents were sent an invitation to participate in the survey. There were 150 superintendents who participated in the survey, with 102 superintendents completing the survey.

This study showed that superintendents had taken a greater role and more responsibility for curriculum, instruction, and assessment due to fiscal limitations. One-half of the responding superintendents reported that administrative curriculum, instruction, and assessment support personnel had decreased in the previous two years due to fiscal limitations. Superintendents increased the curriculum, instruction, and assessment responsibilities of remaining administrators. Results also showed that superintendents utilized support from outside educational agencies and/or consultants to support curriculum, instruction, and assessment in their districts. A small percentage of superintendents had begun to consider the consolidation of services and sharing of positions between neighboring districts to provide opportunities to reduce costs while supporting curriculum, instruction, and assessment.

The data showed that there had been a 25% decrease in district level positions for curriculum, instruction, and assessment from the previous two years to the anticipated 2012-2013 budget process. Superintendents reported assigning additional responsibilities for curriculum, instruction, and assessment to principals in the previous two years, as well as for 2012-2013. Superintendents were concerned with the impact of administrator and teacher reductions on student achievement and implementation of state and federal mandates. Superintendents provided written responses that their responsibilities were far too encompassing to accomplish alone. Further recommendations from Furman's (2013) study suggest policy makers educate school board members regarding the shifting role of superintendents as a result of fiscal limitations and increased accountability for implementing education mandates. Policy makers need to convene focus forums of superintendents based on demographic data to generate creative solutions to the issues confronting superintendents and school districts.

A limitation of Furman's (2013) study is the method for delivery of the survey to the superintendents in New Jersey, New York, and Pennsylvania. Superintendents were invited to participate in the survey via the superintendents' association electronic newsletter for each state. This may have decreased the number of respondents. The survey was sent in an organization's monthly electronic newsletter. It is possible that the request for participation was lost among the other information in the newsletter.

The School Level

Value-added measures have been embraced by school leaders nationwide as a way to objectively measure teacher effectiveness and to reward and retain teachers. There is an appeal to this model, and philosophically many school level leaders were excited about a measurement tool. If a statistical model can isolate a teacher's unique contribution to students' educational progress, where can it go wrong? The implementation of the VAM at the building level has uncovered many inequities in the model that have created vast challenges for principals, assistant principals, and department chairs.

Teachers' value-added measures can vary considerably depending on which test is used. In most states, including New York, New Jersey, and Texas, students are tested in reading and mathematics annually in Grades 3 to 8 and again in high school. Other subjects, including science and social studies, are tested much less often. This creates a difficult landscape of emotions and job responsibilities which must be navigated by our building level leaders. The extent to which teachers spend their time and efforts teaching directly to the test versus robust differentiation and experiential-based learning approaches may be very different also. This variation may be due to the average ability level in their classroom, priorities of school leadership, parental demands, and so on. Given two teachers of equal effectiveness, the teacher whose classroom practice happens to be predominantly aligned with the test will outperform the other teacher based on the value-added model.

The responsibilities of administrators have increased significantly in the NCLB era and greater demands are being made of them. They need to be knowledgeable about assessment and skilled in using data to make instructional decisions. According to Leithwood, Louis, Anderson, and Wahlstrom (2004), schools that face critical barriers to improvement have succeeded only when principals achieve a multitude of specific leadership goals. They stress that the principal's role is second only to the teacher's role in student achievement. Low-performing schools are subject to sanctions if achievement goals are not met for two consecutive years. Students in these schools are allowed to transfer to other public schools; if performance does not improve after five years, the school has to be restructured and may even be closed down. Raudenbush (2004b) argued that school accountability results do not provide "direct evidence of the effects of instructional practice." He added that accountability must come from other sources of information for schools to be successful, in particular, information on organizational and instructional practices (Raudenbush, 2004a).

Neighborhoods and Communities Matter

Schools reflect the neighborhoods and communities they serve. Increasing income inequality is associated with rising segregation in American neighborhoods. Concern has been rising as to whether community environments themselves influence children's life changes. Poor and minority Americans are overrepresented in the most disadvantaged communities. The neighborhood effects on children may add to gaps in overall schooling outcomes along race and class lines in the United States. The Coleman Report (1966), expanded on later in this study, has produced evidence consistent with the idea of large neighborhood effects on children's schooling outcomes. In addition, more recent studies help support this connection.

Harding, Wodtke, and Elwert (2011) studied the effects of student exposure to disadvantaged neighborhoods over a period of time on high school graduation. Their study followed 4,154 children in the Panel Study of Income Dynamics, measuring neighborhood settings once per year from ages one to 17. Measurements of neighborhood background come from the NCLB, which contains nationwide tract-level data from the 1970s to 2000 from the United States Census. Harding, Wodtke, and Elwert (2011) used analysis to create a combined score of neighborhood disadvantages based on seven characteristics: poverty, unemployment, welfare receipt, female-headed households, education, and occupational structure.

Their methods do not “weed out” the effect of neighborhood situations working indirectly on the family. They capture the full impact of a lifetime of neighborhood disadvantage. Harding, Wodtke, and Elwert (2011) found that sustained exposure to disadvantaged neighborhoods has a severe impact on high school graduation. They estimate that growing up in the most (compared to the least) disadvantaged quintile of neighborhoods reduces the probability of graduation from 96% to 76% for Black children, and from 95% to 87% for non-Black children.

Their results indicate that continual exposure to poor neighborhoods throughout childhood has a devastating impact on the chances of graduating from high school. These poor neighborhoods are categorized by high poverty, unemployment, mostly female-headed households, and few well-educated adults. Effect estimates presented in this study suggest a more considerable influence for community than do evaluations reported in previous research (Ginther et al., 2000; Harding, 2003).

Relevant to this connection between the relationship of school and community, Ballou, Mokher, and Cavaluzzo (2012) warn educators about the use of value added models as the tool for high-stakes decisions such as tenure for teachers working with all levels of children. Their research focuses on the impact of omitted variables on teachers' value-added scores. Their work questions if it is the best choice when the model is flawed by omitting relevant student, school, and community characteristics. Value-added models typically include only a small subset of the external influences on learning. Student race and ethnicity, eligibility for free and reduced lunch, and English language learner designation are usual factors utilized by school district administration. These variables are supposed to represent a much larger group of family and neighborhood variables.

The sample for Ballou, Mokher, and Cavaluzzo's (2012) analysis contains all students in Grades 6, 7, and 8 with math test scores and pre-test scores in 1999/2000 to 2007/2008 (N=519,468). Included in the study were 2,221 teachers who had at least 10 students tested. The average number of years of data per teacher was 3.1. The database was created by combining three different sources of data: student-level data from the district, school-level data from the state, and community-level data from the U.S. Census. Ballou, Mokher, and Cavaluzzo (2012) analyzed differences in teacher effects from value-added models under two sets of comparisons. In the first set, they compared teacher effects in a model that omitted many additional student, school, and community variables to a model that included a complete set of both basic and additional student, school, and community variables. Research questions explored by Ballou, Mokher, and Cavaluzzo (2012) were as follows:

1. What is the impact of omitted variables on value-added estimates of teacher effectiveness? In particular, how does the inclusion of additional covariates change which teachers are identified as the highest and lowest performers?
2. Is a single-equation or a two-stage estimate preferable when the value-added model is misspecified by omitting important variables?

While research stresses the importance of teachers among the set of inputs provided by schools, the impact of student characteristics, such as unmeasured family and community inputs, is extremely influential. Ballou, Mokher, and Cavaluzzo (2012) examined the impact of frequently ignored student, school, and community characteristics for teacher value-added models. Using a large data set from an urban district, they found important variances in teacher influence when these additional variables were included in value-added models. Approximately 42% of teachers in the top 10% and 40%of teachers in the bottom 10% would not be in the same classification if additional student, school, and community characteristics were omitted from the model. This supports the claim that districts are a product of the community they serve and cannot be approached as an isolated entity when evaluating teacher effectiveness.

Impact of Community Variables on Student Learning

Community Variables and Achievement

Published in July of 1966, a report by James Coleman and his colleagues titled *Equality of Educational Opportunity* attempted to document what most presumed to be the truth about poor and minority children: they performed poorly in school because their schools lacked resources. Instead, the Coleman report exposed that the impact of school resources on student achievement was modest compared to the impact of students' family backgrounds (Gamoran & Long, 2007). The Coleman Report has produced evidence consistent with the notion that large neighborhood effects on children's schooling outcomes are prevalent. Over 640,000 students in Grades 1,3,6, 9, and 12, categorized into six ethnic and cultural groups, took achievement tests and aptitude tests; and 60,000 teachers in over 4,000 schools completed questionnaires about their background and training (Coleman et al., 1966).

The Coleman Report had two primary effects on perceptions about schooling in America. First, it changed perceptions that schools could be a viable instrument in leveling the discrepancy in students' academic achievement due to environmental factors. Second, it expanded the view that differences in schools have little relationship to student achievement. Coleman's findings unquestionably showed that differences between schools and the variances in their resource levels did not impact or influence individual students. The Coleman Report argued that "attributes of other students account for far more variation in the achievement of minority group children than do any attributes of school facilities and slightly more than do attributes of staff" (Coleman et al., 1966).

Aikens and Barbarin (2008) used the Early Childhood Longitudinal Study, Kindergarten Cohort of 1998–1999, to examine the extent to which family, school, and neighborhood factors account for the impact of socioeconomic status (SES) on children's early reading. They used hierarchical linear modeling techniques and growth curve models to show children's reading paths from kindergarten to third grade. They found that family characteristics made the largest contribution to the prediction of initial kindergarten reading disparities. This included home literacy environment, parental involvement in school, and parental role strain.

Findings show that school and neighborhood conditions contributed more than family characteristics to SES differences in learning rates in reading. This study provides evidence that neighborhood environment may in fact be related to children's growth in reading. Aikens and Barbarin (2008) show that, specifically, community support for the school and poor physical conditions surrounding the school were associated with children's reading. The number of children reading below grade and the presence of low-income peers were consistently associated with initial achievement and growth rates. Their analysis also suggests a compounding effect of low quality environments. Children from low-SES homes grow up in home environments poor in literacy experiences (Aikens & Barbarin, 2008).

The conclusion of this study suggests that there is not one existing solution or specific effort targeted to any single environment that will improve the reading achievement gap; a multidimensional approach is needed. The implementation of intervention must recognize that children's development is affected by multiple variables and rooted in interconnected systems. Improvement due to interventions is likely to be short-lived if those involved in the interventions fail to understand the interconnection among systems and the ways in which multiple risks constrain developmental trajectories (Farmer & Farmer, 2001).

A limitation identified in this study is that there are other factors that may be linked to reading achievement and SES that were not explored in the analysis presented. The inability to explain a larger proportion of the SES gap may be a result of the variables selected. Other variables may better influence contributing factors to the reading achievement gap. This difficulty also may be due to the limited measurement and the inherent weaknesses of relying on self-report measures of family practices and environmental conditions.

Toutkoushian and Curtis (2005) state in *The Journal of Education Research* that higher levels of student performance may not be caused by a community's SES but rather by factors that are correlated with SES, such as parents' involvement in their children's education or parents' emphasis on education. School rankings that are based only on test outcomes tend to penalize schools located in districts with relatively low SES. They state that the problem becomes intensified when states tie funding to those test scores and penalize schools that have low student outcomes and are located in low-SES districts. The authors show how states can use multiple-outcome measures to derive an alternative ranking of high schools that removes the influences of SES to the school-level outcomes (test scores) and how these rankings compare with similar rankings that would be obtained only on the basis of test score outcomes. Results show that socioeconomic factors account for a large portion of the variations in school-level outcomes (test scores) in New Hampshire and that the consequent rankings of schools can change dramatically after controlling for these factors (Toutkoushian & Taylor, 2005). This finding provides more evidence for the design of this study to focus on a model for evaluating school success.

Researchers also found that student performance on Virginia Standard of Learning (SOL) tests is affected by more than school practices and classroom instruction. An inverse relationship exists between the percentage of students receiving subsidized lunches and the adjusted pass rates on the tests showing that students' SES is related to their achievement (Marchant et al., 2006; Rouse et al., 2006; Cunningham & Sanzo, 2002). Cunningham and Sanzo believe high-stakes testing has several disadvantages and that the United States should establish legislation that takes the low SES diversity into account. Their research shows that students with less economic support from home tend to achieve at or below grade level.

Researchers should use multiple and precise measures of poverty when defining a valid conception of poverty. The most common approach has been to analyze student percentage of free and reduced lunch. However it is unclear that educational researchers truly understand what student eligibility for free lunch does and does not represent. Harwell and LaBeau (2010) examined the National School Lunch Program, which is responsible for identifying students as eligible for free lunch. They determined that free lunch eligibility is a poor measure of socioeconomic status and is littered with deficiencies that can prejudice conclusions. They argue that educational researchers who use the variable of free and reduced lunch as an indicator of poverty do so because of its convenience and ease of accessibility. Poverty is more narrowly defined through income-based guidelines issued by the federal government and is more commonly used in public health research. SES, on the other hand, is widely used in educational research and is generally defined more broadly than poverty (Harwell & LeBeau, 2010).

Duncan, Featherman, and Duncan (1972) defined SES as including three parts; parental income, parental education, and parental occupation. This has always been accepted as a valuable and reliable definition of SES. Although this obviously expanded on the singular variable of free and reduced lunch, there is still concern that this three-part approach to SES is still limited and inadequate as a way to properly research SES and its effects on education. Sirin (2005) conducted a meta-analysis of SES studies published between 1990 and 2000. The sample included 74 studies in which various factors were combined and analyzed. The results from this review show that the extent of the relationship between SES and academic achievement is dependent upon several factors. Specifically the type of SES measure, students' grade level, minority status, and school location weakened the strength of the relationship between SES and academic achievement. For example, median income can be a statistically significant variable by itself, but its influence can be negated when it is combined with other variables such as parental education (Sirin, 2005). The use of single or even small numbers of variables when correlating

SES and education can be dangerous and my offer potentially weak results when making decisions about education.

Maylone (2002) references the Standard and Poor's Statewide Evaluation Services' *Statewide Insights* study for data about the impact of SES factors on MEAP scores. On state-mandated standardized tests in Michigan, Maylone (2002) predicted high school state test results from a community's mean annual district household income, percentage of single-parent households, and percentage of high school students eligible for free and reduced lunch. Maylone (2002) identified these district level SES factors and paired them with district MEAP scores. He used multiple regression analysis to find a combination of district SES factors to determine a predictive model of the independent variable, the district MEAP scores. Rather than using a single factor, his research attempted to produce a multivariate predictive equation. The sample size of the intended population of the study was 100%.

Maylone (2002) found that three district SES factors (percent of district students' eligible for free or reduced-lunch, percent of district lone-parent households, and mean annual district household income) produce a predictive equation with the most power (0.749) of a district's composite high school MEAP Score. One limitation of Maylone's (2002) study is the lack of longitudinal analysis completed. The study examined only one year of MEAP scores (2000); further research is needed to establish that the discovered correlations and the multivariate predictive equation are reliable over time.

In New Jersey, Turnamian (2012) aimed to create a predictive model for student achievement on the New Jersey Assessment of Skills and Knowledge (NJ ASK) using data published about each school district in the annual New Jersey School Report Card. Turnamian (2012) used archival NJ ASK third grade results for school district Language Arts and

Mathematics scores from 2009 and five-year estimates from U.S. Census data to determine if a predictive equation existed between the data. Turnamian (2012) recommends this analysis be used to determine if schools are failing to meet expectations, meeting expectations, or exceeding expectations.

This study examined three overarching research questions:

1. How much variance in the 2009 NJ ASK 3 test results in Language Arts and Mathematics is explained by out-of-school variables at the community level?
2. How accurately can community variables predict a school district's percentage of students scoring Proficient or above on the 2009 NJ ASK 3 test results in Language Arts and Mathematics?
3. Which combination of community variables account for the greatest amount of variance in a school district's percentage of students scoring Proficient or above on the 2009 NJ ASK 3 test results in Language Arts and Mathematics?

The NJ ASK was first administered in spring 2003 to all Grades 3 through 8. The NJ ASK test results are used by schools and districts to identify strengths and weaknesses in their programs. It is anticipated that this process will lead to improved instruction and better alignment with the CCCS. The results may also be used, along with other indicators of student progress, to identify those students who may need instructional support in any of the content areas. Students are identified based on specific levels identified by their individual NJ ASK test results. NJ ASK has scale scores for each student organized into three levels: 100-199 is Partially Proficient, 200-249 is Proficient, and 250-300 is Advanced Proficient. In addition, these assessments fulfill the requirements under the 2001 No Child Left Behind Act.

The scores for all first-time NJ ASK takers are included in the New Jersey School Report

Card annual report. The dependent variable for Turnamian (2012) was the 2009 Grade 3 NJ ASK scores for Mathematics and Language Arts. The independent variables examined included 12 community demographic variables found in the census data related to household income, parental education levels, and lone-parent households. Turnamian (2012) predicted Grade 3 results in Language Arts and Mathematics for 60% of all 423 New Jersey elementary schools' test scores within 10 percentage points by using just three community demographic factors.

One limitation of Turnamian's (2012) study is that the data gathered for the study were one point in time. The dependent variable data of school district NJ ASK Language Arts and Mathematics proficiency scores were taken from the year 2009. It is assumed these assessments accurately measured student achievement at the district level. The study was also not experimental in design and therefore cannot determine cause.

The above-mentioned studies compellingly demonstrate the influences of district socioeconomic data on student achievement. The Coleman Report determined that schools have little impact on student achievement compared to out-of-school factors. Additionally, Aikens and Barbarin (2008) found that family characteristics made the largest contribution to the prediction of achievement in educational outcomes. This included home literacy environment, parental involvement in school, and parental role strain. Their analysis also suggests a compounding effect of low-quality neighborhood environments. Children from low-SES homes grow up in home environments poor in educational experiences.

The recent studies by Maylone (2002) and Turnamian (2012) applied multiple regression analyses to identify specific socioeconomic variables at the district level that combine to predict student achievement. Maylone (2002) found three variables combine at the district level to predict high school MEAP scores. These variables are household income, percentage of lone-parent households, and free- and reduced-lunch eligibility. Turnamian (2012) required a larger mix of variables (12) to achieve predictive reliability for NJ ASK Grade 3. Turnamian's (2012) analysis can be used to control for socioeconomic variables to identify a district's ability to exceed, fail, or meet expectations designed in NCLB requirements. Maylone's (2002) study creates a need for further review of literature relevant to the specific predictive socioeconomic variables.

Household Income and Student Achievement

As part of the Next Generation project Morris, Duncan, and Rodrigues (2006) used random-assignment-induced difference in family income in four welfare and anti-poverty programs to identify income effects. They claim their results suggest that family income has a policy-relevant positive impact on the school achievement of preschool children. Data were used from four studies that evaluated eight welfare and antipoverty programs: Connecticut's Jobs First; the New Brunswick and British Columbia sites of the Canadian Self-Sufficiency Project (SSP); the Los Angeles Jobs First GAIN; and the Atlanta, GA, Grand Rapids, MI, and Riverside, CA sites of the National Evaluation of Welfare to Work Strategies (NEWWS). Collectively, these studies provided them with more than 8,000 observations of children age 2 to 5 at the time of random assignment.

Morris, Duncan, and Rodrigues (2006) assembled data across studies to create a more accurate estimate of income effects. Two equations were formed:

The achievement equation, $Yi = \alpha 1\ Income + X'i\ \beta Y + S'i\ \gamma Y + \xi 2i$

The income equation, $Income = X'i\ \beta I + T'i\ \gamma 11 + S'i\ \gamma 12 + \xi 3i$

All four studies specifically chose welfare-recipient single parents at random to control groups or to various welfare and employment policy treatments. All policy treatments were designed to increase employment and reduce welfare. Some were designed to increase total family incomes. None of these policy packages had components designed to affect outcomes for children directly (e.g., direct child care services to children), nor did any target parents or parenting (e.g., through therapy or parenting services). Children's school achievement was measured in surveys and achievement tests administered two to five years after the point of random assignment. Morris, Duncan, and Rodrigues (2006) used the changed family income through random assignment to detect the effects of income on the achievement of young children. The children were between the ages of two and five at the time of their families' random assignment and were between the ages of four and ten when their achievement was assessed.

Program impacts on family income were intensive in the three programs with substantial earnings supplement policies. Morris, Duncan, and Rodrigues (2006) felt this was important since program variation in income was relevant in distinguishing the achievement effects of income from the effects of employment and welfare income. This study's impact on child achievement was plotted against its impact on parental income. A positive slope was evident for programs with the largest positive impacts on income and tended to have larger positive impacts on child achievement. Their estimates suggest that a $1,000 increase in annual income sustained for between two and five years boosts child achievement by 6% of a standard deviation and that a log unit increase in annual income increases child achievement by about half a standard deviation.

Morris, Duncan, and Rodrigues (2006) state that some limitations exist for this study. First, the data were taken from children growing up in single-parent low-income families, which may limit the ability to generalize to other family types and socioeconomic levels. The other limitation is in the process of pooling the data across sites. They assume similarity in the ways in which income affects children across their studies and sites.

Stevens and Schaller (2011) studied the relationship between parental job loss and children's academic achievement. They utilized data from the Survey of Income and Program Participation (SIPP) collected from 1996 to 2006 to examine the relationship between parental job loss and children's academic difficulties. SIPP consists of a series of short panel datasets, covering between 14,000 to 46,000 households per panel and following them for 2-4 years each. Stevens & Schaller (2011) combined data from three SIPP panels, started in 1996, 2001, and 2004, and were able to generate a reasonably large sample of children and their families.

Stevens and Schaller (2011) divided the sample into two groups of children: those whose parents experienced a job loss sometime after the initial SIPP wave in which their family was interviewed, and those whose parents did not experience a job loss. They found other characteristics also differed across the displaced and not displaced groups. The parents displaced consistently showed lower socioeconomic status. Fifty-four percent of fathers and 55% of mothers in the displaced sample have a high school education or less. Children of displaced individuals were also less likely to live with two parents at the beginning of the survey (63%), compared to those whose parents were not displaced (73%).

The study found that estimates for the overall sample suggested that a parent's job loss increases the probability that a child will repeat a grade by around 15% and reduces family income by around 10%. They view grade repetition as a signal of academic difficulties; these short-run effects may be consistent with findings of longer-term negative outcomes in education and earnings. There was no evidence of significantly increased grade retention prior to the job loss, signifying a contributing connection from the parental loss of employment to children's academic difficulties.

A limitation to this study is the possibility that the stress created in families following job loss is driven by emotional conditions, such as uncertainty of income. This may go beyond the standard income effects. These results are supportive of some role for income, or more specifically, income shocks, in affecting the outcomes of children. This limitation leaves them with the major challenge of understanding precisely how these shocks translate to changes in further educational outcomes.

Reardon (2011) built upon the earlier research of Coleman (1966) by further researching how the relationship between family socioeconomic characteristics and academic achievement has changed during the last fifty years. He investigated the degree to which the rising income inequality of the last four decades has been connected with the increase in the income achievement. As the income gap between high- and low-income families widens, so does the achievement gap between children in high- and low-income families. Reardon (2011) shows the achievement gap is roughly 30% to 40% larger among children born in 2001 than among those born 25 years earlier.

Reardon (2011) used data from 19 nationally representative studies, including studies conducted by the National Center for Education Statistics (NCES), the Long-Term Trend and Main National Assessment of Educational Progress (NAEP) studies, U.S. components of international studies, and other studies with information on both family background and standardized-test scores. He compared the average math and reading skills of children from families with incomes at the 90th percentile of the family income distribution (about $160,000 in 2008) to those in families with incomes at the 10th percentile of the family income distribution (about $17,500 in 2008).

In all studies, Reardon (2011) adjusted the estimated relationship between family income and achievement for measurement error in family income. He did not adjust income for family size because his interest was in describing the association between family socioeconomic characteristics and student achievement. Results were organized into five important areas:

1. Income inequality has grown during the last forty years.
2. Family investment patterns have changed differentially during the last half-century. High-income families now invest relatively more time and resources in their children's cognitive development than do lower-income families.
3. Income has grown more strongly correlated with other socioeconomic characteristics of families. High-income families increasingly have greater socioeconomic and social resources that may benefit their children.
4. Increasing income segregation has led to greater differentiation in school quality and schooling opportunities between the rich and the poor.
5. The fact that the relationship between parental education and achievement has not really changed during the same time period suggests that income is the important socioeconomic factor at work.

Some patterns in this study show that the income achievement gaps do not grow in the ways that would be predicted by the changes in income inequality. Although income inequality grew sharply for families with below-median incomes during the 1970s and 1980s, the income achievement gap among children from these families was largely unchanged. The achievement gap did grow among children from above-median-income families, but this appears to be better explained by an increase in the association between income and achievement, not by increases in income inequality.

A limitation to Reardon's (2011) analysis is that it is unclear how the relationships among income, achievement, and income inequality unravel through childhood and adolescence. Few of the studies he used had information on family income throughout a child's life. It was difficult to separate the associations among family income and income inequality during childhood, family income and income inequality at the age when a child is tested, and a student's test scores. The trends described in Reardon's (2011) work are sets of repeated cross-sectional snapshots of the connotation between a child's current family income and his or her current academic achievement.

Existing literature supports the influence of household income on student achievement. Morris, Duncan, and Rodrigues (2006) found important effects of family income on school achievement of young children in most of their instrumental-variable models. This effect of income for young children is consistent with other research as well as developmental theories suggesting that children's development is susceptible to family influences during the preschool period. Income in the form of parental job loss was also looked at in this analysis. Stevens and Schaller (2011) established that there are intergenerational effects of job loss on children's short-term academic achievement, using grade retention as a proxy for academic difficulties. Of note, much of this literature was related to lone-parent households and student achievement. There is an agreement in the literature that the impact of household income is greater in low-income homes and that the income and achievement gap is growing over time in America.

Lone-Parent Households and Student Achievement

Nord (1997) studied the extent to which resident (excluding foster) and nonresident fathers are involved in their children's schools and the influence their involvement has on their children's academic achievement. Information on school involvement was obtained from the parents of 16,910 kindergartners through 12th graders. Nord (1997) used data collected from the 1996 National Household Education Survey (NHES:96). The NHES is a random-digit-dial (RDD) telephone survey that uses computer-assisted telephone interviewing (CATI) technology. NHES:96 was conducted from January to April of 1996 and included interviews with parents and guardians of 20,792 children three years old through 12th grade. Of the 6,908 children with nonresident parents, 5,440 had nonresident fathers.

Even after controlling for the other factors in the models, Nord's (1997) results confirm that parental involvement in schools and parental involvement at home are closely linked. High levels of parent involvement in schools are correlated with other variables such as education, economic status, and family environment. Logistic regression models were used to examine the influence of selected child, family, and school characteristics on high father and mother involvement in school. Fathers are more likely to be highly involved as mothers' involvement increases and vice versa.

Nord (1997) suggests through her models that fathers are more likely to be highly involved in their 6th through 12th graders' schools if their children are doing well academically. The adjusted odds that fathers are highly involved in their 6th through 12th graders' schools are 30% higher when parents report that their children get mostly A's than when they do not. Moreover, children have the most favorable outcomes if both of their parents exhibit high involvement. Although the advantage is relatively small, the differences between having both parents highly involved in the children's schools and having only the mothers highly involved are evident for participation in extracurricular activities, getting A's, enjoying school, and having ever repeated a grade.

A limitation noted by Nord (1997) in the NHES:96 is a cross-sectional survey; therefore, it is not possible to definitively establish the direction of causation for observed associations. For example, fathers may be more likely to be highly involved because their children are doing well, or their children may be doing better because their fathers are highly involved. This study helped set the stage for the next studies which build off the concept of social capital.

Parcel and Dufur (2001) investigated the effects of family and school capital on student math and reading achievement for a sample of elementary and middle school students. They built upon the work of Coleman (1988, 1990) and the concept of social capital. Parcel and Dufur (2001) hypothesized that higher levels of family social capital will have positive effects on child academic achievement. They specifically looked at characteristics such as lower numbers of children within the family, stronger home environments, and intact family status and their association with student test score achievement. They also evaluated the role of both maternal and paternal work hours in hindering or promoting reading and mathematics achievement.

Parcel and Dufur (2001) tested this hypothesis by using the National Longitudinal Survey of Youth (NLSY) compiled by the Center for Human Resource Research (CHRR). The NLSY79 was an ongoing panel study that interviewed 12,686 youths between the ages of 14 and 21 in 1979. From 1986 to 1997 interviews continued, for respondents and students were re-interviewed annually. In 1996, the NLSY surveyed the schools these children, attended and asked for information about the individual children and about their schools for the 1993-94 and 1994-95 school years. Parcel and Dufur (2001) combined the data of the NLSY Child-Mother files and linked this information about maternal background, family conditions, and child cognitive outcomes with information on school resources and experiences.

They examined mathematics and reading achievement using the 1994 Peabody Individual Achievement Test (PlAT). The sample selection consisted of 2,034 children when examining math achievement, and 2,203 when looking at reading recognition. Parcel and Dufur (2001) used weighted data to correct for oversampling of racial minorities and respondents from lower socioeconomic backgrounds. Ordinary least squares regressions were used to test the effects of the social capital variables on child educational outcomes. Social capital was measured by a 28-item scale questionnaire. Samples of these questions are written here with lone-parent household being identified:

- Number of child's close friends mother knows by sight and name (0 = none to 5= all of them)
- How often mother knows child's location when not at home (0 = only rarely to 4= all the time),
- Number of children in family, mother's marital status (1 = married; 0 = not married),
- Both maternal and paternal work hours.

Results of Parcel and Dufur's work (2001) show that changes in math achievement are influenced by family social capital. Better home environments were related to increases in achievement. Living with a mother who was married at the time of the assessment was also a factor connected with higher math achievement. By contrast, higher maternal working hours are negatively associated with math achievement. Additional analysis suggests that weaker but positive effects of the mother growing up in a two-parent family (at least at the age 14) and grandmother's education suggest an intergenerational transfer of human capital. Having a mother who is married is associated with gains in reading recognition. By contrast, dilution of available family social capital through having more siblings or higher maternal work hours has negative effects. Higher work hours for the mother's spouse are related to gains in achievement for reading as well.

Regarding limitations, Parcel and Dufur (2001) felt the data set did not include direct measures of teacher-student interaction. Parental perceptions of teachers caring and school safety likely reflect individual child experiences and not global characteristics of the school.

Pong, Dronkers, and Hampden-Thompson (2003) investigated how the relationship between single parenthood and children's academic achievement varies according to a society's safety-net systems. They tested if the achievement gap between children living with a single parent and those residing with both parents is smaller in those countries that make greater investments in social welfare. They looked at students' TIMSS scores and students' self-reported living arrangements. The second data source was the country's specific welfare policy and demographic indicators. These include important maternal and parental leave policies, policies of child and family allowances, and tax benefits to single parents. Demographic indicators include the prevalence of single parenthood, divorce, and teenage motherhood. Pong, Dronkers, and Hampden-Thompson (2003) analyzed 11 nationally representative samples of young children surveyed in 1994–1995.

The findings of Pong, Dronkers, and Hampden-Thompson (2003) were that the United States and New Zealand consistently rank last among the 11 developed countries in terms of the equality of school performance between children from single- and two-parent household families. They concluded from their multilevel analysis, that the achievement gap between single- and two-parent families is narrowed where there are family policies aimed at better supporting economic resources between single-parent and other families.

A limitation of this study is that they were unable to distinguish children of never-married single parents from children with divorced or separated parents. Research in the United States has found greater disadvantage of children with never-married single mothers than of children with divorced or separated mothers (Korenman et al., 2001). Pong, Dronkers, and Hampden-Thompson (2003) may have overestimated the strength of the association between family policy and a country's achievement gap, depending on which type of single parenthood dominates.

Fram, Miller-Cribbs, and Van Horn (2007) presented a study examining child, classroom, and school-level factors that influence academic achievement among public school children in the South. The data for this study came from the first two years of the early Childhood Longitudinal Study Kindergarten Cohort (eCLS-K) (National Center for education Statistics, 2001). The eCLS-K tracked the educational development of a nationally representative cohort of children, beginning with their kindergarten entry in fall of 1998. The study includes measures at the child and family, classroom, and school levels and considers a subset of the eCLS-K cohort limited to White, Black, and Hispanic students attending public school in the South. This data included 3,501 children, in 1,208 classrooms, in 246 schools. There was an average of 15.6 children per school and 4.4 children per classroom included in the sample (Fram, Miller-Cribbs, & Van Horn, 2007).

Hierarchical linear models were used with ten data sets where they examined the contexts of children's academic achievement in terms of both classroom and school characteristics. Two variables, high poverty school and high minority school, were created. "High poverty school" distinguishes schools with more than 50% free-lunch-eligible students from those with 50% or fewer free-lunch-eligible students. "High ethnic minority school" distinguishes schools with more than 50% ethnic minority students from those with 50% or fewer ethnic minority students. The study estimated a series of three-level random-intercept models (Raudenbush & Bryk, 2002), explaining variability in children's readings scores in terms of school, classroom, and child and family level characteristics.

The findings suggest that the schools where disadvantaged children are concentrated reflect an increase of child and family risk factors. Of the children in our sample, 1,338 (38%) attended high ethnic minority schools. Children with single parents disproportionately attended high ethnic minority schools as did children whose mother became pregnant while a teenager. Children in high ethnic minority schools also had mothers with lower levels of education, and they lived in households with lower socioeconomic status. Along with race and income disadvantage, children in these schools had mothers with lower levels of education. The prevalence of growing up in a single-parent household and of having a teenage mother represented substantial obstacles to their educational achievement. Given these differences between children and classrooms in high and low ethnic minority and poverty schools, test scores were lower in the high ethnic minority and poverty schools. Hierarchical linear modeling analysis demonstrated that most of the variability in children's first-grade learning is attributable to child and family-level factors (Fram, Miller-Cribbs, & Van Horn, 2007).

According to Fram, Miller-Cribbs, and Van Horn (2007), one major limitation of the study is the limited ability to define "the South," the ECLS-K regional identifier, for it is broad, including states with very different histories, demographics, and cultural and racial contexts. Findings of a lack of race differences and of negative influences associated with family structure and rural school location are challenging. Future research should explore alternative definitions of the South, contrasting "Deep South" states to other southern states and perhaps treating states with high Hispanic populations separately from those with high Black populations.

The literature concerning the influence of lone-parent households on student achievement suggests that children have the most favorable academic outcomes if both of their parents exhibit high involvement in school. Interestingly, the literature in this area further supports that high levels of parent involvement in schools are correlated with other variables such as education, economic status, and family environment. Parcel and Dufur's work (2001) further supports the correlation between strong family social capital and academic achievement. Interestingly, higher maternal working hours were negatively associated with math achievement, while higher working hours for the mother's spouse were related to gains in achievement. This outcome exhibits family income and time spent with children as mediating factors potentially influencing their respective impact on student achievement. Studies presented also show that the achievement gap between single- and two-parent families is narrowed when family policies are aimed at better supporting economic resources between single-parent and other families. This impacts the structural theory of poverty described in the theoretical framework.

Poverty and Student Achievement

Smith, Brooks-Gunn, and Klebanov (1997) used the National Longitudinal Survey of Youth (NLSY) dataset and examined the effects of family risks, including maternal education, family structure, and family income on children's math and reading achievement scores. The income-to-needs ratio was calculated by dividing the total income of the family for each year of the child's life by the U.S. poverty threshold for that family size for each year of the child's life. Timing and duration of poverty were also measured by examining the income-to-needs ratio by year and summed across years. Math and reading achievement were measured using standardized PIAT scores when children were five to six years of age and then again at seven to eight years of age.

Child characteristics, including gender, ethnicity, and birth weight, were controlled for in all analyses. Smith, Brooks-Gunn, and Klebanov's (1997) study showed results that indicated that family structure was not a predictor of children's achievement scores. Maternal education and family income were the strong predictors. The income-to-needs ratio alone predicted between 14% and 16% of the variance in children's scores, with income a slightly stronger predictor of reading than math at five years old, and a somewhat stronger predictor of math scores than reading at seven years old. Both transient and continuous poverty were strong predictors of math and reading scores at both five and seven years old, but the strongest findings were for reading at seven years.

Sirin, (2005) reviewed the literature on socioeconomic status (SES) and academic achievement in journal articles published between 1990 and 2000. The sample included 101,157 students, 6,871 schools, and 128 school districts gathered from 74 independent samples. The results showed a medium to strong relation between SES and achievement. Sirin (2005) conducted a replica of White's (1982) meta-analysis to see whether the SES achievement correlation had changed.

Several computer searches and manual searches were employed by Sirin (2005) to gather the best group of studies to represent the large number of existing studies on SES and academic achievement. The computerized search was conducted using the ERIC (Education Resources Information Center), PsycINFO, and Sociological Abstracts reference databases. For SES, the search terms *socioeconomic status, socioeconomic status, social class, social status, income, disadvantaged*, and *poverty* were used. For academic achievement the terms *achievement, success,* and *performance* were used.

Sirin's (2005) work discovered the degree of the relationship between SES and academic achievement to be contingent upon numerous factors. Sirin (2005) concluded the relationship between SES and academic achievement increases across levels of school from primary through middle school with the exception of high school. Sirin (2005) noted a decrease in the overall strength between SES factors and student achievement compared with the findings of White (1982).

Sirin's (2005) use of socioeconomic status, social class, and poverty are described in the structural theory of poverty, which is the theoretical framework of this paper. This framework is community- and neighborhood-based. Building off this structure, Sampson, Sharkey, and Raudenbush, (2008) hypothesized that living in a disadvantaged neighborhood hinders the development of academically significant verbal ability in children. They studied a sample of young people who were growing up in the large urban center of Chicago in 1995. Sampson, Sharkey and Raudenbush, (2008) extended the work of previous researchers by considering the impact of moving into, as well as out of, disadvantaged neighborhoods. They implemented a modeling strategy that incorporated longitudinal sequences of families moving across neighborhoods.

Sampson, Sharkey, and Raudenbush, (2008) analyzed The Project on Human Development in Chicago Neighborhoods (PHDCN) and focused their study on the relationship between verbal ability and neighborhoods. PHDCN's longitudinal design begins with an ethnically and socioeconomically diverse population of children ages 0–18 years living in a major American city. The 1990 U.S. Census data for Chicago were used to identify 343 neighborhood clusters with a sampling of 8,000 people that were similar with respect to distributions of race/ethnicity, socioeconomic status (SES), density, and family structure. A two-stage sampling procedure was used that included selecting a random sample of 80 of 343 Chicago neighborhood clusters stratified by racial/ethnic composition and SES.

Children and their caretakers were followed wherever they moved in the United States. Sampson, Sharkey, and Raudenbush, (2008) geocoded residential addresses collected at each interview wave and matched them to census tract data. Tests of cognitive ability were based on the 2,226 children in Cohorts 6, 9, and 12 and their caregivers. They created a combined measure of students' verbal ability based on the results from two tests, the Wechsler Intelligence Scale for Children vocabulary test and the Wide Range Achievement Test reading examination. Sampson, Sharkey, and Raudenbush, (2008) combined the scaled results from each test using principal factor estimation and regression scoring. They estimated that concentrated poverty and disadvantage reduces later verbal ability by 4 points, or 25% of a standard deviation. This is a loss of almost one and a half years of schooling.

The connections between poverty and student achievement have been explored in many different ways over the past decade. This study focused on poverty and its potential to impact student achievement in mathematics. Recent studies related exclusively to poverty and mathematics achievement have been cited to further support the connection.

Poverty and Math Achievement

Research has shown that family risk affects math and reading achievement differently. Psychologists specializing in mental processes related to learning math have concluded that domain-specific mental structures based on principles of numeracy are commonly present even in very young children. These domain-specific structures allow young children to filter out and attend to the important parts of their environment that relate to their knowledge about math. This allows very early mathematical learning to begin (Case, 1993; Gelman, 2000). Many preschool-aged children have already developed principles underlying the skill of counting. Children between the ages of five and seven have already developed a mental number line which allows them to count and compare quantity with much more facility (Case, 1993).

There also are domain-specific mental structures associated with literacy, but these are different from those associated with math. The development of literacy in young children is extremely complex and is strongly influenced by social context (Pelligrini, 2001). The striking characteristics of the social context include such specific aspects of the home environment as parenting communication style and home activities. Research on the early development of math and literacy skills suggests that risks may impact the development of reading skills more than math skills. Research on early mathematical skills has not recognized such importance to the family environment and seems to indicate that the family context may be less important for math skills.

Lamy (2003) investigated the effects of family risks on children's math and reading achievement during the elementary school years in a sample of urban families and children. Her study examines family risk within a set of family characteristics, including maternal age, maternal depression, maternal education, maternal physical health, family involvement in school, family resources, family structure, family mobility, number of children, and parenting style. As mentioned earlier in this chapter, poverty is associated with lower parental abilities to provide supportive experiences. It is generally understood that children growing up in poverty achieve much less in school than their more advantaged peers. An important research question examined in Lamy's (2003) study is the following: How is the relationship between family risks and children's achievement different for math and reading?

Lamy (2003) used a sample of 197 families whose children attended Head Start (being poor is a requirement) during the 1991/1992 and 1992/1993 school years in a small northeastern city. The study used family data collected in the kindergarten year and yearly achievement data. Information on families was obtained from a family interview. The interviews were administered during the fall and spring of the kindergarten year and then during the spring in each subsequent year of the study. The family interview was composed of four components:

Components of the Family Interview:

- The Family Background Interview – A 21 item section on parent and family characteristics is the source of parent reports on maternal age, maternal education, number of children in the household, mobility during the kindergarten year, and family structure.
- Family Resource Scale – The Family Resource Scale (FRS) measures the parent's perception of the adequacy of the resources (money, time, and energy) available to meet specific family needs. The FRS includes 30 items rated on a Likert scale of 1 (not at all adequate) to 5 (almost always adequate).
- School Involvement of Parents – This instrument is composed of four items reported on a four-point frequency scale (almost every day, 1-2 times a week, 1-3 times a month, less than monthly) to rate parental involvement in children's schooling. The items include discussing the school day with the child, participating in school activities, volunteering at the school, and discussing the child's progress with school staff.
- Parent Health – This instrument includes one item rating the parent's overall physical health on a five-point scale (1 = excellent, 5 = poor). Three items are used to measure depression.

Lamy (2003) used The Woodcock-Johnson Psycho-Educational Battery-Revised (Woodcock & Johnson, 1989, 1990) to measure achievement. Standard scores were used and two subscales assessing mathematics skills were combined into a Broad Math cluster, including calculation and applied problems. Two subscales assessing literacy skills were combined into a

Broad Reading cluster. This cluster includes the letter-word identification and passage comprehension subtests. A regression analysis was done to test the relationships between the family risk index and children's math scores. Results from Lamy's (2003) study show that the most noticeable family characteristic for children's math achievement is parenting style, though only in the early elementary years. For reading achievement, however, maternal education is the most important and consistent predictor from second through fifth grades. Lamy (2003) also presented that the family risk index is as important a predictor of children's achievement, for both math and reading, as parenting style or maternal education. The family risk index also provides the most consistent prediction of children's achievement scores across the elementary school years with the exception of the predictive power of maternal education for children's reading achievement. Most telling in Lamy's (2003) study is that individual family risks influence reading achievement to a greater degree than math. Framed earlier in this chapter and based on the literature cited throughout this paper, Lamy's (2003) research rests on the idea that chronic poverty is not just a matter of income but is composed of interacting individual risk factors.

Some limitations of the study were that the services obtained through Head Start may have weakened the relationships between family risks and children's achievement through the education and preparation the children and parents received. Families living in poverty may have a narrower range of the same theories studied in a more variable sample. For example, though there is a range of income across families living in poverty, that range is much broader in a sample more descriptive of the typical population. Relationships found in studies using a more representative sample may not be found or may appear weaker in samples with a more restricted range.

In 1998, the National Council of Teachers of Mathematics funded a task force on Mathematics Teaching and Learning in Poor Communities. Their results presented a correlation between low mathematical achievement and poverty. Interestingly, the correlations were due to learning gaps in the curriculum and not a poor student's physical or intellectual capabilities. The study stated the following: Poverty limits the out-of-school educational experiences and materials that students encounter, affecting both the prior knowledge that students bring to the classroom and access to the tools students may need to accomplish assigned tasks. Similarly, poverty is often correlated with unstable housing patterns, thereby increasing student mobility and resulting in gaps in learning. (National Council of Teachers of Mathematics, 2003, p. 36)

Clark's (2004) study documented causes of math anxiety among 174 secondary students who have failed or underachieved in math and were in a course designed for students who struggle in math. The results were collected from participants in schools within a targeted geographic area. The schools in the study were selected because they have an average failure rate of 60% or higher in algebra, a course required for graduation. All students who participated in the study were secondary math students who attend neighborhood public schools. These schools participated based on a voluntary basis. Therefore, the study yielded descriptive results and determined the anxiety levels of struggling math students as they compared to the MARS-A norm group. The MARS-A is a 98-item instrument with a 5-item rating scale that included the following: "not at all," "a little," "a fair amount," "much," and "very much" as choices for a response. The range of possible points is from 1 to 5 for each item. The lowest possible score is 98 and the highest possible score is 490.

Subjects in Clark's (2004) study consisted of students within the targeted geographical area of Los Angeles County SPA 6. Service Planning Area (SPA) 6 of Los Angeles County encompasses the following school districts: South Los Angeles, Compton, Lynwood, and Paramount. SPA 6 is the most densely populated SPA and has the highest number of “at-risk” categorizations for children under 18 such as poverty, hunger, out of home care (i.e., foster care, group homes, non-parental relative care, etc.), dropout rates, homicide, and homelessness. Subjects were invited to participate in the study based on the math course in which they were enrolled at the time of survey administration. This included intersession classes, classes taking place during the regular school day, or students who were taking math at a slower pace than their peers. It also included students that were retaking a course due to having received a low grade. Students responded to a 98-item survey where a descriptive analysis of each item (e.g., anxiety level) was determined.

Clark (2004) showed in her study that students experienced higher levels of math anxiety in responding to scenarios about classroom procedures including assignments given, homework, and assessment procedures than they did in scenarios that included actual math computation. Students in the study had statistically significant high anxiety when they were asked to solve a problem out loud in front of peers and when involved with ritual leading up to and during testing. Clark (2004) concluded that how these high-poverty students are treated in math class positively or negatively impacts their comprehension of math more than remediation. A recommendation from this study centered on educators instructing African-American and Latin American students in high-poverty schools adjusting their teaching approaches to include math anxiety-reduction pedagogy over traditional “text book and test'' methods of instruction in order to help these students gain access to higher math and close the math achievement gap.

Some limitations of the study were that it was descriptive and included a group of students who resided in and attended schools within a limited geographical area. All students were targeted because they were enrolled in a program designed to address academic deficiencies in math. Therefore, there was no way to account for students who were programmed into the wrong class.

For the purpose of this study, the findings of Sirin (2005) and Smith, Brooks-Gunn, and Klebanov (1997) suggest school resources alone fail to consistently account for student achievement. Out-of-school variables must be controlled for when determining a school district's influence on student achievement. Sampson, Sharkey, and Raudenbush, (2008) supported this by their estimation that poverty reduces later verbal ability by 25% of a standard deviation. Focusing these findings directly on math achievement, Lamy (2003) showed that the most noticeable family characteristic for children's math achievement is parenting style. Lamy (2003) also presented that the family risk index is as important a predictor of children's achievement for math. This continues to support the strong external influence on student achievement. Clark (2004) bridged the external factors impacting the anxiety levels of students in poverty with teaching styles. Clark's (2004) work showed how high-poverty students are treated in math class positively or negatively impacts their comprehension of math more than remediation. This merits further consideration, as external factors may need to be taken into account as practitioners in schools make policies for enhancing student achievement.

Parental Education and Student Achievement

Potter and Roksa (2013) studied the relationship between family experiences and children's academic achievement using eighth-grade longitudinal data from the Early Childhood Longitudinal Study–Kindergarten Cohort (ECLS-K). Potter and Roksa (2013) used five waves in this study: Spring Kindergarten, Spring Grade 1, Spring Grade 3, Spring Grade 5, and Spring Grade 8. The sample was limited to respondents who remained in the study through the final wave and had at least two valid math or reading test scores (one in the eighth-grade wave and the other in an earlier wave). The final sample was 9,298 children. The dependent variable for their analysis was academic achievement. This was based on children's reading and math test scores on the ECLS-K, which assessed children's reading and math skills using a two-stage testing procedure. The first stage consisted of children receiving a set of questions of varying difficulty, called routing questions. Based on their performance on these questions, they were allotted a second round of questions of high, medium, or low difficulty.

Potter and Roksa's (2013) study included two sets of key independent variables focused on social class background and family experiences. They used maternal educational attainment as the proxy for family social class background. This variable was divided into four categories: high school diploma or less (45% of the sample), some college (33%), bachelor's degree (15%), and graduate work (8%). They focused on education as the key measure of social class, while controlling for family income.

To examine how family practices differ by social class and how they influence inequality in children's academic skills, Potter and Roksa (2013) used a mixed effect growth curve modeling. They used this modeling strategy to examine the relationship between a range of different socio-demographic characteristics and cumulative measures of family experiences and they tried to predict children's reading and math test scores using family experience measures. Results of Potter and Roksa's (2013) study showed children with more educated mothers scored higher on their reading and math assessments in kindergarten and made greater gains in their skills over time. Children whose mothers completed some college started school scoring, on average, 6.2 points higher in reading and 4.6 points higher in math than their peers whose mothers had no college experience. Children whose mothers had a bachelor's degree scored 9.5 points higher in reading and 8.4 points higher in math. Children with mothers who had completed some graduate work scored 14.3 and 11.5 points higher in reading and math, respectively.

Limitations of the study were that family experiences are not bi-annual events but are continuous processes. Potter and Roksa's (2013) data in the ECLS-K were collected during the calendar years of 1999, 2000, 2002, 2004, and 2007. By the time children in the sample reached eighth-grade, they were using only 5 out of 14 possible years of family experiences. Studies including more frequently collected data may produce more precise estimates of the social class discrepancy in the patterns and consequences of cumulative family experiences.

Guryan, Hurst, and Kearney (2008) examined parental time allocated to the care of their children. They documented the total hours spent in caring for their children (educational support is built into this) by different subgroups defined by gender, marital status, employment status, and education. They used data from the 2003-2006 waves of the American Time Use Survey conducted by the U.S. Bureau of Labor Statistics. This survey uses a 24-hour recall of the previous day's activities to elicit time diary information. Guryan, Hurst, and Kearney (2008) gathered data from survey years 2003 through 2006 and analyzed samples of individuals between the ages of 21 and 55, with at least one child under age 18. They used a nationally representative sample which included 22,693 individuals with children, with 13,434 of them being women.

They found that more-highly-educated parents spend more time with their children. More-highly-educated women with children are much more likely to be working (79% for women with more than a college degree compared to 42% for women with less than a high school degree). Other interesting results from Guryan, Hurst, and Kearney's (2008) analysis are that more-highly-educated women tend to have fewer children, specifically 1.8 children per household for women with more than a college degree compared to 2.2 children per household for women with less than a high school degree. More-highly-educated women are also much more likely to be married; the fraction of women with a high-school degree or less who are married is around 60%, compared to more than 85% among college-educated women.

The focus of Guryan, Hurst, and Kearney's (2008) work is that highly-educated parents spend much more time in activities where child care is listed as the primary activity. This supports the concept described earlier in this section regarding social and family capital and its influence on student achievement. The fact that Guryan, Hurst, and Kearney's (2008) study sees the education incline in child care as a principal activity but not in total time spent with children may suggest that highly-educated parents view child care as an investment. Future research could differentiate between these hypotheses.

The literature supports the influence of parental education levels on student achievement. Guryan, Hurst, and Kearney (2008) continue to support the recent thinking about family and social capital by identifying a link between parental education levels and parenting beliefs and behaviors. These findings suggest parental level of education to be a significant aspect of SES family factors influencing student achievement.

Teacher Mobility and Student Achievement

Teacher mobility is a district-faculty level variable that is becoming more prevalent in today’s public school environment. Researchers and policymakers accept that teacher turnover harms student achievement, though recent studies suggest this may not be the case. Mobility is dominant in those teachers starting their educational careers. The USDOE (2010) shows that 13.7% of the teachers with one to three years of experience moved from their original schools and 9.1% exited the educational profession completely in the 2008-2009 school year. A study by

Scafidi, Sjoquist, and Stinebrickner (2007) showed that teachers who started their careers in low-performing, low SES, or high minority student schools had a greater probability of changing schools. Teacher turnover rates also tend to be higher in urban and lower-performing schools (Hanushek, Kain, & Rivkin, 2004). With this, it is important to further examine the impact of teacher mobility and its potential influence over student achievement.

Most of the recent research has shown that negative correlations exist between teacher turnover and student achievement. Guin (2004) examined 66 elementary schools in a large urban district. The study looked at the relationship between school-level turnover and the proportion of students meeting standards on statewide assessments in reading and math. Using a Pearson correlation, Guin's (2004) study results show a positive correlation between teacher turnover rates and the percentage of minority students within a school and a significant negative correlation between academic achievement and teacher turnover. This evidence is not entirely indicative of a causal relationship. Community variable(s) as an added factor(s) may concurrently cause both low achievement and higher turnover. The limitation in the research is that a causal relationship is unclear, teachers leaving may cause low achievement, but low achievement may also cause teachers to leave.

Graziano (2012) examined the strength and direction of relationships between New Jersey School Report Card variables, in particular faculty mobility, and 2009-2010 New Jersey High School Proficiency Assessment (HSPA) Math and Language Arts Literacy test scores. Analysis of simultaneous multiple regressions involving New Jersey School Report Card variables were conducted for both Math and Language Arts Literacy scores. This study sought to determine if a high rate of faculty mobility, defined as a school average greater than the state‘s rate of faculty members who come and go during the school year (New Jersey School Report

Card, 2007), significantly influences the HSPA performance of New Jersey high schools. Hierarchical regression models, including only variables deemed significant by the multiple linear regressions, were analyzed for both Math and Language Arts Literacy scores. The sample was selected purposefully to represent only New Jersey‘s public, comprehensive, and academic secondary schools (Graziano, 2012).

Graziano's (2012) hierarchical multiple regression analysis identified all significant variables used in the study that predicted LAL and Math performance. They were school size, SES, LEP, SPED, student attendance, student mobility, and faculty mobility. Three models were looked at and were all statistically significant. Of the three models, the R^2 change in Model 3 explains the greatest proportion of variance in HSPA LAL performance. Only .3% of the variance changed when faculty mobility was added to the model. Though the model was significant, the change was not (Sig F Change = .061). Model 3 explains the greatest proportion of variance in HSPA Math performance as well. The R^2 change indicates that 1.3% of the change in variance was due to the inclusion of faculty mobility and MA+. The faculty variables are shown here to be statistically significant predictors for HSPA Math performance. In conclusion, the main variable in question, faculty mobility, was the weakest significant correlate of HSPA LAL performance, with a weak but significant correlation to HSPA Math performance.

Continuing to ask the question if teacher mobility impacts student achievement was Ronfeldt, Loeb, and Wyckoff (2013). They studied the link between student test scores in math and English language arts (ELA) to student, class, school, and teacher characteristics. Their study collected data from the New York City Department of Education and the New York State Education Department. They looked at approximately 850,000 observations of fourth and fifth grade students across all NYC elementary schools over eight academic years (2001–2002 and

2005–2010). They asked three important overarching questions: What is the average effect of teacher turnover on student achievement? Are the effects different for different kinds of schools? What explains the relationship between teacher turnover and student achievement?

The regression models show that "a consistently negative and statistically significant estimate suggest that teacher turnover harms student achievement (Ronfeldt et al., 2013, p.18). Specifically, their results indicate that within the same school and within the same year, students in grade levels that experience 100% turnover have lower test scores by 7.4% to 9.6% of a standard deviation in math and by 6.0% to 8.3% of a standard deviation in ELA as compared to grade levels with no turnover at all (Ronfeldt et al., 2013, p. 18). This study also found evidence that changes in teacher quality explain some of the effect of turnover on student achievement. Ronfeldt, Loeb, and Wyckoff (2013) suggest that there may be a disruptive impact of turnover beyond aggregate changes in teacher quality. Their results show that turnover has a harmful effect on student achievement, even after controlling for different indicators of teacher quality.

Teacher Level of Educational Achievement

Goldhaber and Brewer's (2000) analysis of the 1988 National Educational Longitudinal Study showed that high school students assigned to teachers who held master's degrees in Mathematics made greater gains in mathematics achievement than students whose teachers did not have advanced degrees. They also found that high school teachers with bachelor's degrees in science were also more effective at increasing student achievement in science than teachers who taught science but either had no degree or a bachelor's degree in a non-science subject. Subject-specific degrees had no effect on student achievement in English or history. Clotfelter, Ladd, and Vigdor (2007) similarly posited that secondary education teachers who hold various kinds of advanced degrees may have a positive effect on student achievement. They found that high school teachers who completed a master‘s degree were more effective at increasing student achievement than those without advanced degrees (Clotfelter et al., 2007).

Michel (2004) also investigated if teacher educational achievement affected student achievement. The study looked at 888 schools within New Jersey and utilized a multiple regression model. Michel used this model to explain the variance of the scores of the NJ ASK Grade 4. A multiple linear regression was also used to determine the relationship between the variables and fourth grade achievement. “The multiple linear regression aimed to find a linear relationship between the dependent variable (NJ ASK 4 scores) and several possible predictor variables (students, school, and teacher variables)” (Michel, 2004, p. 137). It was determined that there is a positive significant relationship between student attendance and their math performance. School variables such as “DFG, class size, length of the school day, instructional time, and internet connectivity have a statistically significant impact on student performance on the NJ ASK 4” (Michel, 2004, p. 87). This study specified that District Factor Group (DFG) has the strongest impact on proficient language, followed by student mobility rate, student suspension rate, percentage of teacher with a doctorate degree, student attendance rate, percentage of teachers with a master’s degree, and last, library with internet access, in that order (Michel, 2004). Michel (2004) concluded that in addition to student mobility, DFG and percentage of teachers with a master’s degree had a direct impact on fourth grade achievement.

Educational theory conceives that one of the pivotal causes of inadequate school performance is the staffing of under-qualified or inexperienced teachers. Research suggests that high-mobility schools are populated with students who may be more likely to be assigned to inexperienced teachers (Kane, Rockoff, & Staiger, 2006; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004). Also, teacher mobility occurs more often in low-achieving schools. Urban schools suffer from this and as a result function with greater rates of new and uncertified teachers (Ascher, 1991; Darling-Hammond, 1988). The work of Scafidi, Sjoquist, and Stinebrickner (2007) showed that teachers who started their careers in low-performing, low SES, or high minority student schools had a greater probability of changing schools. Similarly, Guin's (2004) study results show a positive correlation between teacher turnover rates and the percentage of minority students within a school and that there was a significant negative correlation between academic achievement and teacher turnover.

For the purpose of this study, community variables as an added factor may work concurrently with teacher turnover and teacher level of achievement to cause low achievement. Ronfeldt, Loeb, and Wyckoff (2013) suggest that there may be a disruptive impact of turnover beyond aggregate changes in teacher quality. Their results show that turnover has a harmful effect on student achievement, even after controlling for different indicators of teacher quality. Goldhaber and Brewer's (2000) and Clotfelter, Ladd, and Vigdor (2007) supported this by finding that high school teachers who completed a master‘s degree were more effective at increasing student achievement than those without advanced degrees. Michel (2004) also investigated if teacher educational achievement affected student achievement. This study specified that a combination of both community and district variables had a direct impact on student achievement. This study sought to continue this research by finding the combination of community variables, teacher mobility, and teacher educational achievement level as a predictive model for student achievement in mathematics.

Chapter Summary

The methodology for evaluating education and specifically teachers has always been an important part of the history of our education system. Horace Mann and Henry Bernard built on

Thomas Jefferson's vision that the role of education was that of equity, progress, and change. Bernard and Mann made annual reports to the Massachusetts Board of Education (1837-1848), which served as some of the first school evaluations ever recorded. Mann focused on instructional approaches and argued that teaching children in heterogeneous groups is essential in order to unify and socialize in a common school. Together they founded institutions which provided some of the original teacher education and in-service professional development vehicles (Tanner & Tanner, 2007). This groundwork started from an approach that schools should be evaluated to provide training and growth for teachers and improve service to the whole child.

Unfortunately, the business model, which rests heavily on efficiency, began to take over school evaluations. Frederick Taylor, the father of scientific management, felt work should be divided into simple tasks, where workers are more robotic than they are thinkers. Taylor did not consider workers as individuals, but rather pieces of a much larger machine, scientifically selected and trained rather than left to passively train themselves. He argued that scientific study could determine the proper method of doing every job (Spring, 2008). Principals initially modeled the corporate world and evaluated teachers much as business managers evaluate their subordinate employees. This concept led to standardization in schools, which resulted in standard curriculum, standard hiring practices, standard teacher training procedures, standard student assessment, and most relevant here, standardized teacher evaluations.

Standardization continued as Ellwood P. Cubberly (1916), one of the leading pioneers in school administration, introduced the formal study of school administration. He wrote of the importance of the scientific management movement for school administration and supervision (Cubberly, 1916). Cubberly believed that the implementation of scientific management in the schools would create a necessary shift for school administration. He wrote that it would change from guesswork to scientific accuracy, and the changing of school supervision from a political job for which there needed little technical preparation to that of a highly skilled piece of professional social engineering. Cubberly suggested that the scientific movement in the schools would demand the creation of standards of measurement which would define the efficiency of the work being done (Fine, 1997).

Scientific management and the business model still exist today. The present approach to school evaluation rests on these concepts and are the backbone of modern evaluation policies. Accountability for teachers and schools was the foundation of the No Child Left Behind Act of 2001. The legislation requires schools to pass yearly standardized tests to measure progress. Governmental financial support was directly tied into these measures. Simply put, schools face declined funding if requirements are not met. As far as teachers are concerned, the No Child Left Behind Act requires states to provide highly qualified teachers to all students. Each state is charged with creating a framework to determine what counts as highly qualified.

Evaluation policies such as AchieveNJ are a direct result of NCLB (2001). AchieveNJ has a student performance component built into the program. Student Growth Percentiles (SGPs) are one of the measures used to assess educators whose students are in Grades 4-8 and take the New Jersey Assessment of Skills and Knowledge (NJ ASK) Math and Language Arts tests. Student growth percentiles (Betebenner, 2009) have been adopted for use in evaluation systems in several states. The student growth percentiles (SGPs) framework avoids all controls for student variables and other factors related to schooling environments. SGPs are student-level conditional performance percentiles relative to a peer group (Ehlert, Koedel, Parsons, & Podgursky, 2013). The developers of the SGP approach maintain that SGPs are descriptive measures designed to stimulate further investigation or discussion and do not advocate their use for identifying causal effects (Betebenner, 2009).

Leadership in education has changed drastically as a result of the mandates described in NCLB. AchieveNJ is an example of a state policy created in order for the state public schools to maintain compliance with the national reformation policy. The ultimate responsibility for reducing the achievement gap and improving student achievement lies with the superintendent. With this said, superintendents must have a comprehensive understanding of data in order to lead conversations on effective instructional practices, better aligned curriculum to standards, and sound assessment practices (Decman et al., 2010). Superintendents of low-performing public schools are faced with the possibility of schools being closed and re-opened as charter schools (DuFour, & Marzano, 2011; Ravitch, 2010). Superintendents are under great pressure to ensure student learning and achievement to meet the rigors and demands set forth by NCLB, RTTT, and the ESEA wavier. According to Padalino (2009), accountability systems enacted by state and federal government have "significantly changed the role of and the stressors placed on public school superintendents forever" (p. 8). Over time, with increasing district size, the role of superintendent has changed many times, reflecting the needs of the society during that particular time period (Kowalski, 1999; Sharp & Walter, 1997).

There is also equal pressure at the building level for each principal performing his or her job under this new evaluation environment. According to Leithwood, Louis, Anderson, and Wahlstrom (2004), schools that face critical barriers to improvement have succeeded only when principals achieve a multitude of specific leadership goals. They stress that the principal's role is second only to the teacher's role in student achievement. Low-performing schools are subject to sanctions if achievement goals are not met for two consecutive years. Students in these schools are allowed to transfer to other public schools; if performance does not improve after five years, the school has to be restructured and may even be closed down.

The problem identified in this study lies in the fact that schools reflect their communities. Increasing income inequality is associated with rising segregation in American neighborhoods. Concern has been rising as to whether community environments themselves influence children's life changes. Poor and minority Americans are overrepresented in the most disadvantaged communities. The neighborhood effects on children may add to gaps in overall schooling outcomes along race and class lines in the United States. While research stresses the importance of teachers among the set of inputs provided by schools, the impact of student characteristics, such as unmeasured family and community inputs, is extremely influential. Ballou, Mokher, and Cavaluzzo (2012) have examined the impact of frequently ignored student, school, and community characteristics for teacher value-added models.

Past and recent studies were examined to give the reader a stronger understanding of the problem. Reports as early as The Coleman Report were looked at to anchor the issue in history. The Coleman report determined that schools have little impact on student achievement compared to out-of-school factors. Aikens and Barbarin (2008) found that family characteristics made the largest contribution to the prediction of achievement in educational outcomes. This included home literacy environment, parental involvement in school, and parental role strain. Their analysis also suggests a compounding effect of low-quality neighborhood environments. Children from low-SES homes grow up in home environments poor in educational experiences.

The recent studies by Maylone (2002) and Turnamian (2012) applied multiple regression analysis to identify specific socioeconomic variables at the district level that combine to predict student achievement. Maylone (2002) found three variables combine at the district level to predict high school MEAP scores. These variables are household income, percentage of lone-parent households, and free- and reduced-lunch eligibility. Turnamian (2012) required a larger mix of variables (12) to achieve predictive reliability for NJ ASK 3. This study increased the mix of variables to 15 and focused on middle school students in two different grades, Grade 6 and Grade 7. This study also added two district level variables to test the impact of teacher mobility and teacher level of education as added variables to the predictive model.

The extant literature reviewed suggested the variables of household income, percentage of lone-parent households, the level of parental education within a school district, and staff mobility and level of education at the school level may combine to explain and predict student achievement as measured by standardized tests.

CHAPTER III

METHODOLOGY

My purpose for this study was to determine the predictive accuracy of family and community demographic variables found in the U.S. Census data on the percentage of students at the school level who scored Proficient or above on the NJ ASK 6 and 7 Mathematics section when controlling for teacher mobility and level of teacher education.

Research Design

This study used a non-experimental, correlational, explanatory, cross-sectional design with quantitative methods. Non-experimental causal comparative research designs attempt to offer evidence of cause and effect relationships between variables and can be seen as a non-experimental research design that may recognize causality. I examined 19 independent community demographic variables from the existing literature found in the census data related specifically to household income, parental education levels, and lone-parent households. I also examined two school-level variables, teacher mobility and teacher level of education attainment found on each individual district report card. The dependent variables were the 2010 Grades 6 and 7 New Jersey Assessment of Skills and Knowledge percentage of students who scored Proficient or above for Mathematics. Data for each school district's median household income were taken from the American Community Survey section of the 2010 U.S. Census, and American FactFinder was used to localize the data. This study examined five-year estimates because they provided the largest sample size.

School achievement data examined for this study were taken from the results of the NJ ASK 6 and 7 assessments for Mathematics from the year 2010. New Jersey has approximately 572 operating school districts that are characterized into eight different district factor groups

(DFG) decided by the U.S. Census data. The New Jersey Department of Education officials use A, B, CD, DE, FG, GH, and J as their codes for categorizing school district District Factor Groups (DFG). Districts categorized as “A” are considered the most economically disadvantaged communities, and those coded as “J” are serving the wealthiest communities in New Jersey.

An a priori calculation was used to determine the power of the sample size. I used up to 20 predictors in the model. Based on the work of Green (1991), who was referenced by Field (2009), a minimum acceptable sample size for regression was determined by the equation $50 + 8(k) = n$ where k is the number of predictors and n is the minimum sample size (Field, 2009). The minimum sample size for 20 predictors was found to be 186, which is $(50 + 8(20) = 210)$. The sample size used in this study, as stated above, is 311 and 301 and thus provides more than enough power to identify an effect size of at least .50 at the 95% confidence level. It is also large enough to make a broader statement about the results to the rest of the districts in the state of New Jersey.

Multiple linear regression models were used to decide the statistical importance of out-of-school community variables and specific school-level variables on the percentage of students scoring Proficient or above on the 2010 NJ ASK 6 and 7 Math. The researcher was able to distinguish between the variables with both significance and strength of the correlation by performing a simultaneous multiple regression. The strongest variables were used to run separate regression models for each grade level. The community variables chosen were identified in the literature as influencing student achievement measured by high-stakes standardized assessments and are the foundation for the theoretical framework of this study. This study looked at three different independent variables and their influence and predictive power on one dependent variable through multiple linear regressions.

This study examines the following independent variables:

- Percentage of people employed
- Percentage of households making under $25,000
- Percentage of households making under $35,000
- Percentage of households making more than $200,000
- Percentage of families making less than $25,000
- Percentage of families making less than $35,000
- Percentage of families making more than $200,000
- Percentage of families in poverty for 12 months
- Percentage of female households in poverty
- Percent of all people under poverty
- Percentage of male-only households, no females
- Percentage of female-only households, no males
- Percentage of lone-parent households (total)
- Percentage of population with less than 9^{th} grade education
- Percentage of population with no high school diploma
- Percentage of population with some college
- Percentage of population with a bachelor’s degree
- Percentage of population with an advanced degree
- Percentage of teachers within a school that hold a bachelor’s degree
- Percentage of teachers within a school that hold a master’s degree
- Percentage of faculty within a school who entered or left the school during the school year

The dependent variables for this study were 2010 NJ ASK 6 and 7 Mathematics results, which are defined as the percentage of students that score Proficient or Advanced Proficient at the school level.

As mentioned above, teacher mobility and teacher level of advanced degree were also evaluated as school level independent variables. Although the greater focus of the research is on the out-of-school variables, I added two school level variables found in the extant literature to impact student achievement as measured by the percentage of students scoring proficient and above on standardized tests.

Research Questions

This study began by examining four main research questions:

1. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
2. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
3. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the NJ ASK 7 on the 2010 Math section when controlling for teacher mobility and level of teacher education?
4. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?

Null Hypotheses

Null Hypothesis 1: No statistically significant relationship exists between the 2010 NJ ASK 6 percentage of students scoring Proficient and Advanced Proficient in Mathematics at the school level and community variables when controlling for teacher mobility and level of teacher education.

Null Hypothesis 2: No statistically significant relationship exists between the 2010 NJ ASK 7 percentage of students scoring Proficient and Advanced Proficient in Mathematics at the school level and community variables when controlling for teacher mobility and level of teacher education.

Population

The target population for this study was 100% of the New Jersey school districts with complete sets of 2010 NJ ASK 6 and 7 data and 2010 U.S. Census data and tested at least 25 students in each grade level. Only schools servicing Grades 6 and 7 students from their hometown were included in order to maintain clean demographic data. Thus, regional schools, charter schools, vocational schools, and districts with more than one school that housed 6^{th} or 7^{th} grades were excluded from the sample. With this said, 311 districts were available for this study in the Grade 6 and 301 in the Grade 7. The sample size represented the entire state of New Jersey with schools in all socio-economic strata and geographic regions.

Sample

The final sample for this study consisted on 311 schools with Grade 6 math scores and 301 schools with Grade 7 math scores. The state of New Jersey consists of 21 counties, with 590 public school districts within those counties that are differentiated by district factor groups

(DFGs). DFGs represent an approximate measure of a community's socioeconomic status (SES) and are calculated using six variables that are closely related to SES:

1. Percent of adults with no high school diploma
2. Percent of adults with some college education
3. Occupational status
4. Unemployment rate
5. Percent of individuals in poverty
6. Median family income

New Jersey schools include elementary, middle schools, comprehensive high schools, magnet schools, vocational schools, charter schools, and special education schools (NJDOE, 2010c). The size and grade structure of schools within each district differs across the state. Some school districts contain all students from pre-kindergarten to Grade 12, and other school districts include only kindergarten through Grade 6 or kindergarten through Grade 8. Districts with PK-6 or K-8 do not have high schools within their districts. Regional school districts contain high schools that include students from various K-8 districts. Middle school-aged children in New Jersey may attend either a PK-8 school, a 6-8 school, or a 7-12 school. Schools that were included in the sample for this study met the following criteria:

1. Serviced Grades 6 and/or Grade 7 in one unique school building in the year 2010
2. Serviced students within their district only
3. Was the only school in the district that served Grades 6 and/or 7
4. Had more than 25 students participate in the administration of the NJ ASK in Language Arts Literacy and Mathematics

Excluded from the sample were schools in regional school districts or schools in districts that had multiple schools that serviced Grade 6 and Grade 7 (i.e., more than one school that contained Grades 6 and 7 in the district, etc.). Also excluded from the sample were regional schools, charter schools, magnet schools, vocational schools, and special education schools.

Data Collection

Data for the dependent variables of 2010 NJ ASK 6 and 7 Mathematics percentages of students who scored Proficient and above for New Jersey school districts were collected from the annual New Jersey School Report Card. The results were identified in the spreadsheet as Proficient Plus Advanced Proficient. The data were downloaded from the New Jersey Department of Education website into an Excel spreadsheet. The independent variables and the 2010 NJ Ask 6 and 7 data could then be compared in an organized manner.

All 21 independent variables and the two dependent variables were entered into an Excel spreadsheet. The 21 independent variables were based on the 2010 U.S. Census Bureau data (American Factfinder). The different New Jersey school districts represented each row of the spreadsheet. The data for the percentage of students Proficient and Advanced Proficient for each school district were added to this Excel spreadsheet as well. Each grade level was approached as its own study.

After the data were collected from the New Jersey Department of Education's website, it was saved in an Excel spreadsheet. I assigned a unique identification code for each district and school and connected the census data for each school district. Specific districts and schools were eliminated from this study. Those that included more than one middle school or more than one school that served sixth and seventh grades were deleted from the spreadsheet. If results from the NJ ASK 6 or 7 were not reported, those districts were eliminated as well. There were two separate and individual spreadsheets representing Grade 6 and Grade 7, respectively. Each spreadsheet included NJ ASK Math scores for each corresponding school. The percentages of the students who scored Proficient or Advanced Proficient were added together and coded as (P + AP). Finally, the data were imported into IBM's SPSS statistical software for analyses.

Instrumentation

Instrumentation for this study included school-level percentages of students who scored Proficient and above on the 2010 NJ ASK 6 and 7 in Mathematics. This study sought to determine the predictability of the 2010 NJ ASK 6 and 7 percentage of students who score Proficient and above explained by community and school-level teacher variables.

Reliability

The NJ ASK Grade 3-8 Technical Report of 2010 stated the following:

> In reading this technical report, it is critical to remember that the testing program does not exist in a vacuum; it is not just a test. It is one part of a complex network intended to help schools focus their energies on dramatic improvement in student learning. NJ ASK is an integrated program of testing, accountability, and curricular and instructional support. It can only be evaluated properly within this full context (New Jersey Department of Education, 2010, p. 1). August 6, 2012, Governor Christie signed into law the TEACHNJ Act which mandated the implementation of a teacher evaluation reform called AchieveNJ. According to the New Jersey Department of Education (NJDOE) Technical Report for NJ ASK (2010), New Jersey's state-required assessment program was designed to measure the extent to which all students at the elementary-, middle-, and secondary-school levels have attained New Jersey's CCCS (NJDOE, 2010, p. 3). This reform uses results from NJ ASK to make decisions about students, teachers, and

educational leaders. As stated above, the NJDOE suggests viewing NJ ASK scores within a "full context" and clearly notes that the results do not exist in “a vacuum.” AchieveNJ and its use of SGP’s is doing quite the opposite.

The SGP score is found by comparing a student’s growth on the NJ ASK to the growth made by that student’s academic peers. Principals are accountable for schoolwide SGP data if enough tested grades and subjects are taught in their school. The TEACHNJ Act connects the earning and retention of tenure to the results of a teacher or principal’s annual summative evaluation, which is based heavily on NJ ASK test results. If any teacher, principal, or assistant principal is rated ineffective or partially ineffective in two consecutive years, the employee may be charged with inefficiency and result in loss of tenure. Aside from evaluation reform, school leaders have been using NJ ASK scores to "stream students into basic skills instruction and Title I programs (elementary and middle school) and recommend remedial high school course sequences, partially or totally depending on the district, on state results" (Tienken, 2008, p. 56).

The New Jersey Department of Education is required by federal law to ensure that the instruments it uses to measure student achievement for school accountability provide reliable results. Reliability is the degree to which a test consistently measures what it is measuring. The more reliable a test is, the more confidence we can have that the scores obtained from the test are essentially the same scores that would be obtained if the test were re-administered to the same test takers at another time or by a different person. If a test is unreliable, then scores will likely be quite different every time the test is administered (Gay, Mills, & Airasian, 2009, p. 158).

The technical term for the amount of error present in the individual student test scores reported by SEA personnel is the standard error of measurement (SEM). Tienken (2010, citing Harville, 1991) explained, “The SEM is an estimate of the amount of error one must consider when interpreting a test score. The SEM describes how far the reported result may differ from a student's true score" (p. 6). School and district leaders set internal cut-scores, linked to statewide test results, for entrance into specialized programs such as Title I basic skills, gifted education, and differentiated high school curricula (Booher-Jennings, 2005). The NJDOE Technical Report made it known that the results of the NJ ASK 6-8 were reliable and that the standard error of measurement (SEM) was reasonable (NJDOE, 2011, p. 112).

Pereira (2011) states that the theoretical foundation for NJ ASK assessments was classical test theory (CTT). Classical test theory assumes that each observed score (X) contains a True component (T) and an Error component (E). According to de Klerk (2008), when measuring a psychological construct, unsystematic errors occur. The errors could be anything from human distractions from outside the testing situation, physical well-being of the candidate or good/bad luck. These influences cause a range of error around the True score, making the True score the average score. Taking a person's average scores on the same test, given that they took the test an infinite number of times, would be the only way in which one may obtain a person's True score (de Klerk, 2008).

The New Jersey Ask Technical Report of 2010 estimated the consistency of individual student performance using Cronbach's coefficient alpha. According to the NJDOE Technical Report for NJ ASK (2010), coefficient alpha is the proportion of total raw score discrepancy that may be attributed to a student's true score variance. Reliability coefficients should be as close to 1.00 as possible. As you can see from the table below, both 6^{th} and 7^{th} grade Cronbach's coefficient alpha scores are close to 1.00 with .91 and .92, respectively.

Table 1

2010 Coefficient Alpha and SEM by Grade and Content Area

Grade	N-count	Cronbach Alpha	SEM
3	101424	0.91	3.24
4	101676	0.90	3.27
5	102501	0.92	2.95
6	**102388**	**0.91**	**3.07**
7	**102590**	**0.92**	**3.19**
8	102059	0.92	3.17

Validity

"Validity refers to the degree to which a test measures what it is supposed to measure and, consequently, permits appropriate interpretation of scores. Validity is, therefore, 'the most fundamental consideration in developing and evaluating tests (American Psychological Association, 1999, p. 9). When we test, we test for a purpose, and our measurement tools must help us achieve that purpose" (Gay et aI., 2009, p. 151).

When evaluating assessment validity, research generally looks at four different measures: content validity, criterion-related validity, construct validity, and consequential validity.

- Content Validity – Compares content of the test to the domain being measured and the purpose is to what extent this test represents the general domain of interest
- Criterion-Related Validity – Correlates scores from one instrument of scores on a criterion measure, either at the same (concurrent) or different (predictive) time. The

purpose is to measure to what extent this test correlates highly with another test?

- Construct Validity – Collects convergent, divergent, and content-related evidence to determine that the presumed construct is what is being measured. The purpose is to measure to what extent this test reflects the construct it is intended to measure?
- Consequential Validity – Observes and determines whether the test has adverse consequences for test takers. The purpose is to measure to what extent the test creates harmful consequences for the test taker. (Gay et aI., 2009 p. 151)

Data Analysis

I examined the data to decide whether the dependent variables, NJ ASK 6 Math and NJ ASK 7 Math were normal. The data needed then to be analyzed for skewness. This measures the degree to which the majority of scores in a frequency distribution are located at one end of the scale of measurement (Hinkle, Wiersma, & Jurs, 2003). I performed analyses of skewness and created histograms for this process. A normal distribution is symmetrical, with approximately the same number of extreme scores at each end of the distribution (Gay, Mills, & Airasian, 2012). The NJ ASK 6 and 7 results met the assumption of normality with skewness coefficients of less than +-1.000.

After evaluating the normality, I ran simultaneous multiple regression models that included all of the independent variables in the study. A correlation coefficient matrix was created that included all of the independent variables. This matrix allowed me to recognize the variables that were potentially statistically significant, insignificant, and had potential for multi-collinearity. The strength of the variable and the direction of the relationship between the dependent variables and the independent variables were the focus of this process.

If two of the variables were highly related, there was a chance that there would be issues with the calculations as to the predicative power of the regression models (Turnamian, 2012). If variables were statistically insignificant, they were removed from the model. Closely related variables, based on the VIF statistic, were eliminated as well and not included in the later hierarchical regression models. The chosen predictor variables should have low correlations among themselves but be highly correlated with the criterion variable (Hinkle, Wiersma, & Jurs, 2003). This process of elimination continued until I arrived at a set of predictor variables that maximized *R* squared without exceeding multicollinearity limits.

Once the statistically significant predictor variables were identified, the next step in the process was to rank the variables that qualified in order from highest beta value to lowest beta value. This rank order was used to run hierarchical regression models which allowed me to identify how much influence each specific variable had on the dependent variable. Hierarchical models were run for both the 6^{th} and 7th grades, and particular attention was paid to the *R* and *R* squared change values. The model of best fit for each grade was chosen based on the largest *R* square, was statistically significant, and showed the most variance.

Maylone (2002) and Turnamian and Tienken (2013) utilized the fromula Ai(Xi) + Aii(Xii) + Aiii(Xiii)…+ Constant = Y. This formula was adopted here as an extension of their work and was utilized as a predictive formula in this study. Ai represents the independent variable and Xi represents the unstandardized beta value for the independent variable. Y represents the predicted percentage of students who scored Proficient or above on the NJ ASK Mathematics Grade 6 and Grade 7. Unstandardized beta values were multiplied by the assigned percentages for each independent variable identified in the model.

This algorithm was then applied to 100% of the population in a new column labeled

Predictive Model. Another column was added next to the Predictive Model column labeled Difference (Diff.) between predicted and actual percentage. The actual 2010 NJ ASK 6 and 7 percentage of students who scored Proficient or above for each school was then subtracted from the predicted percentage. The result was entered as the Diff. score. Last, the standard deviation of the differences was calculated for the two chosen models and entered at the bottom of each Difference column.

Chapter Summary

This study used a correlational, cross-sectional explanatory research design with quantitative methods. This study was of a quantitative nature, utilizing simultaneous and hierarchical regression models. Correlational research deals with collecting data to determine whether, and to what degree, a relation exists between two or more quantifiable variables (Gay, Mills, & Airasian, 2012).

I used both a simultaneous and hierarchical multiple regression model for the study. I used a predictive, explanatory non-experimental research study that builds on the work of Turnamian (2012) and Maylone (2002). Hierarchical multiple regression models were used to determine the extent to which out-of-school variables had a statistically significant influence on a school's 2010 6th and 7th grade NJ ASK percentage of students scoring Proficient or above in Mathematics.

The review of the literature suggested that there were certain independent variables that influenced student performance as evidenced by standardized assessments. There were 21 independent variables utilized in this study, 18 from the census data and three at the school level. Data were obtained from the United States Census Bureau's American Factfinder website and the NJDOE website. The dependent variables for this study were students scoring Proficient or above in the 2010 6th and 7th grade NJ ASK Mathematics assessment. The population for this study was the approximately 311 school districts in grade six and 301 school districts in Grade 7 within the state of New Jersey. All districts that met specific criteria were included in the study; therefore, there were no regional, vocational, charter, or districts with multiple 6th and 7th grade schools added to this study. The study involved school districts that participated in the 2010 NJ ASK Mathematics for the sixth and seventh grades. The data for this study were taken from two primary sources, the American Factfinder website and the NJDOE website.

CHAPTER IV

RESULTS

My purpose for this study was to determine the predictive accuracy of family and community demographic variables found in the U.S. Census data on the percentage of students at the school level who scored Proficient or above on the NJ ASK 6 and 7 Mathematics section when controlling for teacher mobility and level of teacher education. By focusing primarily on out-of-school variables, this study produced evidence that supports the assumption that too much emphasis is being put on standardized testing when evaluating teachers and school quality. Simultaneous and hierarchical regression models were used to analyze which combination of independent variables best predicted how students performed on the 2010 sixth and seventh grade NJ ASK in Mathematics.

Research Questions

The four research questions that drove this study were:

1. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
2. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
3. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?
4. Which combination of family and community variables can accurately predict a

school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?

Summary of Findings for the Dependent Variables

For the purpose of this study, the 2010 sixth and seventh grade NJ ASK in Mathematics percentage of students scoring Proficient or above were the dependent variables. The following 18 out-of-school variables and three school level variables were the independent variables: The independent variables included in this study are listed below:

- Percentage of people employed
- Percentage of households making under $25,000
- Percentage of households making under $35,000
- Percentage of households making more than $200,000
- Percentage of families making less than $25,000
- Percentage of families making less than $35,000
- Percentage of families making more than $200,000
- Percentage of families in poverty for 12 months
- Percentage of female households in poverty
- Percent of all people under poverty
- Percentage of male-only households, no females
- Percentage of female-only households, no males
- Percentage of lone-parent households (total)
- Percentage of population with less than 9th grade education
- Percentage of population with no high school diploma
- Percentage of population with some college

- Percentage of population with a bachelor’s degree
- Percentage of population with an advanced degree
- Percentage of teachers within a school that hold a bachelor’s degree
- Percentage of teachers within a school that hold a master’s degree
- Percentage of faculty within a school who entered or left the school during the school year

Table 1

Names and Labels of Independent Variables

Variable	Label
Percentage of Population Employed	EmployStatus
Percentage of Households Under $25,000	HS Under 25k
Percentage of Households Under $35,000	HS Under 35k
Percentage of Households over $200,000	HS Over 200k
Percentage of Families Under $25,000	Per Fam Under 25k
Percentage of Families Under $35,000	Per Fam Under 35k
Percentage of Families Over $200,000	Per Fam Over 200k
Percentage of Families in Poverty for 12 Months	All Fams Pov 12 mnths
Percentage of Female Households in Poverty	Female House Pov
Percentage of All People Under Poverty	All Under Poverty

Percentage of Male-Only Households, No Females	Lone-parent Male
Percentage of Female-Only Households, No Males	Lone-parent Female
Percentage of Lone-Parent Households	Lone-parent Household (total)
Percentage of Population with Less than 9^{th} Grade	Less than 9^{th} Grade
Percentage of Population with No High School	No HS
Percentage of Population with Some College	Some College
Percentage of Population with Bachelor's Degrees	BA
Percentage of Population with Advanced Degrees	Advanced Degree
Percentage of Teachers with Bachelor's Degrees	BABS
Percentage of Teachers with Master's Degrees	MAMS
Percentage of Faculty who entered or left during the school year	Mobility

Procedure

For each grade level, the following three-step procedure was used to identify the significant independent variables and their relative predictive strengths. The first step in the process was to run the descriptive statistics for all 21 independent variables, including Pearson correlation coefficients. The correlation coefficients helped identify the strength and direction of the relationship between the independent variables and the dependent variable. The correlation coefficient also assisted in identifying the relationships of the independent variables amongst themselves. Simultaneous multiple regressions were run which included all 21 independent variables. The next step was to run a series of multiple regressions with the intent of removing statistically insignificant or high multicollinearity variables throughout the process. As variables were removed, new regression models were run, and the researcher paid particular attention to the *R* square for the new model. This process continued until only variables that were statistically significant and the largest *R* square were included. This process resulted in creating the strongest model of best fit for each grade level.

Hierarchical regression models were run as a last step. Beta values for each independent variable in the model were put into rank order from highest to lowers value and entered into SPSS software in that same order. Important statistics were identified from the SPSS program. The ANOVA table offered the statistical significance of the model, the Model Summary Table identified the *R* Square and the *R* square values for model, standardized and unstandardized beta values were acknowledged, tolerance and the variance inflation factor (VIF) were noted for each variable in the model. The last things identified were collinearity statistics and the standard error of estimate for the model of best fit.

Grade 6 Mathematics

I calculated the means and standard deviations for the dependent and independent variables used in the regressions (see Table 2). The average percentage of students who achieved Proficient or above was about 76% with a standard deviation of roughly 13. The mean percentage of families employed was 72%, with just about 13% of households with incomes under $25,000, 20% of households had incomes under $35,000, and 11% of households had incomes over $200,000. A total of 21% of female households were in poverty. Almost 1% of families were headed by lone-male parent, 5% were headed by lone-female parents, and a total of about 6% of households were headed by lone parents, either male or female. Around 7% of all families were in poverty for 12 months. About 7% of families were under $25,000, 13% were under $35,000, and 13% were over $200,000. Approximately 6% of all people were under poverty. Approximately 23% of the community held bachelor's degrees and about 14% held advanced degrees. About 3% of people had less than a 9th grade education, 9% had no high school education, and 17% attended some college. With respect to the school level variables, approximately 57% of teachers held bachelor's degrees, while about 42% of teachers held master's degrees. Faculty mobility was less than 5%.

Table 2.

Grade 6 Mathematics Descriptive Statistics Table

	Mean	Std. Deviation	*N*
P + AP Total MATH	76.6154	13.62017	311
Employ Status	72.3084	10.45773	311
HS Un 25k	13.4100	7.15500	311
HS Un 35k	20.3701	9.66903	311
HS ov 200k	11.1852	10.86492	311
per fam U 25k	7.6269	6.16391	311
per fam U 35k	13.0762	8.74669	311

per fam ov 200k	13.7463	13.18591	311
All Fams Pov 12 mnths	7.0367	7.03220	311
Female House Pov	21.1920	19.25576	311
All People under Pov	6.338080	4.7624582	311
Lone- Parent Male	1.6707	1.39828	311
Lone-Parent Female	5.2315	3.02261	311
Lone- Parent household (total)	6.8846	3.64284	311
Less than 9th grade	3.4743	2.88254	311
No HS	9.0952	5.62696	311
Some College	17.1138	3.96862	311
BA	23.3768	8.99329	311
Advanced Degree	14.0013	9.07310	311
BABS	56.9749	15.52939	311
MAMS	42.2968	15.39244	311
MOBILITY	4.6643	8.18762	311

Next, I calculated descriptive statistics for the dependent variable, NJ ASK Math Grade 6, to determine if the data met the assumptions of normality. Table 3 displays the descriptive statistics for the dependent variable. Figure 1 shows the histogram for the distribution of the data. Figure 2 shows a stem and leaf plot for the same data with some outliers. Because the skewness did not exceed the +- 1.000 threshold, I did not remove the outliers. The mean percentage of students scoring Proficient and Advanced Proficient was approximately 76, with a median of 79 and a standard deviation of 13. The skewness of the scores was -.971 and the kurtosis was .669.

Table 3.

Grade 6 Mathematics Descriptive Statistics for the Dependent Variable Table

Descriptives

			Statistic	Std. Error
P + AP Total MATH	Mean		76.6154	.77233
	95% Confidence Interval for Mean	Lower Bound	75.0958	
		Upper Bound	78.1351	

	5% Trimmed Mean	77.5058	
	Median	79.3000	
	Variance	185.509	
	Std. Deviation	13.62017	
	Minimum	27.40	
	Maximum	100.00	
	Range	72.60	
	Interquartile Range	17.80	
	Skewness	-.971	.138
	Kurtosis	.669	.276

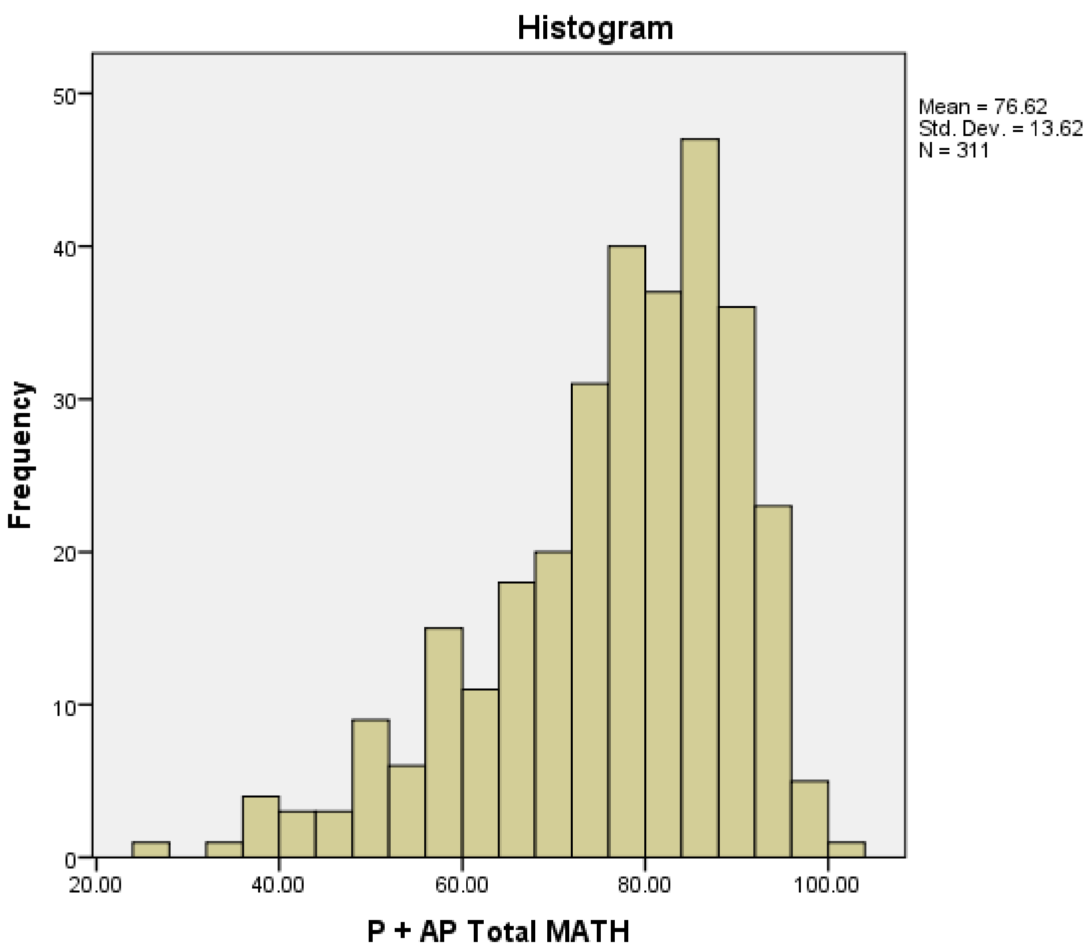

Figure 1. Histogram of Grade 6 Mathematics NJ ASK passing percentages.

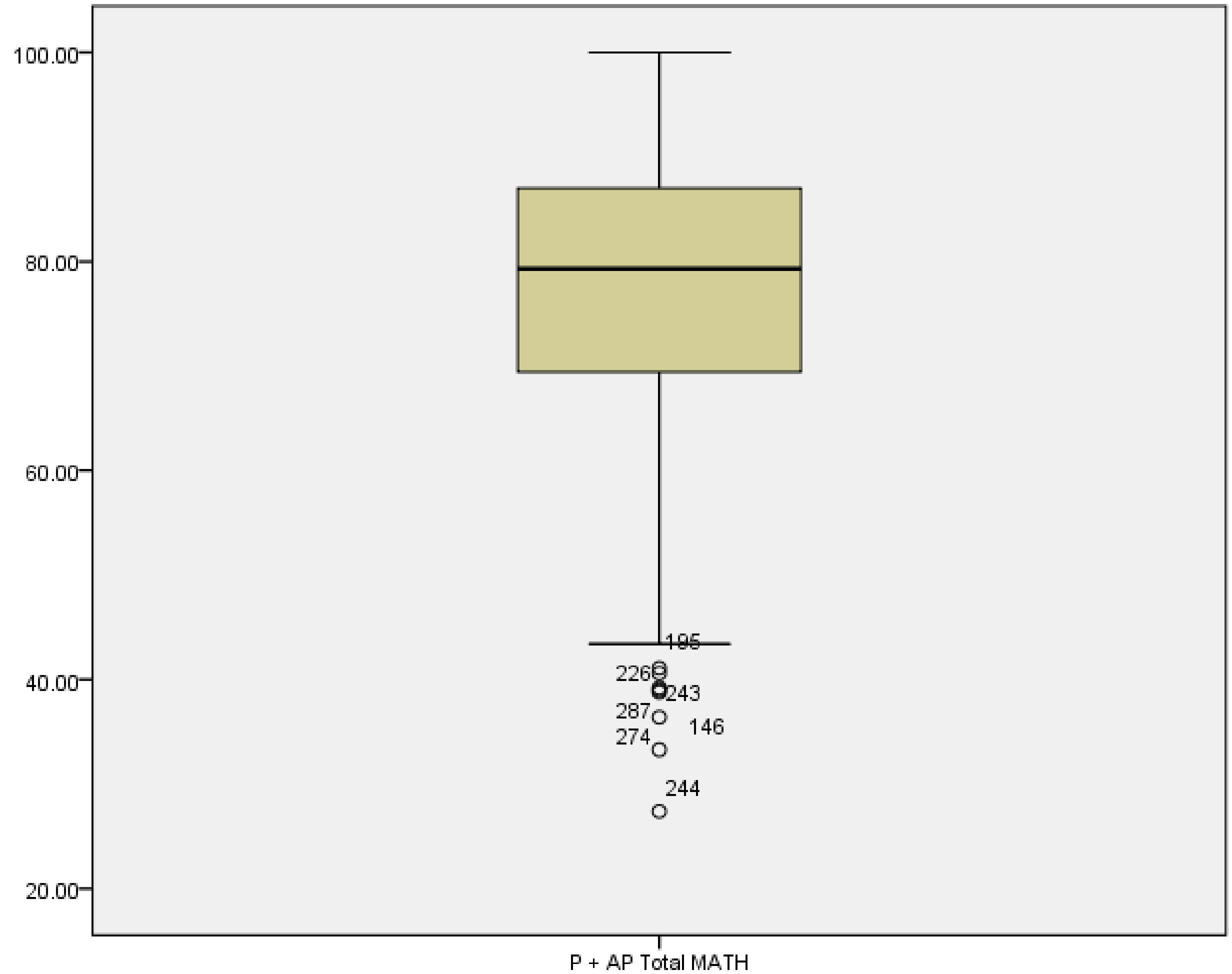

Figure 2. Stem and leaf plot of Grade 6 Math NJ ASK passing percentages.

Analysis of the skewness revealed that the data met the assumption of normality, as the skewness figures are within acceptable limits (Field, 2009). Therefore, the researcher used the data to move forward with simultaneous regression.

Simultaneous Multiple Regression

I ran the first simultaneous regression model with all independent variables included in the model. The Model Summary and the ANOVA tables for the first simultaneous regression model are reflected in Table 4. The ANOVA results show that the regression was statistically significant ($F(21,289)=16.246$, $p = .000 < .05$) and that the R squared for this regression is .541.

Table 4.

Grade 6 Mathematics Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.736[a]	.541	.508	9.55294

a. Predictors: (Constant), MOBILITY, BA, Female House Pov, Lone-Parent Male, Lone- Parent Female, Employ Status, MAMS, Less than 9th grade, Some College, HS Un 25k, per fam ov 200k, per fam U 35k, Advanced Degree, All Fams Pov 12 mnths, HS ov 200k, No HS, All People under Pov, per fam U 25k, HS Un 35k, Lone- Parent household (total), BABS

Table 5.

Grade 6 Mathematics ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31134.049	21	1482.574	16.246	.000[b]
	Residual	26373.736	289	91.259		
	Total	57507.786	310			

a. Dependent Variable: P + AP Total MATH

b. Predictors: (Constant), MOBILITY, BA, Female House Pov, Lone-Parent Male, Lone-Parent Female, Employ Status, MAMS, Less than 9th grade, Some College, HS Un 25k, per fam ov 200k, per fam U 35k, Advanced Degree, All Fams Pov 12 mnths, HS ov 200k, No HS, All People under Pov, per fam U 25k, HS Un 35k, Lone-Parent household (total), BABS

The coefficients table (Table 6) showed that the statistically significant variables in the regression were Per Fam U 25k, No HS, and Some College. The beta values for those variables are as follows: Per Fam U 25k (-.356), No HS (-.380), and Some College (-.147).

Table 6.

Grade 6 Mathematics Coefficients Table

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	170.279	46.807		3.638	.000		
	Employ Status	-.096	.068	-.074	-1.404	.162	.578	1.729
	HS Un 25k	.247	.364	.130	.679	.498	.043	23.064
	HS Un 35k	.010	.263	.007	.039	.969	.046	21.944
	HS ov 200k	.222	.175	.177	1.270	.205	.081	12.274
	per fam U 25k	-.831	.368	-.376	-2.257	.025	.057	17.510
	per fam U 35k	.196	.213	.126	.918	.360	.084	11.839
	per fam ov 200k	-.084	.113	-.081	-.740	.460	.132	7.578
	All Fams Pov 12 mnths	-.399	.288	-.206	-1.384	.168	.072	13.972
	Female House Pov	.071	.042	.100	1.684	.093	.451	2.219
	All People under Pov	-.012	.428	-.004	-.028	.978	.071	14.142
	Lone-parent Male	.655	1.672	.067	.392	.695	.054	18.562
	Lone-parent Female	-.454	1.723	-.101	-.264	.792	.011	92.091
	Lone-parent household (total)	.142	1.702	.038	.084	.933	.008	130.612
	Less than 9th grade	.215	.446	.046	.483	.630	.178	5.609
	No HS	-.919	.353	-.380	-2.601	.010	.074	13.436
	Some College	-.503	.232	-.147	-2.165	.031	.346	2.889
	BA	.076	.156	.050	.483	.630	.149	6.719
	Advanced Degree	-.088	.170	-.059	-.519	.604	.124	8.042
	BABS	-.712	.453	-.811	-1.570	.118	.006	168.337
	MAMS	-.711	.457	-.804	-1.556	.121	.006	168.041
	MOBILITY	.040	.069	.024	.574	.567	.918	1.089

a. Dependent Variable: P + AP Total MATH

The above initial simultaneous regression table was utilized by the researcher to begin the process of eliminating those independent variables which are insignificant and/or present multicollinearity. The independent variables with high VIF values were cross-referenced with the correlation table found in Appendix B. These variables were compared to other independent variables to determine how strong their correlations were with each other. Those independent variables showing high correlations (close to 1.00) were examined to determine which one better influenced the passing percentage of Proficient and Advanced Proficient students on the Grade 6 Mathematics New Jersey Assessment of Skills and Knowledge. The independent variable with less influence was eliminated. This process was repeated until the regression model included only variables that were statistically significant and the largest *R* square was identified. Using this process, I identified the strongest model for each grade level.

Correlational Coefficients for 2010 Grade 6 NJ ASK Math

The Pearson correlation coefficients measured the degree of association between each variable. The correlation coefficient values range from -1.00 to 1.00. To interpret correlation coefficient values the following scale was applied: .8 and above is strong, .6 - .8 is moderate strong, .4 - .6 is moderate, .2 - .4 is weak, and 0 - .2 is very little, if any. Positive and negative signs are ignored when determining the strength of coefficients. A positive value implies a positive relationship and a negative implies a negative relationship between the independent and dependent variables. The significance for all of the pairings was determined to be 0.000. This indicated all the relationships of all the predictors to be significant, with a very low probability that the relationships are randomly associated.

The following independent variables with their correlations were the three strongest correlations that were statistically significant ($p < .05$) to NJ ASK 6 Math. The variable percent of families with no high school diploma had a correlation of -.644 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families with no high school diploma increases, the percentage of students scoring Proficient or higher on the 2010 NJ ASK 6 Math decreases. The variable percentage of families making $25,000 or less had a correlation of -.626 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $25,000 or less increases, the percentage of students scoring Proficient or higher on the 2010 NJ ASK Math decreases. The variable percentage all people under poverty had a correlation of -.613 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of all people under poverty increases, the percentage of students scoring Proficient or higher on the 2010 NJ ASK Math decreases.

Table 7.

Correlation Table for 2010 Sixth Grade Math and the Three Strongest Correlations

Correlations

		P + AP Total MATH	No HS	per fam U 25k	All People under Pov
P + AP Total MATH	Pearson Correlation	1	-.644**	-.626**	-.613**
	Sig. (2-tailed)		.000	.000	.000
	N	311	311	311	311
No HS	Pearson Correlation	-.644**	1	.713**	.703**
	Sig. (2-tailed)	.000		.000	.000
	N	311	311	311	311
per fam U 25k	Pearson Correlation	-.626**	.713**	1	.928**
	Sig. (2-tailed)	.000	.000		.000
	N	311	311	311	311
All People under Pov	Pearson Correlation	-.613**	.703**	.928**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	311	311	311	311

**. Correlation is significant at the 0.01 level (2-tailed).

Results and Interpretation of Hierarchical Regression Model for NJ ASK 6 Math Percentages

A hierarchical linear regression analysis of the remaining independent variables and the dependent variable was conducted. Three models were created. The hierarchical linear regression model estimated the impact of three models on the 2010 NJ ASK 6 Math percentage of students who scored Proficient or above, which was the dependent variable. The models were assessed at the .05 level of significance, which is most commonly used in social science research for significance with an alpha of .05, where $p < .05$ (Gay, Mills, & Airasian, 2012). Table 9 shows the variables that were put into the hierarchical regression model in their order of strength, using the Entered method.

Table 8.

Variables Entered/Removed for Sixth Grade Math

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	No HS[b]	.	Enter
2	per fam U 25k[b]	.	Enter
3	Some College[b]	.	Enter

a. Dependent Variable: P + AP Total MATH

b. All requested variables entered.

For Model l the predictor percentage of population with no high school education reports an *R* Square of .414 and explained 41% of the variance in the dependent variable in that model. In Model 2 the predictor percentage of per family income less than $25,000 was added and reports an *R* Square of .471. Therefore, Model 2 demonstrates the combination of predictors: percentage of population with no high school education and per family income less than $25,000 explains 47% of the variance in the dependent variable. The *R* Square change from Model 1 to

Model 2 was .057, which shows that 5.7% of the variance was now added by the % under $25,000. The *R* Square change was statistically significant *F*(1,308) = 32.999, *p* = .000. In Model 3 the predictor percentage of population with some college education is added and reports an *R* Square of .509. Therefore, Model 3 demonstrates the combination of predictors: percentage of population with no high school education and per family income less than $25,000 and percentage of population with some college education explains 51% of the variance in the dependent variable. The *R* Square change from Model 2 to Model 3 was .038, which shows that 3.8% of the variance was now added by the % with college. The *R* Square change was statistically significant *F*(1,307) = 23.814, *p* = .000. Of the three models, Model 3 explains the greatest amount of variance in the dependent variable.

Interpretation of Two-Way ANOVA for Hierarchical Regression Model for 2010 NJ ASK 6 Math

This two-way ANOVA estimates the impact of three main effects on the dependent variable in the model of best fit. The ANOVA demonstrates the chosen model, Model 3, is statistically significant at the .000 level, *F* = 106.170, *df* = 3, 307.

Coefficient for 2010 NJ ASK 6 Math

The coefficient table within the hierarchical models demonstrate how each predictor influences the dependent variable. In Model 1 the predictor percentage of population with no high school education reports a beta = -.644. It is statistically significant at the .000 level, *t* = -14.789. The beta is negative, which means as the percentage of population with no high school education increases, the 2010 NJ ASK 6 Math percentage of students scoring Proficient and above decrease. In Model 2, the predictor percentage of population with no high school education decreases in power from a beta of -.644 to a beta = -.402. It is significant at the .000 level, *t* = -6.801. The predictor added in Model 2, the percentage of per family under $25,000 income level, reports a beta = -.339. It is significant at the .000 level, *t* = -5.744. The negative beta for the percentage of per family under %25,000 income indicates that as percentage of per family income under %25,000 increases, the 2010 NJ ASK 6 Math percentage of students scoring Proficient or above decrease. In Model 3, the predictor percentage of population with no high school education decreases in power again with a new of beta -.366. It is significant at the .000 level, t = -6.365. The predictor percentage of per family income under %25,000 loses a bit of power with a beta = -.317. It is significant at the .000 level, *t*= -5.546. The predictor added in Model 3, percentage of population with some college education, reports a beta of -.202. It is significant at the .000 level, *t* = -4.880.

Table 9

Standardized Coefficient Betas and Tolerance for Hierarchical Regression Model for 2010 NJ ASK 6 Math

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	90.789	1.126		80.600	.000
	No HS	-1.558	.105	-.644	-14.789	.000
2	(Constant)	91.182	1.074		84.865	.000
	No HS	-.973	.143	-.402	-6.801	.000
	per fam U 25k	-.750	.131	-.339	-5.744	.000
3	(Constant)	101.909	2.430		41.932	.000
	No HS	-.886	.139	-.366	-6.365	.000
	per fam U 25k	-.701	.126	-.317	-5.546	.000
	Some College	-.695	.142	-.202	-4.880	.000

a. Dependent Variable: P + AP Total MATH

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	No HS	1.000	1.000
2	No HS	.492	2.033
	per fam U 25k	.492	2.033
3	No HS	.484	2.067
	per fam U 25k	.489	2.046
	Some College	.929	1.077

a. Dependent Variable: P + AP Total MATH

The VIF for all predictors in all the models fell below the threshold of 5, which would indicate the models do not have a multicollinearity problem. The model with more than one predictor and the lowest VIF rating was Model 2. In Model 2, both predictors reported a VIF of 2.033. Model 3 had no high school education and per family under $25,000 slightly higher in VIF but still very close to a VIF of 2. The addition of the some college education variable had a VIF under 2 reported at 1.077. All VIFs were low and support little to no multicollinearity in each model.

Grade 7 Mathematics

I calculated the means and standard deviations for the dependent and independent variables used in the regressions. The mean percentage of students who achieved Proficient or above was approximately 68, with a standard deviation of approximately 15. The mean percentage of families employed was 72%, with approximately 14% of households under $25,000, 21% of households under $35,000, and 10% of households over $200,000. A total of 21% of female households were in poverty, 6% of all people were under poverty. Also, 1% of families were run by lone male parent, 5% were run by lone female parents, and a total of about 7% of households were run by lone parents. Approximately 7% of all families were in poverty for 12 months. About 8% of families were under $25,000, 13% were under $35,000, and 13% were over $200,000. About 3% of people had less than a ninth grade education, 9% had no high school education, and just fewer than 17% attended some college. Related to school level variables, approximately 55% of teachers held bachelor's degrees and about 43% of teachers held master's degrees. Approximately 23% of the community held bachelor's degrees and about 13% held advanced degrees. Faculty mobility was less than 5%.

Table 10

Grade 7 Mathematics Descriptive Statistics Table

	Mean	Std. Deviation	*N*
P + AP Total MATH	68.49635	15.761213	301
Employ Status	72.656	10.0618	301
HS Un 25k	14.025	7.4614	301
HS Un 35k	21.140	9.9809	301
HS ov 200k	10.658	10.5654	301
per fam U 25k	8.0656	6.68233	301
per fam U 35k	13.613	9.3530	301
per fam ov 200k	13.248	12.9575	301
All Fams Pov 12 mnths	7.374	7.4140	301
Female House Pov	21.100	17.7543	301
All People under Pov	6.681	5.2590	301
Lone-parent Male	1.697	1.4027	301
Lone-parent Female	5.407	3.1465	301
Lone-parent household (total)	7.085	3.8574	301
Less than 9th grade	3.910	3.4839	301
No HS	9.716	6.1760	301
Some College	16.958	4.0028	301
BA	23.098	8.8160	301
Advanced Degree	13.659	8.8001	301
BABS	55.559	14.8556	301
MAMS	43.568	14.7033	301
MOBILITY	4.671	8.2585	301

Next, I calculated descriptive statistics for the dependent variable, NJ ASK Math Grade 7, to determine if the data met the assumptions of normality. Table 13 displays the descriptive statistics for the dependent variable. Figure 3 shows the histogram for the distribution of the data. Figure 4 shows a stem and leaf plot for the same data. The mean percentage of students scoring Proficient and Advanced Proficient was approximately 68, with a median of 70 and a standard deviation of 15. The skewness of the scores was -.579 and the kurtosis was -.286.

Table 11

Grade 7 Mathematics Descriptive Statistics for the Dependent Variable Table

Descriptives

			Statistic	Std. Error
P + AP Total MATH	Mean		68.496	.9084
	95% Confidence Interval for Mean	Lower Bound	66.708	
		Upper Bound	70.284	
	5% Trimmed Mean		69.210	
	Median		70.200	
	Variance		248.416	
	Std. Deviation		15.761	
	Minimum		22.000	
	Maximum		96.000	
	Range		74.000	
	Interquartile Range		24.000	
	Skewness		-.579	.140
	Kurtosis		-.286	.280

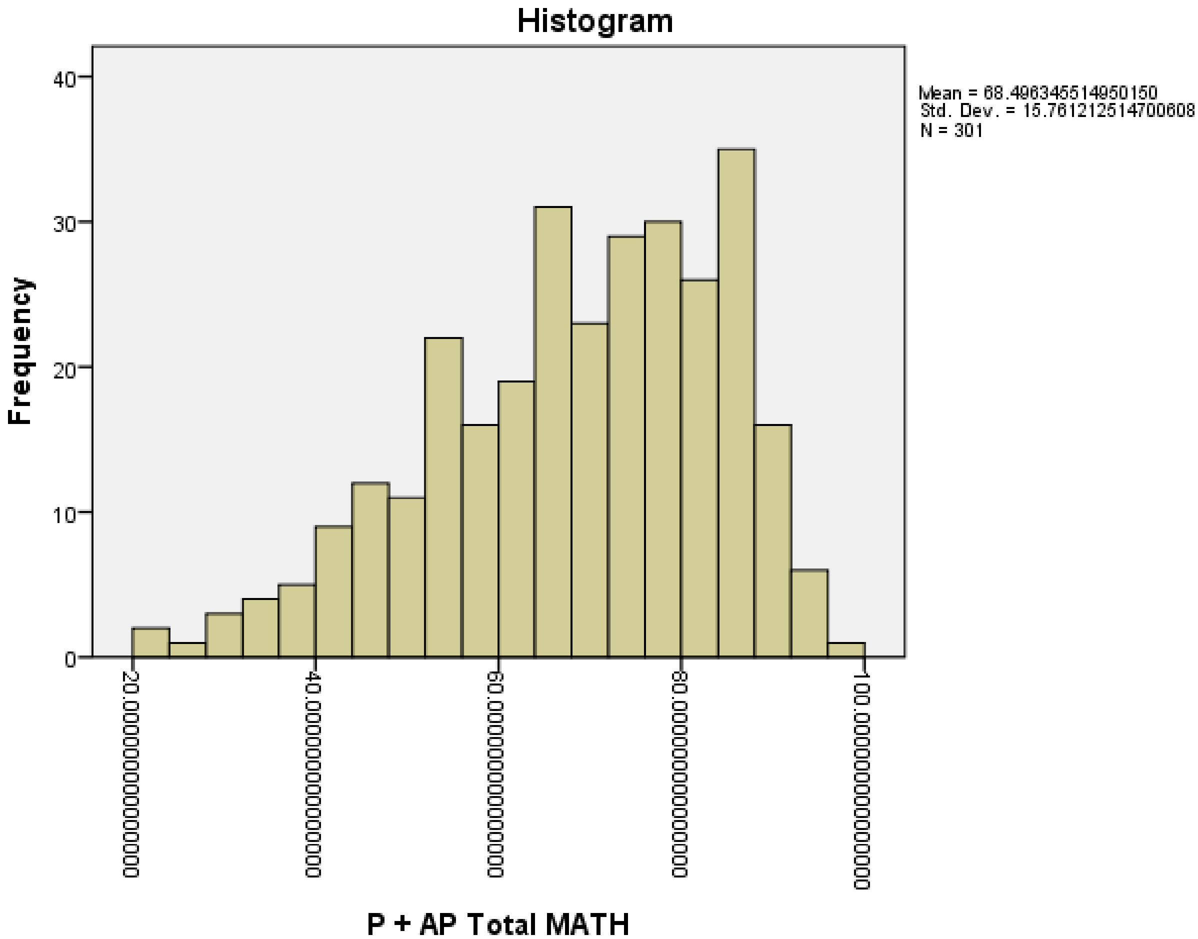

Figure 3. Histogram of Grade 7 Mathematics NJ ASK percentages Proficient and above.

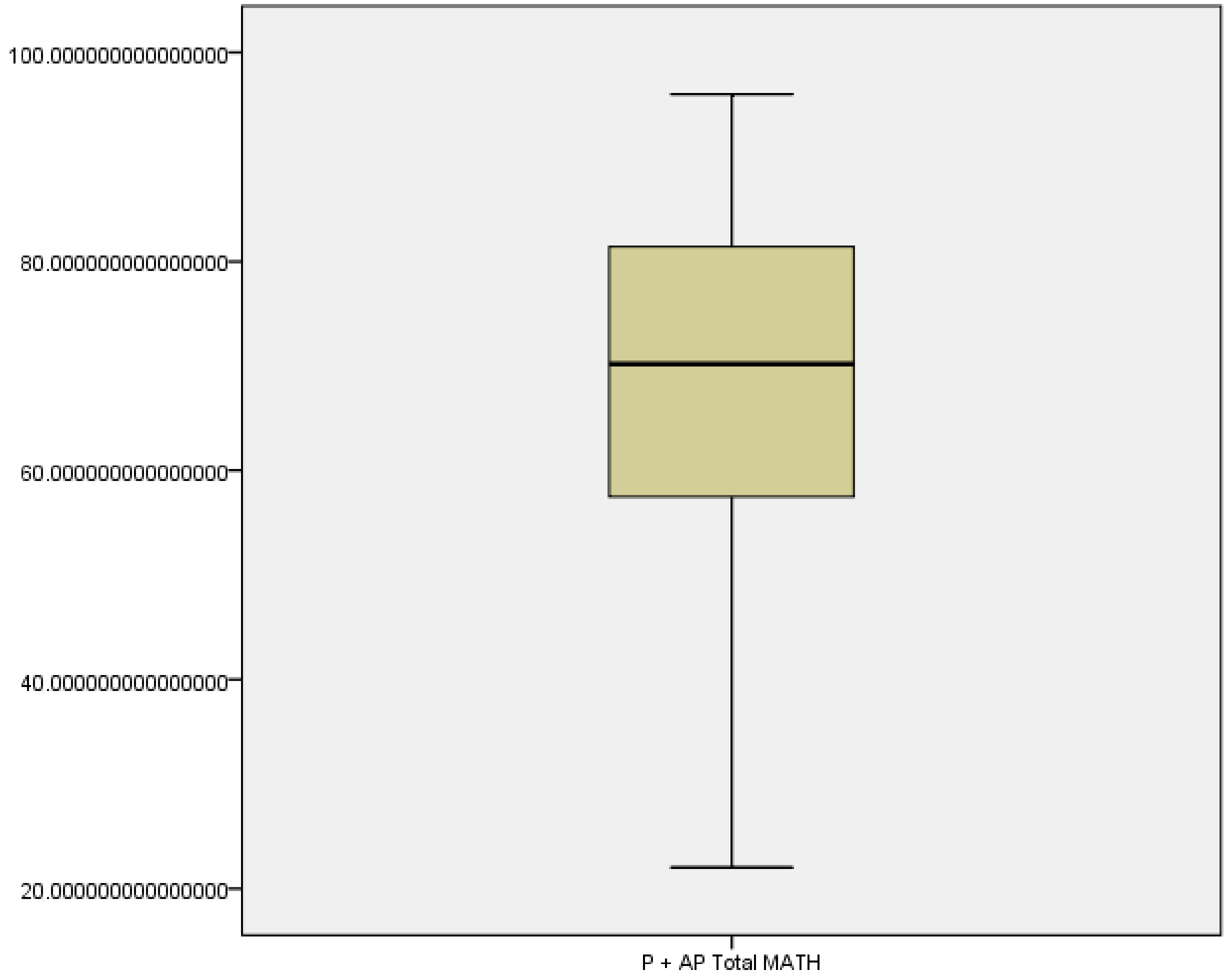

Figure 4. Stem and leaf plot of Grade 7 Math NJ ASK percentages Proficient and above.

Analysis of the skewness revealed that the data met the assumption of normality, as the skewness figures are within acceptable limits (Field, 2009). Therefore, the researcher used the data to move forward with simultaneous regression.

Simultaneous Multiple Regression

I ran the first simultaneous regression model with all independent variables included in the model. The Model Summary and the ANOVA tables for the first simultaneous regression model are reflected in Table 14. The ANOVA results show that the regression was statistically significant ($F(21,278)=21.305$, p = .000 < .05) and that the R squared for this regression is .617.

Table 12

Grade 7 Mathematics Model Summary

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate
1	.785[a]	.617	.588	10.135006

a. Predictors: (Constant), MOBILITY, BA, Female House Pov, Lone-parent Male, Employ Status, Less than 9th grade, MAMS, Lone-parent Female, Some College, per fam ov 200k, HS Un 25k, per fam U 35k, Advanced Degree, All Fams Pov 12 mnths, HS ov 200k, No HS, All People under Pov, per fam U 25k, HS Un 35k, BABS, Lone-parent household (total)

Grade 7 Mathematics ANOVA Table

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	45956.730	21	2188.416	21.305	.000[b]
	Residual	28555.699	278	102.718		
	Total	74512.429	299			

a. Dependent Variable: P + AP Total MATH

b. Predictors: (Constant), MOBILITY, BA, Female House Pov, Lone-parent Male, Employ Status, Less than 9th grade, MAMS, Lone-parent Female, Some College, per fam ov 200k, HS Un 25k, per fam U 35k, Advanced Degree, All Fams Pov 12 mnths, HS ov 200k, No HS, All People under Pov, per fam U 25k, HS Un 35k, BABS, Lone-parent household (total)

The coefficients table (Table 15) showed that the statistically significant variables in the regression were HS ov 200k, All People Under Pov, Less than 9th Grade, No HS, and BA. The beta values for those variables are as follows: HS ov 200k (.280), All people Under Pov (.015), Less than 9th Grade (.233), No HS (-.328), and BA (.233).

Table 13

Grade 7 Mathematics Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	36.245	46.739		.775	.439		
Employ Status	.026	.076	.016	.337	.736	.584	1.712
HS Un 25k	.096	.398	.045	.241	.810	.039	25.704
HS Un 35k	.199	.292	.126	.682	.496	.040	24.757
HS ov 200k	.418	.191	.280	2.189	.029	.084	11.891
per fam U 25k	-.692	.406	-.293	-1.705	.089	.047	21.471
per fam U 35k	.082	.237	.048	.344	.731	.070	14.385
per fam ov 200k	-.058	.121	-.047	-.475	.635	.139	7.170
All Fams Pov 12 mnths	.309	.319	.145	.967	.335	.061	16.349
Female House Pov	.085	.049	.096	1.753	.081	.462	2.163
All People under Pov	-1.134	.462	-.378	-2.455	.015	.058	17.167
Lone-parent Male	2.185	1.775	.194	1.231	.219	.055	18.107
Lone-parent Female	1.079	1.832	.215	.589	.556	.010	97.008
Lone-parent household (total)	-1.462	1.810	-.358	-.808	.420	.007	142.361
Less than 9th grade	1.054	.453	.233	2.329	.021	.138	7.263
No HS	-.837	.379	-.328	-2.206	.028	.062	16.023
Some College	-.191	.238	-.048	-.800	.425	.379	2.636
BA	.416	.173	.233	2.406	.017	.147	6.794
Advanced Degree	.069	.190	.038	.364	.716	.123	8.133
BABS	.304	.453	.287	.672	.502	.008	132.165
MAMS	.226	.457	.211	.495	.621	.008	131.796
MOBILITY	-.037	.074	-.019	-.498	.619	.915	1.093

a. Dependent Variable: P + AP Total MATH

The above initial simultaneous regression table was utilized to begin the process of eliminating those independent variables which are insignificant and/or present multicolinearity. The independent variables with high VIF values were cross-referenced with the correlation table found in Appendix B. These variables were compared to other independent variables to determine how strong their correlations were with one another. Those independent variables showing high correlations (close to 1) were examined to determine which one better influenced the passing percentage of Proficient and Advanced Proficient students on the Grade 7 Mathematics New Jersey Assessment of Skills and Knowledge. The independent variable with less influence was eliminated. This process was repeated until the regression model included only variables that were statistically significant and the largest *R* square was identified. Using this process, I identified the strongest model for each grade level.

Correlational Coefficients for 2010 7 grade NJ ASK Math

To determine the significance, strength, and direction of the relationship between each independent variable for the 2010 NJ ASK 7 Math percentage of students who scored Proficient and above, the Pearson correlational coefficient for each relationship was calculated using the SPSS software. The Pearson correlation coefficients measure the degree of association between each variable. The correlation coefficient values range from -1.00 to 1.00. To interpret correlation coefficient values, the following scale was applied: .8 and above is strong, .6 - .8 is moderate strong, .4 - .6 is moderate, .2 - .4 is weak, and 0 - .2 is very little, if any. Positive and negative signs are ignored when determining the strength of coefficients. A positive value implies a positive relationship and a negative implies a negative relationship between the independent and dependent variables. The significance for all of the pairings was determined to be 0.000. This indicated the relationships of all the predictors to be significant with a very low probability that the relationships are randomly associated.

The following independent variables with their correlations were the three strongest correlations that were statistically significant (p <.05) to NJ ASK 7 Math. The variable percent of families with a bachelor's degree had a correlation of .697 and was statistically significant at the .000 level. This is a high positive correlation, which means that as the percentage of families with a bachelor's degree increases, the percentage of students scoring proficient or higher on the 2010 NJ ASK 7 Math increases. The variable percent of families with an advanced degree had a correlation of .659 and was statistically significant at the .000 level. This is a high positive correlation, which means that as the percentage of families with an advanced degree increases, the percentage of students scoring Proficient or higher on the 2010 NJ ASK 7 Math increases. The variable percentage all households under $35,000 income had a correlation of -.654 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of all households under $35,000 income increases, the percentage of students scoring Proficient or higher on the 2010 NJ ASK Math decreases.

Table 14

Correlation Table for 2010 Seventh Grade Math and the 3 Strongest Correlations

Correlations

		P + AP Total MATH	BA	Advanced Degree	HS Un 35k
P + AP Total MATH	Pearson Correlation	1	.697**	.659**	-.654**
	Sig. (2-tailed)		.000	.000	.000
	N	301	301	301	301
BA	Pearson Correlation	.697**	1	.851**	-.717**
	Sig. (2-tailed)	.000		.000	.000
	N	301	301	301	301
Advanced Degree	Pearson Correlation	.659**	.851**	1	-.651**
	Sig. (2-tailed)	.000	.000		.000
	N	301	301	301	301
HS Un 35k	Pearson Correlation	-.654**	-.717**	-.651**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	301	301	301	301

**. Correlation is significant at the 0.01 level (2-tailed).

Results and Interpretation of Hierarchical Regression Model for NJ ASK 7 Math Percentage of Students who Scored Proficient and Above

A hierarchical linear regression analysis of the remaining independent variables and the dependent variable was conducted. Three models were created. The hierarchical linear regression model estimated the impact of three models on the 2010 NJ ASK 7 Math percentage of students who scored Proficient and above, which was the dependent variable. The models were assessed at the .05 level of significance, which is most commonly used in social science research for significance with an alpha of .05, where $p < .05$ (Gay, Mills, & Airasian, 2012). Table 15 shows the variables that were put into the hierarchical regression model in their order of strength using the Entered method.

Table 15

Variables Entered/Removed for Seventh Grade Math

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	BA[b]	.	Enter
2	per fam ov 200k[b]	.	Enter
3	HS Un 35k[b]	.	Enter

a. Dependent Variable: P + AP Total MATH

b. All requested variables entered.

For Model l the predictor percentage of population with bachelor's degree reports an *R* Square of .486 and explains 49% of the variance in the dependent variable. In Model 2 the predictor percentage of per family income over $200,000 is added and reports an *R* Square of .505. Therefore, Model 2 demonstrates the combination of predictors: percentage of population with bachelor's degree and per family income over $200,000 explains 50% of the variance in the dependent variable. The *R* Square change from Model 1 to Model 2 was .019, which shows that

1.9% of variance was now added by the % over $200,000. The R Square change was statistically significant $F(1,298) = 11.463$, $p = .001$. In Model 3 the predictor percentage of population with income under $35,000 is added and reports an *R* Square of .546. Therefore, Model 3 demonstrates the combination of predictors: percentage of population with bachelor's degree and per family income over $200,000, and percentage of population with income under $35,000 explains 55% of the variance in the dependent variable. The *R* Square change from Model 2 to Model 3 was .041, which shows that 4.1% of the variance was now added by the % under $35,000. The *R* Square change was statistically significant $F(1,297) = 26.606$, $p = .000$. Of the three models, Model 3 explains the greatest amount of variance in the dependent variable.

Interpretation of Two-Way ANOVA for Hierarchical Regression Model for 2010 NJ ASK 7 Math Percentage of Students who Scored Proficient and Above

This two-way ANOVA estimates the impact of three main effects on the dependent variable. The ANOVA demonstrates that the model of best fit, Model 3, is statistically significant at the .000 level, $F = 118.876$, $df = 3, 297$ (See Table 16).

Table 16

Two-Way ANOVA Hierarchical Regression Model for 2010 NJ ASK Math 7

ANOVA[a]

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	36209.004	1	36209.004	282.560	.000[b]
	Residual	38315.742	299	128.146		
	Total	74524.746	300			
2	Regression	37628.226	2	18814.113	151.955	.000[c]
	Residual	36896.520	298	123.814		
	Total	74524.746	300			
3	Regression	40661.724	3	13553.908	118.876	.000[d]
	Residual	33863.022	297	114.017		
	Total	74524.746	300			

a. Dependent Variable: P + AP Total MATH

b. Predictors: (Constant), BA
c. Predictors: (Constant), BA, per fam ov 200k
d. Predictors: (Constant), BA, per fam ov 200k, HS Un 35k

Interpretation of Standardized Coefficient Betas and Tolerance for Hierarchical Regression Model for 2010 NJ ASK 7 Math

The coefficient table demonstrates how each predictor influences the dependent variable. In Model 1 the predictor percentage of population with bachelor's degree reports a beta = .697. It is statistically significant at the .000 level, *t* = 16.810. The beta is positive, which means as the percentage of population with bachelor's degree increases, the 2010 NJ ASK 7 Math percentage of students who scored Proficient and above increases. In Model 2, the predictor percentage of population with bachelor's degree decreases in power from a beta of .697 to a beta = .535. It is significant at the .000 level, *t* = 8.515. The predictor added in Model 2, the percentage of per family income over $200,000, reports a beta = .213. It is significant at the .001 level, *t* = 3.386. The positive beta for the percentage of per family over $200,000 income indicates that as percentage of per family income over $200,000 increases, the 2010 NJ ASK 7 Math percentage of students who scored Proficient and above also increases. In Model 3, the predictor percentage of population with a bachelor's degree decreases in power again with a new of beta of .365. It is significant at the .000 level, *t* = 5.314. The predictor percentage of per family income over $200,000 loses a bit of power with a beta = .160. It is significant at the .010 level, *t*= 2.609. The predictor added in Model 3, percentage of population with household income under $35,000, reports a beta of -.294. It is significant at the .000 level, *t* = -5.158.

The VIF for all predictors in all the models fell below the threshold of 5, which would indicate the models do not have a multicollinearity problem. The model with more than one predictor and the lowest VIF rating was Model 2. In Model 2, both predictors reported a VIF of 2.377. Model 3 had bachelor's degree and per family over $200,000, slightly higher in VIF. The addition of the household income under $35,000 variable had a VIF just above reported at 2.116. All VIFs were low and supported little to no multicollinearity in each model.

Summary of Results

This study examined four main research questions:

1. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
2. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
3. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?
4. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?

Research Question 1. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?

Answer. The three variables were entered into the predictive algorithm and correctly predicted, within the margin of error for this model, the percentage of students scoring Proficient or above on the 2010 NJ ASK Grade 6 Math section for 67% of the schools in the sample.

Research Question 2. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?

Answer. When all 21 variables were assessed and run through the regression model, the variables that best predicted how students performed on the 2010 NJ ASK 6 Math were the percent of families with no high school diploma, percent of families making $25,000 or less, and percent of people with some college education. This model accounted for 50% of the variance in 2010 NJ ASK 6 Math for the schools in the sample.

Research Question 3. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?

Answer. The three variables were entered into the predictive algorithm and correctly predicted within the margin of error for this model, the percentage of students scoring Proficient or above on the 2010 NJ ASK Grade 7 Math section, for 72% of the schools in the sample.

Research Question 4. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?

Answer. When all 21 variables were assessed and run through the regression model, the variables that best predicted how students performed on the 2010 NJ ASK 7 Math were the percent of families with bachelor's degree, percent of families making $200,000 or more, and percent of households making $35,000 or less. This model accounted for 55% of the variance in the 2010 NJ ASK 7 Math for the schools in the sample.

Results of the Study

NJ ASK 6 Mathematics: Dependent Variable

Conclusion. The results of this study suggest that the out-of-school variables identified in this study to have the greatest influence on 2010 NJ Ask 6 Math percentage of students who scored Proficient or above were the percentage of families with no high school diploma, percent of families making $25,000 or less, and percent of people with some college education. These three variables predicted 67% of the 2010 NJ ASK 6 Math percentage of students who scored Proficient or above of the schools in the sample. Furthermore, these three variables accounted for more than 50% of the variance in NJ ASK 6 Math percentage of students who scored Proficient. The addition of the percentage of teachers with education levels of BA and MA did not add much to the model and were not statistically significant. As the additional teacher mobility variable was added to the model, the *R* Squared for the model increased from .509 to .514 but was not significant either. This study highlights the importance that family education level plays in influencing achievement as measured by standardized tests such as the NJ ASK 6 Math.

Table 17

Sixth Grade Math Percentages of Proficient and Above Scores Predicted Accurately:

- Number of schools by grade that meet the study criteria = **311 6^{th} Grade Schools**
- Percentage of schools' percentage of students scoring Proficient or above predicted accurately = **209 schools predicted correctly with a standard error of +/- 9.6 out of 311 = 67%**

NJ ASK 7 Mathematics: Dependent Variable

Conclusion. The results of this study suggest that the out-of-school variables identified in this study to have the greatest influence on the 2010 NJ Ask 7 Math percentage of students scoring Proficient or above were the percentage of families with bachelor's degree education, per family income of $200,000or more, and household income of $35,000 or less. These three variables predicted 72% of the 2010 NJ ASK 7 Math percentage of students scoring Proficient or above of the schools in the sample. Furthermore, these three variables accounted for more than 54% of the variance in NJ ASK 7 Math percentage of students who scored Proficient. The addition of the percentage of teachers with education levels of BA and MA did not add much to the model and were not statistically significant. As the additional teacher mobility variable was added to the model, the *R* Squared for the model increased only slightly, from .54 to .55, but was not significant either. This study also highlights the importance that family education level plays in influencing achievement as measured by standardized tests such as the NJ ASK 7 Math.

Table 18

Seventh Grade Math Percentages of Proficient and Above Scores Predicted Accurately:

- Number of schools by grade that meet the study criteria = **301 7th Grade Schools**
- Percentage of schools' percentage of students scoring Proficient or above predicted accurately = **217 schools predicted correctly with a standard error of +/- 10.67 out of 301 = 72%**

Table 19

Dependent Variables and Important Independent Variables

Dependent Variables	Important Independent Variables
NJ ASK Sixth Grade Math	Percent of families with no High School Diploma
	Percent of families making $25,000 or less
	Percent of people with Some College Education

Dependent Variables	Important Independent Variables
NJ ASK Seventh Grade Math	Percent of families with bachelor's degree (BA)
	Percent of families making $200,000 or more
	Percent of households making $35,000 or less

Table 20

Summary of Predictions

Sixth Grade Math = 311 Schools	209 predicted correctly with a standard error of +/- 9.6 out of 311 = 67%
Seventh Grade Math = 301 Schools	217 predicted correctly with a standard error of +/- 10.67 out of 301 = 72%

Table 21

Summary of Variance Accounted For

Sixth Grade Math	50% of Variance
Seventh Grade Math	54% of Variance

Based on these results, the researcher rejects Null Hypothesis 1 and Null Hypothesis 2.

Null Hypothesis 1: No statistically significant relationship exists between the 2010 NJ ASK 6 percentage of students scoring Proficient or Advanced Proficient in Mathematics at the school level and community variables when controlling for teacher mobility and level of teacher education.

Null Hypothesis 2: No statistically significant relationship exists between the 2010 NJ ASK 7 percentage of students scoring Proficient or Advanced Proficient in Mathematics at the school level and community variables when controlling for teacher mobility and level of teacher education.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

My purpose for this study was to determine the predictive accuracy of family and community demographic variables found in the U.S. Census data on the percentage of students at the school level who scored Proficient or above on the NJ ASK 6 and 7 Mathematics section when controlling for teacher mobility and level of teacher education. The results of the study support the extant literature and past research, which has found that community demographics and out-of-school variables significantly affect how students perform on state standardized assessments. The results of this study suggest that certain family and community demographics that are outside the control of school personnel can be used to predict, with a high level of accuracy, the percentage of students who will score Proficient and above. This mainly focused on out-of-school variables related to community and family demographics found in the 2010 U.S. Census data and their relationship to student achievement as measured by state standardized assessments. I used simultaneous and hierarchical multiple regression procedures to analyze the data.

The following four overarching research questions guided this study:

1. How accurately can family and community variables predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
2. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 6 Math section when controlling for teacher mobility and level of teacher education?
3. How accurately can family and community variables predict a school's percentage of

students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?

4. Which combination of family and community variables can accurately predict a school's percentage of students scoring Proficient or above on the 2010 NJ ASK 7 Math section when controlling for teacher mobility and level of teacher education?

The results from this study aligned to those from Maylone (2002) and Turnamian and Tienken (2013). On state-mandated standardized tests in Michigan, Maylone (2002) predicted high school state test results from a community's mean annual district household income, percentage of single-parent households, and percentage of high school students eligible for free and reduced lunches. Maylone (2002) was able to explain 56% of the variance in the district state test scores and was able to predict 74% of the school districts' MEAP scores. Turnamian and Tienken (2013) identified the out-of-school variables of (a) % bachelor degree, (b) % lone-parent, (c) % advanced degree, (d) % families below poverty, and (e) % economically disadvantaged as the greatest predictors of Language Arts and Mathematics achievement for Grade 3 students in New Jersey. Their models were able to account for 43% to 58% of the variance in school district 2009 NJ ASK 3 Language Arts and Mathematics scores.

In New Jersey public schools with sixth and seventh grade students, certain community demographic variables accurately predicted as much as 72% (seventh grade Math) and as little as 67% (sixth grade Math) of the percentage of students scoring Proficient or above on the state NJ ASK mathematics assessment. Like Maylone (2002) and Turnamian and Tienken (2013), this study showed economically disadvantaged families and level of parental education to be strong predictive variables of standardized test results. Percent of families with no high school diploma, percent of families making $25,000 or less, and percent of people with some college education accounted for 50% of the variance in NJ ASK 6 Math results and accurately predicted 67% of the school results within this study. The proficiency results of the NJ ASK 7 Math were also correctly predicted at 72% accuracy by the percentage of families with BA, percentage of families making $200,000 or more, and percentage of households making $35,000 or less. These three variables accounted for 54% of the variance in the NJ ASK 7 Math scores.

Level of income and level of education were the variables present in both models. This shows the importance of an education and the fact that schools in communities which had a large percentage of the population without a high school diploma, low percentage of BA, or low percentage of college education adversely affected student performance, resulting in fewer students scoring Proficient or above on their state test. Family educational experiences account for most of the growing inequality in academic achievement between children from different social class backgrounds over time. These findings support claims from the social reproduction tradition, and contribute more broadly to the understanding of how family educational experiences contribute to social inequality (Potter & Roksa, 2013). Earning power and level of education are connected in the research and therefore it is not a surprise to see level of income variables present in both predictive models. This is all supported by the structural theory of poverty, which is the theoretical framework at the foundation of this study.

The findings from this study support recent empirical studies and are supported by the extant literature. It is a flawed model when high-stakes data are collected from standardized assessments to measure the value of a school without controlling for external school variables existing in each school community's socioeconomic data. With this said, superintendents and principals are also making evaluation decisions under the assumption that Proficient results on high-stakes standardized assessments accurately identify academic needs within a school.

However, based on prior empirical studies (Tienken, 2010; Turnamian, 2012; Tienken & Orlich, 2013) and the results from this study, which demonstrates that out-of-school variables greatly affect student achievement on state standardized tests, a growing body of research brings into question the use of state standardized assessments as the sole means of measuring student achievement and, consequently, teacher and school success. The present public school landscape is changing drastically, and much of the reform models depend on standardized testing. The predictability of these testing models calls into question the validity of the use of standardized tests. Other states will need to do this research in order to see if the findings can be generalized outside of the states in which they were conducted.

The structural theory of poverty, from a macro level, states that the economic system is structured in such as way that poor people fall behind regardless of how capable they may be. The results of this study show that the families nested within this macro definition support the theory on a micro level. Families with no high school diploma, percent of families making $25,000 or less, families with a bachelor’s degree education, per family income of $200,000 or more, and household income of $35,000 or less were all found in this study to be the strongest predictors of student achievement as defined by test scores. This is evidence that minimum wages do not allow single mothers or their families to be economically self sufficient (Jencks, 1996). The problem of the poor working head of family is that the wages are fixed in a way that creates a structural barrier. This macro lens shows that this structure prevents poor families from getting better jobs, limits their education opportunities, and is complicated even more by having children and supporting a family. It is structured as an endless cycle of poverty on a macro level, the community, and a micro level, the family.

Recommendations for Policy

Researchers such as Tienken, Orlich, and Turnamian state that our current education policies are not created by educators but are produced by politicians and education bureaucrats. Educators should guide the development of educational decisions and policies. Reform policies should be driven by a variety of educators in the field, such as teachers, principals, and superintendents. These educator committees should represent school districts from a variety of socioeconomic backgrounds to better address the glaring inequities. The blanket decisions made from the federal level clearly are not working.

Policy development needs to involve an honest audit of the different components of the evaluation framework, and this is best done by educational practitioners and not bureaucrats and business professionals. Local assessments, teacher valuation procedures, and national standardized test instruments should reflect both local input and national standards. Growth within these areas can be evaluated on a national and local scale to assess district, school, teacher, and student improvement relative to the communities served. The key aspect of this policy recommendation is to determine how the different components need to be interrelated in order to generate complementarities and to avoid a "one score on one test" result. On international tests, every country has an achievement gap comparable to that in the United States (Carter & Welner, 2013). This confirms the need for a multi-component assessment framework for our schools and the communities they serve.

Examples of this multi-component framework are the New York Consortium and Nebraska STARS Program. These consortiums are coalitions of schools which have forged the establishment of educational communities focused on active student learning, sound professional development, and innovative curriculum and teaching strategies for 21st century students. Consortium schools have created a system of assessments which include components which align with state standards, foster professional development, respect external review, and develop formative and summative data. These external review organizations already exist in the form of Tri-States and Middle States Commissions.

Results from this study and those similar have consistently shown that external community characteristics can be used to categorize similar school districts. These similar characteristics correlate, and in this study's case, predict the results of their standardized test. The policy must look at everything that goes into the school and the community which surrounds it. The policy takes a page out of the SGP model for comparing growth on one test and extends the analysis to multiple input and output measures. It should look at things like the quality of the teachers, the children who attend, the families serviced, the facilities, and local taxpayer support to name a few. Only then can we can ask which schools actually beat expectations, which are meeting them, and which are failing within their respective categories.

Resources available and the communities served are essential aspects of an honest reform policy. Outcomes and output measures are important but must be looked at within schools of comparable community characteristics and available resources. The policy should offer a perspective into whether schools, given specific comparable community variables, are making greater or lesser growth in student outcomes compared to the other schools in the group. These outcomes should consist of a variety of assessments, both locally and nationally accepted.

Recommendations for Practice

This study demonstrates that the overreliance on high-stakes standardized assessments, as the sole measure of student achievement is extremely flawed. Prioritizing the result of standardized assessments, as the present evaluation model does, creates different incentives and problems that detract from real learning. There are ways to evaluate student learning that are valuable. There are also ways to evaluate teacher performance that can help principals and supervisors better support effective teachers. This process takes time and demands trust from the public. A recommendation for practice would be to model the medical field. There are multiple measures to evaluate doctors which support practical learning and growth. An instructional round with senior doctors is one example. Training in the medical field is done as a collaborative effort. Teacher evaluation should be approached in a similar fashion. All members of the instructional team should be involved. Some possible examples of this team are the teacher, the librarian, the social worker, the teacher who taught the year before and the teacher who will come after should all become a collaborative team of professionals. Through this process, educators develop a shared practice of observing, discussing, and analyzing learning and teaching (City, 2009).

In order to honestly regain local control of a portion of the assessment process, school districts need to train teachers and principals how to create sound standards-based local assessments. The Common Core State Standards are set by the government and clearly define the knowledge and skills students are expected to have at different stages of their education. Principals and teachers must be confident in the creation of multiple assessments that match the curriculum and the standards so that there is value in judging how well students are learning. Practice needs to give considerable attention to sound strategies to assess performance against standards. Teachers should have the capacity to assess against standards with high degrees of validity, reliability, and usability. Looking to the future, teaching will require new teacher leadership roles, including master and mentor teachers, assessment designers, learning architects, and guides to multi-user virtual environments (Carter & Welner, 2013). If common detailed guidelines are determined (by a council of educators), then school districts have the freedom to create a variety of assessments (portfolios, extended projects, practical assignments, oral work, etc.), which are still valuable for articulation between different teachers and schools.

Continuing on the assessment theme is the focus on sound strategies for improving the connection between formative assessment and summative assessment. By increasing teachers' role in assessment, they can better observe students' progress toward the goals mapped out in the standards and curriculum over time. Perhaps standardized assessments could be used formatively in the classroom to help teachers better gauge how their assessment strategies are strengthening their students' knowledge in a less threatening and more meaningful way. This focus on integration between formative assessment and summative standardized assessment can be attained by making teachers' ability to do this prominent in the evaluation process. Standardized test scores can be utilized but are the least valuable way to evaluate teacher quality as evidenced through this study and many other similar studies performed in New York, New Jersey, Massachusetts, North Carolina, and Connecticut.

Teachers need guidance and ongoing support throughout their careers to maintain effectiveness. Many teachers leave the profession in the first three years; and now with the present model of evaluation, the fear is that candidates will choose not to enter the field of education. This is of great concern considering how important the job of educating our children is to our country and our world. Teaching is very difficult and the profession far surpasses preparing students for one subject specific assessment. In light of this study, it is more important that teachers understand the influence family and community has on students. Teachers must know children and how they develop, how to work with other adults, how to understand cultural factors that support children, and how to access learning opportunities when understanding cultural backgrounds. Teachers can take part in ongoing social and cultural conversations with professional learning communities (PLC) within comparable school districts. These comparable districts can be identified through the collection of community data and predictable test result analysis described above. The use of technologies such as wiki spaces, Google chat rooms, and Facetime can be used in this capacity.

We need a change in policy on what constitutes good teaching for all populations. Teachers should be involved in the discussions on education reform. Educators, teachers, and parents are not involved in the discussion at the policy level. This suggestion asks for a change in policy power. In the twenty-first century the legitimacy of educational authority is in crisis. When authority is weakened, educators must learn to use other types of power and understand the policy environment (Fowler, 2013). Schools can only change for the better when teachers and parents are part of the policy discussion. Education leaders must join the conversation to lobby for more ways of creating community resources within their school buildings, districts and communities. The school must be seen as not only a resource for students but also for parents, caregivers, and the community as a whole. There should be more programs that help parents obtain their GED or high school diploma as well as programs to teach them to read and write. Parents must also learn from the school how to instill the importance of an education to their children.

Recommendations for Future Study

- Conduct a similar study to this research at the other grade levels that use the 21 independent variables to see which variables explain the most variance and make the best predictions.

- Conduct a similar study to this research at the other grade levels that use the same 18 family and community variables but with different district/school level variables to see if certain district/school level variables are significant.
- Conduct a study that looks at the data from this study in order to see why certain schools were not predicted accurately and why others did not appear to be affected by the out-of-school variables.
- Conduct a similar study to this research in a different state that uses the 21 independent variables to see which variables explain the most variance and make the best predictions.
- Conduct a similar study to this research at multiple grade levels beyond 6th and 7th that uses the 21 independent variables to see which variables explain the most variance and makes the best predictions.
- Conduct a study to see what the predictive power is or how much variance can be explained by different parental education levels (high school, BA, and advanced degree).
- Conduct a similar study to this research that uses the 21 independent variables to see which variables explain the most variance in the 2010 NJ ASK ELA.
- Conduct a study in various states that shows the impact of out-of-school variables on student achievement as measured by state standardized assessments.
- Conduct a study to see how a school's culture and climate can combat the out-of-school variables that predict low student achievement as measured by state standardized assessments.

- Conduct a study that looks at how high quality schools are combating out-of-school variables such as poverty and parental education attainment.

Current Reform and Evaluation Models

Reformers think that standardized testing and charter schools are the best way to combat poverty. They often say that we must “fix” schools before we address poverty. The thought is they must create charter schools and voucher programs so that students can overcome poverty on their own. There is clear evidence that charters and vouchers do not, on average, outperform public schools and often are worse in terms of test scores (Ravitch, 2010). The present reform movement takes the position that if students have low test scores, their teachers must be held responsible for those results. It is the new definition of accountability in the public education field. These reform policies do not make sense if family and community variables are ignored.

As evidenced by the theoretical framework of this study, standardized tests are highly correlated with family income and are in some cases predictable based on specific out-of-school variables. The best way to improve test scores is to address the root cause of low scores, which is family income and lack of opportunity. Children who live in poverty are less likely to have regular or timely medical care, less likely to have educated parents, less likely to live in a stable neighborhood, more likely to miss school because of illness, more likely to be hungry, more likely to be homeless (Harding, 2003). The mismatch in current evaluation models is that as a response to this, standardized assessments were given even more attention.

The reform model has not only missed the mark in addressing the issues of poverty but has been destructive to the education field and practice. A consequence of the standardized reform movement is that intense regimens of testing and test prep arose within the public school system. In lower-income communities, curriculum was less likely to have the arts, physical education, field trips, projects, and the kinds of school experiences that make children want to come to school (Ginther, Haveman, & Wolfe, 2000). The curriculum has become extremely narrow, making it less likely children of low-income will have these opportunities. Taking into account the findings in this study, this new evaluation model provides more threat than reform.

Overall Summary

Turnamian (2012) explained 52% of the variance in the 2009 NJ ASK 3 LAL scores and 54.9% of the theoretical framework model of the 2009 NJ ASK 3 LAL scores by focusing on the following three out-of-school variables: percentage of lone-parent households, percentage with bachelor's degrees, and percentage of economically disadvantaged families. Also, Turnamian explained 60% of the variance in the 2009 NJ ASK 3 Math scores by utilizing the same three out-of-school variables listed above. In Maylone's (2002) study the variance was similar, utilizing other out-of-school variables.

This study looked at two dependent variables and 21 independent variables. Out of those 21 independent variables, three were at the school level and eighteen were family and community variables. In all New Jersey schools that qualified for this study, the community demographic variables accurately predicted as much as 72% (seventh grade Math) and as little as 67% (sixth grade Math) of the percentage of students scoring Proficient or above on the state NJ ASK mathematics assessment. Findings from this research study contribute more support to the amassing empirical evidence that community and family demographic variables significantly affect how students perform in school and can be used to predict proficiency results.

This study showed that the use of standardized assessments to evaluate teachers and schools is questionable when taking into account the influence out-of-school variables have on the percentage of students scoring Proficient and above on those assessments. This study showed which combination of the 21 school level, community, and family demographic variables accounted for the most amount of predictive power on student Proficient and Advanced Proficient percentages on the 2010 NJ ASK 6 and 7 Math assessments. Within the new education reform model, success is measured by high-stakes standardized assessment results. The evidence in this research shows that certain combinations of family and community demographic data can be used to predict the percentage of students scoring Proficient or above on NJ ASK 6 and 7. This is a major concern that needs to be studied further.

Conclusion

The findings for this study were very telling to me. This research showed that a parent's education attainment and income level influenced the dependent variable most. Out of the six independent variables used in both hierarchical models, three were parent education level variables and three were specific income level variables. I believed income levels were strong influences over academics, but I did not realize that parent level of education was so strong. Both percent of families with no high school and percentage of parents with BA had the strongest influence in both models. This result was similar to Turnamian and Tienken (2013), who identified % bachelor degree and % advanced degree as strong variables in predicting NJ ASK 3 Math and LA results.

This research further confirms the importance of parental education level. A parent's education level has potential predictive influence over the success and achievement of his or her children. This conclusion directly supports the structural theory of poverty, which is the theoretical framework for this study. Education policy cannot solely focus on the classroom. Recommendations should support parents and families in obtaining stronger levels of education. Support for the community in terms of reading, writing, and general respect for education are needed. Family Resource Centers and other school support programs, if better funded, can be used to offer parents school exposure to skills needed on the GED, the SATs, or even job applications. Parents or guardians learning about the importance of an education must be a primary part of an educational reform policy. As education leaders, we must articulate through practice and policy how important it is for parents to respect and promote education. With support from education leaders, politicians, and policy makers, parents will better attain their educational goals. As evidenced by this study, this reform initiative will greatly influence student achievement as measured through standardized test scores.

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Appendix A

Predictive Town/ District Score: 2010 NJ ASK in Math (% No HS Diploma, % $25,000 or less, % Some College Education): Standard Error + or – 9.6

2010 NJ ASK Sixth Grade Math

District Name	School Name	per fam Un 25k	No HS	Some Col Edu	P + AP Total MATH	Predicted	Diff
MOUNTAIN LAKES	BRIARCLIFF	2.5	0.4	7.6	92.2	94.52	-.12
ENGLEWOOD CLIFFS BORO	UPPER SCHOOL	11.8	5.5	11.1	94.4	85.28	9.12
UPPER SADDLE RIVER BORO	EMIL A CAVALLINI	3.3	2.3	14.3	89.5	92.23	-2.73
LAKEWOOD TOWNSHIP	LAKEWOOD MIDDLE	25.3	17.2	21.5	29.5	50.74	-21.24
SUMMIT CITY	L.C. JOHNSON SUMMIT MS	6.1	5.8	10.2	80.7	82.71	-2.01
MENDHAM TWP	MENDHAM TWP MIDDLE	2.1	2.6	10	86	89.31	-3.31
HOLMDEL TOWNSHIP	WILLIAM SATZ INTERMEDIATE	5.5	7.1	12	85.1	81.56	3.54
TEWKSBURY TWP	OLD TURNPIKE SCHOOL	0.9	0.6	15.7	86.7	85.07	1.63
GARWOOD BORO	LINCOLN/FRANKLIN	1.4	8.7	15.3	69.8	67.99	1.81
NORWOOD BORO	NORWOOD	3.6	9.7	9.6	84.6	82.03	2.57
WOODCLIFF LAKE BORO	WOODCLIFF MIDDLE SCHOOL	1.9	4.7	15.9	92.7	86.91	5.79
COLTS NECK TWP	CEDAR DRIVE	1.5	2.8	13.4	89.4	88.18	1.22

WYCKOFF TWP	DWIGHT D EISENHOWER M.S.	2.1	3.4	13.1	84.3	91.53	-7.23
ALLENDALE BORO	BROOKSIDE	3	4	10.7	89.2	88.90	0.30
FRANKLIN LAKES BORO	FRANKLIN AVE MIDDLE SCH	2.2	3.6	10.6	86	90.46	-4.46
MERCHANTVILLE BORO	MERCHANTVILLE ELEM	15.7	10.5	18.3	55.6	63.91	-8.31
MONMOUTH BEACH BORO	MONMOUTH BEACH ELEM	2.3	3.1	12.2	83.8	85.55	-1.75
BELMAR BORO	BELMAR ELEMENTARY	18.5	8.2	15.9	69.2	62.02	7.18
HARMONY TWP	HARMONY TOWNSHIP SCHOOL	2.5	8.3	15.1	66.7	64.97	1.73
FAIR HAVEN BORO	KNOLLWOOD	3.1	1.3	6.9	89.7	85.98	3.72
NEW PROVIDENCE	NEW PROVIDENCE MIDDLE SCH	4.4	4.3	12.3	90.6	84.74	5.86
RIVER VALE TWP	HOLDRUM	1.3	3.4	10.4	82.7	85.97	-3.27
WILDWOOD CITY	WILDWOOD MIDDLE SCHOOL	34.4	18.9	19.6	40.7	47.13	-6.43
BRIELLE BORO	BRIELLE ELEMENTARY	7.3	2.3	16.7	84.2	79.39	4.81
MONTGOMERY TWP.	MONTGOMERY MIDDLE	1.1	2.7	7.8	85.9	87.07	-1.17
FORT LEE	LEWIS F. COLE MIDDLE	11.9	7.2	14	80.3	73.20	7.10
OLD TAPPAN BORO	CHARLES DEWOLF	1.5	4.5	14.8	87.5	83.53	3.97
HALEDON BORO	HALEDON PUBLIC SCH	9.3	23	13.7	53.4	60.37	-6.97
MULLICA TWP	MULLICA TWP MIDDLE	10.4	12.2	21.5	76.7	56.52	20.18
WHITE TWP	WHITE TWP CONS	9	9.7	22.6	73.8	55.82	17.98
SPRING LAKE HEIGHTS BORO	SPRING LAKE HEIGHTS ELEM	2	4.3	15.8	82.5	74.99	7.51
MILLBURN	MILLBURN MIDDLE	1.9	2.1	6.4	89.7	90.21	-0.51

TOWNSHIP	SCHOOL						
MILLSTONE TWP	MILLSTONE TWP MIDDLE SCH	2.9	5.5	19	85.8	81.83	3.97
WALLINGTON	WALLINGTON JR SR HIGH SCH	11.9	10	16.8	60.5	58.02	2.48
EATONTOWN BORO	MEMORIAL	10.6	9	19.1	65.8	62.59	3.21
HAWORTH BORO	HAWORTH	3.5	3.1	7.7	85.2	87.51	-2.31
WARREN TWP	MIDDLE	1.9	3.4	12.1	78.1	87.15	-9.05
DELANCO TWP	WALNUT ST	1.5	7.3	20.4	46.9	68.84	-21.94
LOWER ALLOWAYS CREEK	LOWER ALLOWAYS CREEK	4.3	18.8	20.7	59.2	56.02	3.18
FLORHAM PARK BORO	RIDGEDALE	5.1	3	15.4	82	78.16	3.84
BERKELEY HEIGHTS	COLUMBIA	2.3	6.9	11.9	88.1	84.68	3.42
GREEN TWP	GREEN HILLS SCHOOL	4.5	4.1	15.8	74	80.04	-6.04
SPARTA TOWNSHIP	SPARTA MIDDLE SCHOOL	3.3	2.8	15.3	77.6	83.57	-5.97
KINNELON BOROUGH	PEARL R MILLER MIDDLE	3.7	1.5	13.1	89	87.66	1.34
RUMSON BORO	FORRESTDALE	5	2.3	14.3	92.2	87.83	4.37
DEMAREST BORO	DEMAREST MIDDLE	4.1	2.6	14.5	87.8	84.40	3.40
SOUTH AMBOY	SOUTH AMBOY HIGH	12.8	11.3	21.5	48.9	57.76	-8.86
HOPEWELL TWP	HOPEWELL CREST	1	4.9	11.3	74.4	84.13	-9.73
MOORESTOWN TOWNSHIP	WM ALLEN III MIDDLE SCH	2.6	4.2	16.3	83.2	81.53	1.67
MONTVILLE TOWNSHIP	ROBERT R LAZAR MIDDLE SCH	5.6	3.3	12.4	82.9	82.43	0.47
DUNELLEN	LINCOLN MIDDLE SCHOOL	10.3	12.3	16.9	59.6	64.28	-4.68
RANDOLPH	RANDOLPH MIDDLE	4.2	3.1	12.8	86	84.85	1.15

TOWNSHIP							
MADISON	MADISON M.S.	3.7	8	9.6	79.5	79.04	0.46
BERNARDS TOWNSHIP	WILLIAM ANNIN MIDDLE	3.2	3.2	11.2	90.1	86.58	3.52
COLLINGSWOOD BOROUGH	COLLINGSWOOD MIDDLE	13.7	7.6	20.3	72.7	66.11	6.59
KEYPORT	CENTRAL SCHOOL	8.2	15.5	18.9	59	54.91	4.09
READINGTON TWP	READINGTON	4.3	3.5	17.7	81.2	77.56	3.64
HADDON TOWNSHIP	WILLIAM G. ROHRER MIDDLE	7.3	7.4	19.2	65.1	68.19	-3.09
FRANKFORD TWP	FRANKFORD TWP	4.7	9.8	19.4	55.1	70.47	-15.37
DENVILLE TWP	VALLEYVIEW MIDDLE	1.6	3.6	16.9	78.5	80.09	-1.59
WOOD-RIDGE	GRETA OSTROVSKY MIDDLE	5.2	11	18	68.1	70.44	-2.34
MAHWAH TOWNSHIP	RAMAPO RIDGE	5.8	6.5	18.4	85.5	79.21	6.29
HARRINGTON PARK BORO	HARRINGTON PARK	3.1	2.5	12.5	88.8	85.31	3.49
TENAFLY	TENAFLY MIDDLE	4.3	4.8	9.4	87.1	84.98	2.12
SHREWSBURY BORO	SHREWSBURY ELEM	2	5.8	12.7	87.3	83.95	3.35
MONTVALE BORO	FIELDSTONE MIDDLE	4.4	1.7	13.7	80.7	82.41	-1.71
PALISADES PARK	LINDBERGH	16.8	16.5	11.4	65	67.68	-2.68
ROCKAWAY BORO	THOMAS JEFFERSON MIDDLE	10.7	12.6	18.1	75.8	64.81	10.99
UNION BEACH	MEMORIAL	8.3	10.1	17.4	57.5	55.22	2.28
PASSAIC CITY	NUMBER 4 LINCOLN	35.9	35.1	10.4	35.2	41.26	-6.06
WILDWOOD CREST BORO	CREST MEMORIAL	9.5	10.1	17.8	77.8	61.26	16.54
HIGHLAND PARK	HIGHLAND PARK MIDDLE	9.1	7	10.5	60.6	68.15	-7.55

WAYNE TOWNSHIP	GEORGE WASHINGTON	3.8	7.7	16.1	69.6	75.96	-6.36
WHARTON BORO	A C MAC KINNON MIDDLE	6.1	15.1	16.1	70.2	62.47	7.73
CARLSTADT BORO	CARLSTADT	12	10.9	17.5	67.1	66.87	0.23
GLOUCESTER CITY	GLOUCESTER CITY JR SR H	17.9	18.6	17.9	49.6	50.64	-1.04
MEDFORD TWP	MEDFORD TWP MEMORIAL	3.1	3.6	15.8	86.5	82.59	3.91
CLOSTER BORO	TENAKILL M.S.	6.6	5.4	11.8	87.7	82.54	5.16
MANCHESTER TOWNSHIP	MANCHESTER TWP MIDDLE	11.3	13.6	19.4	72.5	46.23	26.27
PITTSGROVE TOWNSHIP	PITTSGROVE TWP MIDDLE SCH	7.5	13.8	21.3	55	61.58	-6.58
VENTNOR CITY	VENTNOR MIDDLE SCHOOL	12.5	15.5	22.5	58.1	55.09	3.01
LAWNSIDE BORO	LAWNSIDE PUBLIC	17.9	10.1	21.1	53.5	60.48	-6.98
MANVILLE BOROUGH	ALEXANDER BATCHO INTER	6.6	14.2	17.6	45.7	56.76	-11.06
MOUNTAINSIDE BORO	DEERFIELD ELEMENTARY	2.8	5.7	12.4	86.4	81.88	4.52
OCEANPORT BORO	MAPLE PLACE	9	6.1	17.1	87.6	72.15	15.45
VERNON TOWNSHIP	GLEN MEADOW	4.4	5	23.3	62.7	67.04	-4.34
CRANBURY TWP	CRANBURY	6.2	3.1	10.4	96	84.40	11.60
HILLSDALE BORO	GEORGE G WHITE	3.4	3.9	15.9	73.6	81.00	-7.40
HASBROUCK HEIGHTS	HASBROUCK HEIGHTS MIDDLE	6.5	6.8	18.8	66.7	70.47	-3.77
HO HO KUS BORO	HO-HO-KUS	2.5	2.3	9.5	85.9	91.35	-5.45
HOPATCONG BOROUGH	HOPATCONG MIDDLE	3.8	5.3	24.3	45.8	68.46	-22.66
ROXBURY	EISENHOWER MIDDLE	5.7	6.3	15.7	78.7	75.75	2.95

TOWNSHIP							
BOUND BROOK BOROUGH	SMALLEY	8	21.9	14	36.6	59.01	-22.41
DELAWARE TWP	DELAWARE TWP NO 1	1.6	4.7	14.5	81.3	76.02	5.28
EAST HANOVER TWP	EAST HANOVER MIDDLE	2.2	7	15.3	69.2	74.68	-5.48
PALMYRA BOROUGH	PALMYRA HIGH	10.3	8.5	23.1	56	63.59	-7.59
CLIFFSIDE PARK	NUMBER 6	11.4	14	14.1	67.7	66.47	1.23
LEONIA	LEONIA MIDDLE	10.6	5.1	14.1	72.2	74.11	-1.91
NETCONG BORO	NETCONG ELEM	17.4	11.3	19	77.4	55.05	22.35
WEST LONG BRANCH BORO	FRANK ANTONIDES	3.9	10.4	15	84.3	70.77	13.53
WATCHUNG BORO	VALLEY VIEW	3	6.8	17.2	93.4	79.73	13.67
WEST MILFORD TOWNSHIP	MACOPIN	4.2	5.5	24	63.2	69.42	-6.22
FAIRVIEW BORO	LINCOLN	20.5	27.3	14.1	53.8	53.31	0.49
HADDONFIELD BOROUGH	MIDDLE	4.3	2.1	11.3	87.9	83.85	4.05
LIVINGSTON TOWNSHIP	HERITAGE MIDDLE SCH	1.9	4.1	9	84.4	86.99	-2.59
LODI	THOMAS JEFFERSON MID SCH	12.7	18.1	18.4	70.5	57.41	13.09
LONG HILL TWP	CENTRAL	2.3	9.4	11.4	86.4	81.02	5.38
WEEHAWKEN TOWNSHIP	WEEHAWKEN HIGH	13.8	12.5	18.6	67.4	71.81	-4.41
BERGENFIELD	ROY W BROWN MIDDLE	6.8	11.2	15.4	60.1	71.65	-11.55
MEDFORD LAKES BORO	NEETA SCHOOL	7	2.6	13.1	72.9	81.02	-8.12
FREEHOLD BORO	INTERMEDIATE	17.5	28.9	16	45.1	53.99	-8.89
RINGWOOD BORO	MARTIN J RYERSON	2.4	7.1	21.5	66.7	77.18	-

							10.48
CLINTON TOWN	CLINTON TOWN	10.3	12.8	16.4	81.6	63.25	18.35
LOPATCONG TWP	LOPATCONG TWP MS	2.7	10	20.3	82.4	65.60	16.80
BARNEGAT TWP	RUSSELL O. BRACKMAN M S	9.2	9.8	20.9	69.9	59.62	10.28
EAST BRUNSWICK TOWNSHIP	HAMMARSKJOLD MIDDLE	3.8	6.1	13.4	80.6	77.94	2.66
LITTLE FALLS TWP	NUMBER 1	6.6	9.7	16.4	75.7	68.78	6.92
VERONA	HENRY B WHITEHORNE MIDDLE	4.1	5.2	19.5	77.1	77.57	-0.47
MONROE TOWNSHIP (MIDDLESEX)	APPLEGARTH	5.2	7.6	16.8	65.2	67.11	-1.91
MOUNT EPHRAIM BORO	RAYMOND W. KERSHAW	8.6	12.4	25.7	44.1	55.69	-11.59
POINT PLEASANT BOROUGH	MEMORIAL MIDDLE SCHOOL	5.9	4.3	20.6	78.4	69.34	9.06
WALL TOWNSHIP	INTERMEDIATE	6.7	5.7	17.6	72.1	72.14	-0.04
GLEN ROCK	GLEN ROCK MIDDLE SCH	1.8	3.1	13	81.9	87.03	-5.13
RAMSEY	ERIC S SMITH	3.2	2.9	15.3	77.8	84.93	-7.13
VOORHEES TWP	VOORHEES MIDDLE	4.9	8.4	13.4	81	73.37	7.63
JEFFERSON TWP. SCHOOL DIS	JEFFERSON TWP MIDDLE	3.4	6.3	20.1	73.4	75.39	-1.99
LITTLE FERRY BORO	MEMORIAL	11.8	15.5	14.5	60.7	63.52	-2.82
MILLVILLE	LAKESIDE MIDDLE SCHOOL	22.3	18.4	18	40.9	49.45	-8.55
NORTHVALE BORO	NATHAN HALE	5.4	8.5	16.2	74.6	69.70	4.90
PEMBERTON TOWNSHIP	HELEN A. FORT MIDDLE SCH	11.1	12.6	24.3	47.2	55.74	-8.54

RED BANK BORO	RED BANK MIDDLE	21	16.3	14.2	52.7	65.18	-12.48
LINWOOD CITY	BELHAVEN MIDDLE SCH	4.1	6.7	17.7	88.2	73.66	14.54
OCEAN CITY	INTERMEDIATE	10.9	6.1	14.1	66	65.87	0.13
PARK RIDGE	PARK RIDGE HIGH	4.3	5.3	16.9	76.8	79.78	-2.98
CRESSKILL	CRESSKILL MIDDLE SCH	3.5	5	9.6	86.7	80.60	6.10
SADDLE BROOK TOWNSHIP	SADDLE BROOK HIGH	7.6	10.7	21.2	55.8	66.68	-10.88
MARGATE CITY	EUGENE A TIGHE MID SCH	11	5.8	15.1	75.9	68.50	7.40
MONROE TOWNSHIP (GLOUCESTER)	WILLIAMSTOWN MIDDLE SCH	8.1	14.8	18.9	64.3	61.46	2.84
ASBURY PARK	ASBURY PARK MIDDLE SCHOOL	41.6	23.7	19.4	22	45.28	-23.28
EMERSON	EMERSON JR SR HIGH	0.5	5.7	16.2	73.2	76.91	-3.71
LEBANON TWP	WOODGLEN	6.4	8.4	16.6	79.5	76.55	2.95
SOUTH HACKENSACK TWP	MEMORIAL	3.4	12.9	18.9	50	68.34	-18.34
RIDGEFIELD PARK	RIDGEFIELD PARK JR SR HS	5.5	13	15.4	70	67.27	2.73
HAZLET TOWNSHIP	HAZLET MIDDLE SCHOOL	5	9.5	20.9	60.7	62.29	-1.59
BETHLEHEM TWP	ETHEL HOPPOCK ELEM	3.8	2.5	16.6	81.4	79.75	1.65
DEPTFORD TOWNSHIP	MONONGAHELA MIDDLE SCHOOL	9.7	13.1	19.7	70.9	60.28	10.62
GLEN RIDGE	GLEN RIDGE HIGH	1.6	1.7	8.6	83.3	92.90	-9.60
LACEY TOWNSHIP	LACEY TWP MIDDLE	6.2	6.6	21.5	52.5	63.49	-10.99
FOLSOM BORO	FOLSOM	8.1	14.3	22.7	53.5	61.19	-7.69

HILLSBOROUGH TOWNSHIP	HILLSBOROUGH MIDDLE	2.4	5.7	16.5	82	78.52	3.48
PENNSVILLE TOWNSHIP	PENNSVILLE MIDDLE	12.1	11	19.1	69.2	57.23	11.97
SOMERSET HILLS	BERNARDSVILLE MIDDLE SCH	2.4	5.7	16.5	89.3	78.52	10.78
BRANCHBURG TWP	CENTRAL	1.9	2.3	15.7	76	80.79	-4.79
UPPER DEERFIELD TWP	WOODRUFF SCHOOL	29	16.1	18.1	39.6	46.71	-7.11
RAHWAY	RAHWAY MIDDLE SCHOOL	11.7	12.5	19.2	52.3	57.34	-5.04
TINTON FALLS	TINTON FALLS	5	5.8	17.3	75	69.20	5.80
WESTAMPTON	WESTAMPTON MIDDLE	5	3.2	25.1	69.1	71.38	-2.28
MIDDLE TOWNSHIP	MIDDLE TWP ELEM NO 4	12.1	14.3	17.5	71.6	59.05	12.55
UPPER TWP	UPPER TWP MIDDLE SCH	6.6	4.9	17.3	83.9	69.40	14.50
GARFIELD	GARFIELD MIDDLE SCH	13.1	17.8	17.1	57.6	55.47	2.13
LONG BRANCH	LONG BRANCH MIDDLE	18.6	20.1	16.5	51.2	58.10	-6.90
RIDGEFIELD	SLOCUM/SKEWES SCHOOL	7.7	11	17.3	78.7	64.43	14.27
ALLOWAY TWP	ALLOWAY TWP SCHOOL	5.5	4.9	22.8	58.3	64.45	-6.15
LINCOLN PARK BORO	LINCOLN PARK MIDDLE	5.1	9.5	17.3	91.7	72.29	19.41
MENDHAM BORO	MOUNTAIN VIEW	2.7	4.1	12.1	93.3	84.49	8.81
MORRIS PLAINS BORO	BOROUGH	1.3	6.9	12.8	82.3	80.72	1.58
LITTLE SILVER BORO	MARKHAM PLACE	2.1	1.3	10.4	90.3	90.68	-0.38

MOUNT HOLLY TWP	F W HOLBEIN	9.4	12	19.4	64.7	57.89	6.81
GLASSBORO	GLASSBORO INTERMEDIATE	16.4	9.4	25.1	44.1	58.89	-14.79
QUINTON TWP	QUINTON TWP	7.9	14.3	19.7	68.8	55.07	13.73
LAKEHURST BORO	LAKEHURST ELEM	7	10.5	29.9	50	52.77	-2.77
OAKLAND BORO	VALLEY MIDDLE	2.5	5.1	14.8	84	79.40	4.60
CARTERET	CARTERET MIDDLE SCHOOL	15.7	15.7	18.3	60.9	58.64	2.26
POHATCONG TWP	POHATCONG SCHOOL	7.5	10.9	14.9	67.6	65.27	2.33
UNION CITY	WOODROW WILSON	28	33.7	16.2	87.7	47.54	40.16
MIDLAND PARK BOROUGH	MIDLAND PARK HIGH	3.2	4.8	15.6	66.6	75.70	-9.10
SPOTSWOOD	SPOTSWOOD MEMORIAL SCHOOL	5.6	12.3	15.9	88.7	58.13	30.57
ELMWOOD PARK	MIDDLE SCHOOL	7.9	14.1	17.1	60.1	61.39	-1.29
KEANSBURG BOROUGH	JOSEPH R. BOLGER MID SCH	18.4	17.7	20.8	30.4	47.07	-16.67
CINNAMINSON TOWNSHIP	CINNAMINSON MIDDLE SCHOOL	5.3	7.1	18.9	67.2	68.32	-1.12
HILLSIDE TOWNSHIP	WALTER O. KRUMBIEGEL	15	14.9	2.4	46.2	57.38	-11.18
Woodland Park	MEMORIAL	11.5	11.7	11.9	55.8	64.07	-8.27
OGDENSBURG BORO	OGDENSBURG	5.6	10	25.6	68	66.97	1.03
ROCKAWAY TWP	COPELAND MIDDLE	2.2	5.3	16.4	78.2	77.63	0.57
BLOOMINGDALE BORO	WALTER T BERGEN	3.9	7.6	18.1	64.7	66.49	-1.79
NORTH BRUNSWICK TOWNSHIP	LINWOOD MIDDLE	8.5	10	13.7	69.2	70.41	-1.21
METUCHEN	EDGAR	3	3.4	12.1	70.9	79.57	-8.67

SAYREVILLE	SAYREVILLE MIDDLE	7.1	9.4	17.5	63.6	65.86	-2.26
NEPTUNE TOWNSHIP	NEPTUNE MIDDLE SCHOOL	11.4	11.2	24.3	41	60.22	-19.22
BRIGANTINE CITY	BRIGANTINE NORTH SCHOOL	8.5	9	23.7	61.4	60.96	0.44
ENGLEWOOD CITY	J.E. DISMUS MIDDLE	13.9	11.8	15.5	30.3	66.69	-36.39
SOMERVILLE BOROUGH	SOMERVILLE MIDDLE	5.3	9.6	17.4	66.3	67.06	-0.76
CEDAR GROVE TOWNSHIP	CEDAR GROVE MEMORIAL MS	1.6	6.6	14.5	82.6	80.86	1.74
CLEMENTON BORO	CLEMENTON ELEM	8.7	17.7	24.3	68.2	51.32	16.88
EWING TWP. PUBLIC SCHOOLS	GILMORE J FISHER MIDDLE	6.3	9.3	18.3	45.2	66.91	-21.71
HAWTHORNE	LINCOLN MIDDLE	6.3	8.8	21.9	59.1	71.83	-12.73
MT. OLIVE TOWNSHIP	MT. OLIVE MIDDLE SCHOOL	4.5	5.2	19.2	74.6	74.67	-0.07
NORTH PLAINFIELD BOROUGH	NORTH PLAINFIELD H	11.3	14.3	18	41.9	62.37	-20.47
BELLEVILLE	BELLEVILLE MIDDLE	7.9	14	16.3	54.1	63.35	-9.25
HADDON HEIGHTS	HADDON HEIGHTS JR-SR HS	0.8	7.4	15.7	79.1	77.02	2.08
PENNSAUKEN TOWNSHIP	HOWARD M PHIFER M S	9.2	18.9	20	55	57.35	-2.35
PHILLIPSBURG	MIDDLE	25	21.6	13.1	45.7	47.42	-1.72
POMPTON LAKES	LAKESIDE	5.66	7.4	17.4	51.2	74.05	-22.85
NEWTON	HALSTED ST.	20.1	14.3	19.1	43.3	49.48	-6.18
SHAMONG TWP	INDIAN MILLS MEMORIAL SCH	5.9	7.9	14.1	78.5	74.21	4.29
FLORENCE TOWNSHIP	RIVERFRONT	7.4	11.5	20.2	51.8	66.08	-14.28

HACKETTSTOWN	HACKETTSTOWN MIDDLE	8.9	13.3	17.9	79	63.22	15.78
LUMBERTON TWP	LUMBERTON MIDDLE SCHOOL	5.5	8.5	22.3	82.6	66.78	15.82
STANHOPE BORO	VALLEY ROAD SCHOOL	4	8.3	16.5	52.9	68.64	-15.74
BOONTON TOWN	BOONTON MIDDLE SCH	6.8	9.3	13.6	63.2	75.33	-12.13
ABSECON CITY	EMMA C ATTALES	8.5	7.5	23.3	72	63.12	8.88
BOGOTA	BOGOTA HIGH	7.4	8.4	19.8	57.2	62.81	-5.61
HARDYSTON TWP	HARDYSTON MIDDLE SCHOOL	8.5	8.7	20.5	80.1	63.07	17.03
MILLTOWN BORO	JOYCE KILMER	6	3.6	21.1	74.6	66.61	7.99
TABERNACLE TWP	KENNETH R. OLSON MID SCH	2.1	4	18.7	77.8	71.98	5.82
EAST RUTHERFORD BORO	ALFRED S. FAUST	9.7	6.9	20.4	55.1	67.44	-12.34
GUTTENBERG TOWN	ANNA L KLEIN	22.4	20.1	15.6	43.4	60.60	-17.20
UPPER PITTSGROVE TWP	UPPER PITTSGROVE	6.3	11.7	18.3	55.3	61.29	-5.99
GREEN BROOK TWP	GREEN BROOK MIDDLE	1.9	8.3	11.7	86.5	80.77	5.73
HAMBURG BORO	HAMBURG	15.1	6.5	22.7	64.6	62.29	2.31
FRANKLIN BORO	FRANKLIN ELEM	8.7	12.7	21.4	56.3	59.35	-3.05
POINT PLEASANT BEACH	G HAROLD ANTRIM ELEM	7.6	2.7	15.7	90.4	69.64	20.76
BYRAM TWP	BYRAM TWP INTERMEDIATE	1.7	2.5	21.1	71.8	76.65	-4.85
SOUTH RIVER	SOUTH RIVER MIDDLE	9.7	19.6	16.2	63	60.86	2.14
ALEXANDRIA TWP	ALEXANDRIA SCHOOL	3.4	2.3	15.3	73	82.64	-9.64
HIGH BRIDGE	HIGH BRIDGE MIDDLE	0.7	2.7	19.6	77.5	72.45	5.05

BORO							
MAURICE RIVER TWP	MAURICE RIVER TWP	12.6	28.2	12.2	62.2	53.10	9.10
NORTH ARLINGTON	NORTH ARLINGTON M.S.	9	12	16.1	66.6	63.09	3.51
HAMMONTON TOWN	HAMMONTON MIDDLE SCH	10.4	19.5	14.4	57.5	59.68	-2.18
MOUNT LAUREL TWP	T.E. HARRINGTON MIDDLE	4.4	4.8	17.8	83.4	76.54	6.86
ROSELLE PARK	ROSELLE PARK MIDDLE	6.4	10.5	21.4	72.5	59.84	12.66
WEST NEW YORK	WEST NEW YORK MS	27.8	30.5	13	59.6	53.99	5.61
SOMERS POINT CITY	JORDAN RD ELEM SCH	19.8	11.7	19.5	64.8	54.53	10.27
COMMERCIAL TWP	PORT NORRIS	27.7	21.6	18.2	50.8	47.63	3.17
LAFAYETTE TWP	LAFAYETTE TWP.	6.3	6.1	18.2	65.8	81.94	-16.14
KINGWOOD TWP	KINGWOOD TWP	2.8	5.5	18.7	82.6	71.65	10.95
ROSELLE BOROUGH	WILDAY	14.5	13.4	21.5	34.1	56.10	-22.00
SALEM CITY	SALEM MIDDLE	40.9	25.9	19.6	25.8	37.31	-11.51
LINDENWOLD	LINDENWOLD MIDDLE SCHOOL	20.2	17	17.9	46.2	53.79	-7.59
PITMAN	PITMAN MIDDLE SCHOOL	3.9	10.1	18.3	66.7	66.11	0.59
RIVERDALE BORO	RIVERDALE PUBLIC	2.8	5.8	17.8	56.6	72.23	-15.63
WEST DEPTFORD TOWNSHIP	WEST DEPTFORD MIDDLE	6.3	9.3	20.1	66.2	63.26	2.94
GALLOWAY TWP	GALLOWAY TWP MIDDLE SCH	8.2	10.8	20.1	67.2	63.79	3.41
MIDDLESEX	VON E MAUGER	2.8	10.1	17.9	71.4	66.45	4.95

BOROUGH	MIDDLE						
BUTLER	RICHARD BUTLER	3.9	8.1	18.2	51.5	69.95	-18.45
TOWNSHIP OF ROBBINSVILLE	POND ROAD MIDDLE SCHOOL	2.3	4.9	16.5	79.4	80.68	-1.28
PEQUANNOCK TOWNSHIP	PEQUANNOCK VALLEY	2.6	4.6	14.9	77.8	74.75	3.05
EAST AMWELL TWP	EAST AMWELL TWP	5.4	4.3	15.9	74	72.73	1.27
DOVER TOWN	DOVER MIDDLE	9.9	28.3	14.4	50.5	56.74	-6.24
NUTLEY	JOHN H WALKER MIDDLE SCHOOL	3.7	7.8	14.1	74.5	69.67	4.83
VINELAND CITY	VETERANS MEMORIAL INT SCH	17	21.6	18.4	44.7	54.19	-9.49
TOTOWA BORO	WASHINGTON PARK	9.1	18.7	14.6	61.7	62.70	-1.00
DENNIS TWP	DENNIS TWP MIDDLE	6.3	10.7	23.7	75.7	62.98	12.72
WALDWICK	WALDWICK MIDDLE SCHOOL	2.1	4.8	18.2	79.9	75.00	4.90
HACKENSACK	MIDDLE SCHOOL	15.6	15.3	17.6	43.4	62.02	-18.62
SECAUCUS	SECAUCUS MIDDLE SCHOOL	7.4	13.5	13.7	64.6	69.56	-4.96
MAPLE SHADE TOWNSHIP	MAPLE SHADE HIGH	8.2	11.7	20.8	64.7	57.83	6.87
SOUTH PLAINFIELD	SO PLAINFIELD MIDDLE	3.7	10.4	17.3	68.5	68.04	0.46
KENILWORTH	DAVID BREARLEY HIGH SCH	7.1	11	12.6	72.2	65.14	7.06
MOONACHIE BORO	ROBERT L CRAIG	7.3	18	13.5	42.4	56.40	-14.00
OAKLYN BORO	OAKLYN SCHOOL	2.9	8.5	17.6	51.4	57.45	-6.05
ROCHELLE PARK TWP	MIDLAND #1	5.9	11.4	15.7	57.2	61.55	-4.35

ESTELL MANOR CITY	ESTELL MANOR ELEM SCH	11	6.7	21.2	37	62.84	-25.84
SOUTHAMPTON TWP	SOUTHAMPTON TWP SCH NO 3	7.3	10.8	16.1	64	57.23	6.77
EAST NEWARK BORO	EAST NEWARK PUBLIC	15.8	25.8	19.1	53.4	53.89	-0.49
NORTH HALEDON BORO	HIGH MOUNTAIN	1.2	4.1	14.8	76	77.59	-1.59
SOUTH BOUND BROOK	ROBERT MORRIS SCHOOL	9.9	12.4	15.3	65.9	68.09	-2.19
STRATFORD BORO	SAMUEL S YELLIN	7.5	7.4	21.8	77.1	62.15	14.95
ALLAMUCHY TWP	ALLAMUCHY TWP	4.2	3.1	17.2	84.4	81.06	3.34
WOODBURY	WOODBURY JR-SR HIGH	14.8	12.1	20.6	36.7	57.61	-20.91
BERLIN BORO	BERLIN COMMUNITY	7.9	10.3	20.7	84	63.60	20.40
BELLMAWR BORO	BELL OAKS	11.5	19.2	15.5	64.3	52.58	11.72
DELRAN TOWNSHIP	DELRAN MIDDLE	5	10.3	17.1	63.3	70.29	-6.99
WILLINGBORO	LEVITT MIDDLE SCHOOL	9.4	10.2	25.7	33.2	62.70	-29.50
RUNNEMEDE BORO	MARY E. VOLZ	13.3	15	19.1	86.1	55.24	30.86
PLUMSTED TOWNSHIP	NEW EGYPT MIDDLE SCH	4.5	10.1	18.9	75.2	61.19	14.01
MAYWOOD BORO	MAYWOOD AVE	8.8	8.2	17.7	61.3	69.28	-7.98
OXFORD TWP	OXFORD CENTRAL	6.7	13.1	16.3	53.2	60.56	-7.36
RIVERSIDE TOWNSHIP	RIVERSIDE MIDDLE	11.2	17.6	19.7	42	55.47	-13.47
PLEASANTVILLE	PLEASANTVILLE MIDDLE SCH	22.5	29.4	19.6	39.8	46.28	-6.48
BARRINGTON BORO	WOODLAND	7	9.6	22.9	75.3	60.87	14.43

MANASQUAN	MANASQUAN ELEM	4.7	4.3	16.6	78.8	75.68	3.12
NORTH WILDWOOD CITY	MARGARET MACE ELEM	15.5	10.9	24.4	64	54.67	9.33
BEDMINSTER TWP	BEDMINSTER TWP	2.3	3.1	13.7	87.3	79.05	8.25
NORTHFIELD CITY	NORTHFIELD COMMUNITY M S	7.4	6.9	23.5	87.1	66.78	20.32
HAINESPORT TWP	HAINESPORT	5.8	10.5	19.7	78.2	66.79	11.41
LOGAN TWP	LOGAN ELEM SCHOOL	2.2	8.3	18.9	78.8	69.46	9.34
NEPTUNE CITY	WOODROW WILSON	7.6	11.9	23.3	54	57.51	-3.51
SOMERDALE BORO	SOMERDALE PARK	9.6	11	21.5	52.5	58.48	-5.98
AUDUBON	AUDUBON HIGH	4.8	6.6	23.2	76.8	63.39	13.41
PAULSBORO	PAULSBORO HIGH	25.8	17.4	15.1	32.5	43.07	-10.57
EDGEWATER PARK TWP	SAMUEL M RIDGWAY SCHOOL	15.2	13.1	19.7	53.3	55.37	-2.07
JAMESBURG BORO	GRACE M BRECKWEDEL	6.7	10.9	17.5	58.3	62.46	-4.16
PROSPECT PARK BORO	NUMBER 1 PROSPECT PARK	19.4	18.2	18.5	69.5	53.77	15.73
MAGNOLIA BORO	MAGNOLIA	6.1	8.3	25	84.1	54.37	29.73
BROOKLAWN BORO	ALICE COSTELLO	3.4	10.3	20.7	63	60.33	2.67
EASTAMPTON TWP	EASTAMPTON COMMUNITY	4.5	5	15	74.8	73.26	1.54
WEYMOUTH TWP	WEYMOUTH TWP ELEM	8.2	12.2	18.3	70.9	54.41	16.49
MOUNT ARLINGTON BORO	MT ARLINGTON	1.9	7.4	19.6	60.5	70.42	-9.92
WOODLYNNE BORO	WOODLYNNE	24.4	23.9	17	23	46.43	-23.43
BRADLEY BEACH BORO	BRADLEY BEACH ELEMENTARY	11.6	12.4	20	75	69.59	5.41

Appendix B

2010 NJ ASK in Math (% HS $35,000 or less, % BA, % Per Family over $200,000

Standard Error = or – 10.67

2010 NJ ASK Seventh Grade Math

District Name	School Name	HS Un 35k	BA	per fam ov 200k	P + AP Total MATH	Predicted	Differe
MOUNTAIN LAKES	BRIARCLIFF	4	48.9	46.7	8	99.78	-7.58
ENGLEWOOD CLIFFS BORO	UPPER SCHOOL	18.5	40.3	35.5	16.6	54.16	9.12
UPPER SADDLE RIVER BORO	EMIL A CAVALLINI	5.6	37.9	48.6	16.6	56.89	-2.73
LAKEWOOD TOWNSHIP	LAKEWOOD MIDDLE	42.9	14.3	3.2	38.7	49.16	-21.24
SUMMIT CITY	L.C. JOHNSON SUMMIT MS	16	33.4	39.5	16	67.36	-2.01
MENDHAM TWP	MENDHAM TWP MIDDLE	8.7	35.4	49.4	12.6	69.99	-3.31
HOLMDEL TOWNSHIP	WILLIAM SATZ INTERMEDIATE	14-7.58	30.1	39.9	19.1	68.24	3.54
TEWKSBURY TWP	OLD TURNPIKE SCHOOL	12.6	33	44.9	16.3	55.73	1.63
GARWOOD BORO	LINCOLN/FRANKLIN	16.7	21.9	4	24	46.52	1.81
NORWOOD BORO	NORWOOD	11.2	36.8	13.1	19.3	64.35	2.57
WOODCLIFF LAKE BORO	WOODCLIFF MIDDLE SCHOOL	6.5	34.2	35.8	20.6	62.12	5.79
COLTS NECK TWP	CEDAR DRIVE	5.9	34.8	38.9	16.2	60.41	1.22
WYCKOFF TWP	DWIGHT D EISENHOWER M.S.	8.9	40.6	43.8	16.5	65.41	-7.23
ALLENDALE BORO	BROOKSIDE	8.6	38.2	37.6	14.7	58.00	0.30
FRANKLIN LAKES BORO	FRANKLIN AVE MIDDLE SCH	7.8	38.9	41.4	14.2	63.51	-4.46
MERCHANTVILLE BORO	MERCHANTVILLE ELEM	28.4	22.8	7.9	28.8	49.16	-8.31
MONMOUTH BEACH BORO	MONMOUTH BEACH ELEM	14	38.5	32.2	15.3	52.82	-1.75
BELMAR BORO	BELMAR ELEMENTARY	29.7	21	7.3	24.1	52.59	7.18
HARMONY TWP	HARMONY TOWNSHIP SCHOOL	15.6	15.9	6	23.4	57.21	1.73
FAIR HAVEN BORO	KNOLLWOOD	13.3	39.5	29.4	8.2	58.21	3.72

NEW PROVIDENCE	NEW PROVIDENCE MIDDLE SCH	13	35.9	34.4	16.6	68.05	5.86
RIVER VALE TWP	HOLDRUM	9.7	37.2	28.5	13.8	54.30	-3.27
WILDWOOD CITY	WILDWOOD MIDDLE SCHOOL	51.7	14.6	4.6	38.5	56.89	-6.43
BRIELLE BORO	BRIELLE ELEMENTARY	23.3	38.6	22.3	19	53.98	4.81
MONTGOMERY TWP.	MONTGOMERY MIDDLE	8.5	35	38.7	10.5	54.90	-1.17
FORT LEE	LEWIS F. COLE MIDDLE	26	33.3	14.7	21.2	54.72	7.10
OLD TAPPAN BORO	CHARLES DEWOLF	10.2	32.1	34.3	19.3	62.54	3.97
HALEDON BORO	HALEDON PUBLIC SCH	28.7	19.1	2.8	36.7	50.46	-6.97
MULLICA TWP	MULLICA TWP MIDDLE	26.3	11.3	3.5	33.7	42.03	20.18
SPRING LAKE HEIGHTS BORO	SPRING LAKE HEIGHTS ELEM	23.2	34.2	14.2	20.1	54.90	7.51
MILLBURN TOWNSHIP	MILLBURN MIDDLE SCHOOL	7.4	35.2	51.6	8.5	65.13	-0.51
MILLSTONE TWP	MILLSTONE TWP MIDDLE SCH	6.4	28.1	29.9	24.5	55.97	3.97
WALLINGTON	WALLINGTON JR SR HIGH SCH	32.4	18.6	1.2	26.8	57.82	2.48
EATONTOWN BORO	MEMORIAL	29.7	20.8	10.9	28.1	53.60	3.21
HAWORTH BORO	HAWORTH	9.2	38.9	29.5	10.8	65.23	-2.31
WARREN TWP	MIDDLE	7.3	34.1	39.3	15.5	66.15	-9.05
DELANCO TWP	WALNUT ST	10.7	19.4	2.5	27.7	33.74	-21.94
LOWER ALLOWAYS CREEK	LOWER ALLOWAYS CREEK	24.5	10	1	39.5	50.87	3.18
FLORHAM PARK BORO	RIDGEDALE	16.7	31.3	24.8	18.4	55.55	3.84
BERKELEY HEIGHTS	COLUMBIA	10.1	34.2	32.9	18.8	63.51	3.42
GREEN TWP	GREEN HILLS SCHOOL	11.3	30.8	23.3	19.9	45.83	-6.04
SPARTA TOWNSHIP	SPARTA MIDDLE SCHOOL	10.6	34.9	26	18.1	66.80	-5.97
KINNELON BOROUGH	PEARL R MILLER MIDDLE	8.5	37.6	33	14.6	57.82	1.34
RUMSON BORO	FORRESTDALE	9.7	36.3	41.1	16.6	57.82	4.37
DEMAREST BORO	DEMAREST MIDDLE	11	35.8	28.2	17.1	58.88	3.40
SOUTH AMBOY	SOUTH AMBOY HIGH	30.3	14.9	7.3	32.8	48.88	-8.86
HOPEWELL TWP	HOPEWELL CREST	7.5	30.2	37.3	16.2	46.47	-9.73
MOORESTOWN TOWNSHIP	WM ALLEN III MIDDLE SCH	9.3	28.3	34.6	20.5	62.85	1.67
MONTVILLE TOWNSHIP	ROBERT R LAZAR MIDDLE SCH	13	34	28.9	15.7	62.86	0.47
DUNELLEN	LINCOLN MIDDLE	22.8	19.9	6.2	29.2	49.16	-4.68

	SCHOOL						
RANDOLPH TOWNSHIP	RANDOLPH MIDDLE	11.5	35.3	33.4	15.9	64.39	1.15
MADISON	MADISON M.S.	16.6	31.9	27.1	17.6	59.95	0.46
BERNARDS TOWNSHIP	WILLIAM ANNIN MIDDLE	10.2	34.6	41.6	14.4	67.12	3.52
COLLINGSWOOD BOROUGH	COLLINGSWOOD MIDDLE	28.8	26.8	6.7	27.9	49.58	6.59
KEYPORT	CENTRAL SCHOOL	35.4	15.4	3.1	34.4	58.05	4.09
READINGTON TWP	READINGTON	13.8	28.3	24.9	21.2	59.76	3.64
HADDON TOWNSHIP	WILLIAM G. ROHRER MIDDLE	22.1	25.3	6.5	26.6	62.54	-3.09
FRANKFORD TWP	FRANKFORD TWP	13.9	22.8	7.1	29.2	55.09	-15.37
DENVILLE TWP	VALLEYVIEW MIDDLE	12.8	32	23.1	20.5	61.52	-1.59
WOOD-RIDGE	GRETA OSTROVSKY M.S. MIDDLE	15.7	25	3.8	29	65.55	-2.34
MAHWAH TOWNSHIP	RAMAPO RIDGE	14.8	32.1	23	24.9	67.68	6.29
HARRINGTON PARK BORO	HARRINGTON PARK	9.2	37.8	21.9	15	62.86	3.49
TENAFLY	TENAFLY MIDDLE	10	33.1	37.9	14.2	69.81	2.12
SHREWSBURY BORO	SHREWSBURY ELEM	11.4	35.1	29.2	18.5	52.59	3.35
MONTVALE BORO	FIELDSTONE MIDDLE	14.6	34.3	31.6	15.4	60.73	-1.71
PALISADES PARK	LINDBERGH	29.2	30	5	27.9	54.81	-2.68
MAHWAH TOWNSHIP	RAMAPO RIDGE	14.8	32.1	23	24.9	67.68	6.29
HARRINGTON PARK BORO	HARRINGTON PARK	9.2	37.8	21.9	15	62.86	3.49
TENAFLY	TENAFLY MIDDLE	10	33.1	37.9	14.2	69.81	2.12
SHREWSBURY BORO	SHREWSBURY ELEM	11.4	35.1	29.2	18.5	52.59	3.35
MONTVALE BORO	FIELDSTONE MIDDLE	14.6	34.3	31.6	15.4	60.73	-1.71
PALISADES PARK	LINDBERGH	29.2	30	5	27.9	54.81	-2.68
ROCKAWAY BORO	THOMAS JEFFERSON MIDDLE	18.6	15.8	12.7	30.7	49.16	10.99
MAHWAH TOWNSHIP	RAMAPO RIDGE	14.8	32.1	23	24.9	67.68	6.29
HARRINGTON PARK BORO	HARRINGTON PARK	9.2	37.8	21.9	15	62.86	3.49
TENAFLY	TENAFLY MIDDLE	10	33.1	37.9	14.2	69.81	2.12
SHREWSBURY BORO	SHREWSBURY ELEM	11.4	35.1	29.2	18.5	52.59	3.35
MONTVALE BORO	FIELDSTONE MIDDLE	14.6	34.3	31.6	15.4	60.73	-1.71
PALISADES PARK	LINDBERGH	29.2	30	5	27.9	54.81	-2.68

ROCKAWAY BORO	THOMAS JEFFERSON MIDDLE	18.6	15.8	12.7	30.7	49.16	10.99
MAHWAH TOWNSHIP	RAMAPO RIDGE	14.8	32.1	23	24.9	67.68	6.29
HARRINGTON PARK BORO	HARRINGTON PARK	9.2	37.8	21.9	15	62.86	3.49
TENAFLY	TENAFLY MIDDLE	10	33.1	37.9	14.2	69.81	2.12
SHREWSBURY BORO	SHREWSBURY ELEM	11.4	35.1	29.2	18.5	52.59	3.35
MONTVALE BORO	FIELDSTONE MIDDLE	14.6	34.3	31.6	15.4	60.73	-1.71
PALISADES PARK	LINDBERGH	29.2	30	5	27.9	54.81	-2.68
ROCKAWAY BORO	THOMAS JEFFERSON MIDDLE	18.6	15.8	12.7	30.7	49.16	10.99

MAHWAH TOWNSHIP	RAMAPO RIDGE	14.8	32.1	23	24.9	67.68	6.29
HARRINGTON PARK BORO	HARRINGTON PARK	9.2	37.8	21.9	15	62.86	3.49
TENAFLY	TENAFLY MIDDLE	10	33.1	37.9	14.2	69.81	2.12
SHREWSBURY BORO	SHREWSBURY ELEM	11.4	35.1	29.2	18.5	52.59	3.35
MONTVALE BORO	FIELDSTONE MIDDLE	14.6	34.3	31.6	15.4	60.73	-1.71
PALISADES PARK	LINDBERGH	29.2	30	5	27.9	54.81	-2.68
ROCKAWAY BORO	THOMAS JEFFERSON MIDDLE	18.6	15.8	12.7	30.7	49.16	10.99
UNION BEACH	MEMORIAL	25.8	9.1	3	27.5	51.34	2.28
PASSAIC CITY	NUMBER 4 LINCOLN	56.4	9.8	1.7	45.5	55.96	-6.06
WILDWOOD CREST BORO	CREST MEMORIAL	36.1	23.9	8.9	27.9	42.49	16.54
HIGHLAND PARK	HIGHLAND PARK MIDDLE	24.9	25.2	13.3	17.5	60.46	-7.55
WAYNE TOWNSHIP	GEORGE WASHINGTON	16.7	29.5	19.5	23.8	61.29	-6.36
WHARTON BORO	A C MAC KINNON MIDDLE	20.1	15.8	4.2	31.2	54.81	7.73
CARLSTADT BORO	CARLSTADT	21	21.9	8.5	28.4	56.89	0.23
GLOUCESTER CITY	GLOUCESTER CITY JR SR H	34.4	8.6	1.6	36.5	48.15	-1.04
MEDFORD TWP	MEDFORD TWP MEMORIAL	8.4	33.5	20.4	19.4	56.52	3.91
CLOSTER BORO	TENAKILL M.S.	15.6	37.2	24.9	17.2	67.40	5.16
MANCHESTER TOWNSHIP	MANCHESTER TWP MIDDLE	46.2	10.3	1.3	33	44.53	26.27
PITTSGROVE TOWNSHIP	PITTSGROVE TWP MIDDLE SCH	21.8	15.5	4.7	35.1	44.02	-6.58
VENTNOR CITY	VENTNOR MIDDLE SCHOOL	36.8	15	8.7	38	48.37	3.01

LAWNSIDE BORO	LAWNSIDE PUBLIC	23.6	15	5	31.2	38.51	-6.98
MANVILLE BOROUGH	ALEXANDER BATCHO INTER	24.7	10.8	2.6	31.8	40.55	-11.06
MOUNTAINSIDE BORO	DEERFIELD ELEMENTARY	10.7	30.6	32	18.1	58.74	4.52
OCEANPORT BORO	MAPLE PLACE	18.6	25.1	19.2	23.2	53.98	15.45
VERNON TOWNSHIP	GLEN MEADOW	14.4	18.1	6.4	28.3	67.63	-4.34
CRANBURY TWP	CRANBURY	10.2	33.6	33.7	13.5	63.98	11.60
HILLSDALE BORO	GEORGE G WHITE	11.1	32.8	21	19.8	60.18	-7.40
HASBROUCK HEIGHTS	HASBROUCK HEIGHTS MIDDLE	20.1	24.4	16.5	25.6	63.19	-3.77
HO HO KUS BORO	HO-HO-KUS	6.5	40.5	37.5	11.8	60.92	-5.45

ROXBURY TOWNSHIP	EISENHOWER MIDDLE	12.4	28.3	12.2	22	52.73	2.95
BOUND BROOK BOROUGH	SMALLEY	24.8	13.9	4	35.9	58.98	-22.41
DELAWARE TWP	DELAWARE TWP NO 1	17.6	29.1	23.3	19.2	56.52	5.28
EAST HANOVER TWP	EAST HANOVER MIDDLE	12.9	25.3	18	22.3	61.52	-5.48
PALMYRA BOROUGH	PALMYRA HIGH	22.7	19.9	2.4	31.6	42.54	-7.59
CLIFFSIDE PARK	NUMBER 6	30.1	27.3	10	28.1	49.48	1.23
LEONIA	LEONIA MIDDLE	24.1	32.9	16.2	19.2	52.26	-1.91
NETCONG BORO	NETCONG ELEM	27.3	10.2	2	30.3	51.10	22.35
WEST LONG BRANCH BORO	FRANK ANTONIDES	20.2	24.6	17.6	25.4	52.26	13.53
WATCHUNG BORO	VALLEY VIEW	14.7	28.1	38.9	24	51.43	13.67
WEST MILFORD TOWNSHIP	MACOPIN	14.3	21.2	8	29.5	63.33	-6.22
FAIRVIEW BORO	LINCOLN	39.7	15.5	4.8	41.4	50.27	0.49
HADDONFIELD BOROUGH	MIDDLE	15.6	37.6	30.3	13.4	51.10	4.05
LIVINGSTON TOWNSHIP	HERITAGE MIDDLE SCH	9.1	36.7	34	13.1	63.24	-2.59
LODI	THOMAS JEFFERSON MID SCH	29.3	15.2	2.1	36.5	51.38	13.09
LONG HILL TWP	CENTRAL	12.9	31.8	28.8	20.8	57.54	5.38
WEEHAWKEN TOWNSHIP	WEEHAWKEN HIGH	26.5	32.8	10.4	31.1	56.48	-4.41
BERGENFIELD	ROY W BROWN MIDDLE	20.7	28	11.9	26.6	59.48	-11.55
MEDFORD LAKES BORO	NEETA SCHOOL	10.8	33.6	17.7	15.7	46.98	-8.12
FREEHOLD BORO	INTERMEDIATE	34.3	13.6	1.8	44.9	62.68	-8.89

RINGWOOD BORO	MARTIN J RYERSON	10.1	28	15.1	28.6	61.29	-10.48
CLINTON TOWN	CLINTON TOWN	26.9	21.1	6.6	29.2	56.89	18.35
LOPATCONG TWP	LOPATCONG TWP MS	16.9	17.7	6.3	30.3	53.74	16.80
BARNEGAT TWP	RUSSELL O. BRACKMAN M S	25.1	15.1	3.8	30.7	48.05	10.28
EAST BRUNSWICK TOWNSHIP	HAMMARSKJOLD MIDDLE	13.6	31	17.3	19.5	54.95	2.66
LITTLE FALLS TWP	NUMBER 1	20.7	24.7	8.2	26.1	61.24	6.92
VERONA	HENRY B WHITEHORNE MIDDLE	19.2	32.2	24.7	24.7	57.31	-0.47
MONROE TOWNSHIP (MIDDLESEX)	APPLEGARTH	24.1	22.9	13.8	24.4	56.89	-1.91
MOUNT EPHRAIM BORO	RAYMOND W. KERSHAW	25.2	9	4.3	38.1	48.19	-11.59

POINT PLEASANT BOROUGH	MEMORIAL MIDDLE SCHOOL	17.1	22.8	8.9	24.9	45.32	9.06
WALL TOWNSHIP	INTERMEDIATE	21	27.3	17.5	23.3	45.83	-0.04
GLEN ROCK	GLEN ROCK MIDDLE SCH	8.6	34.8	39.4	16.1	57.31	-5.13
RAMSEY	ERIC S SMITH	11.2	37	27.4	18.2	62.40	-7.13
VOORHEES TWP	VOORHEES MIDDLE	20.4	29	16.7	21.8	54.02	7.63
JEFFERSON TWP. SCHOOL DIS	JEFFERSON TWP MIDDLE	11.1	27.9	8.6	26.4	57.98	-1.99
LITTLE FERRY BORO	MEMORIAL	27.9	22.2	6.7	30	57.63	-2.82
MILLVILLE	LAKESIDE MIDDLE SCHOOL	39.1	9.9	2.3	36.4	48.19	-8.55
NORTHVALE BORO	NATHAN HALE	18.2	22.8	13.4	24.7	63.93	4.90
PEMBERTON TOWNSHIP	HELEN A. FORT MIDDLE SCH	25	9.6	2.1	36.9	54.39	-8.54
RED BANK BORO	RED BANK MIDDLE	27.3	23.3	10.1	30.5	54.44	-12.48
LINWOOD CITY	BELHAVEN MIDDLE SCH	17.4	26.6	19.1	24.4	49.90	14.54
OCEAN CITY	INTERMEDIATE	27.2	24.5	9.4	20.2	69.67	0.13
PARK RIDGE	PARK RIDGE HIGH	15.7	34	21.7	22.2	63.42	-2.98
CRESSKILL	CRESSKILL MIDDLE SCH	18.2	34.8	29.2	14.6	56.89	6.10
SADDLE BROOK TOWNSHIP	SADDLE BROOK HIGH	19.5	21.5	5.3	31.9	62.86	-10.88
MARGATE CITY	EUGENE A TIGHE MID SCH	24.6	25.4	13.7	20.9	69.02	7.40
MONROE TOWNSHIP (GLOUCESTER)	WILLIAMSTOWN MIDDLE SCH	23.7	16.4	5.6	33.7	48.47	2.84
ASBURY PARK	ASBURY PARK MIDDLE SCHOOL	52.2	12.5	3.3	43.1	52.96	-23.28

EMERSON	EMERSON JR SR HIGH	12.3	30.4	10.9	21.9	62.36	-3.71
LEBANON TWP	WOODGLEN	17.8	27.8	30.9	25	54.44	2.95
SOUTH HACKENSACK TWP	MEMORIAL	13.8	20.6	3.3	31.8	65.23	-18.34
RIDGEFIELD PARK	RIDGEFIELD PARK JR SR HS	22.8	24.2	7.1	28.4	59.07	2.73
HAZLET TOWNSHIP	HAZLET MIDDLE SCHOOL	22.9	15.7	10.3	30.4	54.30	-1.59
BETHLEHEM TWP	ETHEL HOPPOCK ELEM	9.5	28.3	25.9	19.1	50.87	1.65
DEPTFORD TOWNSHIP	MONONGAHELA MIDDLE SCHOOL	24.4	15.2	5.2	32.8	50.73	10.62
GLEN RIDGE	GLEN RIDGE HIGH	4.3	40	41.9	10.3	66.71	-9.60
LACEY TOWNSHIP	LACEY TWP MIDDLE	20.4	16.8	6.8	28.1	48.14	-10.99
FOLSOM BORO	FOLSOM	16.2	11.5	2.8	37	52.49	-7.69
PENNSVILLE TOWNSHIP	PENNSVILLE MIDDLE	27.8	13.5	3.3	30.1	48.14	11.97
SOMERSET HILLS	BERNARDSVILLE MIDDLE SCH	10.4	29.4	18	22.2	65.69	10.78
BRANCHBURG TWP	CENTRAL	8.7	30.1	23.3	18	47.72	-4.79
UPPER DEERFIELD TWP	WOODRUFF SCHOOL	47	11.4	2	34.2	51.43	-7.11
RAHWAY	RAHWAY MIDDLE SCHOOL	29.5	15.2	2.2	31.7	61.99	-5.04
TINTON FALLS	TINTON FALLS	22.2	26	9.6	23.1	44.21	5.80
WESTAMPTON	WESTAMPTON MIDDLE	15.5	25	8.2	28.3	49.16	-2.28
MIDDLE TOWNSHIP	MIDDLE TWP ELEM NO 4	25.8	15	2.9	31.8	46.06	12.55
UPPER TWP	UPPER TWP MIDDLE SCH	18.7	25	5.6	22.2	50.13	14.50
GARFIELD	GARFIELD MIDDLE SCH	34.1	15.1	3.9	34.9	61.43	2.13
LONG BRANCH	LONG BRANCH MIDDLE	31.4	16	8	36.6	49.95	-6.90
RIDGEFIELD	SLOCUM/SKEWES SCHOOL	29	24.1	7.6	28.3	57.93	14.27
ALLOWAY TWP	ALLOWAY TWP SCHOOL	16.7	16.6	3.6	27.7	51.61	-6.15
LINCOLN PARK BORO	LINCOLN PARK MIDDLE	12.8	25.4	5.1	26.8	47.63	19.41
MENDHAM BORO	MOUNTAIN VIEW	11.6	33.7	37.2	16.2	57.59	8.81
MORRIS PLAINS BORO	BOROUGH	12.4	30.3	31.1	19.7	48.74	1.58
LITTLE SILVER BORO	MARKHAM PLACE	8.7	41	37.6	11.7	52.96	-0.38
MOUNT HOLLY TWP	F W HOLBEIN	29.2	15.9	2	31.4	49.58	6.81
GLASSBORO	GLASSBORO INTERMEDIATE	32.3	19.3	3.1	34.5	52.54	-14.79
QUINTON TWP	QUINTON TWP	24.5	8.1	2.5	34	49.16	13.73
LAKEHURST BORO	LAKEHURST ELEM	32	9.6	3.5	40.4	46.01	-2.77
OAKLAND BORO	VALLEY MIDDLE	11.1	31.9	15.8	19.9	57.73	4.60
CARTERET	CARTERET MIDDLE SCHOOL	28.3	15.6	4.7	34	50.36	2.26
POHATCONG TWP	POHATCONG SCHOOL	21.2	20.6	5.1	25.8	50.78	2.33
UNION CITY	WOODROW WILSON	44.9	11.3	1.6	49.9	60.64	40.16

MIDLAND PARK BOROUGH	MIDLAND PARK HIGH	17.3	31.4	13.2	20.4	62.45	-9.10
SPOTSWOOD	SPOTSWOOD MEMORIAL SCHOOL	26.7	13.1	6.7	28.2	50.18	30.57
ELMWOOD PARK	MIDDLE SCHOOL	25.8	17.3	7.2	31.2	48.74	-1.29
KEANSBURG BOROUGH	JOSEPH R. BOLGER MID SCH	41	8.2	0.3	38.5	54.81	-16.67
CINNAMINSON TOWNSHIP	CINNAMINSON MIDDLE SCHOOL	20.9	23.4	10.7	26	58.05	-1.12
HILLSIDE TOWNSHIP	WALTER O. KRUMBIEGEL	33.1	16.9	5.3	17.3	58.65	-11.18
Woodland Park	MEMORIAL	22.7	20.1	4.2	23.6	54.44	-8.27
OGDENSBURG BORO	OGDENSBURG	14.9	18.5	5.9	35.6	51.75	1.03
ROCKAWAY TWP	COPELAND MIDDLE	12.5	30.1	16.1	21.7	57.40	0.57
BLOOMINGDALE BORO	WALTER T BERGEN	13.4	17	4.9	25.7	56.89	-1.79
NORTH BRUNSWICK TOWNSHIP	LINWOOD MIDDLE	20.6	27.3	7.6	23.7	55.27	-1.21
OGDENSBURG BORO	OGDENSBURG	14.9	18.5	5.9	35.6	51.75	1.03
ROCKAWAY TWP	COPELAND MIDDLE	12.5	30.1	16.1	21.7	57.40	0.57
BLOOMINGDALE BORO	WALTER T BERGEN	13.4	17	4.9	25.7	56.89	-1.79
OGDENSBURG BORO	OGDENSBURG	14.9	18.5	5.9	35.6	51.75	1.03
ROCKAWAY TWP	COPELAND MIDDLE	12.5	30.1	16.1	21.7	57.40	0.57
BLOOMINGDALE BORO	WALTER T BERGEN	13.4	17	4.9	25.7	56.89	-1.79
KEANSBURG BOROUGH	JOSEPH R. BOLGER MID SCH	41	8.2	0.3	38.5	54.81	-16.67
KEANSBURG BOROUGH	JOSEPH R. BOLGER MID SCH	41	8.2	0.3	38.5	54.81	-16.67
KEANSBURG BOROUGH	JOSEPH R. BOLGER MID SCH	41	8.2	0.3	38.5	54.81	-16.67

Woodland Park	MEMORIAL	22.7	20.1	4.2	23.6	54.44	-8.27
OGDENSBURG BORO	OGDENSBURG	14.9	18.5	5.9	35.6	51.75	1.03
ROCKAWAY TWP	COPELAND MIDDLE	12.5	30.1	16.1	21.7	57.40	0.57
BLOOMINGDALE BORO	WALTER T BERGEN	13.4	17	4.9	25.7	56.89	-1.79
NORTH BRUNSWICK TOWNSHIP	LINWOOD MIDDLE	20.6	27.3	7.6	23.7	55.27	-1.21
METUCHEN	EDGAR	13.1	31.8	21.8	15.5	57.68	-8.67
SAYREVILLE	SAYREVILLE MIDDLE	19.8	20.3	5.8	26.9	48.33	-2.26
NEPTUNE TOWNSHIP	NEPTUNE MIDDLE SCHOOL	29.4	18.3	6.4	35.5	46.29	-19.22
BRIGANTINE CITY	BRIGANTINE NORTH SCHOOL	27.9	17.8	8.3	32.7	47.35	0.44
ENGLEWOOD CITY	J.E. DISMUS MIDDLE	29.5	25.6	15.4	27.3	61.01	-36.39

SOMERVILLE BOROUGH	SOMERVILLE MIDDLE	22.5	24.3	5	27	57.45	-0.76
CEDAR GROVE TOWNSHIP	CEDAR GROVE MEMORIAL MS	11.7	31.5	26.1	21.1	59.48	1.74
CLEMENTON BORO	CLEMENTON ELEM	41	14.2	2	42	45.73	16.88
EWING TWP. PUBLIC SCHOOLS	GILMORE J FISHER MIDDLE	20.1	21.6	7.6	27.6	52.96	-21.71
HAWTHORNE	LINCOLN MIDDLE	13.7	24.2	8.9	30.7	56.38	-12.73
MT. OLIVE TOWNSHIP	MT. OLIVE MIDDLE SCHOOL	16.7	30.2	10.5	24.4	63.10	-0.07
NORTH PLAINFIELD BOROUGH	NORTH PLAINFIELD H	20.9	16.1	4.6	32.3	58.42	-20.47
BELLEVILLE	BELLEVILLE MIDDLE	25.2	20.7	4.4	30.3	66.38	-9.25
HADDON HEIGHTS	HADDON HEIGHTS JR-SR HS	17.5	33.3	14.1	23.1	51.71	2.08
PENNSAUKEN TOWNSHIP	HOWARD M PHIFER M S	27.4	13.5	3	38.9	52.26	-2.35
PHILLIPSBURG	MIDDLE	41.6	8.6	2.2	34.7	48.42	-1.72
POMPTON LAKES	LAKESIDE	15.3	29.3	7	24.8	60.18	-22.85
NEWTON	HALSTED ST.	44.9	13.7	3.5	33.4	59.99	-6.18
SHAMONG TWP	INDIAN MILLS MEMORIAL SCH	11.2	24.8	13.2	22	59.35	4.29
FLORENCE TOWNSHIP	RIVERFRONT	17.6	19	6.1	31.7	46.47	-14.28
HACKETTSTOWN	HACKETTSTOWN MIDDLE	23.6	19.2	5	31.2	58.33	15.78
LUMBERTON TWP	LUMBERTON MIDDLE SCHOOL	22.6	21.3	13.9	30.8	49.16	15.82
STANHOPE BORO	VALLEY ROAD SCHOOL	16.1	21.4	7.6	24.8	51.24	-15.74
BOONTON TOWN	BOONTON MIDDLE SCH	17	31.6	9.9	22.9	53.05	-12.13
BOGOTA	BOGOTA HIGH	21.7	17.4	4.4	28.2	57.77	-5.61
HARDYSTON TWP	HARDYSTON MIDDLE SCHOOL	21.5	16.8	7.3	29.2	56.89	17.03
MILLTOWN BORO	JOYCE KILMER	16.6	19.3	5.4	24.7	53.74	7.99
TABERNACLE TWP	KENNETH R. OLSON MID SCH	9.7	21.3	9.9	22.7	52.26	5.82
EAST RUTHERFORD BORO	ALFRED S. FAUST	21.2	24.2	4.2	27.3	59.21	-12.34
GUTTENBERG TOWN	ANNA L KLEIN	36.3	23.5	7.3	35.7	47.91	-17.20
UPPER PITTSGROVE TWP	UPPER PITTSGROVE	18.2	12.2	5.7	30	49.16	-5.99
GREEN BROOK TWP	GREEN BROOK MIDDLE	8.6	31.3	18.9	20	48.88	5.73
HAMBURG BORO	HAMBURG	26.7	20.2	4.2	29.2	45.59	2.31

FRANKLIN BORO	FRANKLIN ELEM	24.5	14.3	3.7	34.1	54.25	-3.05
POINT PLEASANT BEACH	G HAROLD ANTRIM ELEM	22.8	27.3	8.9	18.4	51.71	20.76
BYRAM TWP	BYRAM TWP INTERMEDIATE	11.2	27.4	17	23.6	49.16	-4.85
SOUTH RIVER	SOUTH RIVER MIDDLE	22.7	14.8	5.5	35.8	49.48	2.14
ALEXANDRIA TWP	ALEXANDRIA SCHOOL	2.6	29	22	17.6	48.79	-9.64
HIGH BRIDGE BORO	HIGH BRIDGE MIDDLE	12.1	24.4	7.6	22.3	44.62	5.05
MAURICE RIVER TWP	MAURICE RIVER TWP	29.3	9.1	0.4	40.4	43.00	9.10
NORTH ARLINGTON	NORTH ARLINGTON M.S.	27.5	21.2	6.9	28.1	53.60	3.51
HAMMONTON TOWN	HAMMONTON MIDDLE SCH	30.6	18.5	5.8	33.9	46.15	-2.18
MOUNT LAUREL TWP	T.E. HARRINGTON MIDDLE	15.3	31.1	13.8	22.6	62.03	6.86
ROSELLE PARK	ROSELLE PARK MIDDLE	29.4	18.1	5.1	31.9	54.44	12.66
WEST NEW YORK	WEST NEW YORK MS	40.3	16.9	5	43.5	51.75	5.61
SOMERS POINT CITY	JORDAN RD ELEM SCH	34.9	14.7	2.3	31.2	47.08	10.27
COMMERCIAL TWP	PORT NORRIS	37.3	6.1	1.4	39.8	41.80	3.17
LAFAYETTE TWP	LAFAYETTE TWP.	15.4	15.9	93	24.3	44.53	-16.14
KINGWOOD TWP	KINGWOOD TWP	11.3	22.4	8.3	24.2	52.45	10.95
ROSELLE BOROUGH	WILDAY	32.3	14.4	5.2	34.9	48.56	-22.00
SALEM CITY	SALEM MIDDLE	57.5	4.3	2.5	45.5	41.84	-11.51
LINDENWOLD	LINDENWOLD MIDDLE SCHOOL	35.2	14.2	0.9	34.9	49.35	-7.59
PITMAN	PITMAN MIDDLE SCHOOL	20.5	21.3	5.4	28.4	51.24	0.59
RIVERDALE BORO	RIVERDALE PUBLIC	10.1	22.8	7.1	23.6	53.05	-15.63

WEST DEPTFORD TOWNSHIP	WEST DEPTFORD MIDDLE	23.7	19	6.1	29.4	48.37	2.94
GALLOWAY TWP	GALLOWAY TWP MIDDLE SCH	22.5	19.5	4.3	30.9	49.02	3.41
MIDDLESEX BOROUGH	VON E MAUGER MIDDLE	19.7	20.3	8.6	28	52.54	4.95
BUTLER	RICHARD BUTLER	17.9	25.2	5.9	26.3	63.51	-18.45
TOWNSHIP OF ROBBINSVILLE	POND ROAD MIDDLE SCHOOL	11	31.5	23.5	21.4	46.34	-1.28
PEQUANNOCK TOWNSHIP	PEQUANNOCK VALLEY	18.4	30.4	14.3	19.5	64.62	3.05
EAST AMWELL TWP	EAST AMWELL TWP	12.1	22.4	15.8	20.2	53.10	1.27
DOVER TOWN	DOVER MIDDLE	24.3	10.9	1.2	42.7	43.79	-6.24

NUTLEY	JOHN H WALKER MIDDLE SCHOOL	21.6	25.7	11.6	21.9	63.79	4.83
VINELAND CITY	VETERANS MEMORIAL INT SCH	32.1	11.4	5	40	45.81	-9.49
TOTOWA BORO	WASHINGTON PARK	21.3	16.2	6.9	33.3	51.10	-1.00
DENNIS TWP	DENNIS TWP MIDDLE	15.6	14.4	0.8	34.4	48.14	12.72
WALDWICK	WALDWICK MIDDLE SCHOOL	15.5	28.1	16.4	23	54.30	4.90
HACKENSACK	MIDDLE SCHOOL	29.9	21.7	5.4	32.9	62.77	-18.62
SECAUCUS	SECAUCUS MIDDLE SCHOOL	18.9	23.2	13	27.2	64.62	-4.96
MAPLE SHADE TOWNSHIP	MAPLE SHADE HIGH	30.4	16.8	1.5	32.5	47.03	6.87
SOUTH PLAINFIELD	SO PLAINFIELD MIDDLE	13.2	18.9	6	27.7	49.16	0.46
KENILWORTH	DAVID BREARLEY HIGH SCH	15.2	15.8	6.3	23.6	66.43	7.06
MOONACHIE BORO	ROBERT L CRAIG	35.7	16.5	7.8	31.5	54.48	-14.00
OAKLYN BORO	OAKLYN SCHOOL	30.7	15.6	4.3	26.1	39.53	-6.05
ROCHELLE PARK TWP	MIDLAND #1	29.1	21.1	3.1	27.1	65.78	-4.35
ESTELL MANOR CITY	ESTELL MANOR ELEM SCH	16.2	14.2	2.2	27.9	49.85	-25.84
SOUTHAMPTON TWP	SOUTHAMPTON TWP SCH NO 3	29.8	13.2	9.1	26.9	41.71	6.77
EAST NEWARK BORO	EAST NEWARK PUBLIC	35.9	14.1	3.4	44.9	48.47	-0.49
NORTH HALEDON BORO	HIGH MOUNTAIN	9.1	27.8	15.5	18.9	51.57	-1.59
SOUTH BOUND BROOK	ROBERT MORRIS SCHOOL	16.5	22	3.7	27.7	54.90	-2.19
STRATFORD BORO	SAMUEL S YELLIN	27.6	20	6.3	29.2	48.14	14.95
ALLAMUCHY TWP	ALLAMUCHY TWP	12.5	34.1	20.3	20.3	52.49	3.34
WOODBURY	WOODBURY JR-SR HIGH	33.5	18.1	3.4	32.7	52.49	-20.91
BERLIN BORO	BERLIN COMMUNITY	23.1	19.6	4.4	31	47.86	20.40
BELLMAWR BORO	BELL OAKS	30.9	9	1.9	34.7	46.66	11.72
DELRAN TOWNSHIP	DELRAN MIDDLE	15.2	23.2	7.9	27.4	53.88	-6.99
RUNNEMEDE BORO	MARY E. VOLZ	27.9	11.1	1.4	34.1	49.48	30.86
PLUMSTED TOWNSHIP	NEW EGYPT MIDDLE SCH	19.4	12.9	5.7	29	48.69	14.01
MAYWOOD BORO	MAYWOOD AVE	21.2	26.6	5.6	25.9	60.32	-7.98
OXFORD TWP	OXFORD CENTRAL	21.4	14.9	0.5	29.4	46.01	-7.36
RIVERSIDE TOWNSHIP	RIVERSIDE MIDDLE	26.3	10.1	2.1	37.3	47.63	-13.47
PLEASANTVILLE	PLEASANTVILLE	42	7.4	1.3	49	45.64	-6.48

	MIDDLE SCH						
BARRINGTON BORO	WOODLAND	24.2	17	1.7	32.5	48.37	14.43
MANASQUAN	MANASQUAN ELEM	19.2	31.3	18	20.9	49.79	3.12
NORTH WILDWOOD CITY	MARGARET MACE ELEM	31.7	12	4.5	35.3	59.11	9.33
BEDMINSTER TWP	BEDMINSTER TWP	14.4	31.5	23.2	16.8	53.98	8.25
NORTHFIELD CITY	NORTHFIELD COMMUNITY M S	17.4	20.7	3.5	30.4	48.14	20.32
HAINESPORT TWP	HAINESPORT	18.9	19.4	11.5	30.2	45.13	11.41
LOGAN TWP	LOGAN ELEM SCHOOL	10.9	19	7.5	27.2	54.30	9.34
NEPTUNE CITY	WOODROW WILSON	27.7	14.4	1.5	35.2	52.96	-3.51
SOMERDALE BORO	SOMERDALE PARK	23.9	13.1	1.8	32.5	52.45	-5.98
AUDUBON	AUDUBON HIGH	22.9	19.2	4.2	29.8	49.95	13.41
PAULSBORO	PAULSBORO HIGH	47.8	6.8	0.6	32.5	46.47	-10.57
EDGEWATER PARK TWP	SAMUEL M RIDGWAY SCHOOL	30.5	12.9	2.2	32.8	46.98	-2.07
JAMESBURG BORO	GRACE M BRECKWEDEL	19.3	15.4	3.6	28.4	47.63	-4.16
PROSPECT PARK BORO	NUMBER 1 PROSPECT PARK	29.9	9.4	4.3	36.7	48.23	15.73
MAGNOLIA BORO	MAGNOLIA	33.7	13.6	2.3	33.3	49.76	29.73
BROOKLAWN BORO	ALICE COSTELLO	19.3	13.2	0	31	50.27	2.67
EASTAMPTON TWP	EASTAMPTON COMMUNITY	15.8	28.3	7.5	20	47.49	1.54
WEYMOUTH TWP	WEYMOUTH TWP ELEM	33.9	13.6	3	30.5	48.60	16.49
MOUNT ARLINGTON BORO	MT ARLINGTON	16.9	24.4	8.6	27	50.60	-9.92
WOODLYNNE BORO	WOODLYNNE	41.4	7	2	40.9	44.25	-23.43
BRADLEY BEACH BORO	BRADLEY BEACH ELEMENTARY	28.8	31.6	8.5	32.4	48.70	5.41

Appendix C --6th Grade - Pearson Correlation Coefficients Scores for All Variables where $N = 311$

Correlations

		P + AP Total MATH	Employ Status	HS Un 25k	HS Un 35k	HS ov 200k	per fam U 25k	per fam U 35k	per fam ov 200k	All Fams Pov 12 mnths	Female House Pov
P + AP Total MATH	Pearson Correlation	1	-.334**	-.609**	-.612**	.557**	-.626**	-.612**	.524**	-.583**	-.283**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
Employ Status	Pearson Correlation	-.334**	1	.292**	.329**	-.587**	.180**	.247**	-.524**	.124*	-.033
	Sig. (2-tailed)	.000		.000	.000	.000	.001	.000	.000	.029	.564
	N	311	311	311	311	311	311	311	311	311	311
HS Un 25k	Pearson Correlation	-.609**	.292**	1	.953**	-.599**	.887**	.848**	-.566**	.822**	.504**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
HS Un 35k	Pearson Correlation	-.612**	.329**	.953**	1	-.665**	.836**	.881**	-.626**	.778**	.481**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311

HS ov 200k	Pearson Correlation	.557**	-.587**	-.599**	-.665**	1	-.489**	-.564**	.925**	-.430**	-.267**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
per fam U 25k	Pearson Correlation	-.626**	.180**	.887**	.836**	-.489**	1	.914**	-.469**	.913**	.559**
	Sig. (2-tailed)	.000	.001	.000	.000	.000		.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
per fam U 35k	Pearson Correlation	-.612**	.247**	.848**	.881**	-.564**	.914**	1	-.540**	.846**	.511**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
per fam ov 200k	Pearson Correlation	.524**	-.524**	-.566**	-.626**	.925**	-.469**	-.540**	1	-.412**	-.243**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	311	311	311	311	311	311	311	311	311	311
All Fams Pov 12 mnths	Pearson Correlation	-.583**	.124*	.822**	.778**	-.430**	.913**	.846**	-.412**	1	.667**
	Sig. (2-tailed)	.000	.029	.000	.000	.000	.000	.000	.000		.000
	N	311	311	311	311	311	311	311	311	311	311

Female House Pov	Pearson Correlation	-.283**	-.033	.504**	.481**	-.267**	.559**	.511**	-.243**	.667**	1
	Sig. (2-tailed)	.000	.564	.000	.000	.000	.000	.000	.000	.000	
	N	311	311	311	311	311	311	311	311	311	311
All People under Pov	Pearson Correlation	-.613**	.187**	.876**	.832**	-.488**	.928**	.864**	-.470**	.937**	.560**
	Sig. (2-tailed)	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
Lone-parent Male	Pearson Correlation	-.292**	.223**	.338**	.364**	-.325**	.415**	.432**	-.275**	.389**	.227**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
Lone-parent Female	Pearson Correlation	-.514**	.237**	.577**	.590**	-.395**	.652**	.680**	-.411**	.652**	.263**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
Lone-parent household (total)	Pearson Correlation	-.529**	.278**	.595**	.620**	-.448**	.683**	.717**	-.442**	.677**	.294**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311

Less than 9th grade	Pearson Correlation	-.507**	.217**	.564**	.574**	-.440**	.581**	.581**	-.424**	.480**	.196**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
No HS	Pearson Correlation	-.644**	.332**	.743**	.762**	-.646**	.713**	.733**	-.629**	.632**	.343**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
Some College	Pearson Correlation	-.371**	.406**	.303**	.384**	-.647**	.236**	.323**	-.608**	.237**	.181**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001
	N	311	311	311	311	311	311	311	311	311	311
BA	Pearson Correlation	.609**	-.464**	-.647**	-.711**	.811**	-.580**	-.643**	.761**	-.533**	-.341**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
Advanced Degree	Pearson Correlation	.564**	-.493**	-.579**	-.644**	.896**	-.498**	-.563**	.856**	-.435**	-.265**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311

BABS	Pearson Correlation	-.322**	.325**	.317**	.362**	-.475**	.261**	.307**	-.423**	.275**	.186**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001
	N	311	311	311	311	311	311	311	311	311	311
MAMS	Pearson Correlation	.319**	-.325**	-.319**	-.363**	.471**	-.267**	-.311**	.420**	-.284**	-.199**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311
MOBILITY	Pearson Correlation	.053	-.083	-.080	-.076	.044	-.027	-.042	.046	-.013	.010
	Sig. (2-tailed)	.354	.145	.162	.184	.435	.632	.458	.421	.815	.858
	N	311	311	311	311	311	311	311	311	311	311

Correlations

		All People under Pov	Lone-parent Male	Lone-parent Female	Lone-parent household (total)	Less than 9th grade	No HS	Some College	BA	Advanced Degree	BA BS	MA MS
P + AP Total MATH	Pearson Correlation	-.613**	-.292**	-.514**	-.529**	-.507**	-.644**	-.371**	.609**	.564**	-.322**	.319**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311

Employ Status	Pearson Correlation	.187**	.223**	.237**	.278**	.217**	.332**	.406**	-.464**	-.493**	.325**	-.325**
	Sig. (2-tailed)	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
HS Un 25k	Pearson Correlation	.876**	.338**	.577**	.595**	.564**	.743**	.303**	-.647**	-.579**	.317**	-.319**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
HS Un 35k	Pearson Correlation	.832**	.364**	.590**	.620**	.574**	.762**	.384**	-.711**	-.644**	.362**	-.363**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
HS ov 200k	Pearson Correlation	-.488**	-.325**	-.395**	-.448**	-.440**	-.646**	-.647**	.811**	.896**	-.475**	.471**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
per fam U 25k	Pearson Correlation	.928**	.415**	.652**	.683**	.581**	.713**	.236**	-.580**	-.498**	.261**	-.267**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311

per fam U 35k	Pearson Correlation	.864**	.432**	.680**	.717**	.581**	.733**	.323**	-.643**	-.563**	.307**	-.311**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
per fam ov 200k	Pearson Correlation	-.470**	-.275**	-.411**	-.442**	-.424**	-.629**	-.608**	.761**	.856**	-.423**	.420**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
All Fams Pov 12 mnths	Pearson Correlation	.937**	.389**	.652**	.677**	.480**	.632**	.237**	-.533**	-.435**	.275**	-.284**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
Female House Pov	Pearson Correlation	.560**	.227**	.263**	.294**	.196**	.343**	.181**	-.341**	-.265**	.186**	-.199**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.001	.000	.000	.001	.000
	N	311	311	311	311	311	311	311	311	311	311	311
All People under Pov	Pearson Correlation	1	.418**	.646**	.681**	.564**	.703**	.262**	-.570**	-.486**	.280**	-.285**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311

Lone-parent Male	Pearson Correlation	.418**	1	.293**	.604**	.309**	.422**	.231**	-.399**	-.328**	.261**	-.259**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
Lone-parent Female	Pearson Correlation	.646**	.293**	1	.934**	.473**	.550**	.248**	-.492**	-.408**	.299**	-.306**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
Lone-parent household (total)	Pearson Correlation	.681**	.604**	.934**	1	.502**	.606**	.293**	-.551**	-.458**	.340**	-.345**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
Less than 9th grade	Pearson Correlation	.564**	.309**	.473**	.502**	1	.860**	.063	-.503**	-.475**	.143*	-.142*
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.269	.000	.000	.012	.012
	N	311	311	311	311	311	311	311	311	311	311	311
No HS	Pearson Correlation	.703**	.422**	.550**	.606**	.860**	1	.256**	-.760**	-.704**	.336**	-.336**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311

Some College	Pearson Correlation	.262**	.231**	.248**	.293**	.063	.256**	1	-.638**	-.669**	.423**	-.420**
	Sig. (2-tailed)	.000	.000	.000	.000	.269	.000		.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
BA	Pearson Correlation	-.570**	-.399**	-.492**	-.551**	-.503**	-.760**	-.638**	1	.849**	-.526**	.523**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
Advanced Degree	Pearson Correlation	-.486**	-.328**	-.408**	-.458**	-.475**	-.704**	-.669**	.849**	1	-.475**	.471**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	311	311	311	311	311	311	311	311	311	311	311
BABS	Pearson Correlation	.280**	.261**	.299**	.340**	.143*	.336**	.423**	-.526**	-.475**	1	-.997**
	Sig. (2-tailed)	.000	.000	.000	.000	.012	.000	.000	.000	.000		.000
	N	311	311	311	311	311	311	311	311	311	311	311
MAMS	Pearson Correlation	-.285**	-.259**	-.306**	-.345**	-.142*	-.336**	-.420**	.523**	.471**	-.997**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.012	.000	.000	.000	.000	.000	
	N	311	311	311	311	311	311	311	311	311	311	311

MOBILITY	Pearson Correlation	-.016	-.051	-.069	-.089	-.025	-.060	-.016	.000	.037	-.077	.079
	Sig. (2-tailed)	.778	.374	.225	.119	.661	.290	.783	.999	.515	.177	.164
	N	311	311	311	311	311	311	311	311	311	311	311

Correlations

		MOBILITY
P + AP Total MATH	Pearson Correlation	.053
	Sig. (2-tailed)	.354
	N	311
Employ Status	Pearson Correlation	-.083
	Sig. (2-tailed)	.145
	N	311
HS Un 25k	Pearson Correlation	-.080
	Sig. (2-tailed)	.162
	N	311
HS Un 35k	Pearson Correlation	-.076
	Sig. (2-tailed)	.184
	N	311
HS ov 200k	Pearson Correlation	.044
	Sig. (2-tailed)	.435
	N	311
per fam U 25k	Pearson Correlation	-.027
	Sig. (2-tailed)	.632
	N	311

per fam U 35k	Pearson Correlation	-.042
	Sig. (2-tailed)	.458
	N	311
per fam ov 200k	Pearson Correlation	.046
	Sig. (2-tailed)	.421
	N	311
All Fams Pov 12 mnths	Pearson Correlation	-.013
	Sig. (2-tailed)	.815
	N	311
Female House Pov	Pearson Correlation	.010
	Sig. (2-tailed)	.858
	N	311
All People under Pov	Pearson Correlation	-.016
	Sig. (2-tailed)	.778
	N	311
Lone-parent Male	Pearson Correlation	-.051
	Sig. (2-tailed)	.374
	N	311
Lone-parent Female	Pearson Correlation	-.069
	Sig. (2-tailed)	.225
	N	311
Lone-parent household (total)	Pearson Correlation	-.089
	Sig. (2-tailed)	.119
	N	311
Less than 9th grade	Pearson Correlation	-.025

	Sig. (2-tailed)	.661
	N	311
No HS	Pearson Correlation	-.060
	Sig. (2-tailed)	.290
	N	311
Some College	Pearson Correlation	-.016
	Sig. (2-tailed)	.783
	N	311
BA	Pearson Correlation	.000
	Sig. (2-tailed)	.999
	N	311
Advanced Degree	Pearson Correlation	.037
	Sig. (2-tailed)	.515
	N	311
BABS	Pearson Correlation	-.077
	Sig. (2-tailed)	.177
	N	311
MAMS	Pearson Correlation	.079
	Sig. (2-tailed)	.164
	N	311
MOBILITY	Pearson Correlation	1
	Sig. (2-tailed)	
	N	311

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix D

7th Grade - Pearson Correlation Coefficients Scores for All Variables where *N* = 301

Correlations

		P + AP Total MATH	Employ Status	HS Un 25k	HS Un 35k	HS ov 200k	per fam U 25k	per fam U 35k	per fam ov 200k	All Fams Pov 12 mnths
P + AP Total MATH	Pearson Correlation	1	-.313**	-.642**	-.654**	.653**	-.631**	.052	.620**	-.585**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.367	.000	.000
	N	301	301	301	301	301	301	301	301	301
Employ Status	Pearson Correlation	-.313**	1	.233**	.258**	-.566**	.142*	.038	-.502**	.091
	Sig. (2-tailed)	.000		.000	.000	.000	.014	.508	.000	.116
	N	301	301	301	301	301	301	301	301	301
HS Un 25k	Pearson Correlation	-.642**	.233**	1	.960**	-.603**	.896**	-.034	-.570**	.850**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.557	.000	.000
	N	301	301	301	301	301	301	301	301	301
HS Un 35k	Pearson Correlation	-.654**	.258**	.960**	1	-.660**	.858**	-.030	-.622**	.817**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.600	.000	.000
	N	301	301	301	301	301	301	301	301	301
HS ov 200k	Pearson Correlation	.653**	-.566**	-.603**	-.660**	1	-.486**	-.005	.921**	-.440**

	Sig. (2-tailed)	.000	.000	.000	.000		.000	.928	.000	.000
	N	301	301	301	301	301	301	301	301	301
per fam U 25k	Pearson Correlation	-.631**	.142*	.896**	.858**	-.486**	1	-.028	-.467**	.929**
	Sig. (2-tailed)	.000	.014	.000	.000	.000		.628	.000	.000
	N	301	301	301	301	301	301	301	301	301
per fam U 35k	Pearson Correlation	.052	.038	-.034	-.030	-.005	-.028	1	.000	-.021
	Sig. (2-tailed)	.367	.508	.557	.600	.928	.628		.994	.713
	N	301	301	301	301	301	301	301	301	301
per fam ov 200k	Pearson Correlation	.620**	-.502**	-.570**	-.622**	.921**	-.467**	.000	1	-.421**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.994		.000
	N	301	301	301	301	301	301	301	301	301
All Fams Pov 12 mnths	Pearson Correlation	-.585**	.091	.850**	.817**	-.440**	.929**	-.021	-.421**	1
	Sig. (2-tailed)	.000	.116	.000	.000	.000	.000	.713	.000	
	N	301	301	301	301	301	301	301	301	301
Female House Pov	Pearson Correlation	-.318**	.005	.554**	.531**	-.285**	.584**	-.007	-.255**	.673**
	Sig. (2-tailed)	.000	.936	.000	.000	.000	.000	.904	.000	.000
	N	301	301	301	301	301	301	301	301	301
Lone-parent Male	Pearson Correlation	-.325**	.240**	.407**	.435**	-.330**	.487**	-.019	-.277**	.453**

	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.749	.000	.000
	N	301	301	301	301	301	301	301	301	301
Lone-parent Female	Pearson Correlation	-.514**	.216**	.604**	.623**	-.403**	.684**	.003	-.420**	.677**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.964	.000	.000
	N	301	301	301	301	301	301	301	301	301
Lone-parent household (total)	Pearson Correlation	-.531**	.260**	.629**	.658**	-.444**	.719**	-.004	-.438**	.704**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.940	.000	.000
	N	301	301	301	301	301	301	301	301	301
Less than 9th grade	Pearson Correlation	-.468**	.164**	.611**	.627**	-.417**	.652**	-.037	-.404**	.571**
	Sig. (2-tailed)	.000	.004	.000	.000	.000	.000	.518	.000	.000
	N	301	301	301	301	301	301	301	301	301
No HS	Pearson Correlation	-.647**	.279**	.770**	.788**	-.618**	.754**	-.043	-.604**	.685**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.457	.000	.000
	N	301	301	301	301	301	301	301	301	301
Some College	Pearson Correlation	-.403**	.376**	.264**	.326**	-.619**	.183**	.013	-.574**	.193**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.001	.821	.000	.001
	N	301	301	301	301	301	301	301	301	301
BA	Pearson Correlation	.697**	-.462**	-.665**	-.717**	.815**	-.588**	.050	.761**	-.556**

	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.387	.000	.000
	N	301	301	301	301	301	301	301	301	301
Advanced Degree	Pearson Correlation	.659**	-.475**	-.591**	-.651**	.896**	-.504**	.026	.852**	-.451**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.657	.000	.000
	N	301	301	301	301	301	301	301	301	301
BABS	Pearson Correlation	-.323**	.355**	.338**	.366**	-.479**	.279**	-.064	-.419**	.278**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.271	.000	.000
	N	301	301	301	301	301	301	301	301	301
MAMS	Pearson Correlation	.326**	-.356**	-.341**	-.368**	.475**	-.287**	.068	.417**	-.287**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.241	.000	.000
	N	301	301	301	301	301	301	301	301	301
MOBILITY	Pearson Correlation	.009	-.065	-.090	-.079	.034	-.045	-.033	.036	-.033
	Sig. (2-tailed)	.876	.257	.120	.173	.554	.441	.570	.538	.570
	N	301	301	301	301	301	301	301	301	301

Correlations

	Female House Pov	Lone-parent Male	Lone-parent Female	Lone-parent household (total)	Less than 9th grade	No HS	Some College	BA	Advanced Degree	BABS

P + AP Total MATH	Pearson Correlation	-.318**	-.325**	-.514**	-.531**	-.468**	-.647**	-.403**	.697**	.659**	-.323**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
Employ Status	Pearson Correlation	.005	.240**	.216**	.260**	.164**	.279**	.376**	-.462**	-.475**	.355**
	Sig. (2-tailed)	.936	.000	.000	.000	.004	.000	.000	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
HS Un 25k	Pearson Correlation	.554**	.407**	.604**	.629**	.611**	.770**	.264**	-.665**	-.591**	.338**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
HS Un 35k	Pearson Correlation	.531**	.435**	.623**	.658**	.627**	.788**	.326**	-.717**	-.651**	.366**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
HS ov 200k	Pearson Correlation	-.285**	-.330**	-.403**	-.444**	-.417**	-.618**	-.619**	.815**	.896**	-.479**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301

per fam U 25k	Pearson Correlation	.584**	.487**	.684**	.719**	.652**	.754**	.183**	-.588**	-.504**	.279**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
per fam U 35k	Pearson Correlation	-.007	-.019	.003	-.004	-.037	-.043	.013	.050	.026	-.064
	Sig. (2-tailed)	.904	.749	.964	.940	.518	.457	.821	.387	.657	.271
	N	301	301	301	301	301	301	301	301	301	301
per fam ov 200k	Pearson Correlation	-.255**	-.277**	-.420**	-.438**	-.404**	-.604**	-.574**	.761**	.852**	-.419**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
All Fams Pov 12 mnths	Pearson Correlation	.673**	.453**	.677**	.704**	.571**	.685**	.193**	-.556**	-.451**	.278**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
Female House Pov	Pearson Correlation	1	.268**	.309**	.338**	.292**	.413**	.163**	-.379**	-.299**	.161**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.005	.000	.000	.005
	N	301	301	301	301	301	301	301	301	301	301

Lone-parent Male	Pearson Correlation	.268**	1	.376**	.647**	.386**	.468**	.163**	-.412**	-.333**	.257**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.005	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
Lone-parent Female	Pearson Correlation	.309**	.376**	1	.945**	.527**	.592**	.188**	-.507**	-.415**	.305**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.001	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
Lone-parent household (total)	Pearson Correlation	.338**	.647**	.945**	1	.563**	.643**	.211**	-.553**	-.453**	.332**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
Less than 9th grade	Pearson Correlation	.292**	.386**	.527**	.563**	1	.884**	-.004	-.490**	-.453**	.153**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.944	.000	.000	.008
	N	301	301	301	301	301	301	301	301	301	301
No HS	Pearson Correlation	.413**	.468**	.592**	.643**	.884**	1	.180**	-.740**	-.680**	.329**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.002	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301

Some College	Pearson Correlation	.163**	.163**	.188**	.211**	-.004	.180**	1	-.596**	-.636**	.418**
	Sig. (2-tailed)	.005	.005	.001	.000	.944	.002		.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301
BA	Pearson Correlation	-.379**	-.412**	-.507**	-.553**	-.490**	-.740**	-.596**	1	.851**	-.526**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	301	301	301	301	301	301	301	301	301	301
Advanced Degree	Pearson Correlation	-.299**	-.333**	-.415**	-.453**	-.453**	-.680**	-.636**	.851**	1	-.474**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	301	301	301	301	301	301	301	301	301	301
BABS	Pearson Correlation	.161**	.257**	.305**	.332**	.153**	.329**	.418**	-.526**	-.474**	1
	Sig. (2-tailed)	.005	.000	.000	.000	.008	.000	.000	.000	.000	
	N	301	301	301	301	301	301	301	301	301	301
MAMS	Pearson Correlation	-.176**	-.256**	-.316**	-.341**	-.157**	-.332**	-.411**	.525**	.471**	-.996**
	Sig. (2-tailed)	.002	.000	.000	.000	.006	.000	.000	.000	.000	.000
	N	301	301	301	301	301	301	301	301	301	301

MOBILITY	Pearson Correlation	.012	-.036	-.090	-.098	-.064	-.082	.020	-.004	.025	-.064
	Sig. (2-tailed)	.834	.535	.117	.089	.269	.156	.728	.951	.670	.266
	N	301	301	301	301	301	301	301	301	301	301

Correlations

		MAMS	MOBILITY
P + AP Total MATH	Pearson Correlation	.326**	.009
	Sig. (2-tailed)	.000	.876
	N	301	301
Employ Status	Pearson Correlation	-.356**	-.065
	Sig. (2-tailed)	.000	.257
	N	301	301
HS Un 25k	Pearson Correlation	-.341**	-.090
	Sig. (2-tailed)	.000	.120
	N	301	301
HS Un 35k	Pearson Correlation	-.368**	-.079
	Sig. (2-tailed)	.000	.173
	N	301	301
HS ov 200k	Pearson Correlation	.475**	.034
	Sig. (2-tailed)	.000	.554
	N	301	301
per fam U 25k	Pearson Correlation	-.287**	-.045
	Sig. (2-tailed)	.000	.441
	N	301	301

per fam U 35k	Pearson Correlation	.068	-.033
	Sig. (2-tailed)	.241	.570
	N	301	301
per fam ov 200k	Pearson Correlation	.417**	.036
	Sig. (2-tailed)	.000	.538
	N	301	301
All Fams Pov 12 mnths	Pearson Correlation	-.287**	-.033
	Sig. (2-tailed)	.000	.570
	N	301	301
Female House Pov	Pearson Correlation	-.176**	.012
	Sig. (2-tailed)	.002	.834
	N	301	301
Lone-parent Male	Pearson Correlation	-.256**	-.036
	Sig. (2-tailed)	.000	.535
	N	301	301
Lone-parent Female	Pearson Correlation	-.316**	-.090
	Sig. (2-tailed)	.000	.117
	N	301	301
Lone-parent household (total)	Pearson Correlation	-.341**	-.098
	Sig. (2-tailed)	.000	.089
	N	301	301
Less than 9th grade	Pearson Correlation	-.157**	-.064
	Sig. (2-tailed)	.006	.269
	N	301	301
No HS	Pearson Correlation	-.332**	-.082

	Sig. (2-tailed)	.000	.156
	N	301	301
Some College	Pearson Correlation	-.411**	.020
	Sig. (2-tailed)	.000	.728
	N	301	301
BA	Pearson Correlation	.525**	-.004
	Sig. (2-tailed)	.000	.951
	N	301	301
Advanced Degree	Pearson Correlation	.471**	.025
	Sig. (2-tailed)	.000	.670
	N	301	301
BABS	Pearson Correlation	-.996**	-.064
	Sig. (2-tailed)	.000	.266
	N	301	301
MAMS	Pearson Correlation	1	.069
	Sig. (2-tailed)		.233
	N	301	301
MOBILITY	Pearson Correlation	.069	1
	Sig. (2-tailed)	.233	
	N	301	301

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).