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The Influence of Community Demographics on Student Achievement on the Connecticut Mastery Test in Mathematics and English Language Arts in Grade 3 Through 8

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THE INFLUENCE OF COMMUNITY DEMOGRAPHICS ON STUDENT ACHIEVEMENT ON THE CONNECTICUT MASTERY TEST IN MATHEMATICS AND ENGLISH LANGUAGE ARTS IN GRADE 3 THROUGH 8

BY

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ABSTRACT

THE INFLUENCE OF COMMUNITY DEMOGRAPHICS ON STUDENT ACHIEVEMENT ON THE CONNECTICUT MASTERY TEST IN MATHEMATICS AND ENGLISH LANGUAGE ARTS IN GRADE 3 THROUGH 8

Student achievement has been measured in the United States for decades through the use of standardized state assessments. The purpose of this study was to examine which combination of 15 out-of-school community demographic variables best predicted and accounted for the most variance in a Connecticut school district's percentages of students scoring goal or above on the 2010 Connecticut Mastery Test (CMT) for the third through eighth grade in Mathematics (Math) and English Language Arts (ELA). Analyses were conducted using both a simultaneous regression model and a hierarchical regression model. This study looked at the entire population of districts that were not regional districts, charter schools, private schools or high schools and had at least 25 students in third through eighth grade who took the 2010 ELA and Math CMT. There were two research questions that guided the researcher in the study. The two research questions involved finding the right combination of the 15 out-of-school variables that best predicted how students actually performed on the 2010 CMT as well as accounted for the greatest amount of variance on the 2010 CMT in Mathematics and English Language Arts. The results of this study revealed that out-of-school community demographic factors greatly affect how students perform on state standardized assessments. This study predicted between 68% and 76% and accounted for between 67% and 79% of the variance in the 2010 CMT's for third through eighth grade in ELA and Math. This study showed that each grade level produced a combination of out-of-school demographic data that was specific to each grade level and subject. Some of these variables (percent no HS diploma, percent married families, percent making less than $35,000) were common across grade level and subject area. The findings from this study corroborate and strongly support the findings from previous empirical studies on the impact of out-of-school factors on student achievement. 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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TABLE OF CONTENTS

Appendix

List of Tables

List of Figures

Chapter 1

Introduction and Background

This study determined which out-of-school variables best predicted how students performed on the 2010 Connecticut Mastery Test (CMT) for grades 3 through 8 in mathematics and English language arts for the school districts represented in the study. This study also looked at the out-of-school variables that explained the most variance on the 2010 CMT for grades 3 through 8 in Mathematics and English Language Arts for the school districts represented in the study. The study utilized the 5 year census data from the 2008-2012 United States Census Bureau as well as the 2010 CMT scores in Mathematics and English Language Arts. This study focused on district level data and not school specific data. The study looked to assess the way student achievement is measured and assessed based on state standardized assessments.

Our current education system began with the foundation that was laid by the Greeks, Romans, Christians, and German tribes during the early history of our western civilization (Cubberley, 2004). Various forms of schooling have existed since spoken and written language have been kept and passed on from generation to generation. Measuring how well students understand the information they are given through formal or informal schooling has always been an issue. Currently, standardized state assessments, the achievement gap, and how districts, schools, and groups of students' performances compare to others, are some of the things that come to mind when one hears or thinks of student achievement. What is student achievement and how is it measured? Currently, in the United States, standardized tests have been the main way that federal, state, local, and district school officials and representatives measure student achievement Deke, Dragoset, Bogen, & Gill, 2012; Koretz, 2000; Stuart, 2010). Exploring the history of standardized assessments, the education achievement gap, and student achievement will enable a better understanding of where the US education system has been and the direction it should head.

Standardized state assessments are described as any assessments given by states in order to meet federal, state and local requirements like No Child Left Behind (Stuart, 2010). As far back as the 1800s, standardized assessments were being used by Horace Mann as a means of assessing the effectiveness of teaching and learning in Boston urban schools (Gallagher, 2003). Based on the results of Horace Mann's testing, standardized assessments became more widespread throughout the country (Gallagher, 2003). During the 1800s achievement tests were utilized to assess the teaching and learning occurring in schools and as a way of measuring schools and students' abilities to learn and achieve academically (Edwards, 2006). In the 1920s, after many years of standardized testing, it was common practice in the United States to utilize standardized tests to make education decisions (Gallagher, 2003). Standardized assessments continued to be utilized, but not in a uniform manner. In 1965, with the enactment of the Elementary and Secondary Education Act (ESEA), standardized testing became a federal requirement which the government used as a funding mechanism to support underfunded schools and ensure that all students had access to appropriate education opportunities (Scott, 2004).

During the 1960s, state standardized assessments were used by some states, school districts, and schools as During the 1960s, state standardized assessments were used by some states, school districts, and schools as measures of student achievement (Farkas & Hall, 2000). President Lyndon Johnson signed the Elementary and Secondary Education Act (ESEA) of 1965 in order to establish a formal system that would hold schools accountable for student achievement and allow for students throughout the country, regardless of financial status, to succeed to their fullest academic potential (Alford, 1965). From its inception in 1965 until the present, ESEA has altered its name and has been reauthorized various times, in order to add various provisions to the law. In 1981, ESEA was reauthorized as the Education Consolidation and Improvement Act, in 1994 it was reauthorized as the Improving America's School Act, and in 2001 the No Child Left Behind Act (Alford, 1965). Each reauthorization brought more accountability to states, districts, and schools in regard to student achievement. An example of this is when the US Congress used sections of the ESEA, such as Title I and Title II, to help ensure that high quality teaching and learning was occurring regardless of a student's income status (Farkas & Hall, 2000; Thomas & Brady, 2005). Title I allocates funds to Local Education Agencies (LEA) to support the education of children of low income families. Title II provides funds for instructional materials and resources to schools, staff and students in order to train, recruit and support high quality teachers and administrators (Farkas & Hall, 2000; Thomas & Brady, 2005).

A system of accountability through the use of assessments that was originated by Horace Mann in the 1800s to access the teaching and learning that was occurring in schools has morphed into the system of standardized testing that we see today (Gallagher, 2003). Although these assessments have changed dramatically from the time of Horace Mann till now, there still remain some similarities between our education system then and now. The concern and influence behind these state, national, and international tests reached a climax in 1983, with the release of the report "A Nation at Risk," which added to the growing concern that the United States was falling behind other nations in international testing (National Commission on Excellence in Education, 1983). This report raised fears that the U.S. was beginning to fall behind in areas such as technological innovation, science, industry, and commerce based on our education system and how US students were performing on various assessments (Amrein, Berliner, & March, 2002). This idea of a failing education system, based on reports like "Nation at Risk," led to a movement for school reform including the privatizing and standardizing of the public education system, leading to increased emphasis on standardized assessments. In the 1980s, over 33 states had some form of standardized testing that was being used to make critical decisions regarding education, policy, and curriculum. This has now progressed to the point that 49 out of the 50 states and the federal government rely on standardized state tests as the underpinnings to set policies and make education decisions (Gallagher, 2003; Heise, 1994).

Based on the apparent education crises, the National Center for Education Statistics (as cited in Rumberger & Palardy, 2005) requested a study to examine the issue of *testing equity*. The findings of this study became the basis for the Coleman Report (as cited in Rumberger & Palardy, 2005). The authors of the Coleman Report noted that, out of all the variables included, *home* and a student's' *family life* had the most influence on how students performed on the state standardized tests, which are now being used to measure student achievement and determine school effectiveness (Edwards, 2006; Rumberger & Palardy, 2005).

Over 50 years later, the United States education system is still facing issues similar to those that it did in the past. Some of these issues include how student achievement is measured, how the achievement gap is being addressed, and how standardized assessments are being utilized (Edwards, 2006; Tienken and Olrich, 2013). Standardized assessments are again being used to set policy and make critical education decisions (Edwards, 2006; Tienken and Orlich, 2013). With the enactment of No Child Left Behind (NCLB), states were held accountable through sanctions or rewards for how students performed on standardized assessments (Edwards, 2006; Fusarelli, 2004). These state tests continued to gain momentum and significance since

NCLB used those scores as the instrument for measuring student achievement. With all the emphasis on standardized assessments, studies were conducted and continue to be conducted that highlight the limitations and flaws of standardized assessments (Amrein & Berliner, 2002; Maylone, 2002; Tienken, 2008; Tienken, 2011; Tienken, 2013; Tienken & Orlich, 2013; Turnamian, 2012). With the level of importance being connected to standardized assessments there is a need to explore the use of standardized assessments as the main way of measuring student achievement.

As our education system continues to change, the challenge is to meet the ever varying needs of our students. Are high stakes examinations such as the SATs, state assessments, Advanced Placement exams, International Baccalaureate exams, Science, Technology, Engineering and Math (STEM), Trends in International Mathematics and Science Study (TIMSS), and the Program for International Student Assessment (PISA) exams and so forth, the best way to measure student achievement and growth? What is the importance of tests like the Connecticut Mastery Test (CMT) and New Jersey Assessment of Skills and Knowledge (NJ ASK)? What can schools do to ensure that their students succeed on such tests considering that the tests are used to evaluate how well students are performing and where and how funding is being appropriated? The fact that policymakers, education bureaucrats, education leaders, school and district leaders, parents, community members, students, and all stakeholders are operating under the assumption that standardized assessments are the main measure of student achievement is an education issue that needs to be explored. There are a myriad of factors outside of school that contribute to how students perform on standardized assessments. Therefore, standardized assessments cannot and should not be used as the sole determinant of a district, school, or student’s ranking or achievement, (Tienken, 2008, Turnamian, 2012, Tienken & Orlich, 2013).

This research study explored the extent to which the factors outside of school, such as community demographic factors, influenced how students in public school districts in the state of Connecticut performed on these statewide assessments.

Statement of the Problem

What is student achievement and how can it be measured accurately? During the 1930s, when the Eight Year Study (Aiken, 1942) was conducted, the Commission on the Relation of School and College developed criteria that defined student achievement and provided insight into how educators could measure a student's achievement. Those criteria included: a recommendation from the school principal that described the student's strengths; interest and purpose; ability to be successful in school studies; a record of the student's school life; and scholastic aptitude tests (Aikin, 1942). The members of the commission realized the importance of using multiple measures to determine student achievement.

Results from recent empirical studies suggest that in today's public schools there is one main determinant of public school student achievement: state mandated standardized tests of mathematics and language arts (Dorn, 1998; Koretz, 2000; Madaus, 1991; Tienken, 2008; Tienken, 2010; Tienken, 2011). State exams like the Connecticut Mastery Test (CMT), Connecticut Academic Performance Test (CAPT), and New Jersey Assessment of Skills and Knowledge (NJ ASK), as well as national exams that include the Scholastic Aptitude Test (SAT) and National Assessment of Education Performance (NAEP), are what are being used to determine and assess student achievement (Anderson, Medrich, & Fowler, 2007; Farkas & Hall, 2000; Tienken & Zhao, 2010).

Too much emphasis is being given to national and standardized state assessments in determining student achievement. A quandary is that, if the results from high stakes standardized state assessments are used in determining a student's achievement, then the fact that the results of these tests can be predicted based on out-of-school factors suggest that their use as a high stakes decision making tool might be flawed (Maylone, 2002; Tienken, 2012; Tienken, 2013; Tienken & Orlich, 2013; Turnamian, 2012). The fact that standardized test scores can be predicted based on certain community demographic variables, such as poverty and parents' education attainment, leads one to believe that children living in poverty will usually and frequently be tracked as underperforming and not achieving academically and therefore will remain in the same or similar circumstances as their parents (Figlio & Page, 2002; Murnane, Willett & Levy, 1995; Vanfossen, Jones, & Spade, 1987).

What does this mean for students who live in communities that have the community demographic variables that predict low test scores and poor student achievement based on those test scores? Does it mean that these students will always be destined to fail and be perceived as underachieving based on a test? Students show their learning and understanding in various ways, including ongoing assessments, class work, portfolios, teacher recommendations, class grades, ~~etc~~ and so forth. Why and how have state standardized assessments become such a powerful tool that most education decisions are made based on these assessments?

As state assessments change and the achievement gap, as defined by state test scores, continues to grow, policy makers and education leaders are interested in determining ways of reducing the existing achievement differential. To do so, efforts are being undertaken to study specific schools that are attempting to reduce the achievement gap. It is hoped that information gained from these investigation can be applied on a broader scale (Anderson, Medrich & Fowler, 2007). To date, among those schools that have been studied in which the achievement gap has been reduced, several factors have been noted. These include: maximizing the time staff have with students when the students are in school and the existence of a positive school climate that allows for the maximization of student achievement (Greene, 2005). In these successful schools, student achievement is not only being measured by test scores but also by attendance, office referrals, school detentions, suspensions, academic progress, ~~etc.~~and so forth (Anderson, Medrich, & Fowler, 2007).

Although researchers have described the amount of variance accounted for in state mandated tests in Michigan and New Jersey, no studies of this nature have been conducted in Connecticut since the inception of the NCLB era (Maylone, 2002; Turnamian, 2012). More results from quantitative, explanatory studies are necessary to inform state policy makers and education bureaucrats.

Theoretical Framework

The theoretical underpinnings of this research study are founded on production function theory (Todd & Wolpin, 2003). Production function theory is rooted in the field of economics and deals with the impact that various inputs have on an output. In this current research study, the independent variable (input) will be the 15 out-of-school community demographic data and the dependent variable (output) will be how students perform on the third through eighth grade Connecticut Mastery Test (CMT) in mathematics and language arts.

Todd and Wolpin (2003) use the education production function (EPF) to describe the school inputs and test score outputs. Pritchett and Filmer (1999) described production function as an expression for the maximum amount of output possible for an amount of inputs (p. 224). The data that will be utilized is drawn from reality (15 out-of-school variables), not based solely for the purpose of research (Pritchett & Filmer, 1999). There are policy implications that exist based on the inputs chosen and the potential output, but in the most simple models inputs are chosen in order to maximize the production of a single education output, which in this case is student achievement as measured by standardized tests scores.

Maylone (2002) used the following inputs: lone-parent household, mean annual household income, and percentage of free and reduced lunch to best predict how students achieve academically (output) as measured by students' test scores. Jones (2008) found that nearly 90% of the variance in the passing rate (output) of literacy arts in the NJ High School Performance Assessment was explained by eight variables (inputs). The eight variables were both in school and out-of-school variables.

For the purpose of this study, and similar to Gemellaro's (2012) description of education production function, the districts acted as the institution, where inputs (15 variables) were transformed into outputs (third through eighth grade CMT scores). This theoretical model is used to describe the Connecticut State Department of Education and the districts that reside within it.

Purpose of the Study

The purpose of this study was to determine which combination of 15 out-of-school community demographic variables best predicted and accounted for the most variance in a Connecticut school district's percentage of students scoring goal or above on the 2010 Connecticut Mastery Test (CMT) for the third through eighth grade in mathematics (math) and English language arts (ELA).

The current study builds on the works of both Maylone (2002) and Turnamian (2012). Both men used out-of-school factors to predict how students would perform on standardized assessments. This study looked at how community demographic data predicted how students performed on the 2010 Connecticut Mastery Test (CMT) in grades 3 through 8 in English language arts and mathematics. This study also created the best combinations of community demographic variables that allowed for the maximum variance in test scores and the maximum prediction to be made on how students performed on the 2010 CMT. This was the first time that a study like this had been conducted in the state of Connecticut. This was also the first time a study like this captured all of the elementary and middle school testing grades within a state.

Research Questions and Sub-Questions

There were two overarching research questions that were addressed in this study:

1. Which combination of out-of-school variables best predicts how students actually performed on the 2010 third through eighth grade CMT‘s in regards to scoring goal or higher in mathematics and English language arts at the district level?

2. Which combination of out-of-school variables explained the most amount of variance in the percent of students who scored goal or higher on the 2010 CMT in mathematics and English language arts at the district level?

In order to fully decipher the two comprehensive research questions, and after extensively reviewing the literature, the following four sub-research questions were created.

Research Question 1

Which combination of out-of-school variables best predicted how students performed in the 2010 third through eighth grade CMT in mathematics?

Research Question 2

Which combination of out-of-school variables best predicted how students performed in the 2010 third through 8^{th} grade CMT in English language arts?

Research Question 3. Which combination of out-of-school variables showed the most variance in students third through eighth grade CMT scores in mathematics?

Research Question 4. Which combination of out-of-school variables showed the most variance in students third through eighth grade CMT scores in English language arts?

Study Design and Methodology

The current investigational study examined 15 out-of-school variables (input) that were linked to poverty, financial status, parent's education attainment, and family support. The independent variables for this study were specific to the state of Connecticut. The independent variables for this study were: median district household income; percentage of families in workforce; percentage of families below the poverty level; percentage of families making $35,000 or less; percentage of families making $25,000 or less; percentage of female only households (no males); percentage of male only households (no females); percentage of families with household annual incomes above $200,000; percentage of lone parent households; percentage of married families with children 6-17 years old; percentage of population 25 years or older with no high school diplomas; percentage of population 25 years or older with high school diplomas; percentage of population 25 years or older with some college experience; percentage of population 25 years or older with bachelor's degrees; percentage of population 25 years or older with advanced degrees. To analyze the data, a simultaneous regression model as well as a hierarchal regression model were used to see which combination of out-of-school variables best predicted how students performed on the 2010, third, fourth, fifth, sixth, seventh, and eighth grade CMTs, as well as which variables showed the most variance in how students performed on the aforementioned state assessments. Both the simultaneous and hierarchical regressions will be discussed in depth in Chapter 3.

In order to determine the combination of out-of-school variables that had a statistically significant relationship to student achievement, a simultaneous regression as well as a hierarchical regression analysis were used. Simultaneous regression is described by Petrocelli (2003) as “a way to explore and maximize prediction…” whereas “hierarchical regression involves theoretically based decisions for how predictors are entered into the analysis” (p. 9).

This study utilized publically available data from the Connecticut State Department of Education website (http://solutions1.emetric.net/cmtpublic/Index.aspx) on third through eighth grade students’ performances on the 2010 CMTs in the areas of math and ELA, along with 2010 United States census data from the US Census Bureau to determine if there was a predictive equation that could be created from this data. The reason why third through eighth grade was chosen was because the third grade is the first time students are assessed with the state standardized test, and the eighth grade is the last time students are assessed at the middle school levem with the state standardized tests in the state of Connecticut. The study design focused on the 15 out-of-school variables representing the input in the production function and student performance on the state test, representing the output in the production function.

The data for this research study was collected through the Connecticut State (CT) Department of Education’s public website for parents, students, and educators. The website has various kinds of data that is both public and private, that is broken up by both school and district. The information on this site that was used for this dissertation was taken from the public section of the CT website. The data that was collected from the CT website was all the school districts in CT with at least 25 students taking the state test in the third through eighth grade in math and

ELA. The other data collection website was the United States Government Census website American Factfinder (web address here). This is also a publicly available website. The 15 out-of-school variables were obtained from this website. The data (15 community demographic data and student test scores) were run through a regression model. The regression models were then analyzed to see which models best predicted students' performance, as well as which models showed the most variance on the 2010 CMT in Math and ELA.

This study builds on the 12 independent variables that were used by Turnamian (2012), as well as others from Maylone (2002) and Jones (2008), with three additional variables that were not used in the first three studies. For this study, the dependent variables that were used were the school districts' proficiency data (goal and advanced) for the third through eighth grade and the(??) CMT scores for math and ELA. The proficiency data focused on all third through eighth grade students in Connecticut public school districts (not regional school districts) that had at least 25 students in the grade who took the 2010 CMT in Math and ELA and scored at goal or above.

Significance of the Study

The focus of this investigation was to determine the strength of the relationship between community demographic factors and students' aggregate scores on their 2010 CMT. By demonstrating the strength of this relationship, the study will provide information that could be utilized by policy makers and education leaders in the development of policies to enhance student learning and achievement. The findings of the study will assist district level and school based administrators in gaining a better understanding of how out-of-school factors can influence test scores for state assessment such as the CMT. Past research has demonstrated that out-of-school variables influence student achievement as measured by standardized state assessments

(Jones, 2008; Maylone, 2002; Tienken, 2012; Tienken, 2013; Tienken & Olrich, 2013; Turnamian, 2012). Also, Jones (2008) showed that the multiple regression analysis of socioeconomic data, along with student achievement data, can be used to create a predictive formula in regards to how students will perform on state standardized assessments. The outcome of this study demonstrated that community demographic factors are able to predict as well as show variance in regards to students' performance on the 2010 CMT in Math and ELA.

Delimitations

The data for this study was gathered from two main sources. The first source was the 2010 CMT data, obtained from the Connecticut State Department of Education CMT website. The second data source was the respective districts' community demographic data, which was obtained from the United States Census Bureau website. The data that was analyzed with regard to community demographics was obtained from the variables used in the Maylone (2002) and Turnamian (2012) studies, along with the review of the literature.

For this study, student achievement in the state of Connecticut is being measured by third through eighth grade CMT scores in Math and ELA. The CMT is a high stakes assessment that every public school in the state of Connecticut administers to students in the third through eighth grade.

The main focus of this study was strictly public school districts that had at least 25 students in the third through eighth grade who took the CMT assessments. Since this study focuses on students in the third through eighth grade in the state of Connecticut, the results of the study can be generalized to students in Connecticut Public School districts that have these specific grades. The study also focused on district level results, therefore generalizations could not be made to individual schools or particular staff members. Also, any generalization that is made can only be made for third through eighth grade students within that district.

Limitations

The results from this study were derived from the third through eighth grade CMT scores in Math and ELA and the 15 community demographic variables that were obtained from the United States Census Bureau website. The study only applied to the state of Connecticut CMT tests and the community demographic data for the state of Connecticut.

The subjects for this study were all districts in the state of Connecticut that had at least 25 students in any of the CMT testing grades (third through eighth grade) and which were not regional school districts. The study also focused on district level community demographic data for various districts in the state of Connecticut.

The study used data from the 2010 third through eighth grade Connecticut Mastery Test (CMT) scores in Math and ELA. This study did not attempt to show cause and effect, but rather sought to show the variance or predictive power.

Definition of Terms

Achievement gap. The academic differential between groups of students based on race and socioeconomic and demographic status, and measured by students' performance on standardized assessments.

Adequate Yearly Progress (AYP). NCLB established the goal of one hundred percent of students achieving proficiency or higher 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 one hundred percent mark. Districts are required to publish their AYP results annually (Turnamian, 2012).

Connecticut Mastery Test (CMT). The assessment used by the state of Connecticut for students in grades 3 to 8 to determine if schools in Connecticut are meeting AYP in math and ELA. This test is administered during the month of March. There is now a science section that has been added to the test.

High-stakes tests. "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 as stated in Turnaimain, 2012, p. 19).

No Child Left Behind (NCLB). A mandate from President Bush that stated that 100% of students will meet proficient or above in English language arts and mathematics.

Positive school climate. The good qualities and character of school life experiences that reflect norms, goals, values, interpersonal relationships, teaching, learning and leadership practices and organizational structures (National School Climate Center, 2007).

Production function theory. Defined as “the maximum level of outcome possible from alternative combinations of inputs” (Monk, 1989, p. 31).

School climate. Defined as “How well the people within the school treat each other physically, emotionally, and intellectually” (Freiberg, 2011, p.??). It is “the set of internal characteristics that distinguish one school from another and influences the behavior of its members” (Hoy & Hannum, 1997, p. ??).

Social capital theory. This is described as the relationships that people build with each other and some of the benefits of those relationships.

Standardized state assessments: Assessments that are given by states in order to meet the NCLB requirements and show student achievement.

Student achievement. Described as how students perform on State Standardized assessments. It is also described by the multiple ways that student learning and growth can be monitored, such as the use of report card grades, teacher recommendations, administration recommendations, and ongoing interim assessments.

Title I. A federal mandate that gives money to support Local Education Agencies (LEA) in order to help them better educate and serve the needs of children of low-income families.

Title II. A federal mandate that gives instructional materials and resources to schools, staff and students in order to train, recruit and support high quality teachers and administrators in order to provide assistance to students who need it most.

Chapter Summary

In the evaluation of successful education practices, state standardized assessments have been the sole criterion that federal, state, district, and school representatives have utilized to measure student achievement (Koretz, 2000). Given that research has demonstrated that community demographic data, such as income level, parent education level,and other out-of-school factors dramatically influenced students' performances on these state assessments, additional information elucidating the relationship of these variables to academic achievement is important (Myers, Kim, Mandala, 2004; Tienken, 2012; Tienken & Orlich, 2013). Community demographic data and its impact on standardized assessments are critical, especially since state achievement tests are also being used to set education policy and make critical education decisions. Research conducted by Maylone (2002) showed that out-of-school variables accounted for more than 56% of the variance in student scores on state assessments in the state of Michigan. Furthermore, research conducted by Turnaimian (2012) used out-of-school variables to predict 60% of third grade students' math and 52% of their Language Arts scores at the district level on their state assessment.

In an attempt to further understand the relationship between community demographic variables and student achievement on state achievement tests, the current study utilized production function theory as the theoretical framework. This study will provide empirical evidence to the growing but limited knowledge of research in the field of education in regards to the influence of poverty and community demographics on students' education performance and will contribute to the professional dialogue and finally offers a possible alternative for measuring student achievement.

The remainder of this dissertation is broken down as follows:

Chapter 2 will provide the review of important literature that deals with state assessments, production function theory, poverty, student achievement, and the influence of a positive school climate. The review of the related literature will also be focusing on the correlation that exists between community demographic data and how students performed on their state assessments. This review also provided the history of student achievement and how we as a country have gotten to this point in our education system.

Chapter 3 deals with the research methodology, including the process that was followed in determining what the correlation coefficients would be (district community demographic data and students' performance on the third through eighth grade CMT in Math and ELA). Also, this chapter focuses on the right combination of community demographic data that best predicted how students performed on their 2010 CMT.

Chapter 4 explains all the data that was obtained. This data is explained in a narrative form but also has charts and the final analyses of all the data.

Chapter 5 summarizes the entire study and states the conclusions, what some of the potential inferences are, and how the research could affect education policy. This chapter will also provide a discussion of recommendations for further studies.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

This chapter provides a relevant review of the literature on student achievement, state standardized assessments, poverty, school climate and production function theory. The literature review also examines current and past education policies related to test scores, and the effect that community demographic data has on those test scores. This literature review is organized into five sections: student achievement and its connection to the achievement gap, state standardized assessments and policies based on them, socioeconomic status and community demographic data and its influence on student achievement as evidenced by state standardized assessments, the importance of a positive school climate in order to maximize student achievement, and production function theory in an education setting. The following literature review provides information in regards to how the literature for this dissertation was analyzed, gathered, and reviewed in order to determine which information was included in this study and which information was omitted.

Literature Search Procedures

I used various research tools and sources to explore the sections above (student achievement, state standardized assessments, poverty, production function theory, and school climate), but the main source of information was the Kappa Delta Pi Record, since this journal has explored this topic in depth. Additionally, the Seton Hall library website including Journal Storage (JSTOR), ProQuest, electronic journals, and ERIC were referenced. Various articles and publications from the Connecticut State Department of Education and the United States Department of Education were reviewed in order to determine current education policies.

Furthermore, the dissertations of Nelson Maylone (2002), Megan Jones (2008), and Peter Turnamian (2012), along with various articles and publications from Christopher Tienken and other education experts, formed the empirical foundation for this research study.

A Brief History of Education in the United States

In 1776, Thomas Jefferson, one of our nation's founding fathers, saw the importance of a public school system where students could learn and achieve and meet their fullest potential (Tanner & Tanner, 2007). In a letter to J. Cabel, written on January 14, 1818, Thomas Jefferson described the public school system as "A system of general instruction, which shall reach every description of our citizens from the richest to the poorest, as it was the earliest, so will it be the latest of all the public concerns in which I shall permit myself to take an interest" (as cited in Adams, 1888, p. 84). Thomas Jefferson knew the importance of monetary status not getting in the way of children learning, and he was adamant that all students would have an opportunity to learn regardless of their socioeconomic status. Based on the concerns expressed by Thomas Jefferson at the foundation of the public school system, it is evident that education of children and student achievement were an issue and concern then, as well as poverty. Both of these factors still remain an issue and concern today. Today, monetary as well as demographic and socioeconomic factors determine how students perform on standardized assessments (Tienken, 2012; Tienken & Olrich, 2013; Turnamian, 2012).

Many of the issues with our public school system are issues that have been faced in the past, and one needs to be aware of this in order not to keep making the same mistakes (Grant, 1993). In 1867, Congress passed legislation that created the United States Department of Education, the purpose of which was to collect statistical data in order to determine how schools were functioning and to assure that best practices were being used in all the schools (Grant, 1993). The Department of Education was dissolved and a new department, the Office of Education, was formed in 1860. Since this time, the Office of Education went through several changes. Grant (1993) described those changes as follows:

> The Office of Education became one of the constituent agencies within the Department of the Interior in 1869, and it remained there for 70 years. During most of those years, it was known as the Bureau of Education, but in 1929 its name was restored to the Office of Education. In 1939, it became part of the Federal Security Agency, and in 1953, it was assigned to the newly established Department of Health, Education, and Welfare. In 1980, education was separated from health and welfare, and a new cabinet-level Department of Education came into existence (p. 1).

Student Achievement and its Connection to the Achievement Gap

Currently in the United States, standardized state and national assessments are the main mechanisms that the federal government, state government, colleges and universities, local education agencies, school districts, and schools use to assess students and schools in order to make education decisions and set education policies, in regards to student achievement, school effectiveness, and the achievement gap (Archbald & Newman, 1988; Haladyna, Haas, & Nolen, 1989; Henderson & Mapp, 2002; Jorgensen & Hoffmann, 2003; Jones, 2002; Laitsch, 2006). The state of Connecticut and the federal government, through the implementation of NCLB, are still relying on standardized test scores to determine how well students and schools are doing, and they are using test scores as a way of measuring the effectiveness of the teaching and learning that is occurring in schools and if schools and districts are closing the achievement gap or not (Jones, 2002; Laitsch, 2006). The state of Connecticut was chosen because it has the biggest discrepancy of any state in America in regards to the gap between the low-income and non-low-income students on how students perform on the state standardized assessments (Connecticut Commission on Education Achievement, 2012). Although the achievement gap is a national issue, it is more prevalent in the state of Connecticut than in any other state in the country.

The achievement gap, which is the reason for most of these standardized assessments and accountability measures, has not been significantly impacted by these state standardized assessments (Elmore, 2004; Hanushek, Raymond, & Rivkin, 2004). The introduction of NAEP in 1969, along with Commissioner Keppel's data collection from the nation's schools, put a spotlight on the growing achievement gap (Snyder, 1993).

We will now briefly explore the student achievement gap and how it is currently measured through standardized tests scores. The achievement gap is described as the disparity in standardized test scores between Black and White, Latin and White, and recent immigrants and White students (Ladson-Billings, 2006, p.3). Ladson-Billings (2006) wrote about the education department and the fact that it is a department that has been built for many years, therefore it is difficult, but not impossible to fix. The first comprehensive study of the achievement gap was in 1966 (during the time of Commissioner Keppel's data collection), when the prominent researcher James Coleman identified a large differential in the achievement of Black versus White students (Chubb & Loveless, 2002).

Prior to the achievement gap, there were other disparities that existed. In the 1800s, there was the literacy gap, where 90% of all White Americans were literate, while 90% of African Americans were illiterate (Anderson, 1995). During this time, there were inequalities in the ways the majority and minority population interacted and learned. Despite all the efforts that were put in place by various religious groups and communities like the Society for the Propagation of the Gospel in the mid-1700s and 1800s, the 90% literacy and the 90% illiteracy gap remained the same (Anderson, 1995). During the 1700s, 1800s, and early parts of the 1900s, states actually created laws that prevented the spread of literacy and kept the illiteracy rate at 90% (Cornelius, 1991). During that time period, people were fined, physically harmed, or imprisoned simply for trying to teach African Americans how to read (Cornelius, 1991). By the end of the slave era, the African American illiteracy rate was around 90 % (Cornelius, 1991). Slavery was just one example of how the achievement gap began.

Another example along these same lines was the Elementary School Attendance Gap. This difference represented the gross disparity between the percentage of time White students were attending elementary school as compared to the percentage of time Black students were attending elementary school (Anderson, 1995). This unfortunate fact led to less African American elementary school age students attending school as compared to their White peers, which continued to increase the education gap in the 1930s (Anderson, 1995).

Prior to the 1930s, there was an 11% decline in births across the United States, but in the 1930s this decline stabilized, and after World War II, there was the baby boom that greatly increased the number of children in the United States (Grant, 1993). This increase in births led to more attention being focused on schools and how state officials would handle this large spike in the number of students attending school. This spike also led to more accountability in regards to the teaching and learning taking place in schools, how that was assessed, and how schools were showing how they closed the achievement gap.

Haycock (2001) wrote about certain “lessons” that schools can control that would both improve student achievement and close the achievement gap. In his lessons he explained that standards are critical, all students must have a challenging curriculum, students need extra help, and teachers matter a lot (Haycock, 2001). Haycock explained that where these four lessons are present, students would be achieving and the achievement gap would close. Building on the work of Haycock, along with the work of Bryk and Schneider (2002), in which they discuss “relational trust” (p. ??), systems can be set up that would assist in the school reform efforts that are currently underway. With President Obama signing into law the Race to the Top program in 2009, the current system of standardized assessments of basic skills was made more important than ever (Onosko, 2011). The president also shared the importance of intervening early for children through programs such as Head Start. Research has shown that enrolling children in high quality pre-school programs and providing their parents with support can drastically narrow the achievement gap by at least half (Haskins & Rouse, 2005; Magnuson & Waldfogel, 2005). Early intervention for children is critical (Bronfenbrenner, 1974; Campbell & Ramey, 1994).

After discussing the past and current impact of the education achievement gap, it is important to have an understanding of the historical context of the education system in the United States and how the achievement gap has grown so much in CT. In order to understand our education system today, it is important to understand the historical development of the United States education system. In 1867, the U.S. Congress passed legislation that established the Department of Education (DOE) in Washington DC (Grant, 1993). The purpose of this DOE was to collect statistics and facts that showed the progress and condition of education in the states and territories (Grant, 1993). The DOE of 1867 recognized the importance of accountability and ensuring that state education systems were appropriate for students and therefore the DOE promoted education in states and territories. Data was collected for over 100 years by the DOE. Although its role, responsibilities, and name changed throughout that time, it continues to collect data to date through the National Center for Education Statistics (Grant, 1993). The DOE of today has a completely different role from the DOE of 1867. As the National Center for Education Statistics' (NCES) roles and responsibilities have changed from year to year, the data they collected has changed also, and in 1972 it began to include national assessments. Prior to collecting national assessment data, the NCES was mainly focused on collecting data on the number of public schools, the enrollment at those schools, teacher salaries, the number of universities, and the degrees they offered (Grant, 1993).

In the *Cardinal Principles of Secondary Education*, the authors described the goal of education in a democracy and the main objectives of education (National Education Association of the United States, Commission on the Reorganization of Secondary Education, 1918). The authors shared that a democracy must place chief reliance upon education in order to meet its goals in a society (National Education Association of the United States, Commission on the Reorganization of Secondary Education, 1918). The authors of the cardinal principles stated that: "Consequently, education in a democracy, both within and without the school, should develop in each individual the knowledge, interests, ideals, habits, and powers whereby he will find his place and use that place to shape both himself and society toward ever nobler ends" (National Education Association of the United States, Commission on the Reorganization of Secondary Education, 1918, p. 9). The authors saw education as the tool by which students would be able to improve themselves and their current situation, their community and the American society as a whole. The authors also discussed what they felt the seven most important objectives of education were: health; command of fundamental skills; worthy homeownership;

vocation; citizenship; worthy use of leisure; and ethical character (National Education Association of the United States, Commission on the Reorganization of Secondary Education, 1918). As far back as 1918, when *Cardinal Principles* was written, the National Education Association of the United States valued the basics, which were described as the command of fundamental skills (reading, writing, arithmetical computations, and oral and written expression) as an indispensable objective of education, but they were still a part of the whole picture in assessing a student's academic performance and growth and not the sole way of measuring student achievement and growth (National Education Association of the United States, Commission on the Reorganization of Secondary Education, 1918). The authors added that the subjects that were assessed in their state standardized assessments were reading and arithmetic, which both fell into the category of command of fundamental skills. This category constitutes just one of seven objectives of education. The authors were interested in educating the whole child and not just assessing their academic skills.

The way in which public school students have been educated and held accountable for their academic achievements, or lack thereof, has been changing drastically from year to year and continues to change even today. An achievement gap has existed since the foundation of the country, and it has changed from year to year. In the early part of the 19th century, it was common for people who were not wealthy, to have an eighth grade education as the highest education attainment (Snyder, 1993). In the 1940s, half of the U.S. population had an eighth grade education, and only 6% of males and 4% of females had completed 4 years of college (Snyder, 1993). As time progressed, the importance of a high school and college degree started to become more of the norm. In the late 1860s, 2 out of every 100 students who were 17 years old or older were receiving high school diplomas, this number rose in the early 1900s to 9 out of every 100, and it rose again in the late 1960s when 77% of students 17 years old or older graduated high school (Snyder, 1993). The change in education attainment that has occurred throughout the years has been attributed to how students were assessed and seen as achieving academically (Snyder, 1993).

The impetus behind implementing a standardized assessment system began in the 1960s when the Commissioner of Education, Frank Keppel, wanted to get a better understanding of how the nation's schools were performing (Snyder, 1993). The commissioner wanted an indicator or measurement of student achievement. He decided to collect data on how well the nation's schools were doing (Snyder, 1993, p. 102). In 1969, he sanctioned the National Assessment of Education Progress (NAEP), which was started in order to use a standardized assessment tool to monitor how 9-year-olds, 13 year-olds and 17-year-olds were performing academically (Snyder, 1993). For close to 50 years, NAEP has been considered a congressionally mandated project by the U.S. Department of Education's National Center for Education Statistics that shows and compares what U.S. students know and can do. Since the enactment of the NAEP Assessments in 1969, various states and the federal government have been trying to use standardized assessments to measure the strength of the U.S. education system. Standardized assessments continue to be the main and in some instances, the sole measurement of a state, district, or school's capacity in measuring how their students are achieving in school.

Student Achievement

Symonds, Schwartz, & Ferguson (2011) stated that "the United States led the world in equipping its young people with the education they would need to succeed" (p.1). Education is the instrument that people can use to succeed and realize their American Dream. We are in an era where education is critical more than ever for the economic success of the United States, and we must continue to equip our children with the tools and resources that they need to succeed (Symonds, Schwartz, & Ferguson, 2011). Gone are the days when the United States dominated the global economy with 72% of its workforce having had high school diplomas or less (Symonds, Schwartz, & Ferguson, 2011).

In our current education system, 49 states are moving towards the implementation of the Common Core State Standards (CCSS), which is evidence of the dominance of the essentialist theory in our current education system (Turnamian, 2012). Past research, such as the Eight Year Study (author, year), has shown that progressive strategies and techniques helped our current education system meet its essentialist goals, while still educating the whole child in the process (Tanner & Tanner, 2007; Turnamian, 2012). Our current system relies heavily on test scores as the basis for assessing student achievement. The Eight Year Study utilized standardized assessments, but only as one step in a seven step process (Aiken, 1942). The Eight Year Study teaches us that testing should only be used for individual student analysis and not as a way of comparing districts, schools, teachers, students and so forth (Aikin, 1942). Testing should be used to measure a child against their own individual growth so that improvements from year to year can be measured. With the introduction of the CCSS and the two assessments that accompany it, student achievement is being once again determined by standardized tests. As it currently stands, the CCSS is the measuring tool for student achievement. The CCSS is a national set of minimum standards that every child should know and be able to meet throughout their journey in the K-12 curriculum from year to year (National Governor's Association, 2012). The CCSS has two national assessments to measure if a student has mastered these national standards or not. These assessments are the Smarter Balance Assessment and the Partnership for the Assessment for College and Career (PARCC) assessment.

As was previously mentioned, one early attempt to use multiple measures to assess student achievement occurred in the 1930s and was known as the Eight Year Study (Aikin, 1942). The Eight Year Study was conducted between 1930 and 1942 by the Progressive Education Association (PEA), which looked at alternative ways of assessing high school students' achievement. This movement led to teacher collaboration, interdisciplinary units, improved rigor in classrooms, and the development of students who were better prepared to succeed in college and the work force (Aikin, 1942). These students still had to deal with the various disparities that existed while trying to prepare for college and career readiness. Obviously, there are various discrepancies, like the achievement gap, which is just one of many types of inequalities, including but not limited to the high school completion gap; the college graduation gap; and the important and probably most critical, besides the achievement gap, income gap. During the time of the Eight Year Study, recommendations from trusted administrators, along with student grades that show academic progress, would allow a student entrance into college or help them prepare for a career. Standardized tests like the SATs were only a part of the determining factor and not the sole basis for education decisions (Aikin, 1942).

Aikin (1942) noted in his 8 year study that part of the reason why the public school system was founded was to be able to create an educational system that was founded on the ideals of a society that respects and acknowledges various groups (racial, socioeconomic, religious, etc.) and their contributions. Aikin reiterated in his book the Eight Year study, what was shared in the Cardinal Principles of Secondary Education. In the Cardinal Principles of Secondary Education it was written that the goal of public education is to have "a clear conception of the meaning of democracy" (Department of the Interior: Bureau of Education, 1918, p. ???). In a democracy, life, liberty, and the pursuit of happiness are what drives this nation and is what should drive the education system.

The CCSS uses the SBAC and PARCC as their assessment tools. Currently, 22 states will be using the PARCC assessment and 25 will be using the SBAC (McTighe & Wiggins, 2012). The SBAC is broken up into four sections: Formative Assessment Tools and Processes, Interim/ Benchmark Assessments, Summative Achievement Measures, and Summative Growth Measures (Daggett, Gendron, & Heller, 2010). Due to technological advancements, college and career readiness and globalization, 49 states have decided to go with the CCSS (Daggett et al., 2010).

In Connecticut, where this research study was conducted, the SBAC has been made the assessment of choice. In Connecticut, like most states, there were state standardized tests (CMTs and CAPT), that were used to measure students' achievement and to compare states, districts, schools, and teachers. The CMTs and CAPT were broken up into English and math and, in some grades, science. These tests used state benchmarks to assess students relative to their peers. The argument against this test was that since it was state based, some state assessments were not as challenging as the assessments in other states. The argument for this test was that it measured what states felt were important.

Research has shown that a district's community demographic data significantly affects a students' achievement, as measured by state standardized assessments (Alspaugh, 1991; Maylone, 2002; Payne & Biddle, 1999; Sirin, 2005; Tienken, 2012; Tienken & Olrich, 2013; Turnamian, 2012). Currently, the United States Department of Education, along with other state and school districts, has established ways of rewarding schools and staff (like linking teacher and administrator evaluations to student results on state standardized assessments) or giving them consequences based on how their students perform on the standardized state assessments, (Laitsch, 2006; Stecher & Barron, 2001; Yeh, 2005).

If community demographic data accounts for even a portion of the variance in how students performed on the state standardized assessments, then holding teachers, administrators, schools, districts, and states accountable based on them is troubling (Jones, 2008; Kane & Staiger, 2001; Kohn, 2000; Maylone, 2002; Turnamian, 2012). Research conducted in New Jersey by Turnamian (2012) found that 60 percent of school districts' 2009 New Jersey Assessment of Skills and Knowledge (NJ ASK) in the third grade for mathematics could be predicted by looking at three out-of-school, district, community, demographic variables. Turnamian (2012) was also able to predict 52 percent of the third grade NJ ASK scores in English language arts within 10 points by looking at three community demographic variables. Similar findings were found in research conducted in Michigan by Maylone (2002).

State Standardized Assessments and Policies

Popham (1999) described standardized assessments as "any examination that's administered and scored in a predetermined, standard manner" (p. 8). Popham further described two kinds of standardized assessments: aptitude tests--such as the SAT and ACT-- and standardized achievement tests--such as state exams like the CMT and NJ ASK. These standardized achievement tests are what policy makers and all stakeholders use to measure a school's effectiveness. The aptitude tests were created to predict how students would most likely perform in another education setting such as colleges, universities, and some private schools (Popham, 1999). Those tests gave stakeholders a way of comparing students relative to the performance of a national sample of their peers (Popham, 1999). The state standardized achievement tests, on the other hand, were created in order to help policy makers, federal, state, and local education agencies evaluate the effectiveness of schools in regard to teaching and learning (Stuart, 2010). Stuart explained that standardized state assessments (standardized achievement tests) are any assessments given by states in order to meet certain federal, state, or local requirements like NCLB or school report cards and so forth.

States across the country, including Connecticut, where this research study is being conducted, are now beginning to link school, administrator, and teacher evaluations to how students perform on these state standardized assessments (Baker, Oluwole, & Green, 2013; Darling-Hammond, 2004). Part of the issue with standardized assessments is that those creating the assessments have to try and find a balance between the subjects and topics that a student has to learn and the questions that are being asked on the test. Currently, in many states, there are disconnects between the two. In some states, based on the curriculum maps created, the pacing of the content taught, or the alignment of the curriculum to the test, many students did not get to cover all the information that was supposed to be covered on the tests, and therefore performed poorly on these assessments (Bushweller, 1997; Webb, 2007). With all these discrepancies in how various states and districts prepare their students for these tests, and other issues with the state assessments, these tests are still being used to make critical education decisions and set education policies.

The main issues with standardized assessments are the influence that community demographic data has on them, and the fact that they are still being used to make critical education decisions. District and community level demographic data are what researchers are utilizing to demonstrate the influence out-of-school variables have on student achievement as measured by students’ test score results. Research shows the clear link between out-of-school factors and student performance on state standardized assessments (Jones, 2008; Maylone, 2002; Tienken & Orlich, 2013; Turnamian, 2012).

The history of standardized assessments is reviewed here in order to provide the background on the present over reliance of test scores to make critical education decisions. Hanley (1981), explained that the "historical accounts of standardized testing in America typically began with either Joseph Rice's spelling surveys in the 1890s or with Lewis Terman's revision of the Binet scale in 1916" (p. 1022). The Binet scale was one of the first adaptive tests created, and the Rice Spelling survey was one of the first surveys that used data (time spent on spelling drills and students' performance on spelling tests) to influence the change in teacher pedagogy and teacher methodology (Hanley, 1981; Houston, 1965). Resnick (1980) gave an overview of the different phases of the United States education system as it related to educational testing and school reform. He shared that between 1890 and 1930, standardized education measurement was part of the progressive effort to reform the organization of public education (Resnick, 1980, p. 3). Resnick (1980) explained the school survey movement and shared that it used standardized education measurement (standardized testing) as a means of helping schools be more efficient in their administration in order to show school boards and taxpayer boards the accountability systems that determined the success of various schools. During this time, there were minimum competency tests (MCTs), which were utilized by two thirds of the states. One example of these MCTs was Rice's spelling survey and this was one of the first standardized assessments (survey of 33,000 students) that was used (Resnick, 1980). Resnick shared that the results from Rice's survey showed that tests of performance could be important for assessing instruction, curriculum, and student learning. Given Rice's findings various achievement tests (38 standardized scales and tests) were developed and marketed in America prior to the First

World War (Resnick, 1980). During this time, standardized assessments were used by central administration to combat the growing problem of school failures, which was evidenced by the number of students dropping out of school and the number of students not being able to obtain jobs after graduating high school (Resnick, 1980). This led to the idea of social promotion, which was part of the new child development movement. This view went against that of Ayers (1909), who explained that it was considered normal for half of the age group to be held back at least once prior to them reaching the eighth grade.

Between the 1930s and late 1950s standardized testing was discussed less in the United States (Resnick, 1980). As a result of the need for equity in the allocation of resources to schools, standardized testing reemerged in the 1960s (Resnick, 1980). During this time, test developers started discussing the effectiveness and the usefulness of the testing instruments they were using. Also, the U.S education system was going through some major changes. In the late 1960s, two-thirds of the 50 states had mandated testing programs for public school students (Resnick, 1980). These assessments were put in place in order to ensure that there was accountability for how students were learning and performing in school (Resnick). In 1965, congress passed the Elementary and Secondary Education Act (ESEA) in order to help low income students by providing extra funding to their schools (Guilfoyle, 2006). From 1968 to 1988, ESEA continued to expand to include bilingual education, Title 1 and, in 1988, it required school districts to use standardized test scores to assess school performance (Guilfoyle, 2006). In 1994, ESEA was reauthorized as the Improving America's Schools Act, which ensured that states used standardized assessments to determine which schools and districts were not making Adequate Yearly Progress (AYP)(Guilfoyle, 2006). In 2002, President George W. Bush signed into law the No Child Left Behind (NCLB) Act, which used student standardized test scores in math and reading for accountability purposes (Guilfoyle, 2006). By NCLB becoming law, test scores were now the country's primary way of assessing how states, school districts and schools were assessed in regards to student achievement.

The whole foundation for our current school accountability system is built on the assumption that one standardized state assessment can determine the future of a child, school, or school district.

Like previous research shows and like similar studies discussed earlier, Tienken (2008) conducted research in New Jersey, where he tested 4th, 8th, and 11th grade students and found that there was a vast difference in students' test scores on the NJ ASK between poor and more affluent students. This gives a view on some of the flaws in standardized tests. The study found that students with means were doing considerably better in these state standardized tests than students with no means. This discrepancy in scores based on community demographic factors show some of the flawed characteristics in state standardized assessments. These shortcomings of the tests were evident in that poor students rarely outperformed their more wealthy peers. These standardized tests did not allow students who lived in poverty to show their other skills or what they were capable of doing, since so much emphasis was put on how they performed on these tests. Students may have varying skills and ability levels but may not be strong academically, yet all the focus is put on the test as one of the main ways of assessing students.

Other research that showed the flawed nature of standardized tests was conducted in Texas. In Texas, the stress of the state tests prompted school districts and the state to lower the bar for students on the state test so that more students could pass the test (Peterson & Hess, 2008). Students in Texas were able to successfully pass their state standardized assessment, but when those same students took the national assessments and even the Texas College Entrance Exam, they failed (Tienken & Orlich, 2013). This finding shows the negative aspects of state standardized assessments and the fact that different states set different bars for their students.

Some researchers are concerned with common state standards because the Cardinal Principles of Secondary Education noted that proximal curriculum (curriculum that is local to the students) was critical and that a national curriculum would not be appropriate to meet the needs of all students (National Education Association of the United States, Commission on the Reorganization of Secondary Education, 1918; Tanner & Tanner, 2007; Tienken & Orlich, 2013). Some feel that the Common Core State Standards (CCSS) are our current "National Curriculum," which does not align with the teachings from the Cardinal Principles (Tienken & Orlich, 2013). The CCSS are a set of curriculum standards that identify what children should know and be able to do as they travel through the K-12 continuum (Grossman, Reyna, & Shipton, 2011; National Governor's Association, 2012; P orter, McMaken, Hwang, & Yang, 2011). Also, there are some who feel that they were created to imply that our nation's public school systems are in crisis and showing a decline in strength, therefore a national standard would be warranted (Grossman, Reyna, & Shipton, 2011; Tienken & Orlich, 2013). This current "crisis" in education stems from the way that public school students in the United States are performing on various standardized assessments (Grossman, Reyna, & Shipton, 2011; OECD, 2011). With the CCSS and its assessment system (such as those provided by PARCC and SBAC), there is not only a national curriculum, but national assessments.

As previously mentioned, states are now setting policies based on these assessments. For example, in Connecticut part of a teacher’s evaluation is based specifically on students’ performances on state standardized assessments. In several states, there are programs that use test scores to rank schools. In New York City, Mayor Michael Bloomberg set a policy that allowed teachers to be ranked from best to worst based upon their students' performances on the New York State Assessment (Chay, McEwan, & Urquiola, 2005; Santos, 2012). More and more states, motivated by the race-to-the-top program, have changed their tenure laws and set policies that directly link teacher evaluations to student achievement as evidenced by students' standardized test scores.

The crisis of today is that the United States is falling behind on international tests like the TIMSS and PISA in comparison to countries like Japan, Finland, Korea, and Chinese Taipei (Tienken, 2013). An examination of standardized testing in these countries revealed that the US is being compared to countries the size of states who only test their elite students (Tienken, 2013; Tienken & Orlich, 2013). In the US, we test everyone who wants to take the test regardless of poverty level or any other factor (OECD, 2012). Some researchers (Tienken, Orlich, Zhao) feel the CCSS are today's version of Sputnik. Sputnik was the launching of the first manned craft to the moon by the Soviets. This was used to support their claim of Soviet scientific and technological superiority (Yager, 1982). In their book *The School Reform Landscape: Fraud, Myths, and Lies,* Christopher Tienken and Donald Orlich (2013), wrote about the birthing of a two-tiered system of education in the United States in which high-stakes testing is used at the state and national levels-- as proposed by the Council of Chief State School Officers (CCSSO), through the CCSS initiative--to create another public education crisis such as Sputnik (Tienken & Orlich, 2013, p. 85). This two-tiered system of which they wrote consisted of the haves (wealthy) and the haves not (impoverished). A two-tiered system takes away from the Jeffersonian ideal of public education as a system created to give all Americans, both rich and poor, a high quality education that would allow them to be contributing members of society. These testing systems are being used for purposes for which they were not intended.

Darling-Hammond (2004) explained that in order for standardized assessments to be useful and support teaching and learning--instead of creating more inequalities--three ideas must be considered: the quality and alignment of standards, curriculum, and assessments; the appropriate use of assessments to improve instruction instead of to give consequences to students and schools; and the development of systems and procedures that are put in place in order to ensure that all students have the opportunity to learn.

Standardized assessments are valuable sources of data and information that can help schools and districts, but they should not be the sole criteria for measuring student achievement. The Eight Year Study encapsulated how student achievement should be assessed using multiple measures, such as: recommendations from the school principal that describe the student's strengths, interests, and purpose; an assessment of a student's ability to be successful in school studies; a record of the student's school life; and scholastic aptitude tests (Aikin, 1942). The Commission on the Relation of School and Colleges (as cited in Aikin, 1942) saw the importance of aptitude tests, but those tests were used in conjunction with other factors to measure student achievement.

Community Demographic Data and their Influence on Student Achievement as Evidenced by State Standardized Assessments

This section is comprised of four subsections: Parental Employment Status; Income Levels; Family/Household Type; and Parent Education Attainment and their influence on student achievement.

Parental Employment Status and Student Achievement

In homes where both parents are working and yet the family is still living in poverty, the effect of not having a parent at home shows up both in early and later years, and students become socially maladjusted and cognitively delayed (Parcel & Menaghan, 1994). In families where both parents are working or in single families where the mother is working, the stress of not being home with the children impacts both the parent and the child, emotionally and intellectually (McLoyd, 1989; Mirowsky & Ross, 1986; Parcel & Menaghan, 1994). Also, in homes where one parent works and the other parent stays at home, and the family is still living in poverty, the effect of having one parent at home positively affects the early developmental stages of children (Milne, Myers, Rosenthal, & Ginsburg, 1986). In homes where both parents are working and the family is middle to upper middle class, there is still an effect of not having the parents at home even though the child may still be exposed to various experiences like child care (Belsky & Rovine, 1988). The benefit is that the child will still be exposed to various experiences that a child living in poverty will not have (Mott, 1991). In homes where one parent is working and the other parent is at home and the family is middle to up middle class or wealthy, the children tend to do a lot better in school because they are exposed to all sorts of experiences at an early age, and their parents can afford all the extra benefits, instruction, trips, and so forth that are known to expand a child's mind and help them to achieve well academically in school (Milne, Myers, Rosenthal, & Ginsburg, 1986).

Muller (1995) discussed working mothers and the effect their employment status had on eighth grade students' achievement in mathematics. Muller explained that research showed that mothers working full time impact children negatively because students will have more unsupervised time at home when they come back from school, than families where a parent is working part time (Muller, 1995). The research on the effects of working mothers on student achievement has shown mixed results. In some instances there was a negative impact of having a working mother, whereas in other instances there was not a negative effect (Heyns & Catsambis, 1986; Hoffman, 1980; Muller, 1995). Muller explained that:

> While the resources of parents (including education, time, and money) almost certainly make a difference in what is available to the child, priorities of the parents in making resources available to the child will also be important. It is the availability of those resources to the child, in other words, the involvement of the parent in the child's education that is likely to be significant to the child and make a difference in the child's performance. And it is the availability of those resources, depending on maternal employment status and in relation to the child's academic success (p. 86).

Research shows that mothers who are not working tended to be from married households where there is more than one child at home, and mothers who work part time tended to be from families where there are two parents in the household and the family is highly educated and has financial means (Muller, 1995).

Research conducted by Muller (1995) found that when family background and grades were accounted for, students in households with mothers working full time performed at slightly lower levels on math achievement tests than their peers with mothers who did not work full time (p. 92). Muller also found that children of mothers working part-time tended to perform the best on math achievement tests (p. 92). Also, families with mothers working half time tended to be present more not only in their children’s school, but also when their children came home from school, ensuring that there was very minimal or no unsupervised time (Muller, 1995).

Other research conducted by Bogenschneider and Steinberg (1994) found that past research had focused primarily on the impact of maternal employment on young children. The researchers explained,

> Among younger children, maternal employment has been shown to be associated with diminished school achievement but this effect appears limited to one subgroup of the population: White, middle-class boys growing up in intact families (Banducci 1967; Bronfenbrenner and Crouter 1982; Crouter and Perry- Jenkins 1986; Gold and Andres 1978b; Hoffman 1979, 1980; Lamb 1982). Comparable effects have seldom been demonstrated for Black children, girls, poor children, or children from single-parent homes (Blau 1981; Milne, Myers, Rosenthal, and Ginsburg 1986; Rieber and Womach 1967; Vandell and Ramanan 1990; Woods 1972). In contrast, only a handful of studies have examined the relation between maternal employment and school achievement among older children (Gold and Andres 1978a; Heyns and Catsambis 1986a; Milne, Myers, Rosenthal, and Ginsberg 1986), and it is not clear how maternal employment affects the school performance of adolescents or whether its affects are limited to White middle class male teenagers (p. 61).

This shows that there is no clear consistent response regarding the influence of parental employment on student academic achievement as measured by test scores. There are a few consistencies including students of parents who work full time not performing as well as students of parents who work part time or not at all (Bogenschneider & Steinberg, 1994; Muller, 1995).

Income Levels and Student Achievement

Some researchers feel that standardized testing has created a two-tiered system, one designed for the rich and another for the poor (Tienken & Orlich, 2013). Research shows that a child's socioeconomic and community demographic background can be used to predict how this child performs on state standardized assessments (Maylone, 2001; Tienken & Orlich, 2013; Turmanian, 2012). Students who attend school in poor neighborhoods are far less likely to succeed academically than those in affluent neighborhoods. The researchers (Tienken, Orlich, Maylone, Turmanian) are arguing that community factors are also contributing to student performance on standardized testing. This research showed that poverty influences test scores, therefore students living in poverty will most often be outperformed by those with wealth (Maylone, 2001; Tienken & Orlich, 2013; Turmanian, 2012). Hence the idea of the two-tiered system, where students and teachers who live in poverty stricken areas will always be penalized based on factors that are outside of their control (Maylone, 2001; Tienken & Orlich, 2013; Turmanian, 2012).

After controlling for school and student characteristics, to what extent do certain community factors account for student performance? Researcher and social scientist St. John (1970) stated that in order to truly assess a school, socioeconomic status must be first neutralized through statistical control. For the purpose of this research study, income level was described as $25,000 or less (below poverty level), $35,000 or less (slightly above poverty level) and $200,000 or more (wealthy). In 2010, the year that this study was conducted, a family of five would have to making no more than $26,675 a year in order to be considered in poverty (Bishaw, 2012). In Connecticut, 10.1 % of the population was living in poverty at the time of this study (Bishaw, 2012). Also, in 2010 the poverty level in the US had reached an all-time 17 year high of 15.3% (Bishaw, 2012).

Research has been conducted by various researchers (authors, year???) regarding the influence of socioeconomic and demographic data on various measures of school achievement

(White, 1982). Socioeconomic status is defined by the Michigan State Department of Education (as cited in White, 1982) as including three major factors: family income, parents' education level, and parents' occupation. Part of the current research focused on two of the three factors described in the Michigan State Department of Education's definition. Researcher Karl White (1982) used meta-analysis techniques to examine nearly 200 different research studies that looked at the relationship between socioeconomic status (SES) and academic achievement. White (1982) was able to determine that a combination of SES factors accounted for 75% of the variance in student achievement as measured by test scores. If SES can in some instances account for this much variance in test scores, then state representatives, university staff, district, and school staff should be mindful of how these test scores are used. White (1982) shared that socioeconomic data could also be used to predict which students could be successful in college, therefore allowing colleges to exclude certain students based on their parents' income level or their communities' poverty levels. This shows how poverty continuously affects the lives of children living in it and limits their options even though they are the ones that need the most options. There are various studies that continue to show a correlation between SES and various standardized assessments. For example, SES and science, SES and composite standardized achievement test score, SES and the Stanford Achievement test score, reading comprehension scores and SES (Baker, Shutz & Hinze, 1961; Dunnell, 1971; Klein, 1971; Warner, Meeker, & Eels, 1949).

A study conducted by Blau (1999) looked at the effect that parental income had on students' social, emotional, and cognitive abilities. Blau used various assessments to measure these three areas including, the Peabody Individual Achievement Tests (PIAT); Verbal Memory Parts A and B; Behavior Problems Index, and the Motor and Social Development tests. Blau

(1999) found that families current income and permanent income impacted child development. Blau's (1999) research showed that family income had its biggest effect on a child's behavior in school, as compared to a child's academic abilities. A follow-up study conducted by Weinberg (2001) also found that parental income was related to students' academic performance as well as how they were being raised. Turnamian (2012) explained the results as the more wealth a family had, the more options they had in molding their children's behaviors, whereas families at lesser income levels tended to use more corporal punishment in order to curb inappropriate behaviors.

Poverty affects student achievement on every front. Research done in four school districts in California found that, for English Language Learners (ELL), the effects of poverty on student performance on standardized assessments are similar to the results found in the study conducted by Hakuta, Butler, & Witt (2000). In the Hakuta, Butler & Witt (2000) study, the researchers looked at various data including socioeconomic factors, and found that in schools with high poverty levels (families making $25,000 or less), students consistently performed worse than in schools with less poverty issues. The researchers included other information like household income and other home and family factors to determine their poverty levels (Hakuta et al., 2000; Moss & Puma, 1995). In areas with higher levels of poverty, students took longer to acquire the English language, and their rate of growth in regards to their performance on standardized assessments was slower when compared with their more wealthy peers (Hakuta, et al. 2000). Another concerning finding was that the achievement gap for poor ELL students and their native English speaking peers continued to widen, which shows the incredible amount of work these students and their teachers have to do simply to catch up with their peers (Hakuta et al. 2000).

In his article “The Influence of Poverty on Achievement” Chris Tienken (2012) wrote about the negative effect poverty has on student achievement, especially achievement measured by test scores. Tienken (2012) explained that state representatives, governors, and commissioners of education have minimized the effects of poverty on student achievement, some even stating that it is a waste of money to provide funding to struggling schools. With our education leaders and political leaders refusing to see the connection between poverty and student achievement, the crisis (Sputnik; A Nation at Risk; etc.) that they are fearing, will surely come to pass. Tienken (2012) and other researchers such as Turnaimian (2012), Jones (2002), and Maylone (2002), stated that poverty matters. Research conducted by Sirin (as cited in Tienken, 2012) showed that poverty accounted for up to 60 percent of the variance in standardized assessment scores. The issue of poverty and its influence on student achievement has been an issue and concern since the days of Thomas Jefferson and it continue to be an issue and concern today. Education leaders must help the politicians and various education stakeholders understand the influence that poverty has on test scores in order to ensure that they stop using the scores to make critical education decisions. In all the research reviewed, there was no state in which students living in poverty outscored their more wealthy peers in any grade level (Tienken, 2011).

As previously mentioned, the poverty issue crosses grade levels, subject areas, state standardized assessments, national assessments such as the NAEP and SAT, international assessments such as the PISA, and any standardized measurement of student achievement (College Board, 2008; Tienken, 2008; Tienken, 2012). Sirin (as cited in Tienken, 2012) reviewed 58 studies that spanned from 1990-2000 and covered over 101,000 students, from 6,800 schools in 128 districts. Sirin found that the average effect size difference in achievement from students in poverty to students not in poverty was 0.28 (p.107). Also, in schools where there was a weak administration and weak teachers, the effect size of poverty more than doubled to 0.60 (Tienken, 2012). Turnamian (2012) explained that there is agreement in the research literature that income influences student achievement, and that this influence is greater in lower income households than in more affluent households. These research findings have been consistent, yet nothing has changed. In most cases, it has actually gotten worse, as standardized assessments are now being used to not only make critical education decisions, but also for teacher and administrator evaluations.

Family/Household Type and Student Achievement

For the purpose of this research study, family and household type included: families with both parents present, female-only, and male-only households (lone parent household).

Researchers Milne, Myers, Rosenthal, and Ginsburg (1986) found that students in two-parent households tended to perform better than students in single family households. They stated that:

> "In general, students from two-parent families have higher scores on reading and math achievement tests than students from one-parent families. This is true for white and black students in elementary school and high school. The total effects of number of parents are significant in all cases for elementary school students and are in the same direction but generally non-significant for high school students. The total effects of number of parents on reading and math achievement are significant for both white and black elementary school students, but they are higher for black students than for white students" (Milne, Myers, Rosental & Ginsburg, 1986, p. 132).

Also, in two parent households the families' income tended to address most of the effects on student achievement for Black students, with less of an effect for White students (Milne et. al., 1986). Milne et al. (1986) also found that in two parent White households, the mothers tended to work less, therefore the mothers were home more with their children, which benefited the children, similar to the benefits in a two family household.

Research conducted by Shinn (1978) found that there was a direct and high correlation between households with no fathers and households with fathers and student achievement. Shin explained that, in a review of the research literature, a majority of the studies "have shown detrimental effects of father absence on children's intellectual performance" (Shinn, 1978, p. 295). Research that was conducted between 1907 and 1951 found that males who grew up in male headed, lone-parent households tended to attain less education than males who were raised in female headed, lone-parent households (Downey, 1994). Downey (1994) found that males raised by just their fathers on average attended 1 less year of school than other students in the cohort, while students raised by just their mothers attended a half year less of school as compared to the rest of the cohort (Downey, 1994). Also, Downey's research showed that fathers were a lot more capable of raising their children by themselves as compared to fathers 30 years prior to the time of the study. Downey's review of research studies also found that single fathers of today outperform their single mother counterparts as it relates to student achievement, but still do not perform as well as children in two parent families. He also found that single fathers performed closer to married fathers in regards to how their children performed on standardized test scores than single mothers (Downey, 1994).

Research conducted by Baydar and Brooks-Gunn (1991) found a negative correlation between single mothers who returned to work during their child's first few years of life and their child's cognitive and social development. Other research conducted by Downey (1994) found that there were various reasons why children in single parent female household performed poorly in school. The researcher explained:

> One of the leading explanations for the relatively poor school performance of children from single mother families is the lower economic standing of single mothers relative to two parent families… economic-deprivation hypothesis as a principal account for why children from single-mother families do poorly in school. (Downey, 1994, p. 130)

This goes on to build on the assumption that students in female only households that live in poverty perform poorly as compared to students from female only households that are wealthy. Downey explained that by using the economic-deprivation explanation it was found that students who lived in single-parent, female households were performing lower academically due to poverty, rather than the family structure.

Research done by Hauser and Sewell (1986) found that family background has a large effect on a student's ability level and schooling. Research conducted by Dawson (1991) on the influence of lone parent households on student achievement found that students who were in single parent households or households with both a biological and step parent were more likely to repeat a grade, get treated for emotional or behavioral issues, have health problems or be expelled from school, than students with both biological parents at home. Dawson's research study found that lone parent household with a biological mother has similar effects to households with a step parent in regards to negative student achievement and students' overall well-being (Turnamian, 2012, p. 77). The literature does not show any major differences in student achievement when students and parents in single-family households are of the same gender (Turnamian, 2012).

Downey (1994) summed up the influence of family/household Type and student achievement,

> First, single fathers and their children enjoy many background advantages over single mothers and their children. With respect to education and race, single fathers more closely match the profile of parents in two-parent families. In contrast, single mothers are less educated and more likely to be of minority status than either single fathers or married parents.
>
> Second, despite these advantages, children from single-father families do no better in school than children from single-mother families. Although children from single-father families score better on standardized tests, they fail to produce higher grades. In addition, contrary to the father absence hypothesis, the classroom behavior of children from single-father families is just as poor as those living in a single-mother family, suggesting that the lack of a father or disciplinarian does not explain the behavioral problems of children in single-parent families. The lack of any parent, whether it is the mother or the father, appears to increase children's behavioral problems in school.
>
> Third, although both children from single-father and single-mother families do less well in school than children from two parent families, the factors explaining the performance varied in emphasis. Economic parental resources are important mediators for understanding why children from both single-mother and single-father families do less well in school than children from two parent families but are slightly more important for understanding the school difficulties of children from single-mother and single-father families. In contrast, interpersonal parental resources, such as time spent talking to the child about school, parental involvement in the child's school activities, and involvement

> with the child's friends, play a larger role explaining the education misfortunes of children in single-father families than children in single-mother families... Single fathers are more successful at providing economic resources where as single mothers are more adept at providing interpersonal resources. (Downey, 1994; p. 144-145).

Parent's Educational Attainment and Student Achievement

Research conducted with regard to the influence of parental education on student achievement has indicated that parental education is an important predictor of student achievement (Haveman & Wolfe, 1995; Klebanov, Brooks-Gunn, & Duncan, 1994).
Also, research has shown that a parent's education level has a direct positive influence on a student's achievement (Jimerson, Anderson, & Whipple, 2002; Kohn, 1963). Researcher Davis-Kean (2005) looked at a sample of low-income minority families and found that mothers with higher education had higher expectations for the children's academic achievement and that these expectations were related to the children's subsequent achievement in math and reading (p. 294). Davis-Kean (2005) concluded, following research in this area that parental education level and income are strong predictors of student achievement and that parents' education level indirectly influences how the child achieves, due to the fact that parents' achievements and beliefs and a stimulating home environment lead children to succeed. Research conducted by Davis-Kean (2005), found that race and student gender played a major role on the influence of parental education on student achievement, where European American boys and African American girls achieved higher academically.

The Importance of a Positive School Climate In Order to Maximize Student Achievement

The research has found that in order to maximize student achievement, there needs to be a positive and caring school climate (Freiberg, 2011). Schools cannot control the out-of-school variables that children face on a daily basis, but schools can maximize the teaching and learning that occurs once students come through the door through the climate they create. There are numerous definitions of school climate that exist in the literature, and there are also various terms that are used to describe a school's climate. For the purpose of this study, *school climate* is defined as "how well the people within the school treat each other physically, emotionally, and intellectually" (Freiberg, 2011). This definition of school climate appears to be the most pertinent because it connects everything to the relationships people build and how they care for each other. School climate has existed for many years, and the way it has been studied and addressed has changed from year to year. As far back as 1908, Perry began talking about school climate and ways to measure it. He divided school climate into four areas: discipline, attendance and punctuality, habits and ideals, and school spirit (Perry, 1908). When describing school climate, Perry (1908) explained that "a school atmosphere must be created, school spirit (*esprit de corps)* a pride in the school and its honor…" (p. 304). This idea of school atmosphere and school pride has been discussed for over 100 years. It was described as a tradition in which students learn certain behaviors and pass them on to other students who come after them (Perry, 1908). Perry's (1908) definition of school spirit or school climate is best defined in his own words. He stated that "in the school of today, feeling and sentiment are to be cultivated no less than thought and expression" (Perry, 1908, p. 303). Even then, Perry was aware of the importance of not only cultivating a student's mind but also cultivating their feelings and sentiments.

The United Nations, in its 1948 Convention on the Rights of the Child, shared that "governments have a responsibility to ensure that every child has equal access to a quality education… and in order to actualize this goal, schools must respect the inherent dignity of the child, create a climate of tolerance, respect and appreciation of human differences, and bar tolerance of bullying and disciplinary practices that harm or humiliate" (National School Climate Center, 2007). Here is another instance where past researchers saw the importance of a positive school climate and mentioned it as a decree that governments had to follow and ensure.

In the 1960s, there were various research studies that were done on the connection between school climate and student achievement. Halpin and Croft (1963) conducted one of the first research studies on school climate in the Chicago Public Schools. Research conducted later on school climate built on their work. They were the pioneers in the use of evaluation tools to monitor and determine the effects of school climate. Halpin and Croft created and utilized the Organizational Climate Description Questionnaire (OCDQ). The OCDQ was originally a 1000 item survey, which was modified to 64 Likert style questions in order to gather data to measure the correlation between a school's climate and student achievement. Their research found that an essential piece of any school's climate is the principal and his/her leadership team. Halpin and Croft utilized the OCDQ (Form IV) to analyze the climate of 71 elementary schools, chosen from six different parts of the country. There were about 1,151 people who responded to the survey. The OCDQ was broken down into 8 subtests, four of the subtests related to teacher behaviors (disengagement, hindrance, intimacy, and esprit), and the other four related to the principal's behavior (aloofness, production emphasis, thrust, and consideration).

Halpin and Croft's (1963) research further differentiated school climate into six characteristics: open climate, autonomous climate, controlled climate, familiar climate, paternal climate, and closed climate. They felt that all schools fell into one of these climate distinctions. Halpin and Croft (1963) also came up with three parameters that they used in conceptualizing the patterns of social interactions in a school: authenticity, satisfaction, and leadership initiation.

Authenticity was described as the authenticity or openness of the leaders and the behaviors of the group members in the school. Satisfaction was described as how satisfied the group members felt in regards to their task accomplishment or their social needs. Leadership initiation was described as the flexibility that staff has in initiating or making leadership decisions. Out of these three, authenticity was the most complicated to measure and understand. This was because people often pretend to be a certain way in front of their supervisors or just for the purpose of a study. Catching individuals who were truly authentic to their field, school, students, and peers was difficult to accomplish.

Halpin and Croft's (1963) research also showed that the openness and closeness in an organization's climate is directly related to similar concepts about the openness and closeness of the individuals' personalities within that environment. Their research also found that the more authentic individuals' behaviors were in an organization, the more authentic was the climate in the organization. They also found that "the amount of need dominated attention present in a group was inversely related to the openness of the climate;" the more needy a group was, the less authenticity there was in their behavior (Halpin & Croft, 1963, p. 5). Kenney, White, and Gentry (1967) utilized Halpin and Croft's OCDQ, and found that teachers who rated their schools as open and were located in a school that was considered to have an open climate were warm, kind-hearted individuals who set high expectations for themselves and their students. Whereas teachers who rated their schools as closed and were located in a school that was considered closed, were dominant and stern with students. In the open schools with the open staff, students were more likely to succeed since the staff was willing and able to commit their time and energy to the students. The opposite was found in schools with closed climates. I believe that schools that have an open positive climate will positively influence student achievement.

The National School Climate Center (NSCC) was founded in 1996, at Columbia University. In 2002, the NSCC was given the task of finding a way to measure and improve school climate (National School Climate Center, 2012). The members of the committee joined forces with members of congress from various state agencies, the United States Department of Education, various state Departments of Education, and various stakeholders. These members worked together in order to improve school climate in the various public schools within their states. The members of the NSCC and their counterparts felt that every child needed to have a foundation, and that the foundation would allow them to be successful in school (Cohen, 2001). They felt that the main way to build this foundation and to have all states and all schools held to high expectations and high standards would be to create National School Climate Standards (Cohen, 2001). In 2002, the NSCC, along with various educators, mental health professionals, families, school boards, and community leaders created the School Climate Standards (Cohen, 2001). Five standards were created that dealt with every aspect of a child's school life. These standards were: developing a shared vision; developing policies that promote social, emotional, ethical learning; promoting practices that promote learning and positive social, emotional, and ethical development; creating an environment where all members are welcomed, supported and feel safe; and promoting social and civic responsibilities and a commitment to social justice (National School Climate Center, 2012).

Based on the work that was done with the Surdna Foundation, the NSCC was engaged in a strategic planning process which led them to leave Teachers College in 1999, in order to become a not-for-profit organization (National School Climate Center, 2012). The work with the Sundra Foundation guided the NSCC to change its main focus from developing leaders in the field of social emotional education to focusing on ways to measure and improve school climate

(National School Climate Center, 2012). The NSCC created the Comprehensive School Climate Inventory (CSCI) survey that was used as a model for various states. This model identified four major areas (Safety, Relationships, Teaching and Learning, and the External Environment) that need to be identified when assessing a school's climate (National School Climate Center, 2012). The NSCC is important because its survey has been modified by various states, including the state of Connecticut.

Production Function Theory in an Education Setting

Production function theory is the theoretical framework that is guiding this study. Production function is described by Monk (1989) as the maximum level of outcome possible from alternative combinations of inputs. Production function theory can be used to find the current rate of output, once inputs have been established (Solow, 1956). For the purpose of this study, production function theory was used to address the community demographic factors and students' performances on standardized state assessments. The input in this study was a school district's community demographic data, and the output was the students' performances on the 2010 Connecticut Mastery Test (CMT) in the third through eighth. Turnamian (2012) stated that a function associates one quantity with another. In this study it will be the community demographic data being associated with students' test scores. Turnamian further explained that when applying production function theory to social science, it is implied that one or more inputs (independent variable: community demographic data) influence the output (dependent variable: students' performance on the CMT) (p. 93).

Todd and Wolpin (2003) discussed production function theory in an education setting and shared that "education production function (EPF)… examines the productivity relationship between schooling inputs and test score outcomes" (p. 3). Their research findings show that in education production function, researchers tend to link the educational attainment of children (knowledge acquisition) and the production that firms generate. The research also shows that the main goal of the EPF is to show the combination of school inputs; in the case of this study, out-of-school inputs and student achievement outcomes (Todd & Wolpin, 2003). Todd and Wolpin (2003) stated that: “The production function analogy provides a conceptual framework that guides the choice of variables and enables a coherent interpretation of their effects” (p. 3). The theoretical framework for this research study is aligned with that of Todd and Wolpin in that production function theory will help to direct the choice of independent variables (single parent household, parent’s education level, household income etc.) and their influence on the dependent variable (standardized test scores).

Chapter Summary

This chapter deals with all the literature that was reviewed for this study. This chapter reviewed the literature search procedures as well as the following: student achievement and its connection to the achievement gap; student achievement; state standardized assessments and policies based on them; community demographic data (parent employment status, parents income levels, family/ household type, parent education attainment) and their influence on student achievement as evidenced by state standardized assessments. The chapter then provided a discussion of the importance of a positive school climate in maximizing student achievement. In this chapter there was also a preview of production function theory which was the theoretical framework that was utilized in this study.

Chapter 3

METHODOLOGY

Introduction

The purpose of this study was to determine which combination of 15 out-of-school community demographic variables best predicted and accounted for the most variance in a Connecticut school district's percentages of students scoring goal or above on the 2010 Connecticut Mastery Test (CMT) for the third through eighth grade in mathematics (Math) and English language arts (ELA) exams. The focus was purposely limited to out-of-school variables and their influence on school district CMT scores for students in third through eighth grade because this will demonstrate the effect out-of-school factors have on this test. The focus was on out-of-school variables and the best combination of these variables that would have a statistically significant relationship to student achievement on the 2010 Connecticut Mastery Test for students in the third through eighth grade in English language arts and mathematics. I sought to add to the body of knowledge that shows the influence of out-of-school factors on student achievement as evidenced by test scores. Various research studies and the current literature show that out-of-school variables account for significant variance in district test scores and, in some cases, even predictive capabilities (Maylone, 2002; Tienken & Orlich, 2013; Turnamian, 2012). If the data continues to reflect the same thing with regard to the influence of community demographic data on test scores, then the fact that test scores are still being used as a primary means to assess students, determine school effectiveness, teacher and school quality, and now as an evaluative measures for school staff, is questionable.

Research Design

This research study was of a quantitative nature and was a non-experimental, correlational, explanatory, cross-sectional study. Quantitative research is the collection and analysis of numerical data to describe, explain, predict, or control phenomena of interest and, in this case, the numerical data is the 15 out-of-school community demographic variables and the students' test scores on the Connecticut Mastery Test (Curry, Nembhard, & Bradley, 2009; Williams, 2007). The test scores are also the phenomena of interest (Gay, Mills, & Airasian, 2012, p. 7). In the field of social science, it is difficult to use experimentation to solve research problems and that is why a non-experimental study is recommended (Johnson, 2001). Correlational research deals with "collecting data to determine whether and to what degree a relationship exists between two or more quantifiable variables" (Gay, Mills, & Airasian, 2012, p. 9). In this correlational study, data was collected from the 2010 U.S. Census Bureau 5 year census data and CMT scores from 2010 to see if there is a relationship that exists between the census data and the 2010 CMT scores.

In correlational research, the researcher looks at various variables, in this case the out-of-school community demographic variables, that can be related to a more complex variable, which in this case is the students' test scores (Gay, Mills, & Airasian, 2012). I chose correlational research because it allowed me to determine which out-of-school variables are important in predicting student test scores. It also allows me to focus on the variables that have a significant influence and spend less time on those that do not (Gay, Mills, & Airasian, 2012). This study did not look for cause and effect, but rather it looked for the variables that were highly correlated, provided the most accurate predictions, and showed the most variance (Gay, Mills, & Airasian, 2012).

Johnson (2001) described a new way of looking at non-experimental research designs. He described three categories of non-experimental research, and these are descriptive research, predictive research, and explanatory research. The three types are:

> Were the researchers primarily describing the phenomenon? Were the researchers documenting the characteristics of the phenomenon? If… yes (and no manipulation)… then the term descriptive non-experimental research will be used. To determine whether the primary objective was predictive one needs to answer the following question: Did the researchers conduct the research so that they could predict or forecast some event or phenomenon in the future (without regard for cause and effect)? If the answer is "yes" (and there is no manipulation) then the term *predictive non experimental research* should be applied. To determine whether the primary objective was explanatory, one needs to answer the following questions: (a) were the researchers trying to develop or test a theory about a phenomenon to explain "how" and "why" it operates? (b) Were the researchers trying to explain how the phenomenon operates by identifying the causal factors that produce change in it? If the answer is "yes" (and there is no manipulation) then the term *explanatory non experimental research* should be applied. (Johnson, 2001, p. 9)

The predictive nature of this study helped to determine which combinations of variables were closest to predicting the criterion variable (Turnamian, 2012, p. 101). Hanushek (1986), as cited in Turnamian (2012), explained that if predictor variables correlate well with a criterion, then making a prediction based on a combination of those variables would be more accurate than making a prediction based on just one of the variables (p. 102). Turnamian used a prediction study to predict which combination of out-of-school variables best correlated and most predicted how students would perform in the 2009 NJASK in langauge arts and mathematics for students in grade 3. Hanushek (1986) explained that a prediction study hopes to determine which independent variables best predict and correlate with a particular dependent variable.

Hierarchical multiple regression models were used to determine the extent to which out-of-school variables had a statistically significant influence on a school district's 2010 third through eighth grade CMT scores in English language arts and mathematics. The 15 out-of-school community demographic variables (Median district household income; Percentage of families in workforce; Percentage of families below poverty; Percentage of families making $35,000 or less; Percentage of families making $25,000 or less; Percentage of female only households no males; Percentage of male only households no females; Percentage of household annual income above $200,000; Percentage of lone parent household; Percentage of married families with children 6-17 years old; Percentage of population 25 years or older, no high school diploma; Percentage of population 25 years or older, high school graduate; Percentage of population 25 years or older and some college experience; Percentage of population 25 years or older, bachelor's degree; Percentage of population 25 years or older, advanced degree) are the predictors and were identified in the literature as influencing student achievement, as measured by state standardized tests, which is the criterion variable (Rose, Holmbeck, Coakley, & Franks, 2004). These 15 out-of-school variables (independent variables), along with the state test scores (dependent variable), provided the structure for the theoretical framework for this study. How a combination of these 15 variables would influence third through eighth grade students' scores on the CMTs was not known prior to this study.

In hierarchical multiple regression, researchers test theoretical assumptions and examine the influence of several predictor variables in a sequential way, so that the researcher can judge how much the new variable adds to the prediction of a given criterion, over and above what can be accounted for by other important variables (Johnson, 2003). Also, in hierarchical regression, the researcher is looking for "the change in predictability associated with the addition of new predictor variables that are entered later in the analysis over and above that contributed by predictor variables entered earlier in the analysis" (Johnson, 2003, p. 11). "In hierarchical multiple regression, changes in R^2 (ΔR^2) are computed by entering predictor variables into the analysis at different steps… therefore ΔR^2 and its corresponding change if F (ΔF) and *p* values are the statistics of greatest interest when using hierarchical regression" (Petrocelli, 2003, p. 11).

Analysis Construct

The variables that the research has shown has the greatest influence on student achievement as measured by standardized test scores are the household income levels for a given district. Although this study is building on those of Maylone (2002) and Turnamian (2012), this study will be looking at five categories of household income (independent variables) including the median household income of a given district as opposed to a districts mean household income. These variables, along with other variables, were combined to find the variables that best predicted students scores on the third through eighth grade CMTs for students who scored goal and above on English language arts and mathematics standardized assessments. Also, this data was used to determine the best combination of variables that showed the greatest amount of variance in the test scores.

First, the variables from the parental income level construct were put into SPSS using simultaneous regression. I then looked at the variables that were statistically significant as well as the variables that were highly correlated to the dependent variable. The statistically significant variables that were highly correlated to the dependent variable in a hierarchical regression model were reentered. These steps were followed for all the constructs and for all the grade levels. Although the various constructs had predictive power and showed some variance, a combination of the constructs had better predictions and more variance.

For this study, the following data sources were obtained from the United States Census Bureau's American Factfinder website and describe parental income level as:

1. Percentage of families below poverty,
2. Median district household income,
3. Percentage of families making $25,000 or less,
4. Percentage of families making $35,000 or less,
5. Percentage of household annual income above $200,000, and
6. Percent of families in the workforce (newly added).

The percentage of parents in the household working also had an influence on students' performance, but since that is a single variable on its own, it was added to the parental income level construct. This variable is also a new variable that was not studied by Maylone (2002), Jones (2008), or Turnamian (2012).

Figure 1 below shows the relationship between a district's income levels and student achievement as measured by the third through eighth grade CMT scores in English language arts and mathematics. A district's income level was described as: the percentage of families below poverty; the median district household income; the percentage of families making $25,000 or less; the percentage of families making $35,000 or less; and the percentage of household annual income above $200,000.

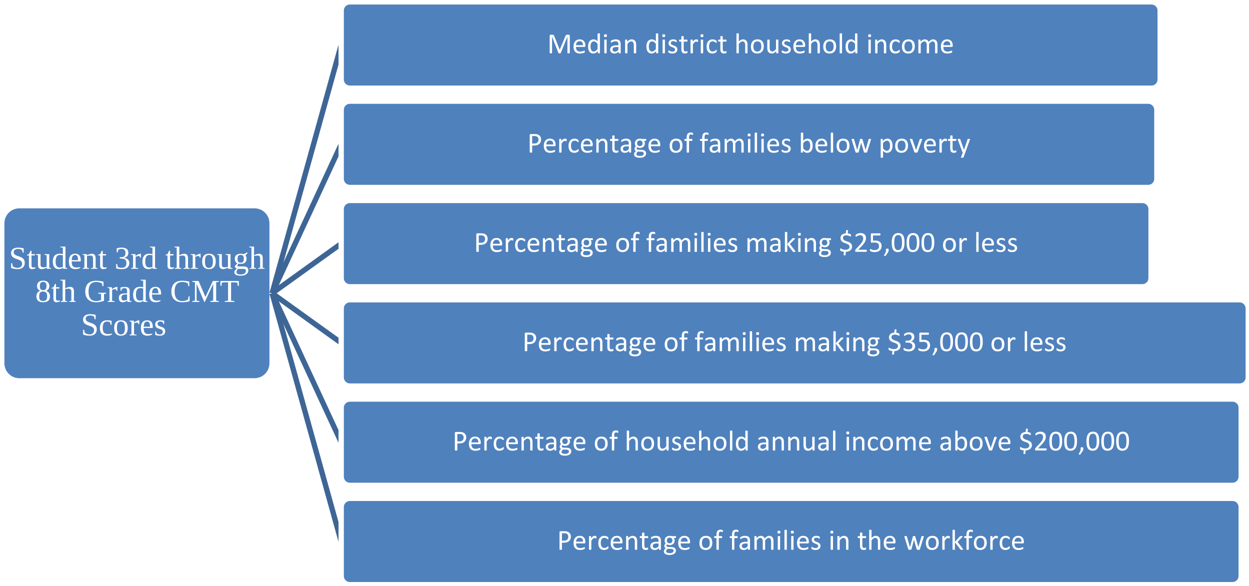

Figure 1: Family income level construct.

The next set of variables that research has shown to have the greatest influence on student achievement as measured by standardized test scores is family/household type. This study continued to build on the studies of Maylone (2002) and Turnamian's (2012), in which they looked at lone parent household status. This study looked a little deeper, by examining not only lone parent households, but also by looking at female-only households and male-only households. Lone parent household was broken up into 4 categories: families with both parents and children between the ages of 6-17, father only households, mother only households, and lone parent household (independent variables). These variables, along with other variables, were combined to find the three or more variables that best predicted students' scores on the third through eighth grade CMT for students who scored goal and above on English language arts and mathematics standardized assessments. This data was used to determine the best combination of variables that show the greatest amount of variance in the test scores. For this study, the following categories were obtained from the United States Census Bureau's American Fact finder website, and describe Family/Household Type as:

1. Percentage of married families with children 6-17 years old,
2. Percentage of female only households no males,
3. Percentage of male only households no females, and
4. Percentage of lone parent household.

Figure 2 shows the relationship between a district's family/ household type and structure and student achievement as measured by the third through eighth grade CMT scores in English language arts and mathematics. A district's family/household type was described as: families with both parents and children between the ages of 6-17, father only households, mother only households, and lone parent household.

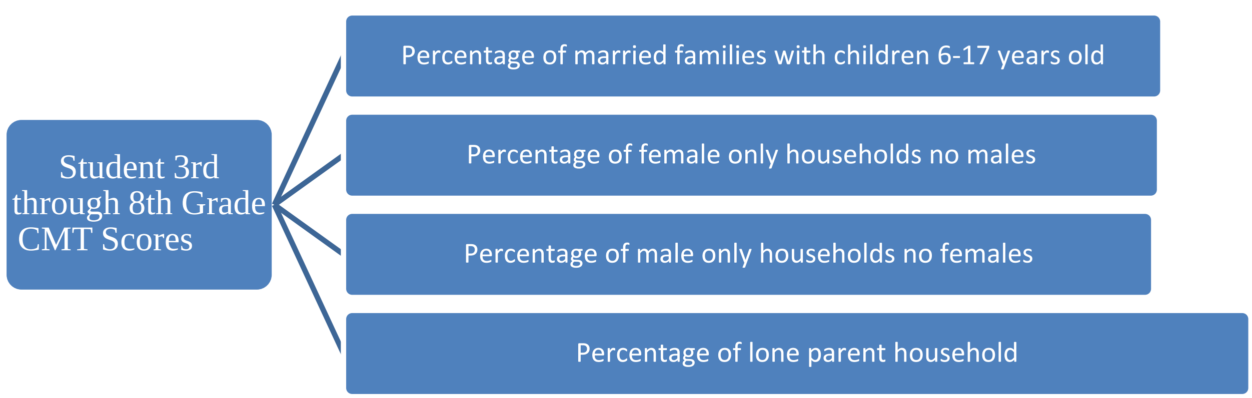

Figure 2: Family/household construct.

The last set of variables that the research had shown to have the greatest influence on student achievement as measured by standardized test scores was parent education attainment. This study looked at parents' education levels. Parents' education attainment was broken up into 4 categories: percentage of population 25 years or older, no high school diploma, percentage of population 25 years or older, high school graduate, percentage of population 25 years or older, some college, and percentage of population 25 years or older, bachelor's degree (independent variables). These variables, along with other variables, were combined to find the three or more variables that best predicted student's scores on the third through eighth grade CMT scores for students who scored goal and above on English language arts and mathematics standardized assessments. This data was used to determine the best combination of variables that show the greatest amount of variance in the test scores. For this study the following categories were obtained from the United States Census Bureau's American Factfinder website, and describe parental education attainment as:

1. Percentage of population 25 years or older, no high school diploma,
2. Percentage of population 25 years or older, high school graduate,
3. Percentage of population 25 years or older, some college,
4. Percentage of population 25 years or older, bachelor's degree, and
5. Percentage of population 25 years or older, advanced degree.

Figure 3 shows the relationship between parents' education levels and student achievement as measured by the third through eighth grade CMT scores on English language arts and mathematics.

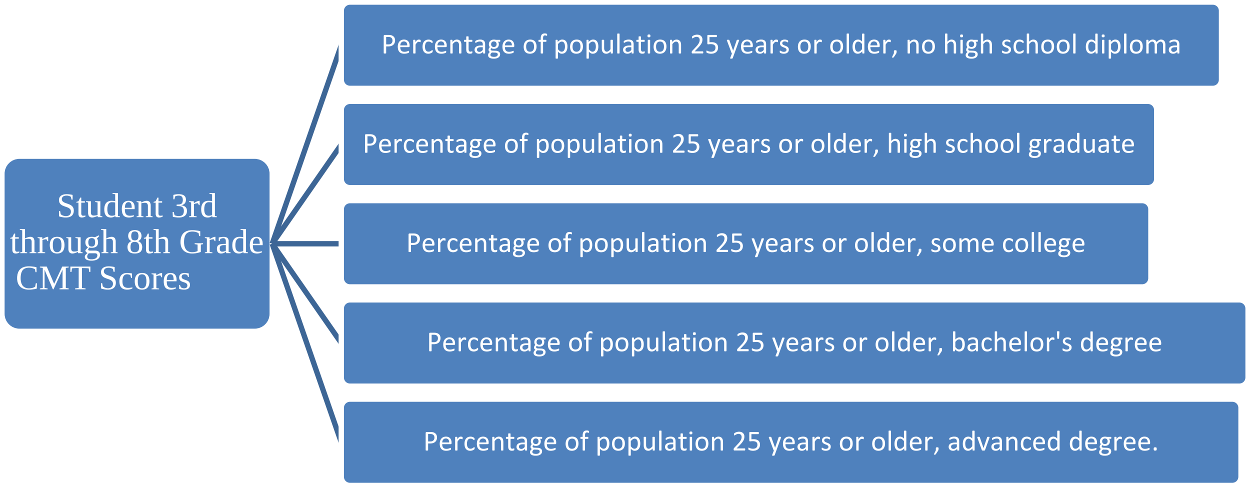

Figure 3: Parent education attainment construct.

Research Questions

This study is guided by two comprehensive research questions:

1. Which combination of out-of-school variables best predicted how students actually performed on the 2010 third through eighth grade CMTs in regards to scoring goal or higher in mathematics and English language arts at the district level?
2. Which combination of out-of-school variables explained the most amount of variance in the percent of students who scored goal or higher on the 2010 CMT in mathematics and English language arts at the district level?

Population

This research study examined student achievement as measured by the 2010, third through eighth grade CMT scores for math and ELA. All the school district data collected for this study was obtained from the Connecticut State Department of Education website. This study focused strictly on elementary schools that had students in grades 3-5, as well as middle schools that had students in grades 6-8. This study did not look at high schools, charter school districts, technical schools, or regional school districts. Currently in the state of Connecticut there are approximately 195 school districts that include regional school districts, various academy districts, charter school districts, community school districts, and technical high schools. Of the 195 school districts, 56 of them--which is 29% of all the districts in CT--did not meet the requirements for this study. This is because some of them were regional high school districts, Academy high school districts, charter high school districts, technical high school districts, and so forth. Therefore, 71% of all school districts in the state of CT were represented in the study. This study did not factor in any districts that did not meet the specific requirements.

Connecticut school districts are broken up into 9 district reference groups (DRG). These DRGs include both extremely wealthy and extremely poor school districts and schools. he DRGs are broken up into A, B, C, D, E, F, G, H and I, with A being the wealthiest districts and I being the poorest school districts. The target population for this study was all school districts in the state of Connecticut that met the requirements and had at least 25 students taking the 2010 CMTs in grades 3, 4, 5, 6, 7, and 8, as well as districts that had 2010 census data. The available population sample for the study was 139 elementary school (K-5) districts and 114 middle school (6-8) districts that met the criteria. This comprised 100% of the population that met the given criteria for the study.

The following 25 school districts were listed in the elementary (3-5) model but were removed from the middle school (6-8) model: Andover; Ashford; Barkhamsted; Bolton; Canterbury; Chester; Deep River; Eastford; Easton; Essex; Franklin; Hartland; Hebron; Kent; Lebanon; Lisbon; Mansfield; Marlborough; New Hartford; North Canaan; Orange; Redding; Salisbury; Willington and Woodbridge. These 25 districts were removed at the middle school level due to the fact that some of them became regional schools once they got to the middle school level.

Data Collection

The data obtained for the dependent variables third through eighth grade CMT scores were collected from the Connecticut State Department of Education's publicly available website (web address here) Data Interaction for Connecticut Mastery Test. In Connecticut, there are five classifications for the scores students can get on the CMTs. They are: Below Basic, Basic, Proficient, Goal, and Advanced. For the purpose of this study, students who scored goal or advanced were combined to represent one passing score. This data was downloaded from the Data Interaction for Connecticut Mastery Test website. This site was created for school districts, principals, teachers, parents, and students. The data was then exported onto an Excel spreadsheet in order for me to have more options in manipulating it. Since I was looking at six different grade levels, each grade level was its own spread sheet, along with its independent variables (http://solutions1.emetric.net/CMTPublic/Index.aspx).

The independent variables (employment status, income Levels, family/household type, education attainment) were obtained from the United States Census Bureau website (America Factfinder). The data obtained was collected from the American Community Survey section of the website (ACS). This information was also downloaded onto an excel spreadsheet and merged with the various grade level variables. For each grade level, spreadsheets were developed that had both dependent variable (grade level) and the independent variables. The 5 year (2008-2012) estimates for this study were taken from the ACS section of the American Factfinder website. The 5 year estimates are not always as accurate, but they capture more of a sample: (http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml).

Instrumentation

In Connecticut, the major test that is administered to students is the Connecticut Mastery Test (CMT). This test has been utilized since 1985 and is given to students in third through eighth grades in English language arts and mathematics and for students in fifth and eighth grade in science (Hendrawan & Wibowo, 2011). The CMT was revised in 1993, 2000, and 2006 in order to adjust content, re-establish standards, and address current technological needs (Hendrawan & Wibowo, 2011). The CMT compares student achievement as measured by the test, but relative to performance standards. The Connecticut General Statutes requires that all students in grades 3 through 8 be tested in English language arts and mathematics (Hendrawan & Wibowo, 2011). The CMT results are used for various purposes including setting high expectations for students, assessment of students' academic skills, the assessment of students, schools, and districts, identifying students who need assistance, and monitoring students' progress (Hendrawan & Wibowo, 2011, p. 1). The CMT is what the state of Connecticut uses to measure student achievement and progress towards meeting Annual Yearly Progress (AYP). The CMT was designed with the intention of capturing the key components of mathematics, reading, writing and science that students in grades 3 through 8 had to master at each grade level.

Each test is broken up into content strands, which are aligned with the Connecticut Framework: K-12 Curricular Goals and Standards (Hendrawan & Wibowo, 2011). The English strands for grades 3 through 8 include skills such as forming a general understanding, developing interpretations, making reader text connections, examining content, and structure (Hendrawan & Wibowo, 2011). The math strands in grades 3 through 8 include numerical and proportional reasoning, geometry and measurement, working with data, algebraic reasoning, and integrated understandings.

Reliability

Hendrawan and Wibowo (2011) defined reliability as the “statistical index of the consistency of test performance over repeated trials” (p. 20). When people are tested and re-tested with the same test, there needs to be a level of consistency with regard to how they perform on both tests (Hendrawan & Wibowo, 2011). This shows that a test is reliable. The CMT is a reliable test administered to students in grades 3 through 8 in English language arts and mathematics based on Cronbach’s alpha estimates (Hendrawan & Wibowo, 2011). In order to measure the reliability of the 2010 CMT, the test items were split in halves, and Cronbach’s alpha was used to estimate the lower-bound estimates of an infinite combination of split-halves, which makes this a conservative way for testing the reliability of the CMT (Hendrawan & Wibowo, 2011, p. 20).

Hendrawn and Wibowo (2012) summarized the reliability estimates for the 2010 CMT. They explained that, “The reliability coefficients are based on Cronbach’s alpha measure of internal consistency. When evaluating these results, it is important to remember that reliability is partially a function of test length and thus reliability is likely to be greater for tests that have more items” (Hendrawan & Wibowo, 2011, p. 20).

Table 1

2010 English Language Arts and Mathematics CMT Cronbach’s Alpha

Grade	Mathematics	Reading	Writing
3	0.938	0.940	0.889
4	0.946	0.935	0.863
5	0.959	0.942	0.887

6	0.964	0.944	0.870
7	0.969	0.947	0.890
8	0.970	0.947	0.893

The Technical Report for the Connecticut Mastery Test states that a reliability of .90 or greater for an assessment to be reliable, but on the other hand, assessments that are .89 are still reported out along with the associated standard error of management (Hendrawan & Wibowo, 2011). Hendrawan and Wiboro (2011) explained that:

> Because the CMT tests are used in making individual decisions about students, they must be very reliable, particularly at cut points (the score points that separate adjacent achievement categories). Target reliability coefficients of .90 (or higher) are therefore set for the important cut points of each test.
>
> Other psychometric properties include item difficulty, item discrimination, and differential item functioning. General statistical targets are provided below:
>
> *For Multiple-Choice (MC) Items*
>
> Percent correct: greater than or equal to .25
>
> Point biserial correlation with total score: greater than or equal to.20
>
> Mantel-Haenszel: No Category C items (see below)
>
> *For Constructed-Response (CR) Items*
>
> Difficulty: any level as long as all score points are well represented Correlation with total score: greater than or equal to.20
>
> Generalized Mantel-Haenszel: No chi-square significant at .05 level of alpha

Since its introduction in the field of epidemiology in 1959, Mantel-Haenszel statistics have been employed by many test developers, and several refinements have been added. Education Testing Service (ETS) uses the Mantel-Haenszel statistic and calculates a D statistic which permits grouping of test items into three categories (Zieky, 1993). The D statistic is a function of the case-control odds estimator of risk generated by SAS's PROC FREQ. The D statistic is calculated as follows:

1. α = case-control estimate of risk (odds ratio)
2. β = natural log of α
3. $D = -2.35*\beta$

Camilli and Shepard (1994, p. 121) describe three categories of items with respect to D:

A. D does not significantly differ from zero using Mantel-Haenszel chi-square, or D's absolute value is less than 1

B. D significantly differs from 0 and D has either (a) an absolute value less than 1.5 or (b) an absolute value not significantly different from 1

C. D's absolute value is significantly greater than or equal to 1.5.

Validity

In order to determine the validity of the CMT, a better understanding of validity is needed. Internal validity is described as the causal inference of the independent variable on the dependent variable, while external validity is described as the ability of the results from the study to be generalized across settings, population and time (Hinkle, Wiersma, & Jurs, 2002). The American Education Research Association (AERA), American Psychological Association (APA), and the National Council on Measurement (NCM) in Education in 1999 stated that, in order to move from the statement of purpose to the final product, four criteria need to be met (Hendrawan & Wibowo, 2012). The four criteria are the "delineation of the purpose of the test… extent of the domain to be measured; development and evaluation of the test specifications; development, field testing, evaluation…; assembly and evaluation of the test for operational use (Hendrawan & Wibowo, 2012, p. 12). While the CMT was being developed, each of the criteria listed above were carefully planned and implemented, in order to ensure that a "strong validity argument for the use and interpretation of CMT's" would be credible (Hendrawan & Wibowo, 2011, p. 7).

The CMT technical report indicates that in order to ensure that the CMT was valid, three types of validation processes occurred: a content validity survey, scoring quality assurance procedures, and an item quality analysis (Hendrawan & Wibowo, 2011).

Content Validity Surveys

With regard to the content validity survey, over 3000 surveys were sent out to educators in October of 1984 in regards to the alignment of the CMTs with the proposed reading, writing, and mathematics objectives, and whether those objectives were taught prior to the administration of the test (Hendrawan & Wibowo, 2011). A similar survey was given to over 8000 educators in October of 1985 with the same purpose as the 1984 survey. Each year that the next generation of CMTs was introduced, a content validity survey was given with regard to the alignment of the CMTs with objectives and content area strands. For the fourth generation CMTs, the company Assessment and Evaluation Concepts, Inc. (AEC) conducted a comprehensive study and found that the Connecticut State Department of Education did a "solid" job in aligning the CMTs with the English language arts and mathematics curriculum frameworks (Hendrawan & Wibowo, 2011).

Scoring Quality Assurance Procedures Undertaken During Development

In an effort to ensure that there was test validity with the CMTs during the test construction period and the field testing phase, checks and balances were developed in various sections of the test (Hendrawan & Wibowo, 2012). These checks and balances ensured that scoring was uniform and that there were quality control measures in place during the scoring process. Some of these processes included making sure that the multiple choice (MC) answer keys with the multiple choice answers did not yield low point-biserial correlations, and if they did, they were checked for miskeying (Hendrawan & Wibowo, 2012). In the constructed response (CR) section, both Connecticut educators and staff that were contracted out to score the tests had to go through a process called *range finding* which allowed them to establish score boundaries (Hendrawan & Wibowo, 2012). The scorers of the CMT CR section were trained for days in order to ensure that there was reader accuracy. They had to work alongside other readers and use anchored samples in order to check the accuracy of their scoring, while always ensuring that there was a second reader for each CR (Hendrawan & Wibowo, 2012).

Item Quality Analysis Undertaken During Development

The final phase of their validity practices included the assessing of the actual test questions, item by item, to see if there was any item bias (Hendrawan & Wibowo, 2012). In the creation of the CMTs, the *Standards for Education and Psychological Testing* (AERA, APA and NCME, 1999) were utilized for their construction, field testing, and for documentation of the test (Hendrawan & Wibowo, 2011, p. 9). Each of these three validation systems along with the four citeria, lead to the validation of the CMT.

Methods

Data Collection

The data for this dissertation was obtained from two primary sources: the Connecticut State Department of Education website and the U.S. Census Bureau American FactFinder website. The literature review provided evidence of the following independent variables representing the constructs of Income Levels, Family/ Household Type, Parent Education Attainment, and Employment Status. This study examined 15 independent variables (out-of-school factors) broken up into 4 constructs.

Employment Status is defined as:

- Percentage of families in workforce.

Income Levels is defined as:

- Percentage of families below poverty
- Median district household income
- Percentage of families making $25,000 or less
- Percentage of families making $35,000 or less
- Percentage of household annual income above $200,000

Family/Household Type is defined as:

- Percentage of female only households no males
- Percentage of male only households no females;
- Percentage of lone parent household
- Percentage of married families with children 6-17 years old

Parent Education Attainment is defined as:

- Percentage of population 25 years or older, no high school diploma

- Percentage of population 25 years or older, high school graduate
- Percentage of population 25 years or older, some college
- Percentage of population 25 years or older, bachelor's degree
- Percentage of population 25 years or older, advanced degree.

The dependent variables for this study are the 2010 third through eighth grade CMT scores in English language arts and mathematics with regard to students who scored goal or above.

Data for each of the 15 variables were obtained from the American Community Survey section of the United States Census Bureau website which looked at a 5-year estimate. A 5-year estimate was used because it gave me the largest possible sample size. The website, American Factfinder was used to find the necessary data.

The literature from Turnamian (2012), Jones (2008), and Maylone (2002), as well as various other studies, all points to mean district household income being the first variable that influences student achievement, as it is measured by standardized test scores. This study builds on the work of Maylone (2002) and Turnamian (2012). Maylone (2002) looked at the mean district household income, combined with the percentage of district lone-parent households and the percentage of students receiving free and reduced lunch to predict students' MEAP scores. Turnamian (2012) looked at a combination of the following five variables: percentage of the population with a bachelor's degree, percentage of lone-parent households, percentage of the population with an advanced degree, percentage of families below poverty, and percentage of economically disadvantaged families to explain the greatest amount of variance on the 2009 NJASK 3 in language arts scores. Turnamian (2012) also looked at the combination of percentage of families with less than $30,000 annual income, percentage of population with a high school diploma and some college, percentage of population with no high school diploma, and percentage of population with a high school diploma, in order to create the greatest amount of variance in NJASK 3 math scores.

The dependent variables for this study are the third, fourth fifth sixth seventh, and eighth grade passing scores (goal or higher) on the 2010 CMT scores in math and ELA. In order to calculate the percentage of students passing in the math and ELA CMTs, I combined students who scored goal and advanced. The dependent variables for this study are:

- Percentage of students passing the 2010, third grade CMT in English language arts,
- Percentage of students passing the 2010, third grade CMT in mathematics,
- Percentage of students passing the 2010, fourth grade CMT in English language arts,
- Percentage of students passing the 2010, fourth grade CMT in mathematics,
- Percentage of students passing the 2010, fifth grade CMT in English language arts,
- Percentage of students passing the 2010, fifth grade CMT in mathematics,
- Percentage of students passing the 2010, sixth grade CMT in English language arts,
- Percentage of students passing the 2010, sixth grade CMT in mathematics,
- Percentage of students passing the 2010, seventh grade CMT in English language arts,
- Percentage of students passing the 2010, seventh grade CMT in mathematics,
- Percentage of students passing the 2010, eighth grade CMT in English language arts, and
- Percentage of students passing the 2010, eighth grade CMT in mathematics.

All the data used for this study is publicly available information that can be found on the internet on websites like the Connecticut State Department of Education, American Factfinder, and the CMT Data Interaction website. I found all the school districts that met the established criteria (at least 25 students in grades 3 through 8 that took the CMTs, no regional school districts, no high schools etc.), and put all those districts on an Excel spread sheet. All the CMT scores of students who scored goal and advanced were also transferred onto the same excel spread sheet. The American Factfinder website was visited and the percentages for the 15 out-of-school variables were obtained and transferred onto the same excel spreadsheet. The 15 out-of-school variables were based on a 5 year estimate from the U.S. Census Bureau website (American Factfinder). Once this was complete, 6 Excel spreadsheets were created that contained all the elements listed previously (CMT scores, school district names, out-of-school variables), and these were broken up by grade level. This was done so that each grade level would be its own study.

This study examined the right combination of community demographic factors that accounted for the greatest amount of variance in students' third, fourth, fifth' , sixth, seventh, and eighth grade CMT scores for Connecticut public school districts in math and ELA. The study looked at the percentage of students who scored goal and above on the third through eighth grade 2010 CMTs in math and ELA. The study also determined the specific community demographic factors that best predicted how students performed on the third through eighth grade CMTs in math and ELA. The focus of the study was to find the best combination of out-of-school community demographic variables that affected student achievement as measured by state standardized test scores. This study was purposely focused on students in grades 3-8 (elementary and middle testing grades). The current study used out-of-school variables because if these variables accounted for even a portion of the variance or had the ability to predict how students performed on their state tests, then these tests should not be used to make critical education decisions or to decide how schools or districts are measured in regards to their performance.

Alignment of Data

Since this study utilized two primary websites for data collection, I first had to make sure that each school district that was put on the Excel spreadsheet had the 15 variables present in the American Factfinder website. If the information was missing from either the CMTs for a specified grade level or from the Census Bureau website, then that district was excluded from the study. After going through the Excel spreadhseets and aligning the data, it was found that 114 school districts met the criteria to be added in this study for grades 6 through 8. It was also found that 139 districts met the criteria in grades 3 through 5. Once all the Excel spreadsheets were current, they were uploaded into SPSS, where a correlational analysis was performed on each dependent variable. Correlational coefficients were generated for each of the 15 independent variables.

SPSS Data Entry

Once all the data from the American Factfinder website, the State of Connecticut website, and the Connecticut Mastery Test websites were transferred into the Excel spreadsheet, all this information was then uploaded into SPSS (Statistical Package for the Social Sciences), and a correlational analysis was done for each of the dependent variables (third through eighth grade CMT scores in mathematics and English langauge arts). Correlation coefficients, ANOVA, collinearity diagnostics, rnd Residual statistics were generated for each independent variable. This was done in order to determine the level of strength and the direction of the relationship between the dependent variables and the independent variables. Histograms, normal probability plots, and scatterplots were created. The histograms were used to graphically display and summarize the distribution of a set of data. The normal probability plots were used to informally assess the non-normality of a set of data (Ryan & Joiner, 1976). The scatter plots were used to determine if there were any irregularities that would disqulify a dependent variable as an indicator of the relationship with the independent variable (Turnamian, 2012, p. 124).

A major concern during this research study was the reliability and validity of the regression models based on multicollinearity of the independent variables. If two of the variables were highly related, there was a chance that there would be issues with the calculations as to the predicitive power of the regression models (Turnamian, 2012). This study utilized Maylone's (2002) formula, therefore multicollinearity had to be examined carefully. In the above studies, the variable percentage of people with some college may be highly correlated with percentage of people with a high school diploma. Or, the variable percentage of people who make $35,000 or less may be highly correlated with the percentage of people living below the poverty line. When these items are both put into the same hierarchical regression model, there is a chance for there to be issues with multicollinearity. The Variance Inlation Factor (VIF) is what measures the degree or level of multicollinearity with the independent (predictor) variables within a regression model.

Once this was completed I looked at the model that was statistically significant and had the largest *R* Square. This model showed the most variance. I then looked at the coefficient tables in order to get the necessary information that would go into Maylone's formula. In the coefficient table, I looked at the unstandardized coefficients and took the *B* value of the best model and multiplied that by the percentage of the independent variable. For example, Maylone's formula $A_i(X_i) + A_{ii}(X_{ii})+A_{iii}(X_{iii})\ldots + \text{Constant} = Y$, where A_i is the independent (predictor) variable and X_i is the beta for the independent variable and Y is the predicted score on the math or ELA CMTs.

Chapter Summary

This study used a non-experimental, corellational, explanatory, investigational 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 a simultaneous, hierarchical multiple regression model for the study. Simultaneous regression is described by Petrocelli (2003) as a way to "explore and maximize prediction… whereas hierarchical regression involves theoretically based decisions for how predictors are entered into the analysis" (p. 9). I used a predictive, explanatory non experimental research study that builds on the work of Turnamian (2012), Maylone (2002), and Jones (2008). Hierarchical multiple regression models were used to determine the extent to which out-of-school variables had a statistically significant influence on a school district's 2010 third through eighth grade CMT scores in English Language Arts and Mathematics.

The review of the literature suggested that there were certain independent variables that influenced student performance as evidenced by test scores. There were 15 independent variables utilized in this study. For this study, data were obtained from the United States Census Bureau's American Factfinder website. The dependent variables for this study were students scoring proficiency or above in the third through eighth grade CMTs in mathematics and English language arts. This study had two main research questions and four follow up research questions. The population for this study was the approximately 139 school districts in grades 3 through 5 and 114 school districts in grades 6 through 8 within the state of Connecticut. All districts that met specific criteria were included in the study, therefore there were no regional school districts added to this study. The study involved school districts that participated in the 2010 CMTs in English language arts and mathematics for the third, fourth, fifth, sixth, seventh, and eighth grade. The data for this study was taken from two primary sources, the American Factfinder website and the CMT Data Interaction website.

Chapter IV

ANALYSIS OF THE DATA

Introduction

The purpose of this study was to determine which combination of 15 out-of-school community demographic variables best predicted and accounted for the most variance in a Connecticut school district's percentages of students scoring proficient or above on the 2010 Connecticut Mastery Test (CMT) for the third through eighth grade in mathematics and English language arts. 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 to measure the quality of a schools personnel and students.

In order to determine which combination of out-of-school variables best predicted how students performed on the 2010 third through eighth grade Connecticut Mastery Test in mathematics and English language arts, simultaneous and hierarchical regression models were used to analyze the data (Petrocelli, 2003). This method of analysis is usually used in order to maximize prediction (Pedhazur, 1997).

Research Questions

The review of various research studies and the empirical research showed that by looking at various out-of-school variables, it would be possible to predict how students in any given state performed on their state standardized assessments (Maylone, 2002; Tienken & Orlich, 2013; Turnamian, 2012). The two research questions that drove this study were:

1. Which combination of out-of-school variables best predicts how students actually performed on the 2010 third through eighth grade CMTs in regards to scoring proficiency or higher?
2. Which combination of out-of-school variables explains the most amount of variance in how students performed on the 2010 CMT?

Summary of Findings for the Dependent Variables

For the purpose of this study, the third through eighth grade CMTs in mathematics and English language arts were the dependent variables and the following 15 out-of-school variables were the independent variables:

1. Percentage of families below poverty,
2. Median district household income,
3. Percentage of families making $25,000 or less,
4. Percentage of families making $35,000 or less,
5. Percentage of household annual income above $200,000,
6. Percentage of married families with children 6-17 years old,
7. Percentage of female only households no males,
8. Percentage of male only households no females,
9. Percentage of lone parent household,
10. Percentage of population 25 years or older, no high school diploma,
11. Percentage of population 25 years or older, high school graduate,
12. Percentage of population 25 years or older some college,
13. Percentage of population 25 years or older, bachelor's degree,
14. Percentage of population 25 years or older, advanced degree, and

15. Percentage of parents working

Table 2

Variables in Their Long and Shortened Form.

Variable	**Variable shortened**
Percentage of families below poverty	% below poverty
Median district household income	Median income
Percentage of families making $25,000 or less	% $25,000
Percentage of families making $35,000 or less	% $35,000
Percentage of household annual income above $200,000	% $200,000
Percentage of married families with children 6-17 years old	% Married
Percentage of female only households no males	% Female household
Percentage of male only households no females	% Male household
Percentage of lone parent household	% Lone parent household
Percentage of population 25 years or older, no high school diploma	% No HS Diploma
Percentage of population 25 years or older, high school graduate	% HS Diploma
Percentage of population 25 years or older some college	% some college
Percentage of population 25 years or older, bachelor's degree	% BA Degree
Percentage of population 25 years or older, advanced degree	% Advanced Degree
Percentage of parents working	% employed
2010 third Grade Mathematics... 8 Mathematics	2010 CMT 3 Math... 8 Math

2010 third Grade English Language Arts… 8	2010 CMT 3ELA… 8ELA

Interpretation of Pearson Correlational Coefficients for Dependent Variables: 2010 Third through Eighth Grade CMT Scores for ELA and Math

Pearson correlation coefficients measure the degree of association or the relationship between two variables, which in this case are each an independent variable, and the dependent variable (Hinkle, Wiersma, & Jurs, 2003). The correlation coefficient ranges from -1.00 to 1.00. When determining the strength of a relationship, the negative and positive signs are ignored, because the closer the number is to -1 or 1 the stronger the relationship, 1 being the strongest possible relationship. In order to interpret the correlation coefficient, Table 3 from Hinkle, Wiersma, and Jurs (2003, p.109) was used.

Table 3

The size of the Correlation and its Interpretation.

Size of Correlation	Interpretation
.90 to 1.00 (-.90 to -1.00)	Very high positive (negative) correlation
.70 to .90 (-.70 to -.90)	High positive (negative) correlation
.50 to 70 (-.50 to -.70)	Moderate positive (negative) correlation
.30 to .50 (-.30 to -.50)	Low positive (negative) correlation
.00 to .30 (.00 to -.30)	Little if any correlation

2010 CMT Third Grade Math (CMT 3 Math) and Third Grade ELA (CMT 3ELA)

The following independent variables with their correlation were the three strongest correlations that were statistically significant ($p < .05$) to CMT 3 math.

1. The variable percent of families 25 and over with no high school diploma had a correlation of -.794 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with no high school diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 3 Math decreases.
2. The variable percentage of families making $35,000 or less had a correlation of -771 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 3 Math decreases.
3. The variable percentage of families making $25,000 or less had a correlation of -737 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 proficiency or higher on the 2010 CMT 3 Math decreases.

Table 4

Correlation Table for 2010 Third Grade Math and the Three Strongest Correlations.

		third Grade Math at or above Goal	25 and over No HS Diploma	Families household 35K and under	Families household 25K and under
Pearson Correlation	third Grade Math at or above Goal	1.000	-.794	-.771	-.737
	25 and over No HS Diploma	-.794	1.000	.884	.869

	Families household 35K and under	-.771	.884	1.000	.968
	Families household 25K and under	-.737	.869	.968	1.000
Sig. (1-tailed)	third Grade Math at or above Goal	.	.000	.000	.000
	25 and over No HS Diploma	.000	.	.000	.000
	Families household 35K and under	.000	.000	.	.000
	Families household 25K and under	.000	.000	.000	.

Table 5

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 3 Math

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.264
Families household 35K and under	-.771
Families household 25K and under	-.737
Families household 200K or more	.551
All families kids under 18 below poverty	-.716
Female head no husband kids under 18	-.653
All married families kids under 18	.662
Male head no wife kids under 18	-.365
Lone Parent Household	-.664
@25 and over No HS Diploma	-.794
@25 and over HS Graduate	-.599
@25 and over Some College	-.357
@25 and over BA Degree	.683
@25 and over Graduate or professional degree	.616
Median Family Income1evel	.671

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 3ELA.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.821 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with no HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 3ELA decreases.
2. The variable percentage of families making $35,000 or less had a correlation of -.801 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 3ELA decreases.
3. The variable percentage of families making $25,000 or less and percentage of all families with children under 18 living below poverty both have a correlation score of -.782 and are statistically significant at the .000 level. These are both high negative correlations, which mean that as percentage of families making $25,000 or less, or percentage of all families with children under 18 who are living in poverty rises, the percentage of students scoring proficient or higher decreases.

Table 6

Correlation Table for 2010 Third Grade ELA and the 3 Strongest Correlations

		third Grade reading at or above Goal	25 and over No HS Diploma	Families household 35K and under	Families household 25K and under	All families kids under 18 below poverty
Pearson Correlation	third Grade reading at or above Goal	1.000	-.821	-.801	-.782	-.782
	25 and over No HS Diploma	-.821	1.000	.884	.869	.865

		third Grade reading at or above Goal	25 and over No HS Diploma	Families household 35K and under	Families household 25K and under	All families kids under 18 below poverty
	Families household 35K and under	-.801	.884	1.000	.968	.921
	Families household 25K and under	-.782	.869	.968	1.000	.955
	All families kids under 18 below poverty	-.782	.865	.921	.955	1.000
Sig. (1-tailed)	third Grade reading at or above Goal	.	.000	.000	.000	.000
	25 and over No HS Diploma	.000	.	.000	.000	.000
	Families household 35K and under	.000	.000	.	.000	.000
	Families household 25K and under	.000	.000	.000	.	.000
	All families kids under 18 below poverty	.000	.000	.000	.000	.

Table 7

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 3 ELA Scores Where N = 139

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.260
Families household 35K and under	-.801
Families household 25K and under	-.782
Families household 200K or more	.545
All families kids under 18 below poverty	-.782
Female head no husband kids under 18	-.694
All married families kids under 18	.692
Male head no wife kids under 18	-.338
Lone Parent Household	-.692

Variable	Pearson Correlation Coefficient
@25 and over No HS Diploma	-.821
@25 and over HS Graduate	-.591
@25 and over Some College	-.344
@25 and over BA Degree	.684
@25 and over Graduate or professional degree	.612
Median Family Income1evel	.685

2010 CMT Fourth Grade Math (CMT 4 Math) and Fourth Grade ELA (CMT 4ELA)

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 4 Math.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.725 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with no HS Diploma increases, the number of students scoring proficiency or higher on the 2010 CMT 4 Math decreases.
2. The variable percent of families making $35,000 or less had a correlation of -.737 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the number of students scoring proficiency or higher on the 2010 CMT 4 Math decreases.
3. The variable percent of families making $25,000 or less had a correlation of -.718 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 number of students scoring proficiency or higher on the 2010 CMT 4 Math decreases.

Table 8

Correlation Table for Fourth Grade Math and the 3 Strongest Correlations

		Fourth Grade Math at or above Goal	25 and over No HS Diploma	Families household 35K and under	Families household 25K and under
Pearson Correlation	4th Grade Math at or above Goal	1.000	-.725	-.737	-.718
	25 and over No HS Diploma	-.725	1.000	.884	.869
	Families household 35K and under	-.737	.884	1.000	.968
	Families household 25K and under	-.718	.869	.968	1.000
Sig. (1-tailed)	4th Grade Math at or above Goal	.	.000	.000	.000
	25 and over No HS Diploma	.000	.	.000	.000
	Families household 35K and under	.000	.000	.	.000
	Families household 25K and under	.000	.000	.000	.

Table 9

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 4 Math Scores Where N = 139

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.255
Families household 35K and under	-.737
Families household 25K and under	-.718
Families household 200K or more	.578
All families kids under 18 below poverty	-.712
Female head no husband kids under 18	-.578
All married families kids under 18	.642
Male head no wife kids under 18	-.339
Lone Parent Household	-.587

Variable	Pearson Correlation Coefficient
@25 and over No HS Diploma	-.725
@25 and over HS Graduate	-.576
@25 and over Some College	-.402
@25 and over BA Degree	.641
@25 and over Graduate or professional degree	.612
Median Family Income1evel	.673

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 4ELA.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.788 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 4ELA decreases.
2. The variable percentage of families making $35,000 or less had a correlation of -.795 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 4ELA decreases.
3. The variable percentage of families making $25,000 or less had a correlation of -.771 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 proficiency or higher on the 2010 CMT 4ELA decreases.

Table 10

Correlation Table for Fourth Grade ELA and the 3 Strongest Correlations

		4th Grade reading at or above Goal	25 and over No HS Diploma	Families household 35K and under	Families household 25K and under
Pearson Correlation	4th Grade reading at or above Goal	1.000	-.788	-.795	-.771
	25 and over No HS Diploma	-.788	1.000	.884	.869
	Families household 35K and under	-.795	.884	1.000	.968
	Families household 25K and under	-.771	.869	.968	1.000
Sig. (1-tailed)	4th Grade reading at or above Goal	.	.000	.000	.000
	25 and over No HS Diploma	.000	.	.000	.000
	Families household 35K and under	.000	.000	.	.000
	Families household 25K and under	.000	.000	.000	.

Table 11

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 4ELA Scores Where N = 139

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.252
Families household 35K and under	-.795
Families household 25K and under	-.771
Families household 200K or more	.591
All families kids under 18 below poverty	-.753
Female head no husband kids under 18	-.660
All married families kids under 18	.646
Male head no wife kids under 18	-.368
Lone Parent Household	-.662
@25 and over No HS Diploma	-.788

Variable	Pearson Correlation Coefficient
@25 and over HS Graduate	-.604
@25 and over Some College	-.422
@25 and over BA Degree	.674
@25 and over Graduate or professional degree	.646
Median Family Income1evel	.696

2010 CMT Fifth Grade Math (CMT 5 Math) and Fifth Grade ELA (CMT 5ELA)

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 5 Math.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.822 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 5 Math decreases.
2. The variable percent of families making $35,000 or less had a correlation of -.813 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 5 Math decreases.
3. The variable percent of families making $25,000 or less had a correlation of -.800 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 proficiency or higher on the 2010 CMT 5 Math decreases.

Table 12

Correlation Table for Fifth Grade Math and the 3 Strongest Correlations

		5th Grade Math at or above Goal	25 and over No HS Diploma	Families household 35K and under	Families household 25K and under
Pearson Correlation	5th Grade Math at or above Goal	1.000	-.822	-.813	-.800
	25 and over No HS Diploma	-.822	1.000	.884	.869
	Families household 35K and under	-.813	.884	1.000	.968
	Families household 25K and under	-.800	.869	.968	1.000
Sig. (1-tailed)	5th Grade Math at or above Goal	.	.000	.000	.000
	25 and over No HS Diploma	.000	.	.000	.000
	Families household 35K and under	.000	.000	.	.000
	Families household 25K and under	.000	.000	.000	.

Table 13

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 5 Math Scores Where N = 139

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.214
Families household 35K and under	-.813
Families household 25K and under	-.800
Families household 200K or more	.528
All families kids under 18 below poverty	-.792
Female head no husband kids under 18	-.705
All married families kids under 18	.692
Male head no wife kids under 18	-.373
Lone Parent Household	-.693

Variable	Pearson Correlation Coefficient
@25 and over No HS Diploma	-.822
@25 and over HS Graduate	-.562
@25 and over Some College	-.352
@25 and over BA Degree	.648
@25 and over Graduate or professional degree	.589
Median Family Income1evel	.680

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 5ELA.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.856 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 5ELA decreases.
2. The variable percent of all families with children under 18 living in poverty had a correlation of -.819 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of all families with children under 18 living in poverty increases, the percentage of students scoring proficiency or higher on the 2010 CMT 5ELA decreases.
3. The variable percent of families making $35,000 or less had a correlation of -.819 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 5ELA decreases.

Table 14

Correlation Table for Fifth Grade ELA and the 3 Strongest Correlations

		5th Grade reading at or above Goal	25 and over No HS Diploma	Families household 35K and under	All families kids under 18 below poverty
Pearson Correlation	5th Grade reading at or above Goal	1.000	-.856	-.819	-.819
	25 and over No HS Diploma	-.856	1.000	.884	.865
	Families household 35K and under	-.819	.884	1.000	.921
	All families kids under 18 below poverty	-.819	.865	.921	1.000
Sig. (1-tailed)	5th Grade reading at or above Goal	.	.000	.000	.000
	25 and over No HS Diploma	.000	.	.000	.000
	Families household 35K and under	.000	.000	.	.000
	All families kids under 18 below poverty	.000	.000	.000	.

Table 15

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 5 ELA Scores Where N = 139

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.300
Families household 35K and under	-.819
Families household 25K and under	-.815
Families household 200K or more	.591
All families kids under 18 below poverty	-.819
Female head no husband kids under 18	-.741

Variable	Pearson Correlation Coefficient
All married families kids under 18	.712
Male head no wife kids under 18	-.390
Lone Parent Household	-.733
@25 and over No HS Diploma	-.856
@25 and over HS Graduate	-.610
@25 and over Some College	-.375
@25 and over BA Degree	.694
@25 and over Graduate or professional degree	.654
Median Family Income1evel	.724

2010 CMT Sixth Grade Math (CMT 6 Math) and Sixth Grade ELA (CMT 6ELA)

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 6 Math.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.784 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 6 Math decreases.
2. The variable percent of families making $35,000 or less had a correlation of -.823 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 6 Math decreases.
3. The variable percent of families making $25,000 or less had a correlation of -.790 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 proficiency or higher on the 2010 CMT 6 Math decreases.

Table 16

Correlation Table for Sixth Grade Math and the 3 Strongest Correlations

		6th Grade Math % at or above Goal	25 and over No HS Diploma	Families % household 35K and under	Families % household 25K and under
Pearson Correlation	6th Grade Math % at or above Goal	1.000	-.784	-.823	-.790
	25 and over No HS Diploma	-.784	1.000	.900	.883
	Families % household 35K and under	-.823	.900	1.000	.972
	Families % household 25K and under	-.790	.883	.972	1.000
Sig. (1-tailed)	6th Grade Math % at or above Goal	.	.000	.000	.000
	25 and over No HS Diploma	.000	.	.000	.000
	Families % household 35K and under	.000	.000	.	.000
	Families % household 25K and under	.000	.000	.000	.

Table 17

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 6 Math Scores Where N = 114

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.234

Families household 35K and under	-.823
Families household 25K and under	-.790
Families household 200K or more	.547
All families kids under 18 below poverty	-.775
Female head no husband kids under 18	-.739
All married families kids under 18	.714
Male head no wife kids under 18	-.365
Lone Parent Household	-.715
@25 and over No HS Diploma	-.784
@25 and over HS Graduate	-.582
@25 and over Some College	-.312
@25 and over BA Degree	.658
@25 and over Graduate or professional degree	.596
Median Family Income1evel	.668

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 6ELA.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.813 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 6ELA decreases.
2. The variable percent of families making $35,000 or less had a correlation of -.841 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 6ELA decreases.
3. The variable percent of families making $25,000 or less had a correlation of -.807 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 proficiency or higher on the 2010 CMT 6ELA decreases.

Table 18

Correlation Table for Sixth Grade ELA and the 3 Strongest Correlations

		6th Grade reading % at or above Goal	Families % household 35K and under	Families % household 25K and under	25 and over No HS Diploma
Pearson Correlation	6th Grade reading % at or above Goal	1.000	-.841	-.807	-.813
	Families % household 35K and under	-.841	1.000	.972	.900
	Families % household 25K and under	-.807	.972	1.000	.883
	25 and over No HS Diploma	-.813	.900	.883	1.000
Sig. (1-tailed)	6th Grade reading % at or above Goal	.	.000	.000	.000
	Families % household 35K and under	.000	.	.000	.000
	Families % household 25K and under	.000	.000	.	.000
	25 and over No HS Diploma	.000	.000	.000	.

Table 19

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 6ELA Scores Where N = 114

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.253
Families household 35K and under	-.841
Families household 25K and under	-.807
Families household 200K or more	.545
All families kids under 18 below poverty	-.786
Female head no husband kids under 18	-.785
All married families kids under 18	.706
Male head no wife kids under 18	-.414
Lone Parent Household	-.772
@25 and over No HS Diploma	-.813
@25 and over HS Graduate	-.585
@25 and over Some College	-.339
@25 and over BA Degree	.680
@25 and over Graduate or professional degree	.612
Median Family Income1evel	.665

2010 CMT Seventh Grade Math (CMT 7 Math) and Seventh Grade ELA (CMT 7ELA)

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 7 Math.

1. The variable percent of all families with kids under 18 below poverty had a correlation of -.819 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 7 Math decreases.
2. The variable percentage of families making $35,000 or less had a correlation of -.833 and was statistically significant at the .000 level. This is a high negative correlation, which

means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 7 Math decreases.

3. The variable percent of families making $25,000 or less had a correlation of -.813 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 proficiency or higher on the 2010 CMT 7 Math decreases.

Table 20

Correlation Table for Seventh Grade Math and the Three Strongest Correlations

		7th Grade Math % at or above Goal	Families % household 35K and under	Families % household 25K and under	All families kids under 18 below poverty
Pearson Correlation	7th Grade Math % at or above Goal	1.000	-.833	-.813	-.819
	Families % household 35K and under	-.833	1.000	.972	.931
	Families % household 25K and under	-.813	.972	1.000	.960
	All families kids under 18 below poverty	-.819	.931	.960	1.000
Sig. (1-tailed)	7th Grade Math % at or above Goal	.	.000	.000	.000
	Families % household 35K and under	.000	.	.000	.000
	Families % household 25K and under	.000	.000	.	.000

		7th Grade Math % at or above Goal	Families % household 35K and under	Families % household 25K and under	All families kids under 18 below poverty
	All families kids under 18 below poverty	.000	.000	.000	.

Table 21

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 7 Math Scores Where N = 114

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.277
Families household 35K and under	-.833
Families household 25K and under	-.813
Families household 200K or more	.573
All families kids under 18 below poverty	-.819
Female head no husband kids under 18	-.762
All married families kids under 18	.743
Male head no wife kids under 18	-.395
Lone Parent Household	-.738
@25 and over No HS Diploma	-.801
@25 and over HS Graduate	-.599
@25 and over Some College	-.351
@25 and over BA Degree	.663
@25 and over Graduate or professional degree	.646
Median Family Income1evel	.694

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 7ELA.

1. The variable percent of all families with kids under 18 below poverty had a correlation of -.845 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 7ELA decreases.
2. The variable percent of families making $35,000 or less had a correlation of -.862 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 7ELA decreases.
3. The variable percent of families making $25,000 or less had a correlation of -.847 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 proficiency or higher on the 2010 CMT 7ELA decreases.

Table 22

Correlation Table for Seventh Grade ELA and the Three Strongest Correlations

		7th Grade reading % at or above Goal	Families % household 35K and under	Families % household 25K and under	All families kids under 18 below poverty
Pearson Correlation	7th Grade reading % at or above Goal	1.000	-.862	-.847	-.845
	Families % household 35K and under	-.862	1.000	.972	.931
	Families % household 25K and under	-.847	.972	1.000	.960

	All families kids under 18 below poverty	-.845	.931	.960	1.000
Sig. (1-tailed)	7th Grade reading % at or above Goal	.	.000	.000	.000
			Families % household 35K and under	Families % household 25K and under	All families kids under 18 below poverty
	Families % household 35K and under	.000		.000	.000
	Families % household 25K and under	.000	.000	.	.000
	All families kids under 18 below poverty	.000	.000	.000	.

Table 23

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 7ELA Scores Where N = 114

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.238
Families household 35K and under	-.862
Families household 25K and under	-.847
Families household 200K or more	.528
All families kids under 18 below poverty	-.845
Female head no husband kids under 18	-.794
All married families kids under 18	.730
Male head no wife kids under 18	-.424
Lone Parent Household	-.770
@25 and over No HS Diploma	-.823
@25 and over HS Graduate	-.548
@25 and over Some College	-.330
@25 and over BA Degree	.637
@25 and over Graduate or professional degree	.616
Median Family Income1evel	.673

2010 CMT Eighth Grade Math (CMT 8 Math) and Eighth Grade ELA (CMT 8ELA)

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 8 Math.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.844 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 6 Math decreases.
2. The variable percent of families making $35,000 or less had a correlation of -.863 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 8 Math decreases.
3. The variable percent of families making $25,000 or less had a correlation of -.847 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 proficiency or higher on the 2010 CMT 8 Math decreases.

Table 24

Correlation Table for Eighth Grade Math and the Three Strongest Correlations

		Eighth Grade Math % at or above Goal	Families % household 35K and under	Families % household 25K and under	25 and over No HS Diploma
Pearson Correlation	Eighth Grade Math % at or above Goal	1.000	-.863	-.847	-.844
		Eighth Grade Math % at or above Goal	Families % household 35K and under	Families % household 25K and under	25 and over No HS Diploma
	Families % household 35K and under	-.863	1.000	.972	.900
	Families % household 25K and under	-.847	.972	1.000	.883
	25 and over No HS Diploma	-.844	.900	.883	1.000
Sig. (1-tailed)	Eighth Grade Math % at or above Goal	.	.000	.000	.000
	Families % household 35K and under	.000	.	.000	.000
	Families % household 25K and under	.000	.000	.	.000
	25 and over No HS Diploma	.000	.000	.000	.

Table 25

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 8 Math Scores Where N = 114

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.272
Families household 35K and under	-.863
Families household 25K and under	-.847
Families household 200K or more	.582
All families kids under 18 below poverty	-.834
Female head no husband kids under 18	-.793
Variable	Pearson Correlation Coefficient
All married families kids under 18	.741
Male head no wife kids under 18	-.455
Lone Parent Household	-.772
@25 and over No HS Diploma	-.844
@25 and over HS Graduate	-.616
@25 and over Some College	-.358
@25 and over BA Degree	.700
@25 and over Graduate or professional degree	.651
Median Family Income1evel	.716

The following independent variables with their correlation were the three strongest correlations that were statistically significant to CMT 8ELA.

1. The variable percent of families 25 and over No HS Diploma had a correlation of -.836 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families 25 and older with No HS Diploma increases, the percentage of students scoring proficiency or higher on the 2010 CMT 8ELA decreases.
2. The variable percent of families making $35,000 or less had a correlation of -.847 and was statistically significant at the .000 level. This is a high negative correlation, which means that as the percentage of families making $35,000 or less increases, the percentage of students scoring proficiency or higher on the 2010 CMT 8ELA decreases.

3. The variable percent of families making $25,000 or less had a correlation of -.837 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 proficiency or higher on the 2010 CMT 8ELA decreases.

Table 26

Correlation Table for Eighth Grade ELA and the Three Strongest Correlations

		Eighth Grade reading % at or above Goal	Families % household 35K and under	Families % household 25K and under	25 and over No HS Diploma
Pearson Correlation	Eighth Grade reading % at or above Goal	1.000	-.847	-.837	-.836
	Families % household 35K and under	-.847	1.000	.972	.900
	Families % household 25K and under	-.837	.972	1.000	.883
	25 and over No HS Diploma	-.836	.900	.883	1.000
Sig. (1-tailed)	Eighth Grade reading % at or above Goal	.	.000	.000	.000
	Families % household 35K and under	.000	.	.000	.000
	Families % household 25K and under	.000	.000	.	.000

	25 and over No HS Diploma	.000	.000	.000	.

Table 27

Pearson Correlation Coefficient for the 15 Independent Variables and the 2010 CMT 8ELA Scores Where N = 114

Variable	Pearson Correlation Coefficient
Emp. Status All parents in family in Labor force 6-17 years	-.238
Families household 35K and under	-.847
Families household 25K and under	-.837
Families household 200K or more	.543
All families kids under 18 below poverty	-.815
Female head no husband kids under 18	-.780
All married families kids under 18	.717
Male head no wife kids under 18	-.480
Lone Parent Household	-.767
@25 and over No HS Diploma	-.836
@25 and over HS Graduate	-.603
@25 and over Some College	-.374
@25 and over BA Degree	.695
@25 and over Graduate or professional degree	.645
Median Family Income1evel	.683

Results and Interpretation of Hierarchical Regression Model for CMT 3 Math Scores

A hierarchical linear regression analysis of the remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimated the impact of four models on 2010 CMT 3 Math scores, 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 28 shows the variables that were put into the hierarchical regression model in their order of strength using the Entered method.

Table 28

Variables Entered/Removed for Third Grade Math

Model	Variables Entered	Variables Removed	Method
1	25 and over No HS Diploma[a]	.	Enter
2	Families household 35K and under[a]	.	Enter
3	25 and over BA Degree[a]	.	Enter
4	All married families kids under 18[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: Third Grade Math at or above Goal

This was the order for 2010 CMT 3 Math (see Table 29). For Model 1, the independent (predictor) variable % No HS Diploma had an *R* Square of .631 and explained 63% of the variance in the 2010 CMT 3 Math scores (dependent variable). In Model 2, the independent (predictor) variable % $35,000 was added and had an *R* Square of .653. Model 2 is a combination of % No HS Diploma and % $35,000 and it explains 65% of the variance in the dependent variable (CMT 3 Math). The *R* Square change from Model 1 to Model 2 was .022, which shows that 2% of the variance was now added by the % $35,000. The *R* Square change was statistically significant F (1, 136) = 8.612, $p < .004$. In Model 3, the independent variable (predictor variable) % BA Degree was added and had an R Square of .676. Model 3 is a combination of % No HS Diploma, % $35,000 and % BA Degree and explained 68% of the variance in the dependent variable (CMT 3 Math). The *R* Square change from Model 2 to Model 3 was .024, which shows that 2% of the variance was now added by the % BA Degree. The *R* Square change was statistically significant F (1, 135) = 9.887, $p < .002$. In Model 4, the independent variable (predictor variable) % married was added and had an R Square of .680. Model 4 is a combination of % No HS Diploma, % $35,000, % BA Degree and % married and explains 68% of the variance in the dependent variable (CMT 3 Math). The R Square change from Model 3 to Model 4 was .003. The R Square change was not statistically significant $p <$ .230. Of the four models, Model 3 explains the greatest amount of variance in the dependent variable (CMT 3 Math). Table 29 shows the Model Summary.

Table 29

Model Summary for Hierarchical Regression Model for 2010 CMT 3 Math

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.794[a]	.631	.628	8.97057	.631	233.966	1	137	.000	
2	.808[b]	.653	.648	8.73130	.022	8.612	1	136	.004	
3	.822[c]	.676	.669	8.45929	.024	9.887	1	135	.002	
4	.825[d]	.680	.670	8.44501	.003	1.457	1	134	.230	2.266

a. Predictors: (Constant), @25_and_over_No_HS_Diploma
b. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under
c. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under, @25_and_over_BA_Degree
d. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under, @25_and_over_BA_Degree, All_married_familes_kids_under_18_
e. Dependent Variable: @third_Grade_Math__at_or_above_Goal_

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 3 Math

The ANOVA table verified that the results were statistically significant (see Table 30). The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 3 Math and were statistically significant (Model 1: F = 233.966, df = 1, 137, p < .000; Model 2: F = 127.788, df = 2, 136, p < .000; Model 3: F = 94.055, df = 3, 135, p < .000; Model 4: F = 71.144, df = 4, 134, p < .000).

Table 30

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 3 Math Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	18827.562	1	18827.562	233.966	.000[a]
	Residual	11024.555	137	80.471		
	Total	29852.116	138			
2	Regression	19484.069	2	9742.034	127.788	.000[b]
	Residual	10368.048	136	76.236		
	Total	29852.116	138			
3	Regression	20191.563	3	6730.521	94.055	.000[c]
	Residual	9660.553	135	71.560		
	Total	29852.116	138			
4	Regression	20295.471	4	5073.868	71.144	.000[d]

	Residual	9556.645	134	71.318		
	Total	29852.116	138			

a. Predictors: (Constant), @25_and_over_No_HS_Diploma
b. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under
c. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under, @25_and_over_BA_Degree
d. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under, @25_and_over_BA_Degree, All_married_familes_kids_under_18_
e. Dependent Variable: @third_Grade_Math__at_or_above_Goal_

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 3 Math Scores

The coefficient table shows how each of the independent (predictor) variables influences the dependent variable (see Table 31). It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % No HS Diploma was statistically significant, $p < .000$ with $t = -15.296$ and a beta = -.794. The beta is negative which means that as the % No HS Diploma increases, the 2010 CMT 3 Math scores decrease. As an independent variable % No HS Diploma is a strong predictor of students who scored proficient or higher on the 2010 CMT 3 Math. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % No HS Diploma decreased in power from a beta of -.794 to a beta = -.514. It is significant, $p < .000$ level, $t = -4.765$. The independent (predictor) variable added in Model 2 % $35,000 had a beta = -.317. It is statistically significant at $p = .004$ level, $t = -2.935$. The negative beta for % $35,000 means that as the % $35,000 increases the 2010 CMT 3 Math scores decreased. The variable %

No HS Diploma continues to be statistically significant predictor of 2010 CMT 3 Math. The variable % $35,000 was also a predictor of CMT 3 Math.

In Model 3, the independent (predictor) variable % No HS Diploma decreased in power again from a beta -.794, to -.514 to a beta = -.325. It is statistically significant at the .008 level, *t* = -2.694. The independent (predictor) variable % $35,000 increased in power from a beta of -.317 to a beta = -.340. It is significant at *p* = .001 level, *t* = -2.694. The independent (predictor) variable added in Model 3 % BA Degree had a beta = .229. It is significant at *p* = .002 level, *t* = 3.144. The independent (predictor) variable % BA Degree had the weakest power of the three independent variables in Model 3. The variables % No HS Diploma and % $35,000 still remained a statistically significant predictor of 2010 CMT 3 Math. In this model % BA Degree becomes a weak predictor of 2010 CMT 3 Math.

In Model 4, the independent (predictor) variable % No HS Diploma increases in power from a beta of -.794, to -.514, to -.325 to a beta = -.340. It is significant at the .006 level, *t* = -2.807. The independent (predictor) variable % $35,000 decreased in power from -.317, to -.340, to a beta = -.290. It is significant at the .011 level, *t* = -2.807. The independent (predictor) variable % BA Degree decreased in power from .229 to a beta = .179. It is significant at the .034 level, *t* = 2.142. The independent (predictor) variable added to Model 4 % married had a beta = -.097. It is not significant at the .230 level. The negative beta for % No HS Diploma indicates that as the % of No HS Diploma increases, the 2010 CMT 3 Math scores decrease. The variable % No HS Diploma remains a statistically significant predictor of 2010 CMT 3 Math. In Model 4 % $35,000, % BA Degree and % Married are weak predictors of 2010 CMT 3 Math.

Table 31

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 3 Math Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	88.388	1.531		57.716	.000	85.360	91.416		
	25 and over No HS Diploma	-2.308	.151	-.794	-15.296	.000	-2.606	-2.010	1.000	1.000
2	(Constant)	87.825	1.503		58.437	.000	84.853	90.797		
	25 and over No HS Diploma	-1.495	.314	-.514	-4.765	.000	-2.115	-.874	.219	4.561
	Families household 35K and under	-.542	.185	-.317	-2.935	.004	-.908	-.177	.219	4.561
3	(Constant)	74.361	4.523		16.442	.000	65.416	83.305		
	25 and over No HS Diploma	-.945	.351	-.325	-2.694	.008	-1.638	-.251	.165	6.073
	Families household 35K and under	-.582	.179	-.340	-3.242	.001	-.937	-.227	.218	4.584
	25 and over BA Degree	.430	.137	.229	3.144	.002	.160	.700	.453	2.208
4	(Constant)	70.927	5.337		13.291	.000	60.372	81.482		

25 and over No HS Diploma	-.988	.352	-.340	-2.807	.006	-1.684	-.292	.163	6.137
Families household 35K and under	-.496	.193	-.290	-2.575	.011	-.877	-.115	.189	5.302
25 and over BA Degree	.336	.157	.179	2.142	.034	.026	.647	.342	2.922
All married families kids under 18	.195	.162	.097	1.207	.230	-.125	.515	.370	2.704

a. Dependent Variable: @third_Grade_Math__at_or_above_Goal_

Results and Interpretation of Hierarchical Regression Model for CMT 3ELA Scores

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 the models on 2010 CMT 3ELA scores, which is 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). In Table 32, the variables that were put into the hierarchical regression model were inputted in their order of strength using the Entered method.

Table 32

Variables Entered/ Removed for Third Grade ELA

Model	Variables Entered	Variables Removed	Method
1	25 and over No HS Diploma[a]	.	Enter
2	All families kids under 18 below poverty[a]	.	Enter
3	All married families kids under 18[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: @third_Grade_reading__at_or_above_Goal_

This was the order for 2010 CMT 3ELA (see Table 33). For Model 1, the independent (predictor) variable % No HS Diploma had an *R* Square of .673 and explained 67% of the variance in the 2010 CMT 3ELA scores (dependent variable). In Model 2, the independent (predictor) variable % below poverty was added and had an *R* Square of .694. Model 2 is a combination of % No HS Diploma and % below poverty and explained 69% of the variance in the dependent variable (CMT 3ELA). The *R* Square change from Model 1 to Model 2 was .021, which shows that 2% of the variance was now added by the % below poverty. The *R* Square change was statistically significant F (1, 136) = 9.251, $p < .003$. In Model 3, the independent variable (predictor variable) % Married was added and had an *R* Square of .724. Model 3 is a combination of % No HS Diploma, % below poverty and % Married and explained 72% of the variance in the dependent variable (CMT 3ELA). The *R* Square change from Model 2 to Model 3 was .030, which shows that 3% of the variance was now added by the % Married. The R

Square change was statistically significant *F* (1, 135) = 14.502, *p* < .000. Of the three models, Model 3 explains the greatest amount of variance in the dependent variable (CMT 3ELA). Table 33 shows the Model Summary.

Table 33

Model Summary for Hierarchical Regression Model for 2010 CMT 3 ELA

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.821[a]	.673	.671	8.86379	.673	282.260	1	137	.000	
2	.833[b]	.694	.690	8.60835	.021	9.251	1	136	.003	
3	.851[c]	.724	.718	8.21042	.030	14.502	1	135	.000	2.022

a. Predictors: (Constant), @25_and_over_No_HS_Diploma
b. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty
c. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty, All_married_familes_kids_under_18_
d. Dependent Variable: @third_Grade_reading__at_or_above_Goal_

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 3ELA

The ANOVA table verified that the results were statistically significant (see Table 34). The independent variables entered in the three models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 3ELA and were statistically significant (Model 1: $F = 282.260$, $df = 1, 137$, $p < .000$; Model 2: $F = 154.256$, $df = 2, 136$, $p < .000$; Model 3: $F = 117.881$, $df = 3, 135$, $p < .000$.

Table 34

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 3 ELA Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	22176.286	1	22176.286	282.260	.000[a]
	Residual	10763.652	137	78.567		
	Total	32939.939	138			
2	Regression	22861.837	2	11430.919	154.256	.000[b]
	Residual	10078.102	136	74.104		
	Total	32939.939	138			
3	Regression	23839.455	3	7946.485	117.881	.000[c]
	Residual	9100.484	135	67.411		
	Total	32939.939	138			

a. Predictors: (Constant), @25_and_over_No_HS_Diploma
b. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty
c. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty, All_married_familes_kids_under_18_
d. Dependent Variable: @third_Grade_reading__at_or_above_Goal_

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 3ELA Scores

The coefficient table shows how each of the independent (predictor) variables influences the dependent variable (see Table 35). In Model 1, the independent (predictor) variable % No HS Diploma was statistically significant, $p < .000$ with $t = -16.801$ and a beta = -.821. The beta is negative which means that as the % No HS Diploma increases, the 2010 CMT 3ELA scores decrease. As an independent variable % No HS Diploma is a strong predictor of students who scored proficient or higher on the 2010 CMT 3 ELA. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % No HS Diploma decreases in power from a beta of -.821 to a beta = -.572. It is significant, $p < .000$ level, $t = -6.041$. The independent (Predictor) variable added in Model 2 % below poverty had a beta = -.288. It is statistically significant at p = .003 level, $t = -3.042$. The negative beta for % below poverty means that as the % below poverty increased the 2010 CMT 3ELA scores decreased. The variable % No HS Diploma continues to be statistically significant predictor of 2010 CMT 3 Math. % below poverty was a weak predictor of CMT 3ELA.

In Model 3, the independent (predictor) variable % No HS Diploma decreases in power again from a beta -.821, to -.572 to a beta = -.433. It is statistically significant at the .000 level, $t = -4.457$. The independent (predictor) variable % below poverty decreased in power from a beta of -.288 to a beta = -.262. It is significant at $p = .004$ level, $t = -2.892$. The independent (predictor) variable added in Model 3 % Married had a beta = .236. It is significant at $p = .000$ level, $t = 3.808$. The independent (predictor) variable % married had the weakest power of the three independent variables in Model 3. The variable % No HS Diploma remained a statistically significant predictor of 2010 CMT 3ELA. In this model % below poverty and % married become weak predictors of 2010 CMT 3ELA.

Table 35

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 3 ELA Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	85.860	1.513		56.740	.000	82.868	88.852		
	25 and over No HS Diploma	-2.505	.149	-.821	-16.801	.000	-2.800	-2.210	1.000	1.000
2	(Constant)	83.344	1.686		49.421	.000	80.009	86.679		
	25 and over No HS Diploma	-1.745	.289	-.572	-6.041	.000	-2.316	-1.174	.251	3.979
	All families kids under 18 below poverty	-.618	.203	-.288	-3.042	.003	-1.020	-.216	.251	3.979
3	(Constant)	67.106	4.557		14.725	.000	58.093	76.119		
	25 and over No HS Diploma	-1.323	.297	-.433	-4.457	.000	-1.910	-.736	.216	4.621
	All families kids under 18 below poverty	-.562	.194	-.262	-2.892	.004	-.946	-.178	.250	4.002
	All married families kids under 18	.499	.131	.236	3.808	.000	.240	.758	.533	1.875

a. Dependent Variable: @third_Grade_reading__at_or_above_Goal_

Results and Interpretation of Hierarchical Regression Model for CMT 4 Math Scores

A hierarchical linear regression analysis of the remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of four models on 2010 CMT 4 Math scores, which is the dependent variable. In Table 36, the variables that were put into the hierarchical regression model were inputted in their order of strength using the Entered method.

Table 36

Variable Entered/ Removed for fourth Grade Math

Model	Variables Entered	Variables Removed	Method
1	Families household 35K and under[a]	.	Enter
2	25 and over No HS Diploma[a]	.	Enter
3	25 and over Graduate or professional degree[a]	.	Enter
4	Female head no husband kids under 18[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: @4th_Grade_Math__at_or_above_Goal_

This was the order for 2010 CMT 4 Math (see Table 37). For Model 1, the independent (predictor) variable % $35,000 had an *R* Square of .542 and explained 54% of the variance in the 2010 CMT 4 Math. In Model 2 the independent (predictor) variable % No HS Diploma was added and had an *R* Square of .568, which explained 57% of the variance. The *R* Square change from Model 1 to Model 2 was .025, which shows that 3% of the variance was now added by % No HS Diploma. Model 2 is a combination of % $35,000 and % No HS Diploma. The *R* Square change was statistically significant F (1, 136) = 7.985, $p \leq .004$. In Model 3, the independent variable (predictor variable) % Advanced Degree was added and had an *R* Square of .612. Model 3 is a combination of % $35,000, % No HS Diploma, % Advanced Degree and explained 61% of the variance in the dependent variable (CMT 4 Math). The *R* Square change from Model 2 to Model 3 was .044, which shows that 4% of the variance was now added by the % Advanced Degree. The *R* Square change was statistically significant F (1, 135) = 15.198, $p < .000$. In Model 4, the independent variable (predictor variable) % female household was added and had an *R* Square of .616. Model 4 is a combination of % $35,000, % No HS Diploma, % Advanced Degree and % female household and explains 62% of the variance in the dependent variable (CMT 4 Math). The *R* Square change from Model 3 to Model 4 was .004. The *R* Square change was not statistically significant $p < .222$. Of the four models, Model 3 explains the greatest amount of variance in the dependent variable (CMT 4 Math). Table 37 shows the Model Summary.

Table 37

Model Summary for Hierarchical Regression Model for 2010 CMT 4 Math

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.737[a]	.542	.539	10.76987	.542	162.417	1	137	.000	
2	.754[b]	.568	.561	10.50537	.025	7.985	1	136	.005	
3	.782[c]	.612	.603	9.99652	.044	15.198	1	135	.000	
4	.785[d]	.616	.604	9.97796	.004	1.503	1	134	.222	1.981

a. Predictors: (Constant), Families__household_35K_and_under
b. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_No_HS_Diploma
c. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_No_HS_Diploma, @25_and_over_Graduate_or_professional_degree
d. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_No_HS_Diploma, @25_and_over_Graduate_or_professional_degree, Female_head_no_husband_kids_under_18
e. Dependent Variable: @4th_Grade_Math__at_or_above_Goal_

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 4 Math

The ANOVA table verified that the results were statistically significant (see Table 38). The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 4 Math and were statistically significant (Model 1: $F = 162.417$, $df = 1, 137$, $p < .000$; Model 2: $F = 89.342$, $df = 2, 136$, $p < .000$; Model 3: $F = 70.845$, $df = 3, 135$, $p < .000$; Model 4: $F = 53.707$, $df = 4, 134$, $p < .000$).

Table 38

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 4 Math Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
	Model	Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	18838.781	1	18838.781	162.417	.000[a]
	Residual	15890.644	137	115.990		
	Total	34729.425	138			
2	Regression	19720.076	2	9860.038	89.342	.000[b]
	Residual	15009.350	136	110.363		
	Total	34729.425	138			
3	Regression	21238.818	3	7079.606	70.845	.000[c]
	Residual	13490.607	135	99.930		
	Total	34729.425	138			
4	Regression	21388.419	4	5347.105	53.707	.000[d]
	Residual	13341.006	134	99.560		
	Total	34729.425	138			

a. Predictors: (Constant), Families__household_35K_and_under
b. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_No_HS_Diploma
c. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_No_HS_Diploma, @25_and_over_Graduate_or_professional_degree
d. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_No_HS_Diploma, @25_and_over_Graduate_or_professional_degree, Female_head_no_husband_kids_under_18
e. Dependent Variable: @4th_Grade_Math__at_or_above_Goal_

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 4 Math Scores

The coefficient table shows how each of the independent (predictor) variables influences the dependent variable (see Table 39). It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % $35,000 was statistically significant, $p < .000$ with t = -.12.744 and a beta = -.737. The beta is negative which means that as the % $35,000 increases the 2010 CMT 4 Math scores decrease. As an independent variable, the percentage of people making $35,000 or less is a strong predictor of students who scored proficient or higher on the 2010 CMT 4 Math. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % $35,000 decreased in power from a beta of -.737 to a beta = -.436. It is significant, $p < .000$ level, $t = -3.621$. The independent (predictor) variable added in Model 2 % No HS Diploma had a beta = -.340. It is statistically significant at $p = .005$ level, $t = -2.826$. The negative beta for % No HS Diploma means that as the % No HS Diploma increased the 2010 CMT 4 Math scores decreased. The variables % $35,000 and % No HS Diploma continue to be statistically significant predictors of 2010 CMT 4 Math.

In Model 3, the independent (predictor) variable % $35,000 increased in power from -.737, to -.436 to beta = -.507. It is statistically significant $p < .000$ level, $t = -4.371$. The variable % No HS Diploma is not statistically significant, $p < .499$. The independent (predictor) variable added % Advanced Degree had a beta = .283. This is statistically significant, $p < .000$ level, $t = 3.898$. In this model % $35,000 is a good predictor of 2010 CMT 4 Math. The variables % No HS Diploma and 5 Advanced Degree are weak predictors of 2010 CMT 4 Math.

In Model 4, the independent (predictor) variable % $35,000 increased in power from -.737, to -.436, to -.507, to beta = -.587. It is statistically significant $p < .000$ level, $t = -4.415$. % No HS Diploma is not statistically significant, $p < .353$. The variable % Advanced Degree had a beta = .268. This is statistically significant, $p < .000$ level, $t = 3.638$. The independent variable added % female household had a beta of .124. This is not statistically significant $p < .222$. The positive beta of % Advanced Degree means that as the % Advanced Degrees increase, the percentage of students scoring proficiency and above on 2010 CMT 4 Math also increases.

Table 39

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 4 Math Scores

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.	95.0% Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	87.918	1.588		55.362	.000	84.777	91.058		
	Families household 35K and under	-1.360	.107	-.737	-12.744	.000	-1.571	-1.149	1.000	1.000
2	(Constant)	90.554	1.808		50.078	.000	86.978	94.130		
	Families household 35K and under	-.805	.222	-.436	-3.621	.000	-1.244	-.365	.219	4.561
	25 and over No HS Diploma	-1.066	.377	-.340	-2.826	.005	-1.813	-.320	.219	4.561
3	(Constant)	76.389	4.020		19.001	.000	68.438	84.340		
	Families household 35K and under	-.936	.214	-.507	-4.371	.000	-1.360	-.513	.214	4.677
	25 and over No HS Diploma	-.279	.412	-.089	-.678	.499	-1.094	.535	.167	6.003
	25 and over Graduate or professional degree	.537	.138	.283	3.898	.000	.264	.809	.545	1.836
4	(Constant)	75.860	4.036		18.796	.000	67.878	83.843		

Families household_35K and under	-1.085	.246	-.587	-4.415	.000	-1.570	-.599	.162	6.174
25 and over No HS Diploma	-.393	.422	-.125	-.933	.353	-1.227	.441	.159	6.309
25 and over Graduate or professional degree	.507	.139	.268	3.638	.000	.232	.783	.529	1.891
Female head no husband kids under 18	.676	.551	.124	1.226	.222	-.415	1.767	.280	3.575

a. Dependent Variable: @4th_Grade_Math__at_or_above_Goal_

Results and Interpretation of Hierarchical Regression Model for CMT 4ELA Scores

A hierarchical linear regression analysis of the remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of following models on 2010 CMT 4ELA scores, which is the dependent variable. In Table 40 the variables that were put into the hierarchical regression model were inputted in their order of strength using the Entered method.

Table 40

Variables Entered/ Removed for Fourth Grade ELA

Model	Variables Entered	Variables Removed	Method

1	Families household 35K and under[a]	.	Enter
2	25 and over Graduate or professional degree[a]	.	Enter
3	Families household 200K or more[a]	.	Enter
4	All families kids under 18 below poverty[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: @4th_Grade_reading__at_or_above_Goal_

This was the order for 2010 CMT 4ELA (see Table 41). For Model 1, the independent (predictor) variable % $35,000 had an *R* Square of .633 and explains 63% of the variance in the 2010 CMT 4 ELA scores. No HS Diploma had an *R* Square of .673 and explained 67% of the variance in the 2010 CMT 4ELA scores (dependent variable). In Model 2, the independent (predictor) variable % Advanced Degree was added and had an *R* Square of .702. Model 2 is a combination of % $35,000 and % Advanced Degree and explains 70% of the variance in 2010 CMT 4ELA. The *R* Square change from Model 1 to Model 2 was .069, which shows that7% of the variance was now added by the % Advanced Degree. The *R* Square change was statistically significant F (1, 136) = 31.547, $p < .000$. In Model 3, the independent variable (predictor variable) % $200,000 was added and had an *R* Square of .705. Model 3 is a combination of % $35,000, % Advanced Degree, and % $200,000 explained 70% of the variance in the dependent variable (CMT 4 ELA). The *R* Square change from Model 2 to Model 3 was .003, which was not statistically significant $p < .249$. In Model 4 the independent (predictor) variable added was % below poverty which had an R Square of .710. This model was not statistically significant. Of the four models, Model 2 explained the greatest amount of variance in the dependent variable (CMT 4 ELA),that was statistically significant. Table 41 shows the Model Summary.

Table 41

Model Summary for Hierarchical Regression Model for 2010 CMT 4 ELA

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.795[a]	.633	.630	9.70056	.633	235.922	1	137	.000	
2	.838[b]	.702	.697	8.77181	.069	31.547	1	136	.000	
3	.839[c]	.705	.698	8.76077	.003	1.343	1	135	.249	
4	.843[d]	.710	.702	8.71115	.005	2.542	1	134	.113	2.235

a. Predictors: (Constant), Families__household_35K_and_under
b. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_Graduate_or_professional_degree
c. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_Graduate_or_professional_degree, Families__household_200K_or_more
d. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_Graduate_or_professional_degree, Families__household_200K_or_more, All_families_kids_under_18_below_poverty
e. Dependent Variable: @4th_Grade_reading__at_or_above_Goal_

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 4 ELA

The ANOVA table verified that the results were statistically significant (see Table 42). The independent variables entered in the three models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 4ELA and were statistically significant (Model 1: F = 235.922, df = 1, 137, p < .000; Model 2: F = 160.036, df = 2, 136, p < .000; Model 3: F = 107.408, df = 3, 135, p < .000; Model 4: F = 82.112, df = 4, 134).

Table 42

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 4 ELA Scores

Model		Sum of Squares	*Df*	Mean Square	*F*	Sig.
1	Regression	22200.496	1	22200.496	235.922	.000[a]
	Residual	12891.812	137	94.101		
	Total	35092.308	138			
2	Regression	24627.833	2	12313.917	160.036	.000[b]
	Residual	10464.475	136	76.945		
	Total	35092.308	138			
3	Regression	24730.917	3	8243.639	107.408	.000[c]
	Residual	10361.391	135	76.751		
	Total	35092.308	138			
4	Regression	24923.838	4	6230.959	82.112	.000[d]
	Residual	10168.470	134	75.884		
	Total	35092.308	138			

a. Predictors: (Constant), Families__household_35K_and_under
b. Predictors: (Constant), Families__household_35K_and_under, @25_and_over_Graduate_or_professional_degree

c. Predictors: (Constant), Families__household_35K_and_under,
@25_and_over_Graduate_or_professional_degree,
Families__household_200K_or_more
d. Predictors: (Constant), Families__household_35K_and_under,
@25_and_over_Graduate_or_professional_degree,
Families__household_200K_or_more,
All_families_kids_under_18_below_poverty
e. Dependent Variable: @4th_Grade_reading__at_or_above_Goal_

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 4 ELA Scores

Table 43 shows how each of the independent (predictor) variables influences the dependent variable. It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % $35,000 was statistically significant, $p < .000$ with $t = -15.360$ and a beta = -.795. The beta is negative which means that as the % $35,000 increases, the 2010 CMT 4 ELA scores decrease. As an independent variable, the percentage of people who make $35,000 or less is a strong predictor of students who scored proficient or higher on the 2010 CMT 4 ELA. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % $35,000 decreases in power from a beta of -.795 to a beta = -.630. It is significant, $p < .000$ level, $t = -11.368$. The independent (Predictor) variable added in Model 2 % Advanced degree had a beta = .311. It is statistically significant at $p = .000$ level, $t = 5.617$. The beta is positive for % Advanced Degree, which means that as the percent of Advanced Degrees increase, the percent of students scoring proficiency or above on the 2010 CMT 4 ELA also increases. Both % $35,000 and % Advanced degree were statistically significant prediction of 2010 CMT 4 ELA.

In Model 3, the independent (predictor) variable % $35,000 decreases in power from a beta of -.795, to a beta of -.630, to a beta = -.628. It is statistically significant at the $p < .000$ level, $t = -11.368$. The beta is negative for % $35,000, which means that as % $35,000 is increasing then students performance in 2010 CMT 4 ELA is decreasing. The beta for % Advanced Degree decreased from a beta of .311 to a beta of .221. This is statistically significant at $p < .022$ level, $t = 2.318$. The beta for % Advanced Degree is positive, which means that as the % Advanced Degree increases, student scores of proficiency and higher on 2010 CMT 4ELA also increases. The independent (predictor) variable % $200,000 was added to the model and had a beta = .106. This is not statistically significant, $p < .249$. % $35,000 is a good predictor of 2010 CMT 4 ELA. The variables% Advanced Degree and % $200,000 are weak predictors of 2010 CMT 4 ELA.

In Model 4 the independent variable % $35,000 decreases in power again from a beta of -.795, to -.630, -.628, to a beta = -.448. This is statistically significant at p < .001 level, $t = -3.559$. The % Advanced Degrees also have declining betas that went from .311, to .221, to beta = .212. This is statistically significant at $p < .027$, $t = 2.230$. The % $200,000 has beta = .123. This is not statistically significant $p < .182$. The % below poverty has a beta of -.193. This is also not statistically significant $p < .113$. In this model % $35,000 has low predictive value to CMT 4 ELA. % Advanced degree has a weak predictive power to 2010 CMT 4 ELA.

Table 43

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 4 ELA Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	83.268	1.430		58.214	.000	80.440	86.097		
	Families household 35K and under	-1.476	.096	-.795	-15.360	.000	-1.666	-1.286	1.000	1.000
2	(Constant)	69.802	2.724		25.623	.000	64.415	75.189		
	Families household 35K and under	-1.170	.103	-.630	-11.395	.000	-1.373	-.967	.717	1.395
	25 and over Graduate or professional degree	.592	.105	.311	5.617	.000	.383	.800	.717	1.395
3	(Constant)	70.863	2.871		24.685	.000	65.186	76.541		
	Families household 35K and under	-1.166	.103	-.628	-11.368	.000	-1.369	-.963	.716	1.396
	25 and over Graduate or professional degree	.420	.181	.221	2.318	.022	.062	.779	.241	4.145
	Families household 200K or more	.141	.122	.106	1.159	.249	-.100	.383	.262	3.817
4	(Constant)	69.686	2.948		23.635	.000	63.855	75.517		
	Families household 35K and under	-.831	.234	-.448	-3.559	.001	-1.293	-.369	.137	7.319
	25 and over Graduate or professional degree	.403	.181	.212	2.230	.027	.046	.760	.240	4.161

Families household 200K or more	.164	.122	.123	1.342	.182	-.078	.406	.258	3.869
All families kids under 18 below poverty	-.427	.268	-.193	-1.594	.113	-.956	.103	.148	6.741

a. Dependent Variable: @4th_Grade_reading__at_or_above_Goal_

Results and Interpretation of Hierarchical Regression Model for CMT 5 Math Scores

A hierarchical linear regression analysis of the four remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of four models on 2010 CMT 5 Math scores, which is 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). In Table 44, the variables that were put into the hierarchical regression model were inputted in their order of strength using the Entered method.

Table 44

Variables Entered/ Removed for Fifth Grade Math

Model	Variables Entered	Variables Removed	Method
1	@25_and_over_No_HS_Diploma[a]	.	Enter
2	Families__household_35K_and_under[a]	.	Enter

3	All_families_kids_under_18_below_poverty[a]	.	Enter
4	All_married_familes_kids_under_18_[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: @5th_Grade_Math__at_or_above_Goal_

This was the order for 2010 CMT 5Math (see Table 45). For Model 1, the independent (predictor) variable % No HS Diploma had an *R* Square of .675 and explained 68% of the variance in the 2010 CMT 5 Math scores (dependent variable). In Model 2, the independent (predictor) variable % $35,000 was added and had an *R* Square of .710. Model 2 is a combination of % No HS Diploma and % $35,000 and explains 71% of the variance in the dependent variable (CMT 5 Math). The *R* Square change from Model 1 to Model 2 was .034, which shows that 3% of the variance was now added by the % $35,000. The *R* Square change was statistically significant F (1, 136) = 16.113, $p < .000$. In Model 3, the independent variable (predictor variable) % below poverty was added and had an *R* Square of .712. Model 3 is a combination of % No HS Diploma, % $35,000, and % below poverty and explains 71% of the variance in the dependent variable (CMT 5 Math). The *R* Square change from Model 2 to Model 3 was .002. Model 3 is not statistically significant $p < .289$. In Model 4, the independent variable (predictor variable) % Married is added and had an R Square of .732. Model 4 is a combination of % No HS Diploma, % $35,000, % below poverty, and % Married and explains 73% of the variance in the dependent variable (CMT 5 Math). The *R* Square change from Model 3 to Model 4 was .020, which shows that 2% of the variance was now added by % Married. The

R Square change was statistically significant *F* (1, 134) = 10.161, *p* < .002. Of the four models, Model 4 explains the greatest amount of variance in the dependent variable (CMT 5 Math).

Table 45

Model Summary for Hierarchical Regression Model for 2010 CMT 5 Math

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.822[a]	.675	.673	8.10905	.675	285.078	1	137	.000	
2	.842[b]	.710	.706	7.69567	.034	16.113	1	136	.000	
3	.844[c]	.712	.706	7.69193	.002	1.132	1	135	.289	
4	.856[d]	.732	.725	7.44352	.020	10.161	1	134	.002	1.917

a. Predictors: (Constant), @25_and_over_No_HS_Diploma
b. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under
c. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under, All_families_kids_under_18_below_poverty
d. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under, All_families_kids_under_18_below_poverty, All_married_familes_kids_under_18_
e. Dependent Variable: @5th_Grade_Math__at_or_above_Goal_

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 5 Math

The ANOVA table verified that the results were statistically significant (see Table 46). The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 5 Math and were statistically significant (Model 1: F = 285.078, df = 1, 137, p < .000; Model 2: F = 166.320, df = 2, 136, p < .000; Model 3: F = 111.365, df = 3, 135, p < .000; Model 4: F = 91.732, df = 4, 134, p < .000).

Table 46

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 5 Math Scores

Model		Sum of Squares	*Df*	Mean Square	*F*	Sig.
1	Regression	18745.744	1	18745.744	285.078	.000[a]
	Residual	9008.662	137	65.757		
	Total	27754.405	138			
2	Regression	19700.021	2	9850.011	166.320	.000[b]
	Residual	8054.384	136	59.223		
	Total	27754.405	138			
3	Regression	19767.020	3	6589.007	111.365	.000[c]
	Residual	7987.386	135	59.166		
	Total	27754.405	138			
4	Regression	20329.994	4	5082.499	91.732	.000[d]
	Residual	7424.411	134	55.406		
	Total	27754.405	138			

a. Predictors: (Constant), @25_and_over_No_HS_Diploma
b. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under
c. Predictors: (Constant), @25_and_over_No_HS_Diploma, Families__household_35K_and_under, All_families_kids_under_18_below_poverty

d. Predictors: (Constant), @25_and_over_No_HS_Diploma,
Families__household_35K_and_under,
All_families_kids_under_18_below_poverty,
All_married_familes_kids_under_18_

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 5 Math Scores

The coefficient table shows how each of the independent (predictor) variables influences the dependent variable (see Table 47). It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % No HS Diploma was statistically significant, $p < .000$ with $t = -16.884$ and a beta = -.822. The beta is negative which means that as the % No HS Diploma increases, the 2010 CMT 5 Math scores decrease. As an independent variable % No HS Diploma is a strong predictor of students who scored proficient or higher on the 2010 CMT 5 Math. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % No HS Diploma decreases in power from a beta of -.822 to a beta = -.472. It is significant, $p < .000$ level, $t = -4.784$. The independent (predictor) variable added in Model 2 % $35,000 had a beta = -.396. It is statistically significant at $p = .000$ level, $t = 4.014$. The negative beta for % below poverty means that as the % below poverty increases the 2010 CMT 5 Math scores also decreases. The variable % No HS Diploma continues to be statistically significant predictor of 2010 CMT 5Math. The variable % $35,000 was also a predictor of CMT 5 Math.

In Model 3, the independent (predictor) variable % No HS Diploma decreases in power again from a beta -.822, to -.472 to a beta = -.441. It is statistically significant at the .000 level, $t = -4.295$. The independent (predictor) variable % $35,000 below poverty also decreased in power from a beta of -.396 to a beta = -.302. It is significant at *p* = .024 level, *t* = -2.275. The independent (predictor) variable added in Model 3 % below poverty had a beta = - .132. It is not significant at *p* = .289 level. The independent (predictor) variable % below poverty had the weakest power of the three independent variables in Model 3. The variables % No HS Diploma and % $35,000 remains a statistically significant predictor of 2010 CMT 5 Math. In this model % below poverty becomes a weak predictor of 2010 CMT 5 Math.

In Model 4, the independent (predictor) variable % No HS Diploma continues to decrease in power from a beta of -.822, to -.472, to -.441 to a beta = -.370. It is significant at the .000 level, *t* = -3.626. The independent (predictor) variable % $35,000 decreased in power from -.396, to -.302 to a beta = -.158. It is not significant at the .247. The independent (predictor) variable % below poverty increased in power from -.132 to a beta = -.199. It is not significant at the .105 level, *t* = -1.633. The independent (predictor) variable added to Model 4 % married had a beta = .207. It is significant at the .002 level, *t* = 3.188. The negative beta for the % No HS Diploma indicates that as the % No HS Diploma increases, the 2010 CMT 5 Math scores decrease. The variable % No HS Diploma remains a statistically significant predictor of 2010 CMT 5 Math. The positive beta % married means that as the % married increases, then 2010 CMT 5 Math also increases.

Table 47

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 5 Math Scores

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	*t*	Sig.	95.0% Confidence Interval for B	Collinearity Statistics

	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	97.122	1.384		70.157	.000	94.385	99.860		
@25_and_over_No_HS_Diploma	-2.303	.136	-.822	-16.884	.000	-2.573	-2.033	1.000	1.000
2 (Constant)	96.443	1.325		72.807	.000	93.824	99.063		
@25_and_over_No_HS_Diploma	-1.322	.276	-.472	-4.784	.000	-1.869	-.776	.219	4.561
Families__household_35K_and_under	-.654	.163	-.396	-4.014	.000	-.976	-.332	.219	4.561
3 (Constant)	95.547	1.569		60.898	.000	92.444	98.650		
@25_and_over_No_HS_Diploma	-1.236	.288	-.441	-4.295	.000	-1.806	-.667	.202	4.951
Families__household_35K_and_under	-.498	.219	-.302	-2.275	.024	-.931	-.065	.121	8.247
All_families_kids_under_18_below_poverty	-.260	.244	-.132	-1.064	.289	-.742	.223	.139	7.194
4 (Constant)	82.012	4.509		18.187	.000	73.094	90.931		
@25_and_over_No_HS_Diploma	-1.036	.286	-.370	-3.626	.000	-1.601	-.471	.192	5.204
Families__household_35K_and_under	-.261	.224	-.158	-1.162	.247	-.705	.183	.108	9.265
All_families_kids_under_18_below_poverty	-.392	.240	-.199	-1.633	.105	-.866	.083	.135	7.415
All_married_families_kids_under_18_	.401	.126	.207	3.188	.002	.152	.650	.475	2.106

a. Dependent Variable: @5th_Grade_Math__at_or_above_Goal_

Results and Interpretation of Hierarchical Regression Model for CMT 5 ELA Scores

A hierarchical linear regression analysis of the four remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of four models on 2010 CMT 5 ELA scores, which is 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). In Table 48, the variables that were put into the hierarchical regression model were inputted in their order of strength using the Entered method.

Table 48

Variables Entered/ Removed for Fifth Grade ELA

Model	Variables Entered	Variables Removed	Method
1	25 and over No HS Diploma[a]	.	Enter
2	All families kids under 18 below poverty[a]	.	Enter
3	All married families kids under 18 [a]	.	Enter
4	25 and over HS Graduate[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: @5th_Grade_reading__at_or_above_Goal_

This was the order for 2010 CMT 5ELA (see Table 49). For Model 1, the independent (predictor) variable % No HS Diploma had an *R* Square of .732 and explained 73% of the variance in the 2010 CMT 5 ELA scores (dependent variable). In Model 2, the independent (predictor) variable % below poverty was added and had an *R* Square of .756. Model 2 is a combination of % No HS Diploma and % below poverty and explains 76% of the variance in the dependent variable (CMT 5 ELA). The *R* Square change from Model 1 to Model 2 was .024, which shows that 2% of the variance was now added by the % below poverty. The *R* Square change was statistically significant F (1, 136) = 13.677, p < .000.

In Model 3, the independent variable (predictor variable) % married was added and had an *R* Square of .784. Model 3 is a combination of % No HS Diploma, % below poverty, and % married and explains 78% of the variance in the dependent variable (CMT 5 ELA). The *R* Square change from Model 2 to Model 3 was .027, which shows that 3% of the variance was now added by the % married. The *R* Square change was statistically significant F (1, 135) = 17.001, p < .000. In Model 4, the independent variable (predictor variable) % HS Diploma is added and had an *R* Square of .794. Model 4 is a combination of % No HS Diploma, % below poverty, % married and % HS Diploma and explains 79% of the variance in the dependent variable (CMT 5 ELA). The *R* Square change from Model 3 to Model 4 was .011, which shows that 1% of the variance was now added by % HS Diploma. The *R* Square change was statistically significant F (1, 134) = 7.027, p < .009. Of the four models, Model 4 explains the greatest amount of variance in the dependent variable (CMT 5 ELA). Table 49 shows the Model Summary.

Table 49

Model Summary for Hierarchical Regression Model for 2010 CMT 5 ELA

Model				Std. Error of the Estimate	Change Statistics					
	R	*R* Square	Adjusted *R* Square		*R* Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	Durbin-Watson

1	.856[a]	.732	.730	8.19253	.732	373.978	1	137	.000	
2	.870[b]	.756	.753	7.83792	.024	13.677	1	136	.000	
3	.885[c]	.784	.779	7.41390	.027	17.001	1	135	.000	
4	.891[d]	.794	.788	7.25375	.011	7.027	1	134	.009	2.144

a. Predictors: (Constant), @25_and_over_No_HS_Diploma
b. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty
c. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty, All_married_familes_kids_under_18_
d. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty, All_married_familes_kids_under_18_, @25_and_over__HS_Graduate
e. Dependent Variable: @5th_Grade_reading__at_or_above_Goal_

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 5 ELA

The ANOVA table verified that the results were statistically significant (see Table 50). The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 5 ELA and were statistically significant (Model 1: F = 373.938, df = 1, 137, p < .000; Model 2: F = 211.130, df = 2, 136, p < .000; Model 3: F = 162.981, df = 3, 135, p < .000; Model 4: F = 129.449, df = 4, 134, p < .000).

Table 50

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 5 ELA Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	25100.470	1	25100.470	373.978	.000[a]
	Residual	9195.104	137	67.118		
	Total	34295.574	138			
2	Regression	25940.677	2	12970.339	211.130	.000[b]
	Residual	8354.897	136	61.433		
	Total	34295.574	138			
3	Regression	26875.167	3	8958.389	162.981	.000[c]
	Residual	7420.408	135	54.966		
	Total	34295.574	138			
4	Regression	27244.905	4	6811.226	129.449	.000[d]
	Residual	7050.669	134	52.617		
	Total	34295.574	138			

a. Predictors: (Constant), @25_and_over_No_HS_Diploma
b. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty
c. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty, All_married_familes_kids_under_18_
d. Predictors: (Constant), @25_and_over_No_HS_Diploma, All_families_kids_under_18_below_poverty, All_married_familes_kids_under_18_, @25_and_over__HS_Graduate
e. Dependent Variable: @5th_Grade_reading__at_or_above_Goal_

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 5 ELA Scores

The coefficient table shows how each of the independent (predictor) variables influences the dependent variable (see Table 51). It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % No HS Diploma was statistically significant, $p < .000$ with $t = -19.339$ and a beta = -.856. The beta is negative which means that as the % No HS Diploma increases, the 2010 CMT 5 ELA scores decrease. As an independent variable % No HS Diploma is a strong predictor of students who scored proficient or higher on the 2010 CMT 5 ELA. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % No HS Diploma decreases in power from a beta of -.856 to a beta = -.585. It is significant, p < .000 level, t = -6.934. The independent (predictor) variable added in Model 2 % below poverty had a beta = -.312. It is statistically significant at p = .000 level, t = -3.698. The negative beta for % below poverty means that as the % below the poverty increases the 2010 CMT 5 ELA scores decreases. The variable % No HS Diploma continues to be statistically significant predictor of 2010 CMT 5 ELA. The variable % below poverty was also a predictor of CMT 5 ELA.

In Model 3, the independent (predictor) variable % No HS Diploma decreases in power again from a beta -.856, to -.585 to a beta = -.453. It is statistically significant at the .000 level, t = -5.264. The independent (predictor) variable % below poverty also decreased in power from a beta of -.312 to a beta = -.287. It is significant at p = .000 level, t = -3.587. The independent (predictor) variable added in Model 3 % married had a beta = .226. It is significant at p = .000 level, t = 4.123. The independent (predictor) variable % married had the weakest power of the three independent variables in Model 3. The variable % No HS Diploma remains a statistically significant predictor of 2010 CMT 5 ELA. In this model % below poverty becomes a weak predictor of 2010 CMT 5 ELA. The variable % married also becomes a weak predictor of 2010 CMT 5 ELA.

In Model 4, the independent (predictor) variable % No HS Diploma, continues to decrease in power from a beta of -.856, to -.585, to -.453 to a beta = -.344. It is significant at the .000 level, t = -3.671. The independent (predictor) variable % below poverty increased in power from -.312, to -.287 to a beta = -.357. It is significant at the .000 level, t = -4.322. The independent (predictor) variable % married decreased in power from .226 to a beta = .165. It is significant at the .006 level, *t* = 2.816. The independent (predictor) variable added to Model 4 percentage of the population that are 25 years and older with a HS Diploma had a beta = -.148. It is significant at the .009 level, *t* = -2.651. The negative beta for percentage of the population that are 25 years and older with a HS Diploma indicates that as the percentage of the population 25 years and older without a HS Diploma increases, the 2010 CMT 5 ELA scores decrease. The variable % No HS Diploma remains a statistically significant predictor of 2010 CMT 5 ELA. In Model 4 % below poverty becomes a statistically significant predictor of 2010 CMT 5ELA. The variable % married remains a weak predictor of 2010 CMT 5 ELA.

Table 51

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 5 ELA Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	*T*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	91.207	1.399		65.213	.000	88.442	93.973		
	25 and over No HS Diploma	-2.665	.138	-.856	-19.339	.000	-2.937	-2.392	1.000	1.000
2	(Constant)	88.422	1.535		57.586	.000	85.385	91.458		
	25 and over No HS Diploma	-1.823	.263	-.585	-6.934	.000	-2.343	-1.303	.251	3.979

	All families kids under 18 below poverty	-.684	.185	-.312	-3.698	.000	-1.050	-.318	.251	3.979
3	(Constant)	72.546	4.115		17.629	.000	64.407	80.684		
	25 and over No HS Diploma	-1.411	.268	-.453	-5.264	.000	-1.941	-.881	.216	4.621
	All families kids under 18 below poverty	-.629	.175	-.287	-3.587	.000	-.976	-.282	.250	4.002
	All married families kids under 18	.488	.118	.226	4.123	.000	.254	.722	.533	1.875
4	(Constant)	81.464	5.247		15.526	.000	71.086	91.841		
	25 and over No HS Diploma	-1.072	.292	-.344	-3.671	.000	-1.649	-.494	.175	5.724
	All families kids under 18 below poverty	-.783	.181	-.357	-4.322	.000	-1.141	-.425	.224	4.458
	All married families kids under 18	.355	.126	.165	2.816	.006	.106	.605	.449	2.226
	25 and over HS Graduate	-.274	.103	-.148	-2.651	.009	-.478	-.070	.491	2.035

a. Dependent Variable: @5th_Grade_reading__at_or_above_Goal_

Results and Interpretation of Hierarchical Regression Model for CMT 6 Math Scores Based of the Simultaneous Regression Model

A hierarchical linear regression analysis of the four remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of four models on 2010 CMT 6 Math scores, which is the dependent variable. As shown in Table 52 the variables that were put into the hierarchical regression model were inputted in their order of strength using the Entered method.

Table 52

Variables Entered/ Removed for sixth Grade math

Model	Variables Entered	Variables Removed	Method
1	25 and over No HS Diploma	.	Enter
2	All families kids under 18 below poverty	.	Enter
3	All married families, kids under 18, [a]	.	Enter
4	25 and over BA Degree	.	Enter

a. All requested variables entered.
b. Dependent Variable: 6th Grade Math % at or above Goal

This was the order for 2010 CMT 6 Math (see Table 53). For Model 1, the independent (predictor) variable % No HS Diploma had an *R* Square of .614 and explained 61% of the variance in the 2010 CMT 6 Math scores (dependent variable). In Model 2, the independent (predictor) variable % below poverty was added and had an *R* Square of .639. Model 2 is a combination of % No HS Diploma and % below poverty and explains 64% of the variance in the dependent variable (CMT 6 Math). The *R* Square change from Model 1 to Model 2 was .031, which shows that 3% of the variance was now added by the % below poverty. The *R* Square change was statistically significant F (1, 111) = 9.748, $p < .002$.

In Model 3, the independent variable (predictor variable) % married was added and had an R Square of .684. Model 3 is a combination of % No HS Diploma, % below poverty, and % married and explains 68% of the variance in the dependent variable (CMT 6 Math). The *R* Square change from Model 2 to Model 3 was .047, which shows that 5% of the variance was now added by the % married. The *R* square change was statistically significant F (1, 110) = 16.740, $p < .000$. In Model 4, the independent variable (predictor variable) % BA Degree is added and had an *R* Square of .683. Model 4 is a combination of % No HS Diploma, % below poverty, % married, and % BA Degree and explains 68% of the variance in the dependent variable (CMT 6 Math). The *R* Square change from Model 3 to Model 4 was .002, which shows that there was no variance added to the model by % BA Degree. The *R* Square change was not statistically significant F (1, 109) = .778, $p < .380$. Of the four models, Model 3 explains the greatest amount of variance in the dependent variable (CMT 6 Math). Table 53 shows the Model Summary.

Table 53

Model Summary for Hierarchical Regression Model for 2010 CMT 6 Math

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df1*	*df*2	Sig. *F* Change	
1	.784[a]	.614	.611	9.9722	.614	178.497	1	112	.000	
2	.803[b]	.646	.639	9.6042	.031	9.748	1	111	.002	
3	.832[c]	.692	.684	8.9881	.047	16.740	1	110	.000	
4	.833[d]	.695	.683	8.9971	.002	.778	1	109	.380	1.378

a. Predictors: (Constant), 25 and over No HS Diploma
b. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty
c. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty, All married families, kids under 18,
d. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty, All married families, kids under 18, , 25 and over BA Degree
e. Dependent Variable: 6th Grade Math % at or above Goal

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 6 Math

The ANOVA table verified that the results were statistically significant (see Table 54). The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 6 Math and were statistically significant (Model 1: F = 178.497, df = 1, 112, p < .000; Model 2: F = 101.093, *df* = 2, 111, *p* < .000; Model 3: *F* = 82.532, *df* = 3, 110, *p* < .000; Model 4: *F* = 61.969, *df* = 4, 109, *p* < .000).

Table 54

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 6 Math Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	17750.761	1	17750.761	178.497	.000[a]
	Residual	11137.914	112	99.446		
	Total	28888.675	113			
2	Regression	18649.910	2	9324.955	101.093	.000[b]
	Residual	10238.765	111	92.241		
	Total	28888.675	113			
3	Regression	20002.265	3	6667.422	82.532	.000[c]
	Residual	8886.410	110	80.786		
	Total	28888.675	113			
4	Regression	20065.280	4	5016.320	61.969	.000[d]
	Residual	8823.395	109	80.949		
	Total	28888.675	113			

a. Predictors: (Constant), 25 and over No HS Diploma
b. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty
c. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty, All married familes, kids under 18,
d. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty, All married familes, kids under 18, , 25 and over BA Degree
e. Dependent Variable: 6th Grade Math % at or above Goal

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 6 Math Scores

The coefficient table shows how each of the independent (predictor) variables influences the dependent variable (see Table 55). It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % No HS Diploma was statistically significant, $p < .000$ with $t = -13.360$ and a beta = -.784. The beta is negative which means that as the % No HS Diploma increases, the 2010 CMT 6 Math scores decrease. As an independent variable % No HS Diploma is a strong predictor of students who scored proficient or higher on the 2010 CMT 6 Math. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % No HS Diploma decreases in power from a beta of -.784 to a beta = -.453. It is significant, $p < .000$ level, $t = -3.775$. The independent (predictor) variable added in Model 2 % below poverty reports a beta = -.375. It is statistically significant at $p = .002$ level, $t = -3.122$. The negative beta for % below poverty means that as the % below the poverty increases the 2010 CMT 6 Math scores decrease. The variable % No HS Diploma continues to be a predictor of 2010 CMT 6 Math. The variable % below poverty was also a predictor of CMT 6 Math.

In Model 3, the independent (predictor) variable % No HS Diploma decreases in power again from a beta -.784, to -.453 to a beta = -.292. It is statistically significant at the .016 level, $t = -2.450$. The independent (predictor) variable % below poverty also decreased in power from a beta of -.375 to a beta = -.319. It is significant at $p = .006$ level, $t = -2.819$. The independent (predictor) variable added in Model 3 % married had a beta = .303. It is significant at $p = .000$ level, $t = 4.091$. The independent (predictor) variable % No HS Diploma had the weakest power of the three independent variables in Model 3. The variable % below poverty and % Married remain predictors of 2010 CMT 6 Math. In this model % No HS Diploma becomes a weak predictor of 2010 CMT 6 Math.

In Model 4, the independent (predictor) variable % No HS Diploma, continues to decrease in power from a beta of -.784, to -.453, to -.292 to a beta = -.230. It is not significant at the .099 level, *t* = -1.664. The independent (predictor) variable % below poverty also decreased in power from -.375, to -.319, but increased in power to beta = -.353. It is significant at the .004 level, *t* = -2.950. The independent (predictor) variable % married decreased in power from .303 to a beta = .258. It is significant at the .005 level, *t* = 2.857. The independent (predictor) variable added to Model 4 % BA Degree reports a beta = -.086. It is significant at the .380 level, *t* = .882. Of the four models, model 3 has the most power and is a predictor of 2010 CMT 6 Math. The negative beta for % No HS Diploma and % below poverty showed that as the percentage increases the 2010 CMT 6 Math decreases. The positive beta for % Married and % BA Degree showed that as they increased the 2010 CMT 6 Math also increased. The variable % poverty remains a predictor of 2010 CMT 6 Math. The variables % No HS Diploma, % Married, and % BA Degree are weak predictors of 2010 CMT 6 Math.

Table 55

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 6 Math Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta	*T*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	96.337	1.868		51.570	.000	92.636	100.038		

	25 and over No HS Diploma	-2.353	.176	-.784	-13.360	.000	-2.701	-2.004	1.000	1.000
2	(Constant)	93.288	2.047		45.572	.000	89.232	97.345		
	25 and over No HS Diploma	-1.360	.360	-.453	-3.775	.000	-2.074	-.646	.222	4.514
	All families kids under 18 below poverty	-.805	.258	-.375	-3.122	.002	-1.315	-.294	.222	4.514
3	(Constant)	72.183	5.503		13.118	.000	61.279	83.088		
	25 and over No HS Diploma	-.876	.357	-.292	-2.450	.016	-1.584	-.167	.197	5.071
	All families kids under 18 below poverty	-.685	.243	-.319	-2.819	.006	-1.166	-.203	.218	4.580
	All married families, kids under 18,	.649	.159	.303	4.091	.000	.335	.963	.510	1.963
4	(Constant)	69.851	6.110		11.433	.000	57.742	81.960		
	25 and over No HS Diploma	-.690	.415	-.230	-1.664	.099	-1.512	.132	.147	6.817
	All families kids under 18 below poverty	-.759	.257	-.353	-2.950	.004	-1.268	-.249	.195	5.120
	All married families, kids under 18,	.552	.193	.258	2.857	.005	.169	.935	.344	2.905
	25 and over BA Degree	.170	.193	.086	.882	.380	-.212	.552	.297	3.365

a. Dependent Variable: 6th Grade Math % at or above Goal

Results and Interpretation of Hierarchical Regression Model for CMT 6 ELA Scores

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 estimates the impact of following models on 2010 CMT 6 ELA scores, which is the dependent variable. In Table 56 the variables that were put into the hierarchical regression model were inputted in their order of strength. The Entered method was used for this model.

Table 56

Variables Entered/ Removed for Sixth Grade ELA

Model	Variables Entered	Variables Removed	Method
1	Families % household 35K and under	.	Enter
2	All married families, kids under 18, [a]	.	Enter
3	25 and over No HS Diploma	.	Enter

a. All requested variables entered.
b. Dependent Variable: 6th Grade reading % at or above Goal

Table 57 shows the order for 2010 CMT 6 ELA. For Model 1, the independent (predictor) variable % $35,000 had an R Square of .707 and explains 71% of the variance in the 2010 CMT 6 ELA scores. In Model 2, the independent (predictor) variable % Married was added and had an *R* Square of .728. Model 2 is a combination of % $35,000 and % Married and explains 73% of the variance in 2010 CMT 6 ELA. The *R* Square change from model 1 to model

2 .021, which shows that 2% of the variance was added by % Married. Model 2 is statistically significant *F* (1, 111) = 8.599. In Model 3, the independent (predictor) variable % No HS Diploma had an *R* Square of .740. Model 3 is a combination of % $35,000, % Married and % No HS Diploma and explains 74% of the variance in 2010 CMT 6 ELA. The *R* Square change from Model 2 to Model 3 was .012, which shows that 1% of the variance was now added by the variable % No HS Diploma. The *R* Square change was statistically significant *F* (1, 110) = 5.000, $p < .027$. Table 57 shows the Model Summary. Of the three models, Model 3 explains the greatest amount of variance in the dependent variable (CMT 6 ELA).

Table 57

Model Summary for Hierarchical Regression Model for 2010 CMT 6 ELA

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics: *R* Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	Durbin-Watson
1	.841[a]	.707	.704	7.3718	.707	270.040	1	112	.000	
2	.853[b]	.728	.723	7.1338	.021	8.599	1	111	.004	
3	.860[c]	.740	.733	7.0086	.012	5.000	1	110	.027	1.544

a. Predictors: (Constant), Families % household 35K and under
b. Predictors: (Constant), Families % household 35K and under, All married families, kids under 18,
c. Predictors: (Constant), Families % household 35K and under, All married families, kids under 18, , 25 and over No HS Diploma
d. Dependent Variable: 6th Grade reading % at or above Goal

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 6 ELA

Table58 showed that the results were statistically significant. The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 6 ELA and were statistically significant (Model 1: $F = 270.040$, $df = 1, 112$, $p < .000$; Model 2: $F = 148.480$, $df = 2, 111$, $p < .000$; Model 3: $F = 104.221$, $df = 3, 110$, $p < .000$

Table 58

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 6 ELA Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	14674.984	1	14674.984	270.040	.000[a]
	Residual	6086.501	112	54.344		
	Total	20761.484	113			
2	Regression	15112.584	2	7556.292	148.480	.000[b]
	Residual	5648.900	111	50.891		
	Total	20761.484	113			
3	Regression	15358.201	3	5119.400	104.221	.000[c]
	Residual	5403.284	110	49.121		
	Total	20761.484	113			

a. Predictors: (Constant), Families % household 35K and under

b. Predictors: (Constant), Families % household 35K and under, All married families, kids under 18,

c. Predictors: (Constant), Families % household 35K and under, All married families, kids under 18, , 25 and over No HS Diploma

d. Dependent Variable: 6th Grade reading % at or above Goal

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 6 ELA Scores

The coefficient table shows how each of the independent (predictor) variables influences the dependent variable (see Table 59). It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % $35,000 was statistically significant, $p < .000$ with $t = -16.433$ and a beta = -.841. The beta is negative which means that as the variable % 35,000 increases the 2010 CMT 6 ELA scores decrease. As an independent variable % $35,000 is a strong predictor of students who scored proficient or higher on the 2010 CMT 6 ELA. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % $35,000 decreased in power from a beta of -.841 to a beta = -.690. It is significant, $p < .000$ level, $t = -9.671$. The independent (predictor) variable added in Model 2 % Married had a beta = .209. It is statistically significant $p < .004$ level, $t = 2.932$. The positive beta for % Married explains that as the variable % Married rises, the 2010 CMT 6 ELA also rises. The beta in Model 2 for % Married is a weak predictor of 2010 CMT 6 ELA. The predictor % $35,000 is still a strong predictor of 2010 CMT 6 ELA.

In Model 3, the independent variable % $35,000 decreased in power from -.841, to -.690, to a beta = -.480. This was statistically significant, $p < .000$, with $t = -4.092$. The negative beta means that as % $35,000 rises then 2010 CMT 6 ELA decreases. The independent variable % Married also decreased in power from .290 to .185. The variable % Married is statistically significant, $p < .010$ level, $t = 2.604$. The beta in model 3 for % Married is a weak predictor of 2010 CMT 6 ELA. The variable % No HS Diploma had a beta = -.253. It is statistically significant at $p = .027$ level, t = -2.236. The negative beta for % No HS Diploma means that as the % No HS Diploma increased the 2010 CMT 6 ELA scores decreased. The variable % $35,000 continues to be statistically significant predictors of 2010 CMT 6 ELA. The variables % Married and % No HS Diploma are weak predictors of 2010 CMT 6 ELA.

Table 59

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 6 ELA Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	94.866	1.220		77.791	.000	92.450	97.282		
	Families % household 35K and under	-1.275	.078	-.841	-16.433	.000	-1.429	-1.121	1.000	1.000
2	(Constant)	82.689	4.317		19.153	.000	74.134	91.244		
	Families % household 35K and under	-1.047	.108	-.690	-9.671	.000	-1.261	-.832	.481	2.077
	All married familes, kids under 18,	.380	.130	.209	2.932	.004	.123	.637	.481	2.077
3	(Constant)	85.552	4.431		19.310	.000	76.772	94.332		
	Families % household 35K and under	-.728	.178	-.480	-4.092	.000	-1.080	-.375	.172	5.812

	All married familes, kids under 18,	.335	.129	.185	2.604	.010	.080	.591	.470	2.128
	25 and over No HS Diploma	-.644	.288	-.253	-2.236	.027	-1.214	-.073	.185	5.412

a. Dependent Variable: 6th Grade reading % at or above Goal

Results and Interpretation of Hierarchical Regression Model for CMT 7 Math Scores

A hierarchical linear regression analysis of the remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of following models on 2010 CMT 7 Math scores, which is the dependent variable. Table 60 shows the variables that were put into the hierarchical regression model were inputted in their order of strength using the Entered method.

Table 60

Variables Entered/ Removed for Seventh Grade Math

Model	Variables Entered	Variables Removed	Method
1	Families % household 35K and under[a]	.	Enter
2	25 and over No HS Diploma[a]	.	Enter

3	Female head no husband kids under 18[a]	.	Enter
4	All married families, kids under 18, [a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: 7th Grade Math % at or above Goal

This was the order for 2010 CMT 7 Math (see Table 61). For Model 1, the independent (predictor) variable % $35,000 had an *R* Square of .694 and explains 69% of the variance in the 2010 CMT 7 Math scores. In Model 2, the independent (predictor) variable % No HS Diploma was added and had an *R* Square of .708. Model 2 is a combination of % $35,000 and % No HS Diploma and explains 71% of the variance in 2010 CMT 7 Math. The *R* Square change from Model 1 to Model 2 was .013, which shows that 1% of the variance was now added by the % No HS Diploma. The *R* Square change was statistically significant F (1, 111) = 5.109, $p < .026$. In Model 3, the independent variable (predictor variable) % Female Household was added and had an *R* Square of .701. Model 3 is a combination of % $35,000, % No HS Diploma and % Female Household and explained 70% of the variance in the dependent variable (CMT 7 Math). The *R* Square change from Model 2 to Model 3 was .002, which was not statistically significant ($p <$ .346, F (1, 110) = .895). In Model 4 the independent (predictor) variable added was % Married which had an *R* Square of .746. Model 4 is a combination of % $35,000, % No HS Diploma, % Female household, and % Married and explained 75% of the dependent variable 2010 CMT 7 Math. This model was statistically significant ($p < .000$, F (1, 109) = 15.260). Of the four models, Model 4 explained the greatest amount of variance in the dependent variable (CMT 5 math). Table 61 shows the Model Summary.

Table 61

Model Summary for Hierarchical Regression Model for 2010 CMT 7 Math

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.833[a]	.694	.691	9.6725	.694	254.090	1	112	.000	
2	.841[b]	.708	.702	9.4998	.013	5.109	1	111	.026	
3	.843[c]	.710	.702	9.5043	.002	.895	1	110	.346	
4	.863[d]	.746	.736	8.9423	.036	15.260	1	109	.000	1.900

a. Predictors: (Constant), Families % household 35K and under

b. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma

c. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma, Female head no husband kids under 18

d. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma, Female head no husband kids under 18, All married families, kids under 18,

e. Dependent Variable: 7th Grade Math % at or above Goal

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 7 Math

Table 62 shows that the results were statistically significant. The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 7 Math and were statistically significant (Model 1: F = 254.090, df = 1, 112, p < .000; Model 2: F = 134.260, df = 2, 111, p < .000; Model 3: F = 89.721, df = 3, 110, p < .000; Model 4: F = 79.829, df = 4, 109, p < .000).

Table 62

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 7 Math Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	23771.782	1	23771.782	254.090	.000[a]
	Residual	10478.339	112	93.557		
	Total	34250.121	113			
2	Regression	24232.805	2	12116.403	134.260	.000[b]
	Residual	10017.316	111	90.246		
	Total	34250.121	113			
3	Regression	24313.694	3	8104.565	89.721	.000[c]
	Residual	9936.427	110	90.331		
	Total	34250.121	113			
4	Regression	25533.983	4	6383.496	79.829	.000[d]
	Residual	8716.138	109	79.965		
	Total	34250.121	113			

a. Predictors: (Constant), Families % household 35K and under

b. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma

c. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma, Female head no husband kids under 18

d. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma, Female head no husband kids under 18, All married families, kids under 18,

e. Dependent Variable: 7th Grade Math % at or above Goal

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 7 Math Scores

Table 63 shows the influence of each of the independent (predictor) variables on the dependent variable. It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % $35,000 was statistically significant (p < .000 with t = -.15.940 and a beta = -.833). The beta is negative which means that as the % $35,000 increases the 2010 CMT 7 Math scores decrease. As an independent variable % $35,000 is a strong predictor of students who scored proficient or higher on the 2010 CMT 7 Math. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % $35,000 decreased in power from a beta of -.833 to a beta = -.593. It is significant ($p < .000$ level, $t = -5.026$). The independent (predictor) variable added in Model 2 % No HS Diploma had a beta = -.261. It is statistically significant at $p = .026$ level, $t = -2{,}260$. The negative beta for % No HS Diploma means that as the % No HS Diploma increased the 2010 CMT 7 Math scores decreased. The variable % $35,000 continues to be a statistically significant predictors of 2010 CMT 7 Math. In Model 2 % No HS Diploma is a weak predictor of 2010 CMT 7 Math.

In Model 3, the independent (predictor) variable % $35,000 decreased in power from -.833, to -.593 to beta = -.526. It is statistically significant ($p < .000$ level, $t = -3.824$). The variable % No HS Diploma also decreased from -.267, to -.242. It is statistically significant, $p < .047$ level, $t = -2.008$. The independent (predictor) variable added to Model 3 is % Female Household, which had a beta = -.102. This is not statistically significant ($p < .346$ level, $t = -.946$. In this model % $35,000 remains a strong predictor of 2010 CMT 7 Math. The variables % No HS Diploma and % female household were weak predictors of 2010 CMT 7 Math.

In Model 4, the independent (predictor) variable % $35,000 continued to decrease in power from -.833, to -.593, to -.526, to beta = -.402. It is statistically significant ($p < .003$ level, $t = -3.017$). The variable % No HS Diploma continues to decrease in power from -.267 to, -.242, -.179 and is not statistically significant ($p < .121$ level, $t = -1.564$). The variable % female household also had a decreased beta from -.102 to -.081 level. This is not statistically significant ($p < .424$ level, $t = -.802$). The independent (predictor) variable % Married was added and had a beta of .276. This was statistically significant ($p < .000$ level, $t = 3.906$). In this model % $35,000 is a strong predictor of 2010 CMT 7 Math. Also in this model, % No HS Diploma, % female household, and % Married were weak predictors of 2010 CMT 7 Math.

Table 63

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 7 Math Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	93.498	1.600		58.433	.000	90.328	96.668		
	Families % household 35K and under	-1.623	.102	-.833	-15.940	.000	-1.825	-1.421	1.000	1.000
2	(Constant)	95.445	1.792		53.256	.000	91.894	98.997		
	Families % household 35K and under	-1.155	.230	-.593	-5.026	.000	-1.611	-.700	.189	5.283
	25 and over No HS Diploma	-.871	.386	-.267	-2.260	.026	-1.635	-.107	.189	5.283
3	(Constant)	96.590	2.163		44.658	.000	92.304	100.876		
	Families % household 35K and under	-1.025	.268	-.526	-3.824	.000	-1.556	-.494	.139	7.176

	25 and over No HS Diploma	-.792	.395	-.242	-2.008	.047	-1.575	-.010	.181	5.531
	Female head no husband kids under 18	-.599	.633	-.102	-.946	.346	-1.855	.656	.229	4.376
4	(Constant)	75.255	5.828		12.912	.000	63.704	86.806		
	Families % household 35K and under	-.783	.260	-.402	-3.017	.003	-1.298	-.269	.131	7.608
	25 and over No HS Diploma	-.587	.375	-.179	-1.564	.121	-1.330	.157	.177	5.642
	Female head no husband kids under 18	-.479	.597	-.081	-.802	.424	-1.662	.704	.228	4.387
	All married families, kids under 18,	.643	.165	.276	3.906	.000	.317	.969	.469	2.133

a. Dependent Variable: 7th Grade Math % at or above Goal

Results and Interpretation of Hierarchical Regression Model for CMT 7 ELA Scores

A hierarchical linear regression analysis of the remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of following models on 2010 CMT 7ELA scores, which is the dependent variable. Table 64 shows the variables that were put into the hierarchical regression model in their order of strength using the Entered method.

Table 64

Variables Entered/ Removed for Seventh Grade ELA

Model	Variables Entered	Variables Removed	Method
1	All families kids under 18 below poverty[a]	.	Enter
2	25 and over No HS Diploma[a]	.	Enter
3	All married familes, kids under 18, [a]	.	Enter
4	25 and over BA Degree[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: 7th Grade reading % at or above Goal

This was the order for 2010 CMT 7 ELA (see Table 65). For Model 1, the independent (predictor) variable % below poverty had an R square of .714 and explains 71% of the variance in the 2010 CMT 7 ELA scores. In Model 2, the independent (predictor) variable % No HS Diploma was added and had an R square of .741. Model 2 is a combination of % below poverty and % No HS Diploma and explains 74% of the variance in 2010 CMT 7 ELA. The R Square change from Model 1 to Model 2 was .027, which shows that 3% of the variance was now added by the % No HS Diploma. The R Square change was statistically significant F (1, 111) =

11.603, *p*< .001. In Model 3, the independent variable (predictor variable) % Married was added and had an *R* Square of .777. Model 3 is a combination of % below poverty, % No HS Diploma and % Married and explained 78% of the variance in the dependent variable (CMT 7ELA). The *R* Square change from Model 2 to Model 3 was .036, which shows that 4% of the variance was now added by % Married. The *R* Square change was statistically significant (*F* (1, 110) = 17.869, *p* < .000). In Model 4 the independent (predictor) variable added was % BA Degree which had an *R* Square of .778. This model was not statistically significant (*p* < .893). Of the four models, Model 3 explained the greatest amount of variance in the dependent variable (CMT 7 ELA). Table 65 shows the Model Summary.

Table 65

Model Summary for Hierarchical Regression Model for 2010 CMT 7 ELA

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.845[a]	.714	.712	7.3763	.714	280.009	1	112	.000	
2	.861[b]	.741	.737	7.0501	.027	11.603	1	111	.001	
3	.882[c]	.777	.771	6.5686	.036	17.869	1	110	.000	
4	.882[d]	.778	.769	6.5982	.000	.018	1	109	.893	1.971

a. Predictors: (Constant), All families kids under 18 below poverty

b. Predictors: (Constant), All families kids under 18 below poverty, 25 and over No HS Diploma

c. Predictors: (Constant), All families kids under 18 below poverty, 25 and over No HS Diploma, All married families, kids under 18,
d. Predictors: (Constant), All families kids under 18 below poverty, 25 and over No HS Diploma, All married families, kids under 18, , 25 and over BA Degree
e. Dependent Variable: 7th Grade reading % at or above Goal

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 7 ELA

Table 66 shows the results were statistically significant. The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 7 ELA and were statistically significant (Model 1: F = 280.009, df = 1, 112, $p < .000$; Model 2: F = 159.060, df = 2, 111, $p < .000$; Model 3: F = 128.111, df = 3, 110, $p < .000$; Model 4: F = 95.230, df = 4, 109, $p < .000$).

Table 66

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 7 ELA Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	15235.157	1	15235.157	280.009	.000[a]
	Residual	6093.858	112	54.409		
	Total	21329.014	113			
2	Regression	15811.862	2	7905.931	159.060	.000[b]
	Residual	5517.153	111	49.704		
	Total	21329.014	113			
3	Regression	16582.846	3	5527.615	128.111	.000[c]
	Residual	4746.168	110	43.147		
	Total	21329.014	113			
4	Regression	16583.634	4	4145.909	95.230	.000[d]
	Residual	4745.380	109	43.536		
	Total	21329.014	113			

a. Predictors: (Constant), All families kids under 18 below poverty

b. Predictors: (Constant), All families kids under 18 below poverty, 25 and over No HS Diploma
c. Predictors: (Constant), All families kids under 18 below poverty, 25 and over No HS Diploma, All married families, kids under 18,
d. Predictors: (Constant), All families kids under 18 below poverty, 25 and over No HS Diploma, All married families, kids under 18, , 25 and over BA Degree
e. Dependent Variable: 7th Grade reading % at or above Goal

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 7 ELA Scores

Table 67 shows how each of the independent (predictor) variables influences the dependent variable. It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % below poverty was statistically significant (p < .000 with *t* = -.16.733 and a beta = -.845). The beta is negative which means that as the % below poverty increases the 2010 CMT 7 ELA scores decrease. As an independent variable % below poverty is a strong predictor of students who scored proficient or higher on the 2010 CMT 7 ELA. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % below poverty decreased in power from a beta of -.845 to a beta = -.537. It is significant *(p* < .000 level, *t* = -5.235). The independent (predictor) variable added in Model 2 % No HS Diploma had a beta = -.349. It is statistically significant at *p* = .001 level, *t* = -3.406. The negative beta for % No HS Diploma means that as the % No HS Diploma increased the 2010 CMT 7 ELA scores decreased. The variables % below poverty and % No HS Diploma continue to be statistically significant predictors of 2010 CMT 7 ELA.

In Model 3, the independent (predictor) variable % below poverty decreased in power from -.845, to -.537 to beta = -.488. It is statistically significant (*p* < .000 level, *t* = -5.069).The variable % No HS Diploma is statistically significant (p < .041 level, t = -2.049). The independent (predictor) variable added % Married had a beta = .266. This is statistically significant (*p* < .000 level, *t* = 4.227). In this model % below poverty is a good predictor of 2010 CMT 7 ELA. The variables % No Hs Diploma and % Married are weak predictors of 2010 CMT 7 ELA.

In Model 4, the independent (predictor) variable % below poverty decreased in power from -.845, to -.537, to -.488, to beta = -.483. It is statistically significant (*p* < .000 level, *t* = -4.729). The variable % No HS Diploma decreased in power from -.349 to, -.208, and then rose to -.216 and is not statistically significant (*p* < .070). The variable % Married had a beta = .226 and increased in power to .272. This is statistically significant (*p* < .001 level, *t* = 4.227). The independent variable added % BA Degree had a beta of -.011. This is not statistically significant (*p* < .893). The variable % below poverty is a strong predictor of 2010 CMT 7 ELA. The variables % No HS Diploma, % Married, and % BA Degree remain weak predictors of the 2010 CMT 7 ELA.

Table 67

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 7 ELA Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	92.590	.986		93.948	.000	90.638	94.543		

	All families kids under 18 below poverty	-1.559	.093	-.845	-16.733	.000	-1.744	-1.374	1.000	1.000
2	(Constant)	96.578	1.503		64.271	.000	93.601	99.556		
	All families kids under 18 below poverty	-.990	.189	-.537	-5.235	.000	-1.365	-.616	.222	4.514
	25 and over No HS Diploma	-.901	.264	-.349	-3.406	.001	-1.425	-.377	.222	4.514
3	(Constant)	80.643	4.021		20.054	.000	72.674	88.612		
	All families kids under 18 below poverty	-.900	.178	-.488	-5.069	.000	-1.252	-.548	.218	4.580
	25 and over No HS Diploma	-.535	.261	-.208	-2.049	.043	-1.053	-.018	.197	5.071
	All married families, kids under 18,	.490	.116	.266	4.227	.000	.260	.720	.510	1.963
4	(Constant)	80.904	4.481		18.057	.000	72.024	89.784		
	All families kids under 18 below poverty	-.892	.189	-.483	-4.729	.000	-1.266	-.518	.195	5.120
	25 and over No HS Diploma	-.556	.304	-.216	-1.827	.070	-1.159	.047	.147	6.817
	All married families, kids under 18,	.501	.142	.272	3.536	.001	.220	.782	.344	2.905
	25 and over BA Degree	-.019	.141	-.011	-.135	.893	-.299	.261	.297	3.365

a. Dependent Variable: 7th Grade reading % at or above Goal

Results and Interpretation of Hierarchical Regression Model for CMT 8 Math Scores

A hierarchical linear regression analysis of the four remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of four models on 2010 CMT 8 Math scores, which is the dependent variable. Table 68 shows the variables that were put into the hierarchical regression model in their order of strength using the Entered method.

Table 68

Variable Entered/ Removed for Eighth Grade Math

Model	Variables Entered	Variables Removed	Method
1	25 and over No HS Diploma[a]	.	Enter
2	All families kids under 18 below poverty[a]	.	Enter
3	All married families, kids under 18, [a]	.	Enter
4	Male head no wife kids under 18[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: eighth Grade Math % at or above Goal

Table 69 shows the order for 2010 CMT 8 Math. For Model 1, the independent (predictor) variable % No HS Diploma had an *R* Square of .713 and explained 71% of the variance in the 2010 CMT 8 Math scores (dependent variable). In Model 2, the independent (predictor) variable % below poverty was added and had an *R* Square of .749. Model 2 is a combination of % No HS Diploma and % below poverty and explains 75% of the variance in the dependent variable (CMT 8 Math). The *R* Square change from Model 1 to Model 2 was .036, which shows that 4% of the variance was now added by the % below poverty. The *R* Square change was statistically significant (F (1, 111) = 15.851, p < .000). In Model 3, the independent variable (predictor variable) % married was added and had an *R* Square of .786. Model 3 is a combination of % No HS Diploma, % below poverty, and % married and explains 79% of the variance in the dependent variable (CMT 8 Math). The *R* Square change from Model 2 to Model 3 was .037, which shows that 4% of the variance was now added by the % married. The *R* Square change was statistically significant (F (1, 110) = 19.177, p < .000). In Model 4, the independent variable (predictor variable) % Male household is added and had an *R* Square of .789. Model 4 is a combination of % No HS Diploma, % below poverty, % married, and % Male household and explains 79% of the variance in the dependent variable (CMT 8 Math). The *R* Square change from Model 3 to Model 4 was .010, which shows that 1% of the variance was now added by % Male Household. The *R* Square change was statistically significant (F (1, 109) = 5.498, p < .021). Of the four models, Model 4 explains the greatest amount of variance in the dependent variable (CMT 8 Math). Table 69 shows the Model Summary.

Table 69

Model Summary for Hierarchical Regression Model for 2010 CMT 8 Math

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	$df1$	$df2$	Sig. F Change	
dimension0 1	.844[a]	.713	.710	9.0650	.713	278.303	1	112	.000	
2	.865[b]	.749	.744	8.5179	.036	15.851	1	111	.000	
3	.887[c]	.786	.780	7.8959	.037	19.177	1	110	.000	
4	.892[d]	.796	.789	7.7392	.010	5.498	1	109	.021	1.736

a. Predictors: (Constant), 25 and over No HS Diploma
b. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty
c. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty, All married families, kids under 18,
d. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty, All married families, kids under 18, , Male head no wife kids under 18
e. Dependent Variable: eighth Grade Math % at or above Goal

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 8 Math

The ANOVA table verified that the results were statistically significant (see Table 70). The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 8 Math and were statistically significant (Model 1: $F = 278.303$, $df = 1, 112$, $p < .000$; Model 2: $F = 165.528$, $df = 2, 111$, $p < .000$; Model 3: $F = 134.816$, $df = 3, 110$, $p < .000$; Model 4: $F = 106.621$, $df = 4, 109$, $p < .000$).

Table 70

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 8 Math Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	22869.590	1	22869.590	278.303	.000[a]
	Residual	9203.613	112	82.175		
	Total	32073.203	113			
2	Regression	24019.644	2	12009.822	165.528	.000[b]
	Residual	8053.559	111	72.555		
	Total	32073.203	113			
3	Regression	25215.256	3	8405.085	134.816	.000[c]
	Residual	6857.947	110	62.345		
	Total	32073.203	113			
4	Regression	25544.556	4	6386.139	106.621	.000[d]
	Residual	6528.647	109	59.896		
	Total	32073.203	113			

a. Predictors: (Constant), 25 and over No HS Diploma
b. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty
c. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty, All married families, kids under 18,
d. Predictors: (Constant), 25 and over No HS Diploma, All families kids under 18 below poverty, All married families, kids under 18, , Male head no wife kids under 18
e. Dependent Variable: eighth Grade Math % at or above Goal

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 8 Math Scores

Table 71 shows how each of the independent (predictor) variables influenced the dependent variable. It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % No HS Diploma was statistically significant ($p < .000$ with $t = -16.682$ and a beta = -.844). The beta is negative which means that as the % No HS Diploma increases the 2010 CMT 8 Math scores decrease. As an independent variable % No HS Diploma is a strong predictor of students who scored proficient or higher on the 2010 CMT 8 Math. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % No HS Diploma decreases in power from a beta of -.844 to a beta = -.489. It is significant ($p < .000$ level, $t = -4.844$). The independent (predictor) variable added in Model 2 % below poverty had a beta = -.402. It is statistically significant at $p = .000$ level, $t = -3.981$. The negative beta for % below poverty means that as the % below the poverty increases the 2010 CMT 8 Math scores decreases. The variable % No HS Diploma continues to be a predictor of 2010 CMT 8 Math. The variable % below poverty was also a predictor of CMT 8 Math.

In Model 3, the independent (predictor) variable % No HS Diploma decreases in power again from a beta -.844, to -.489 to a beta = -.345. It is statistically significant at the .001 level ($t = -3.479$). The independent (predictor) variable % below poverty also decreased in power from a beta of -.402 to a beta = -.353. It is significant at p = .000 level, $t = -3.736$. The independent (predictor) variable added in Model 3 % married had a beta = .270. It is significant at $p = .000$ level, $t = 4.379$. The independent (predictor) variable % married had the weakest power of the three independent variables in Model 3. The variable % No HS Diploma remains a predictor of 2010 CMT 8 Math. In this model % below poverty remains a predictor of 2010 CMT 8 Math, but % Married becomes a weak predictor of 2010 CMT 8 Math.

In Model 4, the independent (predictor) variable % No HS Diploma continues to decrease in power from a beta of -.844, to -.489, to -.345 to a beta = -.328. It is significant at the .001 level ($t = -3.366$). The independent (predictor) variable % below poverty also decreased in power from -.402, to -.353 to a beta = -.316. It is significant at the .001 level *(t* = -3.372). The independent (predictor) variable % married increased in power from .270 to a beta = .275. It is significant at the .000 level (*t* = 4.547). The independent (predictor) variable added to Model 4 % Male household had a beta = -.112. It is significant at the .021 level *(t* = -2.345). The negative beta for % Male household indicates that as the % of Male household increases, the 2010 CMT 8 Math scores decrease. The variables % No HS Diploma and % below poverty remain a predictor of 2010 CMT 8 Math. % Male household is a weak predictor of 2010 CMT 8 Math.

Table 71

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 8 Math Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	95.765	1.698		56.394	.000	92.400	99.130		
	25 and over No HS Diploma	-2.670	.160	-.844	-16.682	.000	-2.988	-2.353	1.000	1.000
2	(Constant)	92.317	1.816		50.849	.000	88.720	95.915		
	25 and over No HS Diploma	-1.548	.320	-.489	-4.844	.000	-2.181	-.915	.222	4.514
	All families kids under 18 below poverty	-.910	.229	-.402	-3.981	.000	-1.363	-.457	.222	4.514

3	(Constant)	72.473	4.834		14.993	.000	62.893	82.053		
	25 and over No HS Diploma	-1.092	.314	-.345	-3.479	.001	-1.714	-.470	.197	5.071
	All families kids under 18 below poverty	-.797	.213	-.353	-3.736	.000	-1.220	-.374	.218	4.580
	All married families, kids under 18,	.610	.139	.270	4.379	.000	.334	.887	.510	1.963
4	(Constant)	74.130	4.790		15.475	.000	64.635	83.624		
	25 and over No HS Diploma	-1.039	.309	-.328	-3.366	.001	-1.650	-.427	.196	5.099
	All families kids under 18 below poverty	-.715	.212	-.316	-3.372	.001	-1.136	-.295	.212	4.709
	All married families, kids under 18,	.621	.137	.275	4.547	.000	.351	.892	.509	1.965
	Male head no wife kids under 18	-1.697	.724	-.112	-2.345	.021	-3.131	-.263	.813	1.230

a. Dependent Variable: eighth Grade Math % at or above Goal

Results and Interpretation of Hierarchical Regression Model for CMT 8 ELA Scores

A hierarchical linear regression analysis of the remaining independent variables and the dependent variable was conducted. Four models were created. The hierarchical linear regression model estimates the impact of following models on 2010 CMT 8 ELA scores, which is the dependent variable. Table 72, shows the variables that were put into the hierarchical regression model in their order of strength using the Entered method.

Table 72

Variable Entered/ Removed for Eighth Grade ELA

Model	Variables Entered	Variables Removed	Method
1	Families % household 35K and under[a]	.	Enter
2	25 and over No HS Diploma[a]	.	Enter
3	All married families, kids under 18, [a]	.	Enter
4	Male head no wife kids under 18[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: eighth Grade reading % at or above Goal

Table 73 shows the order for 2010 CMT 8 ELA. For Model 1, the independent (predictor) variable % $35,000 had an *R* Square of .714 and explains 71% of the variance in the 2010 CMT 8 ELA scores. In Model 2, the independent (predictor) variable % No HS Diploma was added and had an *R* Square of .746. Model 2 is a combination of % $35,000 and % No HS Diploma and explains 75% of the variance in 2010 CMT 8 ELA. The *R* Square change from Model 1 to Model 2 was .029, which shows that 3% of the variance was now added by the % No

HS Diploma. The *R* Square change was statistically significant (*F* (1, 111) = 12.633, *p* < .001). In Model 3, the independent variable (predictor variable) % Married was added and had an *R* Square of .756. Model 3 is a combination of % $35,000, % No HS Diploma, and % Married and explained 76% of the variance in the dependent variable (CMT 8 ELA). The *R* Square change from Model 2 to Model 3 was .017, which was statistically significant (*p* < .006). In Model 4 the independent (predictor) variable added was % Male household which had an *R* Square of .780. This model was statistically significant (*p* < .006). Of the four models, Model 4 explained the greatest amount of variance in the dependent variable (CMT 8 ELA). Table 73 shows the Model Summary.

Table 73

Model Summary for Hierarchical Regression Model for 2010 CMT 8 ELA

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	
1	.847[a]	.717	.714	7.8513	.717	283.728	1	112	.000	
2	.864[b]	.746	.741	7.4728	.029	12.633	1	111	.001	
3	.873[c]	.763	.756	7.2547	.017	7.776	1	110	.006	
4	.883[d]	.780	.772	7.0221	.017	8.408	1	109	.005	1.639

a. Predictors: (Constant), Families % household 35K and under
b. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma
c. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma, All married families, kids under 18,

d. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma, All married families, kids under 18, , Male head no wife kids under 18
e. Dependent Variable: eighth Grade reading % at or above Goal

Interpretation of Two-Way ANOVA for Hierarchical Linear Regression Model for 2010 CMT 8 ELA

Table 74 shows that the results were statistically significant. The independent variables entered in the four models showed the amount of variance and predicted the percent of students who scored proficient and above on the 2010 CMT 8 ELA and were statistically significant (Model 1: F = 238.728, df = 1, 112, p < .000; Model 2: F = 162.915, df = 2, 111, p < .000; Model 3: F = 117.833, df = 3, 110, p < .000; Model 4: F = 96.428, df = 4, 109, p < .000).

Table 74

Two-Way ANOVA for Hierarchical Regression Model for 2010 CMT 8 ELA Scores

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	17489.994	1	17489.994	283.728	.000[a]
	Residual	6904.077	112	61.644		
	Total	24394.072	113			
2	Regression	18195.453	2	9097.727	162.915	.000[b]
	Residual	6198.618	111	55.843		
	Total	24394.072	113			
3	Regression	18604.725	3	6201.575	117.833	.000[c]
	Residual	5789.347	110	52.630		
	Total	24394.072	113			
4	Regression	19019.317	4	4754.829	96.428	.000[d]
	Residual	5374.755	109	49.310		
	Total	24394.072	113			

a. Predictors: (Constant), Families % household 35K and under

b. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma
c. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma, All married families, kids under 18,
d. Predictors: (Constant), Families % household 35K and under, 25 and over No HS Diploma, All married families, kids under 18, , Male head no wife kids under 18
e. Dependent Variable: eighth Grade reading % at or above Goal

Interpretations of Standardized Coefficients Betas and Tolerance for Hierarchical Regression Model for 2010 CMT 8 ELA Scores

Table 75 shows how each of the independent (predictor) variables influences the dependent variable. It shows the strength the independent variables have on the dependent variable. In Model 1, the independent (predictor) variable % $35,000 was statistically significant (p < .000 with t = -.16.844 and a beta = -.847). The beta is negative which means that as the % 35,000 increases the 2010 CMT 8 ELA scores decrease. As an independent variable % $35,000 is a strong predictor of students who scored proficient or higher on the 2010 CMT 8 ELA. This is because the beta is close to 1 and the closer the beta is to 1, the stronger the prediction power. In Model 2, the independent (predictor) variable % $35,000 decreased in power from a beta of -.847 to a beta = -.495. It is significant (p < .000 level, t = -4.500). The independent (predictor) variable added in Model 2 % No HS Diploma had a beta = -.391. It is statistically significant at p = .001 level, t = -3.554. The negative beta for % No HS Diploma means that as the % No HS Diploma increased the 2010 CMT 8 ELA scores decreased. The variables % $35,000 and % No HS Diploma continue to be statistically significant predictors of 2010 CMT 8 ELA.

In Model 3, the independent (predictor) variable % $35,000 decreased in power from -.847, to -.495 to beta = -.401. It is statistically significant (p < .001 level, t = -3.578). The variable % No HS Diploma is statistically significant (*p* < .002 level, *t* = -3.187). The independent (predictor) variable added % Married had a beta = .189. This is statistically significant (*p* < .006 level, t = 2.789). In this model % $35,000 and % No HS Diploma are good predictors of 2010 CMT 8 ELA. The variable % Married is a weak predictors of 2010 CMT 8 ELA.

In Model 4, the independent (predictor) variable % $35,000 decreased in power from -.847, to -.495, to -.401, to beta = -.345. It is statistically significant (*p* < .002 level, *t* = -3.134). The variable % No HS Diploma continues to decrease in power from -.391 to, -.344, -.327 and is statistically significant (*p* < .002). The variable % Married had a beta = .202. This is statistically significant (*p* < .003 level, *t* = 3.070). The independent variable added % male household had a beta of -.145. This is statistically significant (*p* < .005). The variables % $35,000 and % No HS Diploma remain predictors of the 2010 CMT 8 ELA. The variables % Married and % male household are weak predictors of 2010 CMT 8 ELA.

Table 75

Standardized Coefficient Betas and Tolerance for Hierarchical Multiple Regression Model for 2010 CMT 8 ELA Scores

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for *B*		Collinearity Statistics	
		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	94.650	1.299		72.873	.000	92.076	97.223		
	Families % household 35K and under	-1.392	.083	-.847	-16.844	.000	-1.556	-1.228	1.000	1.000
2	(Constant)	97.058	1.410		68.846	.000	94.265	99.852		

	Families % household 35K and under	-.813	.181	-.495	-4.500	.000	-1.172	-.455	.189	5.283
	25 and over No HS Diploma	-1.078	.303	-.391	-3.554	.001	-1.679	-.477	.189	5.283
3	(Constant)	84.852	4.586		18.502	.000	75.764	93.941		
	Families % household 35K and under	-.659	.184	-.401	-3.578	.001	-1.023	-.294	.172	5.812
	25 and over No HS Diploma	-.950	.298	-.344	-3.187	.002	-1.540	-.359	.185	5.412
	All married families, kids under 18,	.372	.133	.189	2.789	.006	.108	.636	.470	2.128
4	(Constant)	86.026	4.457		19.299	.000	77.192	94.861		
	Families % household 35K and under	-.567	.181	-.345	-3.134	.002	-.926	-.209	.167	5.994
	25 and over No HS Diploma	-.902	.289	-.327	-3.120	.002	-1.474	-.329	.184	5.429
	All married families, kids under 18,	.397	.129	.202	3.070	.003	.141	.653	.468	2.137
	Male head no wife kids under 18	-1.907	.658	-.145	-2.900	.005	-3.210	-.604	.810	1.234

a. Dependent Variable: eighth Grade reading % at or above Goal

Summary of Results

Research Questions and Answers for Dependent Variables Third through Eighth Grade CMT's in Mathematics and Language Arts

This study began by examining two main research questions:

1. Which combination of out-of-school variables best predicted how students actually performed on the 2010 third through eighth grade CMTs in regards to scoring proficiency or higher?

2. Which combination of out-of-school variables explained the most amount of variance in how students performed on the 2010 CMT?

To better understand this research, a thorough review of the literature as well as the research questions were reviewed and answered.

2010 Third through Eighth Grade CMTs in Mathematics and English Language Arts

Research question 1. Which combination of out-of-school variables best predicts how students actually performed on the 2010 third grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. When all 15 variables were assessed and run through the regression model the variables that best predicted how students performed on the 2010 CMT 3 Math were the percent of families 25 and older without a high school diploma, percent of families making $35,000 or less, and percent of people 25 and over with a BA degree. These 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 CMT Grade 3 Math section for 72% of the school districts in the sample. In regards to the 2010 CMT 3 ELA, the best predictors were percentage of people 25 and older with no HS diploma, percentage of all families below the poverty level, and percentage of all married families. These three variables were entered into the predictive algorithm and correctly predicted the percentage of students scoring proficient or above on the 2010 CMT Grade 3 ELA section for 70% of the school districts in the sample within the margin of error for this model.

Research question 2. Which combination of out-of-school variables explains the most amount of variance on how students performed on the 2010 third grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. The same three variables (% No HS Diploma; % of families making $35,000 or less; % with BA Degree) that predicted 72% of 2010 CMT 3 Math scores accounted for 67% of the variance in 2010 CMT 3 Math for the school districts in the sample. The same two variables (% of families making $35,000 or less; and % with Grad Degree) that predicted 72% of 2010 CMT 3 ELA scores also accounted for 72% of the variance in 2010 CMT 3 ELA for the school districts in the sample.

Research question 1. Which combination of out-of-school variables best predicts how students actually performed on the 2010 fourth grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. When all 15 variables were assessed and run through the regression model the variables that best predicted how students performed on the 2010 CMT 4 Math were the percent of families making $35,000 or less, percentage of the population 25 and older without a high school diploma, and percentage 25 and older with a graduate degree. These 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 CMT Grade 4 Math section for 68% of the school districts in the sample. In regards to the 2010 CMT 4 ELA, the best predictors were percentage of families making $35,000 or less and percent of people 25 and older with a graduate degree. These 2 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 CMT Grade 4 ELA section for 76% of school districts in the sample.

Research question 2. Which combination of out-of-school variables explains the most amount of variance on how students performed on the 2010 fourth grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer: The same three variables (% families $35,000 or less; % No HS Diploma; and % with Grad Degree) that predicted 68% of 2010 CMT 4 Math scores accounted for 67% of the variance in 2010 CMT 4 Math for the school districts in the sample. The same two variables (% families $35,000 or less; and % with Grad Degree) that predicted 76% of 2010 CMT 4 ELA scores also accounted for 70% of the variance in 2010 CMT 4 ELA for the school districts in the sample.

Research question 1. Which combination of out-of-school variables best predicts how students actually performed on the 2010 fifth grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. When all 15 variables were assessed and run through the regression model the variables that best predicted how students performed on the 2010 CMT 5 Math were percentage of people 25 and older without a HS Diploma, percentage of families making $35,000 or less, percentage of the population with children under 18 below the poverty level, and the percentage of the population that is married. These four 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 CMT Grade 5 Math section for 74% of schools districts in the sample. In regards to the 2010 CMT 5 ELA, the best predictors were the percentage of people 25 and older without a high school diploma, percentage of all families with children under the age of 18 living below poverty, percentage of all married people with children under 18, and percentage of the population 25 and older without a high school diploma. These four 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 CMT Grade 5 ELA section for 76% of school districts in the sample.

Research question 2. Which combination of out-of-school variables explains the most amount of variance on how students performed on the 2010 fifth grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. The same four variables (% No HS Diploma; % families $35,000 or less; % below poverty and % married) that predicted 74% of 2010 CMT 5 Math scores accounted for 73% of the variance in 2010 CMT 5 Math for the school districts in the sample. The same four variables (% No HS Diploma, % below poverty, % married and % HS Diploma) that predicted 76% of 2010 CMT 5 ELA scores also accounted for 79% of the variance in 2010 CMT 5 ELA for the school districts in the sample.

Research question 1. Which combination of out-of-school variables best predicts how students actually performed on the 2010 sixth grade CM‘s in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. When all 15 variables were assessed and run through the regression model the variables that best predicted how students performed on the 2010 CMT 6 Math were percentage of the population 25 and older without a high school diploma, percentage of all families with children under the age of 18 living below poverty, and percentage of all married people with children under 18. These 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 CMT Grade 6 Math section for 70% of schools districts in the sample. In regards to the 2010 CMT 6 ELA, the best predictors were the percentage of families making $35,000 or less, percentage of all married families with children under the age of 18 and percentage of the population without a high school diploma. These 3 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 CMT Grade 6 ELA section for 75% of school districts in the sample.

Research question 2. Which combination of out-of-school variables explains the most amount of variance on how students performed on the 2010 sixth grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. The same three variables (% No HS Diploma; % below poverty; and % married) that predicted 70% of 2010 CMT 6 Math scores accounted for 68% of the variance in 2010 CMT 6 Math for the school districts in the sample. The same two variables (% families $35,000 or less; and % with Grad Degree) that predicted 76% of 2010 CMT 6 ELA scores also accounted for 75% of the variance in 2010 CMT 6 ELA for the school districts in the sample.

Research question 1. Which combination of out-of-school variables best predicts how students actually performed on the 2010 seventh grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. When all 15 variables were assessed and run through the regression model the variables that best predicted how students performed on the 2010 CMT 7 Math were percentage of the population making $35,000 or less, percentage of the population 25 and older without a high school diploma, percentage of families with a female head and no husband with children under the age of 18, and percentage of all married people with children under 18. These four 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 CMT Grade 7 Math section for 74% of schools districts in the sample. In regards to the 2010 CMT 7 ELA, the best predictors were percentage of all families with children under the age of 18 living below poverty, percentage of the population 25 and older without a high school diploma, and percentage of all married people with children under 18. These 3 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 CMT Grade 7 ELA section for 71% of school districts in the sample.

Research question 2. Which combination of out-of-school variables explains the most amount of variance on how students performed on the 2010 seventh grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. The same four variables (% $35,000 or less; % No HS Diploma; % female head; and % married) that predicted 74% of 2010 CMT 7 Math scores accounted for 74% of the variance in 2010 CMT 7 Math for the school districts in the sample. The same three variables (% below poverty; % No HS Diploma; and % married) that predicted 71% of 2010 CMT 7 ELA scores also accounted for 74% of the variance in 2010 CMT 7 ELA for the school districts in the sample.

Research question 1. Which combination of out-of-school variables best predicts how students actually performed on the 2010 eighth grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. When all 15 variables were assessed and run through the regression model the variables that best predicted how students performed on the 2010 CMT 8 Math were percentage of the population 25 and older without a high school diploma, percentage of all families with children under the age of 18 living below poverty, and percentage of all married people with children under 18, percentage of male head of household with no wife and children under 18. These four 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 CMT Grade 8 math section for 70% of schools districts in the sample. In regards to the 2010 CMT Grade 8 ELA, the best predictors were the percentage of families making $35,000 or less, percentage of the population without a high school diploma, percentage of all married families with children under the age of 18, and percentage of male head of household with no wife with children under 18. These 4 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 CMT Grade 8 ELA section for 71% of school districts in the sample.

Research question 2. Which combination of out-of-school variables explains the most amount of variance on how students performed on the 2010 eighth grade CMTs in mathematics and English language arts in regards to scoring proficiency or higher?

Answer. The same four variables (% No HS Diploma; % below poverty; % married; and % male head no female) that predicted 70% of 2010 CMT 8 Math scores accounted for 78% of the variance in 2010 CMT 8 Math for the school districts in the sample. The same four variables (% $35,000 and less; % No HS Diploma; % married; and % male head no wife) that predicted 71% of 2010 CMT 8 ELA scores also accounted for 77% of the variance in 2010 CMT 8 ELA for the school districts in the sample.

Results of the Study

CMT 3 Math: Dependent Variable

Conclusion. The results of this study suggest that more than 67% of the variance in CMT 3 Math scores could be explained by out-of-school variables. This study, as well as the empirical literature, showed that out-of-school variables significantly affected student achievement as measured by the 2010 CMT third grade Math assessment. The out-of-school variables identified in this study to have the greatest influence on 2010 CMT 3 Math scores were percentage of people in the population 25 years and older without a high school diploma, percentage of people making $35,000 or less, and percentage of people in the population with a Bachelor of Arts degree. These three variables also predicted 72% of the 2010 CMT 3 Math Scores of the school districts in the sample. The addition of the percentage of people married with children under 18 did not add much to the model, and was actually not statistically significant. As additional variables were added to the model, the power of some of those variables decreased. In the case of the 2010 CMT 3 Math, the power of the percentage of people 25 and older with a high school diploma decreased while the power of the percentage of people making $35,000 or less increased with the addition of the percentage of people with a Bachelors Degree. The addition of any of the parental education construct that was less than some college had a reverse effect on 2010 CMT 3 Math. The higher the percentage of people with a high school diploma or without a high school diploma, the lower the student's performance on the 2010 CMT 3 Math was. When some college was added, there was a gradual increase, but when a Bachelors degree was added there was a positive and substantial increase in power to the relationship to 2010 CMT 3 Math. This study highlights the importance and strength a 4 year college degree and beyond has on student achievement as measured by state test such as the 2010 CMT 3 Math.

Table 76

Third Grade Math Percentage of Scores Predicted Accurately

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Third Grade Math = 139 School Districts	100 predicted correctly with a standard error of + or – 8.5 out of 139 = 72% Predicted

CMT 3 ELA: Dependent Variable

Conclusion. For the 2010 CMT 3 ELA the results of this study were similar to what the research showed in regards to the effects that the out-of-school factors have on student achievement as measured by state standardized tests. The results from this study showed that three out-of-school variables predicted 70% of the district 2010 CMT 3 ELA scores of the school districts in the sample. The three out-of-school variables that best predicted the test scores were percentage of the population 25 years and older with no HS diploma, percentage of the population living below the poverty level and percentage of the population that is married with children under 18. These three variables also explained more than 72% of the variance in CMT 3 ELA scores. This study showed that the 2010 CMT 3 ELA scores were more influenced by out-of-school factors than were the 2010 CMT 3 Math scores. This study showed that in 2010, in the third grade, the way students performed in reading and writing was greatly influenced by out-of-school variables.

Table 77

Third Grade ELA Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Third Grade English Language Arts = 139 School Districts	97 predicted correctly with a standard error of + or – 8.2 out of 139 = 70% Predicted

CMT 4 Math: Dependent Variable

Conclusion. The findings from this study showed that three out-of-school variables predicted 68% of the test scores of the districts that were in the sample. The three out-of-school variables that explain this variance are percentage of the population 25 years and older with no HS diploma, percentage of the population making $35,000 or less, and percentage of the population 25 years and older with an advanced degree. These three variables also accounted for more than 61% of the variance in CMT 4 Math scores. This study continues to support what the research is saying and what past studies have also shared in regards to the influence out-of-school variable have on the school environment.

Table 78

Fourth Grade Math Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Fourth Grade Math = 139 School Districts	95 predicted correctly with a standard error of + or – 9.9 out of 139 = 68% Predicted

CMT 4 ELA: Dependent Variable

Conclusion. The results continue to support the research. In the 2010 CMT 4 ELA, two out-of-school variables accounted for 70% of the variance in test scores. The two out-of-school variables that explained the most amount of variance were percentage of the population making $35,000 or less and percentage of people in the population 25 and older with an advanced degree. These two out-of-school variables also predicted 76% of 2010 CMT 4 ELA test scores of the school districts in the sample.

Table 79

Fourth Grade ELA Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Fourth Grade English Language Arts = 139 School Districts	106 predicted correctly with a standard error of + or – 8.8 out of 139 = 76% Predicted

CMT 5 Math: Dependent Variable

Conclusion. In the fifth grade the findings were similar to the third and fourth grade. Out-of-school factors continued to predict test scores as well as account for high percentage of variance in how students performed on the test. In the 2010 CMT 5 Math, the findings from the research study showed that the percentage of the population 25 and older without a high school diploma, percentage of families with children under 18 making $35,000 or less, and percentage of all married families with children under 18 predicted 74% of the test scores for the school districts in the sample. These same variables also accounted for 73% of the variance in the 2010 CMT 5 Math scores.

Table 80

Fifth Grade Math Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Fifth Grade Math = 139 School Districts	103 predicted correctly with a standard error of + or – 7.4 out of 139 = 74% Predicted

CMT 5 ELA: Dependent Variable

Conclusion. In the 2010 CMT 5 ELA, four out-of-school variables predicted 76% of the 2010 CMT 5 ELA test scores of the school districts in the sample. The four out-of-school variables that predicted the scores were percentage of the population 25 and older without a high school diploma, percentage of all families living below the poverty level, percentage of all families that were married with children under 18, and percentage of the population 25 and older with an advanced degree. These four out-of-school variables also accounted for 79% of the variance in the test scores.

Table 81

Fifth Grade ELA Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Fifth Grade English Language Arts = 139 School Districts	106 predicted correctly with a standard error of + or – 7.3 out of 139 = 76% Predicted

CMT 6 Math: Dependent Variable

Conclusion. In the middle schools the findings were also similar to the elementary schools but not as high. In the 2010 CMT 6 Math, three out-of-school variables predicted 70%

of the scores of the districts in the sample. The three out-of-school variables that predicted the student's scores were percentage of the population 25 and older without a high school diploma, percentage of all families living below the poverty level, and percentage of all families that were married with children under 18. These three out-of-school variables also accounted for 68% of the variance in 2010 CMT 6 Math test scores.

Table 82

Sixth Grade Math Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Sixth Grade Math = 114 School Districts	80 predicted correctly with a standard error of + or – 9 out of 114 = 70% Predicted

CMT 6 ELA: Dependent Variable

Conclusion. In the 2010 CMT 6 ELA, three out-of-school variables predicted 75% of the 2010 CMT 6 ELA of the school districts that were in the sample. The three out-of-school variables that best predicted the test scores were percentage of the population making $35,000 or less, percentage of all families that were married with children under 18, and percentage of the population 25 and older without a high school diploma. These three out-of-school variables also accounted for 74% of the variance in test scores of the 2010 CMT 6 ELA.

Table 83

Sixth Grade ELA Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Sixth Grade English Language Arts = 114 School Districts	86 predicted correctly with a standard error of + or – 7 out of 114 = 75% Predicted

CMT 7 Math: Dependent Variable

Conclusion. In the middle schools the findings remained the same or similar to the elementary schools. In the 2010 CMT 7 Math, four out-of-school variables predicted 68% of the test scores of the districts that were in the sample. The four out-of-school variables that predicted the students test scores were percentage of all families making $35,000 or less, percentage of the population 25 and older without a high school diploma, percentage of the population that had a female head of household without a male, and percentage of all families that were married with children under 18. These four out-of-school variables accounted for 74% of the variance in test scores.

Table 84

Seventh Grade Math Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Seventh Grade Math = 114 School Districts	84 predicted correctly with a standard error of + or – 8.6 out of 114 = 74% Predicted

CMT 7 ELA: Dependent Variable

Conclusion. In the 2010 CMT 7 ELA, three out-of-school variables predicted 71% of the test scores of the districts that were in the sample. The three out-of-school variables that predicted the test scores were percentage of all families living below the poverty level with children under 18, percentage of people in the population 25 years and older without a high school diploma, and percentage of all families that were married with children under 18. These three variables also accounted for 74% of the variance in 2010 CMT 7 ELA test scores.

Table 85

Seventh Grade ELA Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Seventh Grade English Language Arts = 114 School Districts	81 predicted correctly with a standard error of + or – 6.5 out of 114 = 71% Predicted

CMT 8 Math: Dependent Variable

Conclusion. In the middle schools the findings remained the same or similar to the elementary schools. In the 2010 CMT 8 Math, four out-of-school variables predicted 71% of the test scores of the districts that were in the sample. The four out-of-school variables that predicted the test scores were percentage of people in the population 25 years and older without a high school diploma, percentage of all families living below the poverty level with children under 18, percentage of all families that were married with children under 18, and percentage of all families with a male head of household and no wife with children under 18. These four variables also accounted for 78% of the variance in the 2010 CMT 8 Math test scores.

Table 86

Eighth Grade Math Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Eighth Grade Math = 114 School Districts	80 predicted correctly with a standard error of + or – 8 out of 114 = 70% Predicted

CMT 8 ELA: Dependent Variable

Conclusion. In the 2010 CMT 8 ELA, four out-of-school variables predicted 75% of the test scores of the districts that were in the sample. The four out-of-school variables that predicted the test scores were percentage of people making $35,000 or less, percentage of people in the population 25 years and older without a high school diploma, percentage of all families that were married with children under 18, and percentage of all families with a male head of household and no wife with children under 18. These four variables also accounted for 77% of the variance in 2010 CMT 8 ELA test scores.

Table 87

Eighth Grade ELA Percentage of Scores Predicted Correctly

Number of school districts by grade that meet the study criteria	Percentage of scores predicted accurately
Eighth Grade English Language Arts = 114 School Districts	85 predicted correctly with a standard error of + or – 7 out of 114 = 75% Predicted

Overall Summary of Findings for Dependent Variables and Important Independent Variables

Table 88

Dependent Variables and the Important Independent Variables

Dependent Variables	Important Independent Variables
Third Grade Math	Percentage of the population 25 and older without a HS Diploma
	Percentage of people with children under 18 making $35,000 or less
	Percentage of people in the population 25 or older with a Bachelor of Arts degree

Third Grade English Language Arts	Percentage of the population 25 and older without a HS Diploma
	Percentage of people in the population living below the poverty level with children under 18
	Percentage of the population that is married with children under 18
Fourth Grade Math	Percentage of the population 25 and older without a HS Diploma
	Percentage of people with children under 18 making $35,000 or less
	Percentage of people in the population 25 or older with an Advanced degree
Fourth Grade English Language Arts	Percentage of people with children under 18 making $35,000 or less
	Percentage of people in the population 25 or older with an Advanced degree
Fifth Grade Math	Percentage of the population 25 and older without a HS Diploma
	Percentage of people with children under 18 making $35,000 or less
	Percentage of the population that is married with children under 18
Fifth Grade English Language Arts	Percentage of the population 25 and older without a HS Diploma
	Percentage of people in the population living below the poverty level with children under 18
	Percentage of the population that is married with children under 18
	Percentage of people in the population 25 or older with an Advanced degree

Sixth Grade Math	Percentage of the population 25 and older without a HS Diploma
	Percentage of people in the population living below the poverty level with children under 18
	Percentage of the population that is married with children under 18
Sixth Grade English Language Arts	Percentage of people with children under 18 making $35,000 or less
	Percentage of the population that is married with children under 18
	Percentage of the population 25 and older without a HS Diploma
Seventh Grade Math	Percentage of people with children under 18 making $35,000 or less
	Percentage of the population 25 and older without a HS Diploma
	Percentage of the population with a female head of household without a male
	Percentage of the population that is married with children under 18
Seventh Grade English Language Arts	Percentage of people in the population living below the poverty level with children under 18
	Percentage of the population 25 and older without a HS Diploma
	Percentage of the population that is married with children under 18
Eighth Grade Math	Percentage of the population 25 and older without a HS Diploma
	Percentage of people in the population living below the poverty level with children under 18

	Percentage of the population that is married with children under 18
	Percentage of the population with a male head of household without a female
Eighth Grade English Language Arts	Percentage of people with children under 18 making $35,000 or less
	Percentage of the population 25 and older without a HS Diploma
	Percentage of the population that is married with children under 18
	Percentage of the population with a male head of household without a female

Table 89

Overall Summary of Predictions

ELEMENTARY SCHOOL	ELEMENTARY SCHOOL
• Third Grade Math = 139 School Districts	• 100 predicted correctly out of 139 with a standard error of + or – 8.5 = 72% Predicted
• Third Grade English Language Arts = 139 School Districts	• 97 predicted correctly out of 139 with a standard error of + or – 8.2 = 70% Predicted
• Fourth Grade Math = 139 School Districts	• 95 predicted correctly out of 139 with a standard error of + or – 9.9 = 68% Predicted
• Fourth Grade English Language Arts = 139 School Districts	• 106 predicted correctly out of 139 with a standard error of + or – 8.8 = 76% Predicted
• Fifth Grade Math = 139 School Districts	• 103 predicted correctly out of 139 with a standard error of + or – 7.4 = 74% Predicted
• Fifth Grade English Language Arts = 139 School Districts	• 106 predicted correctly out of 139 with a standard error of + or – 7.3 = 76% Predicted
MIDDLE SCHOOL	MIDDLE SCHOOL
• Sixth Grade Math = 114 School Districts	• 80 predicted correctly out of 114 with a standard error of + or – 9 = 70%

	Predicted
• Sixth Grade English Language Arts = 114 School Districts	• 86 predicted correctly out of 114 with a standard error of + or – 7 = 75% Predicted
• Seventh Grade Math = 114 School Districts	• 84 predicted correctly out of 114 with a standard error of + or – 8.6 = 74% Predicted
• Seventh Grade English Language Arts = 114 School Districts	• 81 predicted correctly out of 114 with a standard error of + or – 6.5= 71% Predicted
• Eighth Grade Math = 114 School Districts	• 80 predicted correctly out of 114 with a standard error of + or – 8 = 70% Predicted
• Eighth Grade English Language Arts = 114 School Districts	• 85 predicted correctly out of 114 with a standard error of + or – 7 = 75% Predicted

Table 90

Overall Summary of Variance Accounted For

• Third Grade Math	• 67% of the Variance
• Third Grade ELA	• 72% of the Variance
• Fourth Grade Math	• 67% of the Variance
• Fourth Grade ELA	• 70% of the Variance
• Fifth Grade Math	• 73% of the Variance
• Fifth Grade ELA	• 79% of the Variance
MIDDLE SCHOOL	MIDDLE SCHOOL
• Sixth Grade Math	• 68% of the Variance
• Sixth Grade ELA	• 75% of the Variance
• Seventh Grade Math	• 74% of the Variance
• Seventh Grade ELA	• 74% of the Variance
• Eighth Grade Math	• 78% of the Variance
• Eighth Grade ELA	• 77% of the Variance

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

The purpose of my study was to determine which combination of 15 out-of-school community demographic variables best predicted and accounted for the most variance in a Connecticut school district's percentages of students scoring goal or advanced on the 2010 Connecticut Mastery Tests (CMT) for the third through eighth grade in mathematics (Math) and English language arts (ELA). 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, statistically significantly influence not only how students perform on state standardized assessments but also predict, with a high level of accuracy, the percentage of students who will score goal or above. This study focused specifically 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 two overarching research questions guided this study:

1. Which combination of community and family-level demographic variables best predicted the percentage of students who scored goal or above on the 2010 grades 3 through 8 CMTs in language arts and mathematics sections of the tests at the district level?

2. Which combination of out-of-school variables explained the most amount of variance in the percent of students who scored goal or higher on the 2010 CMT on the Grades 3 through 8 mathematics and English language arts sections at the district level?

The results from this study aligned to those from Maylone (2002) and Turnamian and Tienken (2013). Maylone (2002) was able to explain 56% of the variance in the district state test scores by looking at three out-of-school variables: percent of district students eligible for free or reduced priced lunches, percent of district lone-parent households, and mean district annual household income (p. 99). Utilizing these same three out-of-school variables, Maylone was also able to predict accurately the percentage of students scoring proficient or above on the MEAP (Michigan High School Assessment) in 74% of the school districts in the state. 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 the public elementary schools in Connecticut, community and family-level demographic variables accounted for as much as 79% (2010 CMT 5 ELA) and as little as 61% (2010 CMT 4 Math) of the variance in students performance on the state assessments. Furthermore, the community demographic variables accurately predicted as much as 76% (fourth and fifth grade ELA) and as little as 68% (fifth grade math) of the percentage of students scoring goal or above on the state CMT language arts and mathematics assessment. In the elementary school districts, certain variables were constant across multiple grades and subject areas. For example, the out-of-school variable, percentage of the population 25 years and older without a high school diploma was present in all grade levels and subject areas except for fourth grade 2010 CMT ELA. Another variable that was also constant in many of the elementary school grades and test subject areas was the percentage of people in a population making $35,000 or less. There were other variables that did not appear to have as much of an impact on the test scores. Variables like the median household income, families making $200,000 or more, and the employment status of parents with children under 18 were not good predictors of how students performed on their state standardized assessments. Also certain variables predicted as much as 76% of what???on the 2010 CMT 4 ELA and as little as 68% of what???on the 2010 CMT 4 Math. In the elementary model 78% of the variance on fifth grade students ELA scores were explained by the percentage of families 25 and older without a high school diploma, percentage of all families living in poverty with children under 18, percentage of all married families with children under 18, and percentage of people over 25 with a high school diploma.

In the public middle schools in Connecticut, out-of-school variables accounted for as much as 78% of the variance in the 2010 CMT 8 Math and as little as 68% of the variance in the 2010 CMT 6 Math in regards to students performance on the state assessments. These variables also predicted as much as 75% and as little as 70% of the percentage of students scoring goal or above on the 2010 CMTs for middle schools at the district level. In the middle school level, similar to the elementary school level, the out-of-school variable that appeared the most was the percentage of people in the population 25 and older without a high school diploma. In the middle school level this variable was present in both ELA and math and in all grade levels. This shows the importance of an education and the fact that districts that had a large percentage of the population 25 and older without a high school diploma adversely affected student performance, resulting in less students scoring goal or above on their state test. The percentage of the population 25 and older without a high school diploma has a negative correlation to students' performances on the state assessment. Another variable that was present in all of the middle levels was the percentage of the population that was married with children under the age of 18. Although this appears in the elementary level as well, it appears to be more impactful as children get older. This also shows that districts and communities that had a high percentage of married families with children under 18 had a positive correlation to student's performance on the state standardized assessment.

There were other variables that were present that had an impact on both the elementary and secondary levels. Some of these variables included male head of household no wife, female head of household no husband, percentage of people 25 and older with a BA degree, and percentage of people 25 and older with a high school diploma. There were also some variables that combined to create a predictive model. For mathematics the variables that created the best predictive model were the percentage of people making $35,000 or less, the percentage of the people 25 and older without a high school diploma, the percentage of female head, no husband, and percentage of married families with children under 18. This predictive model was for seventh grade math and predicted 74% of the 2010 seventh grade CMT Math scores. For ELA the variables that created the best predictive model were percentage of people making $35,000 or less and percentage of the people 25 and older with a graduate degree. This predictive model was for fourth grade ELA and predicted 76% of the 2010 fourth grade CMT scores. For both math and ELA percentage of people making $35,000 or less was a strong predictor of how students performed on the test.

The findings from this study support the existing empirical studies and the research literature. The results of the study indicate that schools and districts are not being measured accurately and that simply using state standardized assessments as the sole purpose of determining student achievement is flawed. The test makers would like us to believe that these tests are accurately measuring a student's education ability. However, based on prior empirical studies (Tienken, 2010; Tienken & Olrich, 2013) and the results from the current 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. Given the nature of the study and the findings presented from previous studies as well as the conclusion presented in this chapter, there will need to be further research done on this topic. As of now, this research has been completed in Michigan and New Jersey, and now all of third through eighth-grade in Connecticut. Other states will need to do this research in order to see if the findings can be generalized outside of the states that they were conducted.

Recommendations for Policy

Policy makers, state and district education leaders, school leaders, and all stake holders must be aware of the connection between education research and education policy. The way policy is currently developed in education is not always based on empirical research studies (Turnamian, 2010; Tienken & Orlich, 2013). Based on the fact that out-of-school variables account for so much of the variance in the test scores and in some instance predictive power, policy makers need to allocate more of their funding to various strategies that address the out-of-school variables that impact student achievement. Policy makers have tried to set various policies for combating poverty but those policies have not achieved their intended purpose. Knowing that poverty affects student's academics negatively, more needs to be done to help families living in poverty in order to address the negative impact poverty has on student achievement.

Research shows that by the time students living in poverty reach school age they are already behind their wealthy peers academically (Lee, 2009). A push for policies requiring early intervention programs, pre-school programs, and head start programs will be critical in battling the issue of poverty. There is also a need for programs that are free to young mothers, single mothers living in poverty, mothers of young children below the poverty line, families with young children below the poverty line, and families with young children who are illiterate or cannot read or write in English. There needs to be programs where parents can take their children to the library to be read to on a regular basis. This will be another way to ensure that children are being exposed to written text, new words and literacy at an early age.

In Connecticut, Governor Malloy signed Executive Order number 11 in October of 2011, which created the Early Childhood Office. This ~~office's~~ job of the members of this office was to create a comprehensive early childhood program that was aligned and coordinated with the Department of Education, Social Services, Developmental Services, Children and Family Services, Public Health Services, and the Office of Policy and Management in order to create an integrated early childhood program (Malloy, 2011). Policies, such as the one created by Governor Malloy, are needed to address and reduce the achievement gap in CT as well as improve overall student achievement. There needs to be more policies where there are coordinated efforts by all stakeholders in regards to how to best support children at the early stages of life and beyond. Congressman Himes, in 2009, began an initiative to fund early childhood education programs that were similar to successful programs like Bridgeport's Total

Learning Program. These are two instances where policy makers sought out proactive ways of ensuring that young children and families who needed support were receiving such support.

Although it is critical that there is some level of separation between politics and education reform, there will need to be a level of accountability for policy makers in regards to the education policies they enact. There is a need for a certain level of separation between education and politics in order to prevent education policy from changing each time there is a new politician in office. Education policy should be written in such a manner that it can be revised and improved and not simply change based on the political leaders that are in office. Another major consideration is that educators should lead the development of educational decisions and policies. Policy makers should have educators in the field (principals, assistant principals, superintendents, directors, etc.) who make education recommendations that will impact student learning. Education is a complex, multi-layered system that is very complicated even for those who live through it every day. Not being an educator and making education decisions adds to the complexity and nature of some of the current education issues and policies.

The current political landscape is what opponents of the CCSS use to state that these standards are not suitable for all children (Tienken & Olrich, 2013; Turnaimian, 2012). Researchers such as Tienken, Olrich and Tunaimian explain that our current major education policies were not created by educators but were instead created by politicians and education bureaucrats. Turnaimian (2012) stated that: “Worrisome is the lack of a research base for this nationalized approach to public education. A policy which may lead to one of the largest social experiments ever conducted on children. Where is the evidence to suggest it will be successful?” (p. 202). Those who are in favor of the CCSS view this differently. They feel that the CCSS was a collaboration of policy makers, legal councils, governors and educators. The level of collaboration of each agency is what comes into question.

Recommendations for Practice

The current study demonstrates that the overreliance on state standardized assessments as the sole measure of student achievement is not only flawed, but needs to be addressed. Policy makers and all stakeholders must revisit the findings from the Eight Year Study (Aikin, 1942) which showed that there should be multiple measures of student achievement and not just one. Using multiple measures of student achievement allows students to show what they are truly capable of doing in various settings. Standardized assessments play an important part in measuring student achievement, but that should not be the whole process. There should not be an *either-or* mentality in which it must be standardized assessments only or no standardized assessments at all (Brandt, 1992). The results of the current study showed that at the very minimum, the definition of student achievement should be revised to include factors beyond state assessments. There ought to be a balance of state standardized assessments and other measures like student's grades, teacher and administrator recommendations, formative assessments, summative assessments, and so forth. Student input especially at the late elementary and secondary levels will be very important as well.

Considering that out-of-school factors impact student performance in school, schools must proactively look for ways to battle some of the issues that their students are facing outside of school. The research shows that besides classroom teachers the most powerful in school force in improving student achievement is the school principal and his/her leadership team (Hawley, Rosenholtz, Goodstein, & Hasselbring, 1984; Nettles & Herrington, 2007). It would be up to the principal and his/her leadership team to determine what the appropriate program would be in order to best support the students within their buildings (Tomlinson & Allan, 2000). The principal should know, based on their population of students, what programs would work best for their students. Principals will need to get a better sense of their students, staff and communities before they can truly serve and support them. In certain communities there will be a need for more emphasis on reading and writing at earlier ages.

Education leaders must insist that they are part of the discussions regarding the direction of education. With educators in the discussions, policy makers will receive advice from actual practitioners and not just other policy makers or people who are not educators. Education leaders must also 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 teach them to read and write. Parents must also learn from the school how to instill the importance of an education to their children.

Fear as a Driving Force in Education Policy and Practice

Fear has always been used as a way to express the idea of a failing United States Education system. The events involving the Sputnik spacecraft for example, was when America was being told that we were being outsmarted by the Russians; the National Defense Education Act (NDEA) channeled billions of dollars into education due to failing schools, and A Nation at Risk (authors, year)?? shared that the United States had failing schools (DuBridge, 1958; Flemming, 1960; Gardner, Larsen, Baker, & Campbell, 1983). These were all different occasions when Americans were scared into believing that our education system was failing and that other education systems around the world were surpassing us academically and financially. In reality, when these education crises were occurring, they were not actually happening as they were presented.

We are again at a point in time where we are being told that our education system is failing, and we are being surpassed by other countries intellectually and soon financially. This has contributed to increased anxiety for many Americans who are now, as in the past, calling for a reevaluation of the effectiveness of our existing education methods. To address these concerns, the Common Core State Standards(CCSS) were adopted by almost every state in the country.

I believe there are major benefits to the CCSS, but I also believe that while the American education system is as strong as ever, there needs to be some improvements. I believe that even though we may be out performed by certain countries or big cities on certain international assessments, I want to state the fact that in the United States we test anyone who wants to be tested, while in other countries mainly the elite students are being tested (Tienken, 2011; Tienken, 2013; Tienken & Orlich, 2013). I also caution that more emphasis need to be placed on how states are using the CCSS to create their own curriculum. By doing this, there will not be a national curriculum because it takes the curiculum further away from the people utilizing it, which impacts the whole idea of a proximal curriculum. We have to remember that although we are lagging behind on some of these international assessments, the U.S. still leads the world in patents and new inventions, most of which can be attributed to our public school systems. Although we may not be doing as well as small cities (Shanghi, Hong Kong etc.) on international standardized aseessments like the TIMMS and PISA, our public schools are still strong and are still producing students who are inventors and who are responsible for the most patents in the world.

Overall Summary

Turnaimian (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, Turnaimian 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.

In this study there were 12 dependent variables and 15 independent variables. In the public elementary schools in Connecticut, out-of-school variables accounted for as much as 79% (2010 CMT 5 ELA) and as little as 61% (2010 CMT 4 Math) of the variance in students' performance on the state assessments. In the public middle schools in Connecticut, out-of-school variables accounted for as much as 78% of the variance in the 2010 CMT 8 Math and as little as 68% of the variance in the 2010 CMT 6 Math in regards to students' performance on the state assessments. Also these out-of-school variables predicted as much as 76% of the 2010 CMT 4 ELA and as little as 68% of the 2010 CMT 4 Math. These variables also predicted as much as 75% and as little as 70% of the 2010 CMT scores for the middle level grades. Findings from this research study contribute further support in the accumulating empirical evidence that out-of-school factors greatly affect how students' perform in school.

This study showed that the use of standardized assessments to measure student achievement is questionable, since there were outside variables that affected how students performed on those assessments. This study showed which combination of the 15 out-of-school variables accounted for the most amount of variance and predictive power in how students performed on the CMT state assessments. Student achievement is currently measured through State Standardized test scores, and the fact that community demographic data can potentially predict the scores is a major concern that needs to be studied further.

In Conclusion

The findings for this study were very telling to me. Prior to starting this study, I believed income level would be the main outside determinant in predicting student achievement. This research showed that a parent's education attainment actually trumped income level, as it appeared in 11 out of the 12 models. Percent of the population that is married with children under 18 appeared in 9 out of 12 models. Income level (% $35,000 or less) appeared in 7 out of 12 models and income level (% below poverty) appeared in 5 out of the 12 models. This research shows the importance of parents' education, and that it is critical to the success and achievement of their children. Also, this research shows the importance of developing new policies that support parents in obtaining their GED and help parents to improve their own reading and writing.

There is a strong need for GED classes and classes where parents improve their own reading and writing while preparing for the GED classes. The parents' influence on their children's learning as well as their understanding of education, would encourage students to learn about the importance of obtaining an education and reading. Parents or guardians learning about the importance of an education, as well as learning to read themselves so that they can read to their children, needs to be a critical piece of any plan that will be established. As education leaders we should be teaching parents the importance of reading to their children as well as the importance of an education. The more educated a citizenry, the better their children will perform on standardized test and therefore achieve academically.

Although the CMT is a good measure of a student's knowledge over time, it is also just one snap shot of a child and does not truly measure a student's achievement, instead it gives us some good diagnostic tools that we can use to access students. Teachers and school administrators also know their students, and a recommendation from them should also be considered and account as a measure of a student's achievement, rather than just standardized test scores.

Recommendation for Future Study

- Conduct a similar study to this research at the high school level that uses the 15 out-of-school variables to see which variables explain the most variance and makes the best predictions.
- Conduct a study that looks at the elementary, middle, and high school levels and see if there are certain out-of-school variables that are a strong predictor of students' test scores for all the grades.
- Conduct a study that looks at the data from this study, in order to see why certain school districts were not predicted, and why others did not appear to be affected by the out-of-school variables.

- Conduct a study to see what the predictive power or how much variance will be explained at the different poverty levels (below poverty, $35,000 or less and $25,000 or less).
- Utilize this study not just at the district level, but at the individual school level to see if there is consistency with the data in regards to the variables utilized and the school level data collected.
- Conduct a study that looks at the out-of-school factors that explained the most variance and had the strongest predictive power to see if there are ways or interventions that would address those variables.
- Conduct a study to determine more effective ways of improving students' skills in ELA and mathematics.
- Conduct a study that reviews our current public education system of evaluating student achievement through the use of standardized state assessments and compare it to other education systems that are using other means of measuring student achievement, similar to those discussed and utilized in the Eight Year Study (Aikin, 1942).
- Conduct a study that focuses on poverty and ways of battling poverty by providing opportunities for families in poverty to better support their children.
- Conduct a study of schools that are in poverty-stricken areas that are still able to show that their students are achieving academically as measured by state standardized assessments.
- 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 that helps policy makers gain a better understanding of the effects poverty has on children and ways of battling poverty.
- 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.
- Conducting a study that looks at how high quality schools are combating out-of-school variables such as poverty and parental education attainment.
- Conduct a study that looks at the achievement gap and how out-of-school factors are affecting the closing or widening of the achievement gap.
- Conduct a study that looks at student achievement and different ways of assessing student achievement and not just through standardized state assessments.
- Conduct a study that looks at the Smarter Balance Assessment and the Partnership for Assessment of Readiness for College and Careers to see if those assessments are also affected by out-of-school variables.

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Appendix A

Predictive Town/ District Score: 2010 CMT in Math and ELA

2010 CMT 3 Math (% No HS Diploma, % $35,000 or less, % Bachelor's Degree): Standard Error + or – 8.5

2010 CMT 3 ELA (% No HS Diploma, % Poverty, and % Married) Standard of Error + or – 8.2

2010 CMT third Grade Math and ELA

Town/ District	third Grade Math % at or above Goal	Predicted Math Scores	Difference in Prediction	third Grade ELA % at or above Goal	Predicted Math Scores	Difference in Prediction
Andover	88.2	73.2333	14.9667	91.2	67.5006	23.6994
Ansonia	55.9	50.9757	4.9243	47.6	49.0524	-1.4524
Ashford	65.9	72.2045	-6.3045	63.6	65.7126	-2.1126
Avon	80.4	80.1475	0.2525	83.1	74.2421	8.8579
Barkhamsted	74.5	78.549	-4.049	76.5	73.4971	3.0029
Berlin	72	68.1826	3.8174	66.9	64.1441	2.7559
Bethel	83.5	73.5755	9.9245	74	70.669	3.331
Bloomfield	43.1	68.1866	-25.0866	48.9	55.6868	-6.7868
Bolton	79.6	72.8468	6.7532	69.8	69.3174	0.4826
Bozrah	85	66.5307	18.4693	85	65.8187	19.1813
Branford	65.1	70.1264	-5.0264	58.3	61.3	-3
Bridgeport	27.3	31.6854	-4.3854	24.6	25.2003	-0.6003
Bristol	55.1	58.7674	-3.6674	45.5	54.7165	-9.2165
Brookfield	78	79.0931	-1.0931	74.2	73.6401	0.5599
Brooklyn	47.7	56.1341	-8.4341	54.1	49.8332	4.2668
Canterbury	66.1	64.9063	1.1937	70.2	61.7113	8.4887
Canton	74.8	78.0975	-3.2975	74.4	71.4395	2.9605
Cheshire	73.2	76.5408	-3.3408	70.4	74.3475	-3.9475
Chester	81.4	67.8391	13.5609	77.5	62.7594	14.7406
Clinton	61.2	68.9012	-7.7012	62.9	66.5115	-3.6115
Colchester	63.5	75.5642	-12.0642	64.8	75.028	-10.228
Columbia	57.1	73.9715	-16.8715	58.9	71.2712	-12.3712

Coventry	75.4	75.0188	0.3812	67.5	73.0525	-5.5525
Cromwell	63	73.0706	-10.0706	60.2	69.55	-9.35
Danbury	59.5	55.2047	4.2953	46.5	48.6598	-2.1598
Darien	83.1	86.1213	-3.0213	81.1	83.6121	-2.5121
Deep River	72.2	71.073	1.127	63	63.9755	-0.9755
Derby	61.8	51.9612	9.8388	44.6	45.5344	-0.9344
Eastford	68.2	72.3296	-4.1296	77.3	69.018	8.282
East Granby	73.2	75.9861	-2.7861	62.2	70.2553	-8.0553
East Haddam	76.5	71.3399	5.1601	80	69.5988	10.4012
East Hampton	76.6	75.9463	0.6537	65.5	71.6664	-6.1664
East Hartford	41.3	45.3678	-4.0678	29	36.0683	-7.0683
East Haven	45.9	56.8011	-10.9011	46	57.3828	-11.3828
East Lyme	73.9	67.8471	6.0529	67	65.4058	1.5942
Easton	84	83.1752	0.8248	74.6	82.1141	-7.5141
East Windsor	44.1	66.046	-21.946	45.2	62.241	-17.041
Ellington	69.5	73.8181	-4.3181	69.3	71.834	-2.534
Enfield	76.9	62.2595	14.6405	60	57.4929	2.5071
Essex	77.1	80.912	-3.812	81.4	72.4291	8.9709
Fairfield	80.5	79.6794	0.8206	76.2	74.7264	1.4736
Farmington	81.1	80.1441	0.9559	81.8	71.9352	9.8648
Franklin	83.3	71.0409	12.2591	87	69.4189	17.5811
Glastonbury	79.6	79.6323	-0.0323	74.8	75.4944	-0.6944
Granby	84.7	81.0403	3.6597	80.7	75.7497	4.9503
Greenwich	76.3	78.7611	-2.4611	76.2	74.9116	1.2884

Griswold	48.2	60.3267	-12.1267	49.3	59.6581	-10.3581
Groton	61.5	63.4125	-1.9125	55.1	60.6621	-5.5621
Guilford	81.5	78.3483	3.1517	70	74.039	-4.039
Hamden	59.9	67.6459	-7.7459	50	62.8447	-12.8447
Hartford	31.5	17.5339	13.9661	26.9	7.092	19.808
Hartland	85.7	76.3116	9.3884	90	73.6239	16.3761
Hebron	81.3	81.8081	-0.5081	79.7	82.2298	-2.5298
Kent	56.3	68.0933	-11.7933	62.5	62.9261	-0.4261
Killingly	46.9	50.8605	-3.9605	56.4	49.0392	7.3608
Lebanon	59.6	65.1864	-5.5864	52.1	64.5559	-12.4559
Ledyard	77.4	75.3379	2.0621	65.4	71.8962	-6.4962
Lisbon	51.9	63.2656	-11.3656	52.9	66.8821	-13.9821
Litchfield	87.2	71.1157	16.0843	70.5	66.7058	3.7942
Madison	91.1	81.4247	9.6753	84.9	76.6633	8.2367
Manchester	61.3	63.7351	-2.4351	51.9	58.3806	-6.4806
Mansfield	75.9	68.6506	7.2494	70.5	58.026	12.474
Marlborough	87.8	79.0689	8.7311	82.3	78.5781	3.7219
Meriden	50.2	46.1069	4.0931	36.7	41.1467	-4.4467
Middletown	60.4	62.1013	-1.7013	49.2	53.2773	-4.0773
Milford	69.1	70.5087	-1.4087	63.8	66.4251	-2.6251
Monroe	80.6	77.0544	3.5456	78.7	75.0788	3.6212
Montville	75.5	59.0759	16.4241	54.3	53.4728	0.8272
Naugatuck	56.7	59.6958	-2.9958	45	55.1198	-10.1198
New Britain	20.4	34.7717	-14.3717	20.5	26.8124	-6.3124

New Canaan	88.4	85.1308	3.2692	91	81.8196	9.1804
New Fairfield	74.1	79.326	-5.226	65.4	78.148	-12.748
New Hartford	94.2	72.6257	21.5743	84.9	69.6992	15.2008
New Haven	32.6	39.7311	-7.1311	24.9	30.3357	-5.4357
Newington	74.7	66.802	7.898	74.4	60.8174	13.5826
New London	32.7	45.6002	-12.9002	27.2	36.6178	-9.4178
New Milford	72.9	75.205	-2.305	72.6	69.7627	2.8373
Newtown	86.1	77.0532	9.0468	78.5	77.3326	1.1674
North Branford	62.4	69.8506	-7.4506	68.9	68.7474	0.1526
North Canaan	48.7	47.5965	1.1035	43.6	40.7183	2.8817
North Haven	74.8	68.5839	6.2161	64.4	67.1011	-2.7011
North Stonington	76.5	71.0146	5.4854	72	68.6853	3.3147
Norwalk	64	66.9525	-2.9525	51.4	56.2177	-4.8177
Norwich	48.6	51.2353	-2.6353	42.7	44.1416	-1.4416
Old Saybrook	78.4	72.1424	6.2576	81.8	66.1887	15.6113
Orange	86	75.334	10.666	80.9	72.9646	7.9354
Oxford	68.9	76.2303	-7.3303	67.8	75.3696	-7.5696
Plainfield	52	49.2313	2.7687	49.5	46.3702	3.1298
Plainville	66.5	62.2613	4.2387	63.7	54.5183	9.1817
Plymouth	60	64.9492	-4.9492	59.2	64.3658	-5.1658
Pomfret	77.6	71.362	6.238	81.6	70.8126	10.7874
Portland	64.1	75.7417	-11.6417	68.5	70.4522	-1.9522
Preston	63.4	61.2849	2.1151	48.8	53.6656	-4.8656
Putnam	51	53.5576	-2.5576	39.4	50.4274	-11.0274

Redding	88.8	85.7461	3.0539	76.1	75.3541	0.7459
Ridgefield	81.7	86.8878	-5.1878	79.9	82.9661	-3.0661
Rocky Hill	75.4	71.73	3.67	69.7	64.8715	4.8285
Salem	72.5	77.3106	-4.8106	74.5	74.4176	0.0824
Salisbury	92	71.4022	20.5978	88	63.5611	24.4389
Seymour	69.3	67.4934	1.8066	58	68.0206	-10.0206
Shelton	68	69.7276	-1.7276	67.1	65.4436	1.6564
Sherman	79.2	84.0053	-4.8053	80.9	75.947	4.953
Simsbury	85.6	83.9593	1.6407	79.5	78.6199	0.8801
Somers	62.7	67.2652	-4.5652	56.5	66.7262	-10.2262
Southington	86.5	70.19	16.31	70.1	66.7767	3.3233
South Windsor	63.6	76.8031	-13.2031	58.8	72.0518	-13.2518
Sprague	62.2	67.6473	-5.4473	47.2	55.0525	-7.8525
Stafford	52.8	61.3236	-8.5236	60.5	64.1442	-3.6442
Stamford	55.8	61.4084	-5.6084	50.2	53.2772	-3.0772
Sterling	67.5	54.5318	12.9682	66.7	53.9843	12.7157
Stonington	73.9	71.9621	1.9379	69.9	64.9655	4.9345
Stratford	60.8	62.9895	-2.1895	53.8	59.654	-5.854
Suffield	74.7	73.8146	0.8854	71.4	69.1793	2.2207
Thomaston	58.7	69.3341	-10.6341	58.7	65.5384	-6.8384
Thompson	59.2	57.7551	1.4449	60.8	57.726	3.074
Tolland	80.8	76.6828	4.1172	73.2	77.5944	-4.3944
Torrington	59.4	54.0233	5.3767	54.3	49.0339	5.2661
Trumbull	86.1	77.2447	8.8553	72.9	75.0534	-2.1534

Vernon	59.8	63.8141	-4.0141	46.5	52.6318	-6.1318
Voluntown	56.7	65.1718	-8.4718	73.3	61.9738	11.3262
Wallingford	70.7	68.0313	2.6687	62.9	63.3516	-0.4516
Waterbury	44.3	37.6394	6.6606	32.9	31.663	1.237
Waterford	72.1	70.1296	1.9704	64.7	66.5844	-1.8844
Watertown	58.7	69.3186	-10.6186	61.1	68.4446	-7.3446
Westbrook	77.8	62.6303	15.1697	74.6	64.7575	9.8425
West Hartford	75.6	74.1686	1.4314	70.9	68.1352	2.7648
West Haven	47.5	55.6887	-8.1887	52.2	52.9133	-0.7133
Weston	81.3	90.2442	-8.9442	75.6	88.2844	-12.6844
Westport	85.3	85.463	-0.163	76.3	79.8628	-3.5628
Wethersfield	65.1	68.2823	-3.1823	63.1	61.042	2.058
Willington	66	68.6593	-2.6593	68.1	63.9863	4.1137
Wilton	84.9	87.3912	-2.4912	89.4	83.6026	5.7974
Winchester	57	58.8034	-1.8034	52.3	58.0686	-5.7686
Windham	39	37.0884	1.9116	27.3	26.3712	0.9288
Windsor	53.6	71.4649	-17.8649	52.4	66.423	-14.023
Windsor Locks	75.4	61.0599	14.3401	50	56.9978	-6.9978
Wolcott	68.8	69.4834	-0.6834	66	70.1575	-4.1575
Woodbridge	81.4	78.4741	2.9259	78.2	76.2117	1.9883
Woodstock	79.2	74.3508	4.8492	70.1	70.7949	-0.6949

Appendix B

Predictive Town/ District Score: 2010 CMT in Math and ELA

2010 CMT 4 Math (% No HS Diploma, % $35,000 or less, % Advanced Degree): Standard Error + or – 9.9

2010 CMT 4 ELA (% $35,000 or less, % Advanced Degree) Standard of Error + or – 8.8

2010 CMT 4th Grade Math and ELA

Town/ District	4th Grade Math % at or above Goal	Predicted Math Scores	Difference in Predicition	4th Grade ELA % at or above Goal	Predicted ELA Scores	Difference in Prediction
Andover	70.7	75.9543	-5.2543	73.2	70.939	2.261
Ansonia	66.2	53.3463	12.8537	41	43.932	-2.932
Ashford	58.3	68.3391	-10.0391	56.3	67.2258	-10.9258
Avon	91	85.5765	5.4235	84.4	80.7406	3.6594
Barkhamsted	68.6	74.7858	-6.1858	68	72.8772	-4.8772
Berlin	84.2	67.3908	16.8092	76.1	63.1788	12.9212
Bethel	82.6	72.1143	10.4857	74.5	69.0992	5.4008
Bloomfield	53.4	69.813	-16.413	46.9	67.643	-20.743
Bolton	81	73.0287	7.9713	72.4	73.025	-0.625
Bozrah	75	65.1492	9.8508	67.9	61.2662	6.6338
Branford	81.9	68.9508	12.9492	70.4	66.37	4.03
Bridgeport	32.6	35.1093	-2.5093	26.1	29.8836	-3.7836
Bristol	64.5	58.3134	6.1866	55.9	53.4752	2.4248
Brookfield	82	79.8345	2.1655	77.6	74.5204	3.0796
Brooklyn	72.6	57.7263	14.8737	59.5	56.1238	3.3762
Canterbury	61.7	67.2477	-5.5477	65.9	66.5722	-0.6722
Canton	89.8	74.8161	14.9839	89.1	70.5792	18.5208
Cheshire	82.9	80.0154	2.8846	78.4	78.2728	0.1272
Chester	69.2	68.313	0.887	64.1	69.9378	-5.8378
Clinton	64.6	65.5605	-0.9605	66.7	63.4254	3.2746

Colchester	80.3	70.2351	10.0649	62.8	70.919	-8.119
Columbia	81.2	71.7282	9.4718	75.4	74.1554	1.2446
Coventry	77.5	71.8809	5.6191	64.7	71.7086	-7.0086
Cromwell	81.4	73.3359	8.0641	78.8	70.3974	8.4026
Danbury	73.2	58.7622	14.4378	53.6	56.6072	-3.0072
Darien	90.5	100.215	-9.715	84.3	83.977	0.323
Deep River	83.6	74.3232	9.2768	76.4	71.2858	5.1142
Derby	34.4	49.9131	-15.5131	44.1	46.8188	-2.7188
Eastford	34.4	70.5819	-36.1819	44.1	69.4432	-25.3432
East Granby	78.7	74.5845	4.1155	73.3	70.9404	2.3596
East Haddam	60.2	68.1867	-7.9867	63.5	66.046	-2.546
East Hampton	72.4	77.5299	-5.1299	69.3	74.7208	-5.4208
East Hartford	36.5	45.9852	-9.4852	32	39.8328	-7.8328
East Haven	58.5	56.943	1.557	47.5	51.4298	-3.9298
East Lyme	88.1	71.6487	16.4513	82.4	70.6482	11.7518
Easton	87.6	95.3784	-7.7784	80.8	89.194	-8.394
East Windsor	65.1	65.022	0.078	54.7	60.2682	-5.5682
Ellington	77.8	71.1684	6.6316	76.5	69.2134	7.2866
Enfield	72.9	62.2824	10.6176	58.8	58.3356	0.4644
Essex	86.8	82.0386	4.7614	89	73.3928	15.6072
Fairfield	83.7	87.0999	-3.3999	78.7	77.9484	0.7516
Farmington	90.9	81.2058	9.6942	87.3	79.5766	7.7234
Franklin	93.1	71.1783	21.9217	79.3	69.3294	9.9706
Glastonbury	84.4	80.8473	3.5527	79.6	78.8406	0.7594

Granby	93.9	83.3004	10.5996	84.7	81.5078	3.1922
Greenwich	80.5	91.0284	-10.5284	77.7	78.9152	-1.2152
Griswold	58.5	60.9483	-2.4483	56.2	56.7638	-0.5638
Groton	62.1	60.0093	2.0907	55.9	56.438	-0.538
Guilford	81.8	80.0628	1.7372	77.4	79.1226	-1.7226
Hamden	58.1	65.2572	-7.1572	54.6	65.0886	-10.4886
Hartford	28.3	19.8075	8.4925	20.3	12.6296	7.6704
Hartland	28.3	72.3696	-44.0696	20.3	70.9996	-50.6996
Hebron	74.1	79.7421	-5.6421	80	77.0762	2.9238
Kent	70.4	68.7123	1.6877	75	63.4492	11.5508
Killingly	52.4	51.978	0.422	57.8	46.9768	10.8232
Lebanon	75.3	62.4906	12.8094	64.5	62.6022	1.8978
Ledyard	84.8	76.0965	8.7035	80.1	74.7166	5.3834
Lisbon	69.6	64.4442	5.1558	66.7	59.101	7.599
Litchfield	77	69.6774	7.3226	75.9	66.0092	9.8908
Madison	90.1	81.8205	8.2795	83	79.0676	3.9324
Manchester	62.6	59.6031	2.9969	54.4	56.796	-2.396
Mansfield	83.8	71.1237	12.6763	81.5	80.2698	1.2302
Marlborough	84.4	79.011	5.389	85.3	76.019	9.281
Meriden	55.6	47.0709	8.5291	41.6	42.597	-0.997
Middletown	63.2	63.0867	0.1133	58.2	56.3872	1.8128
Milford	73.4	70.7913	2.6087	64.5	67.698	-3.198
Monroe	88.9	81.4224	7.4776	79.4	74.264	5.136
Montville	69.9	65.1708	4.7292	60.5	62.3686	-1.8686

Naugatuck	57.7	59.7219	-2.0219	47.1	56.6412	-9.5412
New Britain	27.3	35.6658	-8.3658	21.8	30.8914	-9.0914
New Canaan	92.7	100.7346	-8.0346	89.9	85.147	4.753
New Fairfield	76.6	77.9052	-1.3052	57.9	71.8326	-13.9326
New Hartford	80.2	69.7626	10.4374	74.4	66.0544	8.3456
New Haven	40.8	36.927	3.873	30.2	34.8238	-4.6238
Newington	76.8	64.4097	12.3903	67	63.1028	3.8972
New London	28.2	44.3151	-16.1151	21.4	39.9764	-18.5764
New Milford	63.4	74.4075	-11.0075	69	68.5454	0.4546
Newtown	89.7	80.2644	9.4356	79.8	73.1686	6.6314
North Branford	69.9	68.2719	1.6281	53.9	67.4584	-13.5584
North Canaan	61.3	47.9808	13.3192	53.3	41.3566	11.9434
North Haven	74.4	68.2758	6.1242	68.9	66.8226	2.0774
North Stonington	74.6	69.6729	4.9271	76.3	69.4922	6.8078
Norwalk	62.3	68.8011	-6.5011	53.6	63.472	-9.872
Norwich	43	50.8152	-7.8152	40.9	45.6968	-4.7968
Old Saybrook	79	68.4063	10.5937	69.7	68.132	1.568
Orange	89.5	80.3145	9.1855	78.7	78.491	0.209
Oxford	77.8	80.1054	-2.3054	74.9	73.6552	1.2448
Plainfield	66.7	52.7082	13.9918	52.8	48.1272	4.6728
Plainville	77.2	62.0298	15.1702	72	55.9098	16.0902
Plymouth	55.4	64.0089	-8.6089	54.7	60.4304	-5.7304
Pomfret	73.2	71.8473	1.3527	67.9	74.7092	-6.8092
Portland	72.2	75.843	-3.643	71.9	71.0164	0.8836

Preston	55.3	66.8781	-11.5781	51.1	63.8556	-12.7556
Putnam	45.1	51.4944	-6.3944	33.7	44.4028	-10.7028
Redding	87.7	90.6516	-2.9516	82.9	82.937	-0.037
Ridgefield	93.9	95.2839	-1.3839	82.6	84.4156	-1.8156
Rocky Hill	83.8	69.6642	14.1358	74.3	69.2838	5.0162
Salem	80.3	79.9506	0.3494	75.8	79.0228	-3.2228
Salisbury	85.3	71.007	14.293	81.8	69.1436	12.6564
Seymour	75.3	65.7672	9.5328	63	61.0942	1.9058
Shelton	73.8	72.9348	0.8652	74.1	68.207	5.893
Sherman	90.7	81.2331	9.4669	79.6	75.2084	4.3916
Simsbury	91.1	84.5877	6.5123	85.5	81.1144	4.3856
Somers	73.9	74.4885	-0.5885	68.7	71.6536	-2.9536
Southington	87.8	69.4557	18.3443	74.9	66.2054	8.6946
South Windsor	83.8	74.8293	8.9707	72.6	74.0258	-1.4258
Sprague	63	65.7516	-2.7516	73.1	64.0686	9.0314
Stafford	75.9	57.9957	17.9043	60.4	54.6508	5.7492
Stamford	60.9	65.9004	-5.0004	51.1	61.0458	-9.9458
Sterling	65.2	54.9666	10.2334	52.2	48.2386	3.9614
Stonington	71.5	70.7343	0.7657	65	67.9008	-2.9008
Stratford	68.5	64.5183	3.9817	61.6	60.9926	0.6074
Suffield	83.2	78.8862	4.3138	75.5	74.4644	1.0356
Thomaston	69.4	69.8727	-0.4727	71.8	67.1656	4.6344
Thompson	75	58.6254	16.3746	64.5	55.4586	9.0414
Tolland	78.3	75.7932	2.5068	76.5	74.4528	2.0472

Torrington	66.1	53.1852	12.9148	60.3	47.0896	13.2104
Trumbull	89.4	80.6907	8.7093	79.1	76.804	2.296
Vernon	58.1	60.9228	-2.8228	47.9	58.833	-10.933
Voluntown	80.8	68.6823	12.1177	76	68.881	7.119
Wallingford	78.3	66.9705	11.3295	67.1	63.5708	3.5292
Waterbury	51.1	37.1034	13.9966	34.6	30.4164	4.1836
Waterford	75.5	71.2095	4.2905	73.9	70.568	3.332
Watertown	65.1	68.4204	-3.3204	61.8	65.2088	-3.4088
Westbrook	77.7	59.163	18.537	74.5	55.2382	19.2618
West Hartford	77.5	74.3616	3.1384	68.6	75.635	-7.035
West Haven	46.9	53.046	-6.146	44.8	47.5744	-2.7744
Weston	91.9	104.3247	-12.4247	81.5	88.4906	-6.9906
Westport	90.3	96.1689	-5.8689	81.4	85.2048	-3.8048
Wethersfield	73.7	68.1888	5.5112	65.1	65.9388	-0.8388
Willington	50	67.428	-17.428	52.6	65.6498	-13.0498
Wilton	90.3	98.7705	-8.4705	87.2	85.4714	1.7286
Winchester	48.9	60.3312	-11.4312	43.6	57.229	-13.629
Windham	39.5	37.563	1.937	32.4	32.4222	-0.0222
Windsor	67.6	69.8808	-2.2808	62.1	68.6228	-6.5228
Windsor Locks	60.2	59.6916	0.5084	54.7	54.3562	0.3438
Wolcott	85.9	71.6265	14.2735	71.4	67.0034	4.3966
Woodbridge	87	91.0734	-4.0734	83.7	89.6928	-5.9928
Woodstock	66	73.254	-7.254	73.2	71.841	1.359

Appendix C

Predictive Town/ District Score: 2010 CMT in Math and ELA

2010 CMT 5 Math (% No HS Diploma, % $35,000 or less, % Married): Standard Error + or – 7.4

2010 CMT 5 ELA (% No HS Diploma, % Below Poverty, % Married, % Advanced Degree) Standard of Error + or – 7.3

2010 CMT 5th Grade Math and ELA

Town/ District	5^{6h} Grade Math % at or above Goal	Predicted Math Scores	Difference in Predicition	Grade ELA % at or above Goal	Predicted ELA Scores	Difference in Prediction
Andover	83	82.1649	0.8351	78.7	71.3146	7.3854
Ansonia	71.1	61.1511	9.9489	42	51.135	-9.135
Ashford	73.3	78.5157	-5.2157	70.5	70.093	0.407
Avon	92	87.5475	4.4525	89	80.4739	8.5261
Barkhamsted	87	86.6574	0.3426	85.2	77.011	8.189
Berlin	87.7	77.574	10.126	75.9	66.9571	8.9429
Bethel	87.9	83.3715	4.5285	81.5	73.4829	8.0171
Bloomfield	57.2	71.4444	-14.2444	33.8	62.7575	-28.9575
Bolton	94.7	81.6948	13.0052	86	74.4186	11.5814
Bozrah	73.3	77.8383	-4.5383	67.9	67.4942	0.4058
Branford	79.5	74.9922	4.5078	68	67.1663	0.8337
Bridgeport	40.2	39.8106	0.3894	24.7	29.1918	-4.4918
Bristol	74.6	68.1372	6.4628	59.2	56.5737	2.6263
Brookfield	87.6	86.3913	1.2087	79.7	78.099	1.601
Brooklyn	56.6	65.9949	-9.3949	52.5	51.9614	0.5386
Canterbury	68.5	74.8851	-6.3851	63	65.2766	-2.2766
Canton	84	83.6109	0.3891	85.7	77.6482	8.0518
Cheshire	88.5	86.7258	1.7742	84.7	79.3964	5.3036
Chester	88.1	75.5979	12.5021	73.8	67.8077	5.9923
Clinton	78.1	77.9244	0.1756	77.2	70.2585	6.9415
Colchester	77.8	86.4126	-8.6126	71.4	78.3232	-6.9232

Columbia	87.7	85.2561	2.4439	70.3	74.4463	-4.1463
Coventry	83.4	86.3484	-2.9484	73.8	75.7666	-1.9666
Cromwell	73.9	81.117	-7.217	67.9	74.2765	-6.3765
Danbury	77	62.7921	14.2079	53.4	53.6347	-0.2347
Darien	92.6	94.9305	-2.3305	90	88.7773	1.2227
Deep River	72.1	77.7582	-5.6582	65.1	69.5471	-4.4471
Derby	39.8	61.2054	-21.4054	43.5	46.0077	-2.5077
Eastford	87	82.1772	4.8228	78.3	72.6498	5.6502
East Granby	80	83.9313	-3.9313	63.1	75.1406	-12.0406
East Haddam	85.3	82.3311	2.9689	68.6	72.0021	-3.4021
East Hampton	85.4	85.6071	-0.2071	73.9	75.1127	-1.2127
East Hartford	45.6	53.2212	-7.6212	30.6	37.7325	-7.1325
East Haven	65.7	67.5381	-1.8381	60	58.6548	1.3452
East Lyme	86.1	77.6229	8.4771	78.4	70.7662	7.6338
Easton	90.4	93.7188	-3.3188	84.2	88.4047	-4.2047
East Windsor	63.5	75.1296	-11.6296	52.1	64.4174	-12.3174
Ellington	87	84.1749	2.8251	78.7	75.638	3.062
Enfield	78.1	71.3925	6.7075	59.2	59.7562	-0.5562
Essex	81	84.7608	-3.7608	83.3	78.3937	4.9063
Fairfield	86	86.9982	-0.9982	77.6	80.6171	-3.0171
Farmington	90.3	86.0031	4.2969	84.5	77.9994	6.5006
Franklin	90.5	82.9509	7.5491	71.4	71.6661	-0.2661
Glastonbury	89.5	87.8451	1.6549	77.6	81.0803	-3.4803
Granby	86.3	88.5879	-2.2879	82.6	81.6453	0.9547

Greenwich	86.8	86.2353	0.5647	79.9	80.9632	-1.0632
Griswold	69.5	71.5617	-2.0617	64.7	61.2652	3.4348
Groton	77.1	72.5889	4.5111	61.8	64.169	-2.369
Guilford	87	86.8749	0.1251	79.9	79.021	0.879
Hamden	66.4	74.7195	-8.3195	56.5	68.1403	-11.6403
Hartford	33.4	23.5857	9.8143	18	11.0996	6.9004
Hartland	95.7	85.3542	10.3458	87	77.5907	9.4093
Hebron	92.7	94.1091	-1.4091	85	85.3897	-0.3897
Kent	62.1	73.9101	-11.8101	86.2	68.746	17.454
Killingly	71.7	61.0011	10.6989	64	51.5455	12.4545
Lebanon	80.6	73.6866	6.9134	80.6	70.6027	9.9973
Ledyard	84.4	86.0121	-1.6121	66.9	74.9449	-8.0449
Lisbon	79.6	76.5222	3.0778	74.1	66.6221	7.4779
Litchfield	80.2	79.1001	1.0999	74.4	72.1801	2.2199
Madison	90.7	87.9867	2.7133	81.7	83.7656	-2.0656
Manchester	71.2	70.4415	0.7585	59	63.0906	-4.0906
Mansfield	81.5	75.8046	5.6954	66.9	65.0875	1.8125
Marlborough	87.9	89.9685	-2.0685	82.2	81.8806	0.3194
Meriden	59.5	55.4457	4.0543	44.8	44.1388	0.6612
Middletown	70.1	68.3061	1.7939	59	56.6393	2.3607
Milford	75.4	78.7173	-3.3173	66.1	70.9528	-4.8528
Monroe	88.8	86.8578	1.9422	78	79.3431	-1.3431
Montville	67.2	69.2913	-2.0913	61.3	56.1182	5.1818
Naugatuck	54.2	69.7596	-15.5596	46.5	57.599	-11.099

New Britain	34.3	41.8773	-7.5773	25.6	30.2019	-4.6019
New Canaan	91.9	92.3706	-0.4706	91.9	89.0677	2.8323
New Fairfield	84.5	89.1006	-4.6006	68.3	81.9942	-13.6942
New Hartford	94.7	81.0657	13.6343	84	74.4079	9.5921
New Haven	43.7	46.1103	-2.4103	30.8	33.5048	-2.7048
Newington	77.6	74.0916	3.5084	64.4	65.5509	-1.1509
New London	51.9	52.38	-0.48	36.6	39.4293	-2.8293
New Milford	66.2	83.2458	-17.0458	66.3	72.762	-6.462
Newtown	89.9	87.8526	2.0474	86.9	81.5594	5.3406
North Branford	82.9	79.5552	3.3448	59.7	72.1596	-12.4596
North Canaan	60	56.7663	3.2337	58.8	42.6051	16.1949
North Haven	79.3	78.3399	0.9601	72.6	70.463	2.137
North Stonington	80.6	80.9736	-0.3736	80	71.5565	8.4435
Norwalk	68.1	71.0079	-2.9079	54.8	61.952	-7.152
Norwich	53.8	59.7699	-5.9699	44.1	46.3744	-2.2744
Old Saybrook	88.2	79.011	9.189	72	71.8685	0.1315
Orange	91.6	84.234	7.366	83.1	79.5924	3.5076
Oxford	80.1	87.7869	-7.6869	67.4	77.7151	-10.3151
Plainfield	75.8	61.5423	14.2577	55.8	46.702	9.098
Plainville	78.6	70.4793	8.1207	73.7	56.3139	17.3861
Plymouth	68.9	76.9188	-8.0188	59.4	66.8835	-7.4835
Pomfret	68.9	84.2148	-15.3148	69.4	73.1519	-3.7519
Portland	87.8	84.7461	3.0539	81.7	72.9195	8.7805
Preston	72.7	72.0285	0.6715	63.6	56.258	7.342

Putnam	48.1	63.8142	-15.7142	41.8	51.4919	-9.6919
Redding	93.5	89.2329	4.2671	83.6	81.8906	1.7094
Ridgefield	93.8	94.2696	-0.4696	85.9	88.9898	-3.0898
Rocky Hill	80.4	78.591	1.809	66.3	69.5607	-3.2607
Salem	92.3	87.7848	4.5152	84.6	79.083	5.517
Salisbury	80.4	74.5266	5.8734	80.4	71.2996	9.1004
Seymour	83.2	78.3216	4.8784	64.9	70.2742	-5.3742
Shelton	80.4	78.7998	1.6002	73.6	69.1354	4.4646
Sherman	79.6	88.4067	-8.8067	77.1	82.0745	-4.9745
Simsbury	89.3	90.5067	-1.2067	85.4	85.7554	-0.3554
Somers	76.6	81.045	-4.445	64.9	69.6448	-4.7448
Southington	91.3	79.3716	11.9284	72.8	70.2047	2.5953
South Windsor	85	84.9975	0.0025	74.4	76.9522	-2.5522
Sprague	70.3	73.7529	-3.4529	51.4	57.7139	-6.3139
Stafford	81.3	73.0578	8.2422	70.4	66.102	4.298
Stamford	72.1	67.3722	4.7278	55.6	59.1588	-3.5588
Sterling	72.3	69.7218	2.5782	46.8	50.6003	-3.8003
Stonington	78.5	78.5877	-0.0877	68.8	68.8977	-0.0977
Stratford	68.5	71.8713	-3.3713	61.8	63.991	-2.191
Suffield	83.4	82.9428	0.4572	73.6	74.6754	-1.0754
Thomaston	81	79.0095	1.9905	68.3	68.9172	-0.6172
Thompson	59.1	68.4645	-9.3645	53.3	60.4229	-7.1229
Tolland	89.2	88.2552	0.9448	82.8	81.6385	1.1615
Torrington	73.2	63.0627	10.1373	65.8	50.683	15.117

Trumbull	94.1	87.0213	7.0787	84.8	79.6214	5.1786
Vernon	74	70.1793	3.8207	55.9	55.7703	0.1297
Voluntown	73.3	76.2552	-2.9552	80	66.4795	13.5205
Wallingford	76.5	76.5075	-0.0075	68.9	66.7251	2.1749
Waterbury	61.8	46.173	15.627	39.3	33.5621	5.7379
Waterford	78.1	79.1928	-1.0928	72.7	70.8563	1.8437
Watertown	67.1	79.1652	-12.0652	60.1	72.7244	-12.6244
Westbrook	70.7	71.7069	-1.0069	68	69.7345	-1.7345
West Hartford	85.6	80.6664	4.9336	76	74.8073	1.1927
West Haven	58.1	65.2161	-7.1161	44.8	54.127	-7.427
Weston	92.3	98.9004	-6.6004	81.5	94.0016	-7.5016
Westport	94.9	92.226	2.674	81.4	86.5567	3.6433
Wethersfield	79.3	74.1087	5.1913	65.1	66.6698	0.0302
Willington	87.3	76.0203	11.2797	52.6	69.8589	-16.1589
Wilton	94.1	94.8426	-0.7426	87.2	90.1528	-3.2528
Winchester	53.3	70.1808	-16.8808	43.6	61.3515	-3.6515
Windham	22.7	45.2652	-22.5652	32.4	26.8187	-4.8187
Windsor	64.7	79.7811	-15.0811	62.1	70.7875	-15.8875
Windsor Locks	73.8	70.9575	2.8425	54.7	58.0047	-4.9047
Wolcott	90.4	82.356	8.044	71.4	71.7244	5.0756
Woodbridge	92	88.6533	3.3467	83.7	83.6044	6.1956
Woodstock	72.9	83.9352	-11.0352	73.2	74.089	2.111

Appendix D

Predictive Town/ District Score: 2010 CMT in Math and ELA

2010 CMT 6 Math (% No HS Diploma, % Below Poverty, % Married): Standard Error: + or – 9

2010 CMT 6 ELA (% $35,000 or less, % Married, % No HS Diploma) Standard of Error: + or – 7

2010 CMT 6th Grade Math and ELA

Town/ District	6th Grade Math % at or above Goal	Predicted Math Scores	Difference in Prediction	6th Grade ELA % at or above Goal	Predicted ELA Scores	Difference in Prediction
Ansonia	75.9	61.7764	14.1236	64.5	63.9255	0.5745
Avon	93.5	84.6825	8.8175	96.4	87.888	8.512
Berlin	86.1	75.1455	10.9545	88.1	79.0545	9.0455
Bethel	89.2	82.3775	6.8225	86.4	84.8923	1.5077
Bloomfield	74.8	66.0951	8.7049	70.2	75.1414	-4.9414
Bozrah	66.7	76.7082	-10.0082	61.9	79.4184	-17.5184
Branford	78.8	71.0213	7.7787	80.2	76.6218	3.5782
Bridgeport	50	41.6494	8.3506	49.2	46.7671	2.4329
Bristol	64.3	66.6833	-2.3833	67.5	71.1301	-3.6301
Brookfield	93.6	84.4972	9.1028	89.8	87.2562	2.5438
Brooklyn	61.4	63.1206	-1.7206	76.2	70.8055	5.3945
Canton	87.3	81.9546	5.3454	89.7	84.4152	5.2848
Cheshire	89.3	87.2452	2.0548	90	89.2423	0.7577
Clinton	65	77.5891	-12.5891	83.1	78.9313	4.1687
Colchester	82.4	86.4914	-4.0914	88.4	87.2234	1.1766
Columbia	76.4	82.1379	-5.7379	61.8	86.7481	-24.9481
Coventry	86	84.6116	1.3884	84.3	88.2441	-3.9441
Cromwell	78.8	80.6585	-1.8585	81.8	82.8636	-1.0636
Danbury	67	63.6299	3.3701	68.6	68.8225	-0.2225
Darien	94.9	95.9785	-1.0785	93.1	94.5762	-1.4762
Derby	51	56.8301	-5.8301	61.6	63.9318	-2.3318

East Granby	89.3	82.7612	6.5388	90.5	86.9194	3.5806
East Haddam	75	80.0179	-5.0179	81.6	82.9477	-1.3477
East Hampton	85	82.8979	2.1021	86	87.7397	-1.7397
East Hartford	44.4	48.8073	-4.4073	47.2	57.6155	-10.4155
East Haven	67	69.5404	-2.5404	74.4	69.8679	4.5321
East Lyme	81	77.4446	3.5554	82.1	80.4921	1.6079
East Windsor	77.8	73.9024	3.8976	80.9	77.6962	3.2038
Ellington	87.4	83.1756	4.2244	92.5	85.3579	7.1421
Enfield	84.9	69.433	15.467	82.8	74.7106	8.0894
Fairfield	85.4	86.6473	-1.2473	89	88.3078	0.6922
Farmington	90.3	82.4074	7.8926	92.9	87.6409	5.2591
Glastonbury	89.5	86.3929	3.1071	90.9	88.3519	2.5481
Granby	95.3	86.7331	8.5669	94.1	90.1636	3.9364
Greenwich	83.3	86.6072	-3.3072	88.7	87.1133	1.5867
Griswold	67.4	70.9838	-3.5838	74	73.76	0.24
Groton	60.1	71.9206	-11.8206	74.8	73.8906	0.9094
Guilford	89.3	84.6276	4.6724	91.4	87.8121	3.5879
Hamden	65.2	73.5665	-8.3665	73.6	76.285	-2.685
Hartford	41.6	23.0488	18.5512	45.3	30.2177	15.0823
Killingly	75.4	62.9959	12.4041	74	65.1113	8.8887
Ledyard	89.1	82.8589	6.2411	87.4	88.0147	-0.6147
Litchfield	85.1	77.7849	7.3151	90.1	80.3557	9.7443
Madison	94.6	88.1408	6.4592	90.9	88.8384	2.0616
Manchester	60.9	69.259	-8.359	70.7	72.0469	-1.3469

Meriden	50.6	54.9108	-4.3108	56	59.8606	-3.8606
Middletown	64.9	63.5179	1.3821	68.4	70.336	-1.936
Milford	77.3	77.8072	-0.5072	82.6	80.7888	1.8112
Monroe	88.1	87.6987	0.4013	88.3	88.7886	-0.4886
Montville	66.4	67.2132	-0.8132	77.1	75.3203	1.7797
Naugatuck	55.3	67.7514	-12.4514	66.2	73.4508	-7.2508
New Britain	28.6	41.1597	-12.5597	31.8	47.2837	-15.4837
New Canaan	92.3	94.5799	-2.2799	94.9	93.06	1.84
New Fairfield	85.7	90.4574	-4.7574	87.3	90.3106	-3.0106
New Haven	49.5	42.2092	7.2908	55.9	48.7734	7.1266
Newington	74.4	72.5439	1.8561	82.3	77.1378	5.1622
New London	28.8	48.2705	-19.4705	52.4	55.7662	-3.3662
New Milford	77.9	80.9132	-3.0132	88.7	85.0385	3.6615
Newtown	93.8	90.5024	3.2976	94.3	89.0636	5.2364
North Branford	74.3	80.2858	-5.9858	67.9	81.3904	-13.4904
North Haven	73.6	79.3346	-5.7346	76.7	80.5564	-3.8564
North Stonington	74.1	79.4119	-5.3119	65.5	81.7747	-16.2747
Norwalk	53.3	67.9526	-14.6526	66	74.7068	-8.7068
Norwich	43	55.9386	-12.9386	57.1	63.0443	-5.9443
Old Saybrook	66.7	75.4615	-8.7615	89.6	79.6041	9.9959
Oxford	71.4	87.8281	-16.4281	88.5	89.8219	-1.3219
Plainfield	68.9	60.7082	8.1918	75	66.7557	8.2443
Plainville	77.6	65.5377	12.0623	79.1	73.7616	5.3384
Plymouth	72.2	76.8027	-4.6027	69.2	79.7082	-10.5082

Pomfret	77.6	82.1557	-4.5557	96	85.7078	10.2922
Portland	95.7	81.5979	14.1021	92.2	86.5685	5.6315
Preston	93.8	65.525	28.275	85.4	76.5637	8.8363
Putnam	72.7	61.3943	11.3057	70.1	65.2404	4.8596
Ridgefield	90.8	94.5414	-3.7414	89.9	94.4067	-4.5067
Rocky Hill	85.1	76.6295	8.4705	92	81.2999	10.7001
Salem	95	85.6332	9.3668	88.3	89.707	-1.407
Seymour	75.1	79.5554	-4.4554	73.4	79.7998	-6.3998
Shelton	75.7	77.4782	-1.7782	85.6	81.787	3.813
Sherman	91.5	86.7483	4.7517	84.8	89.1707	-4.3707
Simsbury	93.6	90.0098	3.5902	96.6	91.267	5.333
Somers	81.5	81.708	-0.208	79.7	86.0094	-6.3094
Southington	88.8	78.5179	10.2821	81.1	81.7533	-0.6533
South Windsor	88.6	83.883	4.717	93	87.1555	5.8445
Sprague	70	65.5751	4.4249	93.1	77.7158	15.3842
Stafford	82	75.9112	6.0888	81.8	74.3982	7.4018
Stamford	62.9	66.7248	-3.8248	69.7	71.5178	-1.8178
Sterling	59	67.1397	-8.1397	72.4	72.5019	-0.1019
Stonington	64.4	74.7273	-10.3273	76.4	79.5038	-3.1038
Stratford	71.9	72.4392	-0.5392	76.7	75.4535	1.2465
Suffield	92.6	82.3542	10.2458	86.6	87.1027	-0.5027
Thomaston	68.9	77.909	-9.009	79.8	82.8495	-3.0495
Thompson	46.6	71.5705	-24.9705	65	72.6309	-7.6309
Tolland	92.3	90.4453	1.8547	90.4	89.5976	0.8024

Torrington	74.6	60.9398	13.6602	72	65.9714	6.0286
Trumbull	89	88.0972	0.9028	90.9	89.2603	1.6397
Vernon	62.9	62.0807	0.8193	71.9	72.4599	-0.5599
Voluntown	87.5	75.0743	12.4257	79.2	81.2684	-2.0684
Wallingford	73	74.9245	-1.9245	77.7	78.9749	-1.2749
Waterbury	38.1	45.2015	-7.1015	47.7	50.0668	-2.3668
Waterford	81.3	78.1897	3.1103	85.1	81.9292	3.1708
Watertown	64.5	80.9148	-16.4148	81.7	81.5556	0.1444
Westbrook	71.4	75.7751	-4.3751	75.8	71.6644	4.1356
West Hartford	80.9	79.1711	1.7289	84.9	82.0158	2.8842
West Haven	50.5	64.3914	-13.8914	61.9	66.9502	-5.0502
Weston	89.2	100.8056	-11.6056	91.5	98.48	-6.98
Westport	92.7	91.1315	1.5685	94	92.4316	1.5684
Wethersfield	83.6	73.2308	10.3692	85.8	77.4755	8.3245
Wilton	92.8	96.5564	-3.7564	93.5	95.7232	-2.2232
Winchester	54.4	70.8547	-16.4547	70.9	73.6536	-2.7536
Windham	26.4	39.3163	-12.9163	36.9	49.7146	-12.8146
Windsor	63.4	77.1379	-13.7379	55.5	81.8323	-26.3323
Windsor Locks	73.1	67.7535	5.3465	69.2	72.8413	-3.6413
Wolcott	86.7	82.499	4.201	83.3	84.8855	-1.5855
Woodstock	80.8	81.6478	-0.8478	82.8	85.7741	-2.9741

Appendix E

Predictive Town/ District Score: 2010 CMT in Math and ELA

2010 CMT 7 Math (%$35,000 or less, % No HS Diploma, % Female head no male, % Married): Standard Error: + or – 8.6

2010 CMT 7 ELA (% Below Poverty, % No HS Diploma, % Married) Standard of Error: + or – 6.5

2010 CMT 7th Grade Math and ELA

Town/ District	7th Grade Math % at or above Goal	Predicted Math Scores	Difference in Prediction	7th Grade ELA % at or above Goal	Predicted ELA Scores	Difference in Prediction
Ansonia	56.3	58.7429	-2.4429	64	69.1695	-5.1695
Avon	94.7	79.8234	14.8766	96.4	88.3405	8.0595
Berlin	87.4	70.7185	16.6815	90.7	80.548	10.152
Bethel	77.7	80.2483	-2.5483	86.8	87.1455	-0.3455
Bloomfield	47.6	62.4396	-14.8396	53.9	74.669	-20.769
Bozrah	70.4	74.1352	-3.7352	85.2	83.2725	1.9275
Branford	71.9	65.7604	6.1396	88.3	78.111	10.189
Bridgeport	37.1	41.4333	-4.3333	46.8	51.317	-4.517
Bristol	66.4	63.8697	2.5303	76.7	74.026	2.674
Brookfield	86.2	81.285	4.915	92	88.9525	3.0475
Brooklyn	75.9	61.0473	14.8527	90.8	70.3115	20.4885
Canton	91.3	78.6096	12.6904	94.9	87.2365	7.6635
Cheshire	88.3	88.6609	-0.3609	93.7	92.275	1.425
Clinton	70.1	74.5209	-4.4209	85.6	83.389	2.211
Colchester	78.2	84.8802	-6.6802	86.9	91.032	-4.132
Columbia	75.5	78.6565	-3.1565	85.7	86.8895	-1.1895
Coventry	59.3	83.2023	-23.9023	77.6	89.599	-11.999
Cromwell	77.9	79.7002	-1.8002	85.1	87.328	-2.228
Danbury	69.6	66.3085	3.2915	73.6	72.3645	1.2355
Darien	95.2	93.8864	1.3136	97.3	97.1255	0.1745
Derby	29.9	49.26	-19.36	47.9	63.509	-15.609

East Granby	83.6	83.049	0.551	92.4	88.3525	4.0475
East Haddam	70	75.3329	-5.3329	81.7	84.8295	-3.1295
East Hampton	79.5	81.0337	-1.5337	90.2	88.2795	1.9205
East Hartford	30.2	41.9107	-11.7107	48.4	56.106	-7.706
East Haven	57.4	68.9293	-11.5293	72.4	77.6895	-5.2895
East Lyme	90.7	77.7143	12.9857	89.3	84.6815	4.6185
East Windsor	62.2	72.1318	-9.9318	70	80.807	-10.807
Ellington	90.7	80.7929	9.9071	92.4	87.9915	4.4085
Enfield	77.6	67.4502	10.1498	86	76.8305	9.1695
Fairfield	88.3	85.352	2.948	92.5	90.881	1.619
Farmington	91.1	79.2039	11.8961	93.8	87.7445	6.0555
Glastonbury	89.6	83.1659	6.4341	92.2	90.3845	1.8155
Granby	94.3	85.4626	8.8374	95.6	92.0065	3.5935
Greenwich	84.6	85.2351	-0.6351	90.5	91.0425	-0.5425
Griswold	57.9	68.7088	-10.8088	75	78.5135	-3.5135
Groton	65.4	67.8534	-2.4534	77.5	77.9965	-0.4965
Guilford	93.9	81.5083	12.3917	94.2	89.4215	4.7785
Hamden	61.3	70.4392	-9.1392	69.7	80.5805	-10.8805
Hartford	36.5	16.4923	20.0077	46.3	32.5585	13.7415
Killingly	65.2	63.3237	1.8763	75	71.2495	3.7505
Ledyard	78	80.5255	-2.5255	79.4	88.1995	-8.7995
Litchfield	89.5	74.3837	15.1163	87.5	83.2945	4.2055
Madison	88.8	87.018	1.782	90.8	92.6735	-1.8735
Manchester	55.8	65.1619	-9.3619	67.6	76.3055	-8.7055

Meriden	48.9	52.039	-3.139	59.3	62.7435	-3.4435
Middletown	61.1	56.3566	4.7434	72.4	70.2345	2.1655
Milford	77.1	76.3052	0.7948	86.7	84.3825	2.3175
Monroe	88.2	88.474	-0.274	96.5	92.465	4.035
Montville	73.8	68.9937	4.8063	86.1	75.8775	10.2225
Naugatuck	53.6	65.5784	-11.9784	66.8	74.602	-7.802
New Britain	23	36.9253	-13.9253	39.6	50.2875	-10.6875
New Canaan	93.3	95.2178	-1.9178	95.8	97.612	-1.812
New Fairfield	85.9	90.9842	-5.0842	88	94.792	-6.792
New Haven	42.6	31.4086	11.1914	52.8	48.9925	3.8075
Newington	70.9	71.184	-0.284	86.1	79.972	6.128
New London	25.5	40.3056	-14.8056	52.1	56.098	-3.998
New Milford	71.7	78.3191	-6.6191	87.1	86.27	0.83
Newtown	91.6	91.4868	0.1132	92.3	94.212	-1.912
North Branford	72	80.1748	-8.1748	80.2	87.186	-6.986
North Haven	72.7	79.4916	-6.7916	85.6	85.8665	-0.2665
North Stonington	75.8	75.4351	0.3649	85.5	84.537	0.963
Norwalk	63.3	65.654	-2.354	70.8	75.6615	-4.8615
Norwich	46.1	49.4469	-3.3469	61.5	63.0515	-1.5515
Old Saybrook	73.7	69.6433	4.0567	85.8	81.683	4.117
Oxford	80.6	88.2535	-7.6535	90.6	92.4865	-1.8865
Plainfield	58.5	59.9931	-1.4931	79.7	68.2575	11.4425
Plainville	72	60.6994	11.3006	81.8	72.6775	9.1225
Plymouth	68.4	76.4704	-8.0704	75.7	83.29	-7.59

Pomfret	82.5	79.248	3.252	94.7	86.8	7.9
Portland	79.2	78.4521	0.7479	88.8	86.4045	2.3955
Preston	80.4	61.2195	19.1805	80.4	72.1305	8.2695
Putnam	55.3	54.0438	1.2562	68	67.621	0.379
Ridgefield	90.5	93.2025	-2.7025	91.8	97.432	-5.632
Rocky Hill	80.8	74.9619	5.8381	93.5	82.918	10.582
Salem	98.4	84.4098	13.9902	98.4	90.92	7.48
Seymour	66.5	78.9862	-12.4862	76.8	86.277	-9.477
Shelton	78.5	76.9478	1.5522	90.5	84.12	6.38
Sherman	75.9	84.0507	-8.1507	79.3	91.1635	-11.8635
Simsbury	91.8	88.5426	3.2574	95.2	93.9835	1.2165
Somers	83.7	85.6194	-1.9194	89.6	87.463	2.137
Southington	85.5	77.5757	7.9243	86	84.957	1.043
South Windsor	88.6	83.2373	5.3627	95	89.2905	5.7095
Sprague	60.9	59.648	1.252	82.6	72.4515	10.1485
Stafford	85.8	75.5954	10.2046	86.7	83.345	3.355
Stamford	55.4	65.8822	-10.4822	70.5	73.876	-3.376
Sterling	66.7	61.8467	4.8533	68.6	71.23	-2.63
Stonington	80.6	68.7396	11.8604	85.9	80.4385	5.4615
Stratford	64.7	73.2693	-8.5693	80.5	80.3375	0.1625
Suffield	87.3	85.0713	2.2287	87.3	89.09	-1.79
Thomaston	74.5	79.2417	-4.7417	78.1	85.4655	-7.3655
Thompson	72.7	74.9325	-2.2325	80.9	80.3555	0.5445
Tolland	83.6	91.5582	-7.9582	92.8	94.616	-1.816

Torrington	66.4	56.183	10.217	69	68.1435	0.8565
Trumbull	85.7	89.4729	-3.7729	91.6	92.7525	-1.1525
Vernon	57.4	52.7775	4.6225	68.9	68.3975	0.5025
Voluntown	86.7	77.6646	9.0354	83.3	83.361	-0.061
Wallingford	76.6	72.8941	3.7059	85.1	81.5155	3.5845
Waterbury	33.5	38.9742	-5.4742	52.7	52.883	-0.183
Waterford	74.1	77.9362	-3.8362	89.3	85.36	3.94
Watertown	67.6	82.2748	-14.6748	80.6	87.736	-7.136
Westbrook	88.2	74.2066	13.9934	84.2	83.1415	1.0585
West Hartford	82.6	76.1316	6.4684	89.4	84.699	4.701
West Haven	53.1	59.3722	-6.2722	67.2	71.1345	-3.9345
Weston	90.3	100.2312	-9.9312	94.4	101.869	-7.469
Westport	96.4	88.2318	8.1682	96.8	93.938	2.862
Wethersfield	83.9	72.9305	10.9695	85	80.7835	4.2165
Wilton	93.3	97.3864	-4.0864	95.9	99.092	-3.192
Winchester	51.4	71.2162	-19.8162	74.5	78.745	-4.245
Windham	24	28.96	-4.96	35.7	45.861	-10.161
Windsor	66.9	74.4243	-7.5243	74	83.6995	-9.6995
Windsor Locks	60.7	62.1729	-1.4729	69.2	74.1605	-4.9605
Wolcott	86.8	83.1029	3.6971	89.5	88.563	0.937
Woodstock	87.3	79.6127	7.6873	87.2	87.591	-0.391

Appendix F

Predictive Town/ District Score: 2010 CMT in Math and ELA

2010 CMT 8 Math (% No HS Diploma, % Below Poverty, % Married, % Male head no female): Standard Error: + or – 8

2010 CMT 8 ELA (% $35,000 or less, % No HS Diploma, % Married, Male head no female) Standard of Error: + or – 7

2010 CMT eighth Grade Math and ELA

Town/ District	eighth Grade Math % at or above Goal	Predicted Math Scores	Difference in Prediction	eighth Grade ELA % at or above Goal	Predicted ELA Scores	Difference in Prediction
Ansonia	57.9	56.1266	1.7734	59.3	61.1006	-1.8006
Avon	90.6	83.8601	6.7399	94.8	89.1916	5.6084
Berlin	87.8	72.381	15.419	88.6	78.3142	10.2858
Bethel	78.7	80.1039	-1.4039	83	84.5522	-1.5522
Bloomfield	47.7	63.001	-15.301	59.5	72.223	-12.723
Bozrah	65.7	72.8692	-7.1692	74.3	76.9048	-2.6048
Branford	71.1	69.9858	1.1142	80.4	76.8941	3.5059
Bridgeport	30.6	34.2522	-3.6522	38.6	43.0027	-4.4027
Bristol	69	61.9356	7.0644	77.3	68.1472	9.1528
Brookfield	90.9	82.4355	8.4645	86.8	86.9082	-0.1082
Brooklyn	68.9	57.005	11.895	75.6	66.2441	9.3559
Canton	80.3	79.9461	0.3539	89.4	84.0182	5.3818
Cheshire	87.5	85.6005	1.8995	91.7	89.1272	2.5728
Clinton	83.3	76.1943	7.1057	89	79.7934	9.2066
Colchester	78	84.5365	-6.5365	88.6	87.2254	1.3746
Columbia	76.5	78.6002	-2.1002	76.5	84.4624	-7.9624
Coventry	62.6	79.335	-16.735	77.6	83.8726	-6.2726
Cromwell	72	77.5235	-5.5235	79.7	80.7383	-1.0383
Danbury	53.9	58.1969	-4.2969	68.3	64.8844	3.4156
Darien	92.2	94.42	-2.22	89	96.2703	-7.2703

Derby	44.9	51.2484	-6.3484	59.6	60.9095	-1.3095
East Granby	88.9	81.3674	7.5326	87.5	86.8083	0.6917
East Haddam	72.1	79.3851	-7.2851	80.4	84.4722	-4.0722
East Hampton	81.2	80.5541	0.6459	83.7	86.355	-2.655
East Hartford	35.2	40.9466	-5.7466	41.9	52.4744	-10.5744
East Haven	61	65.3534	-4.3534	68.1	67.6641	0.4359
East Lyme	79.9	74.0326	5.8674	86.2	78.0673	8.1327
East Windsor	67.6	69.3281	-1.7281	71.3	74.3684	-3.0684
Ellington	84.9	75.9908	8.9092	85.4	79.4053	5.9947
Enfield	70.3	64.7087	5.5913	74.8	71.2008	3.5992
Fairfield	87.6	85.1904	2.4096	89	88.8647	0.1353
Farmington	87.6	81.4675	6.1325	91.3	87.7412	3.5588
Glastonbury	86.1	84.5515	1.5485	85.6	88.4511	-2.8511
Granby	93.7	83.8574	9.8426	92.1	88.0525	4.0475
Greenwich	80.4	84.9086	-4.5086	84.1	87.5234	-3.4234
Griswold	67.6	64.7142	2.8858	73.5	68.7328	4.7672
Groton	64	68.2676	-4.2676	80.4	72.6431	7.7569
Guilford	94.1	82.8758	11.2242	93.1	87.4879	5.6121
Hamden	60.8	71.1642	-10.3642	71.8	75.5065	-3.7065
Hartford	32.9	13.7478	19.1522	44.9	26.165	18.735
Killingly	69.8	56.1029	13.6971	77.1	60.4298	16.6702
Ledyard	83.4	79.7486	3.6514	77.6	85.6942	-8.0942
Litchfield	84.6	74.4993	10.1007	85.9	78.954	6.946
Madison	95.5	86.9654	8.5346	93.8	89.5279	4.2721

Manchester	52.3	64.3246	-12.0246	67.7	68.9362	-1.2362
Meriden	47.4	47.8474	-0.4474	50.8	55.555	-4.755
Middletown	58.5	60.5908	-2.0908	63.5	69.395	-5.895
Milford	75.2	75.9126	-0.7126	81.7	80.3181	1.3819
Monroe	82.5	84.446	-1.946	83	87.1207	-4.1207
Montville	62.7	64.9581	-2.2581	71.4	73.762	-2.362
Naugatuck	62.5	63.8077	-1.3077	70.6	71.3077	-0.7077
New Britain	26.9	33.5159	-6.6159	36.8	43.1213	-6.3213
New Canaan	91.4	92.8654	-1.4654	93.5	93.8066	-0.3066
New Fairfield	84.8	89.9778	-5.1778	85.3	91.8905	-6.5905
New Haven	40.8	36.1836	4.6164	48.5	47.174	1.326
Newington	73.5	70.3014	3.1986	83.8	76.1453	7.6547
New London	27.8	40.464	-12.664	43.7	50.6281	-6.9281
New Milford	70.1	76.5986	-6.4986	78.2	81.8444	-3.6444
Newtown	90.2	88.6426	1.5574	94.5	89.8117	4.6883
North Branford	71.7	78.5395	-6.8395	80.4	81.0413	-0.6413
North Haven	80.7	76.9098	3.7902	78.5	79.8164	-1.3164
North Stonington	70	75.622	-5.622	70.5	79.8185	-9.3185
Norwalk	53.9	65.2765	-11.3765	60.9	73.1612	-12.2612
Norwich	47.7	51.0349	-3.3349	55.4	60.7177	-5.3177
Old Saybrook	72.9	73.9051	-1.0051	82.1	79.4845	2.6155
Oxford	79.4	87.1696	-7.7696	83.7	90.8925	-7.1925
Plainfield	61.4	50.5677	10.8323	77.6	58.2603	19.3397
Plainville	77.6	63.0431	14.5569	76.9	72.6126	4.2874

Plymouth	71.9	70.2381	1.6619	68.5	74.302	-5.802
Pomfret	66.1	79.4651	-13.3651	92.1	84.7202	7.3798
Portland	86.9	79.4665	7.4335	83.1	85.853	-2.753
Preston	72.7	63.701	8.999	79.6	75.935	3.665
Putnam	45.3	54.2935	-8.9935	48	60.8768	-12.8768
Ridgefield	93.5	93.8807	-0.3807	94.1	95.9716	-1.8716
Rocky Hill	79	75.0069	3.9931	90	81.1048	8.8952
Salem	88.9	85.6654	3.2346	85.9	90.8764	-4.9764
Seymour	75.3	75.5348	-0.2348	74.3	77.2705	-2.9705
Shelton	75.7	76.0319	-0.3319	80.1	81.6084	-1.5084
Sherman	82	85.8636	-3.8636	100	89.9591	10.0409
Simsbury	90.9	89.7629	1.1371	92.1	92.9382	-0.8382
Somers	83.5	77.9138	5.5862	86.3	83.5036	2.7964
Southington	83.9	75.8536	8.0464	85.6	80.3905	5.2095
South Windsor	83.2	80.2181	2.9819	90.1	84.5698	5.5302
Sprague	73.5	62.7066	10.7934	94.1	75.3589	18.7411
Stafford	79.3	71.4973	7.8027	77.3	71.9055	5.3945
Stamford	58.4	62.4803	-4.0803	66.9	69.2976	-2.3976
Sterling	41.5	51.7766	-10.2766	54.7	59.2259	-4.5259
Stonington	72.7	73.0665	-0.3665	86	79.5497	6.4503
Stratford	60.5	70.5744	-10.0744	77	75.1197	1.8803
Suffield	85.9	80.6842	5.2158	79.9	86.0629	-6.1629
Thomaston	66.3	77.0017	-10.7017	67	82.6309	-15.6309
Thompson	52	68.5586	-16.5586	54.5	71.1942	-16.6942

Tolland	78.1	87.5578	-9.4578	88.6	88.7807	-0.1807
Torrington	61	56.5034	4.4966	59.2	63.9801	-4.7801
Trumbull	83.9	86.2423	-2.3423	93.7	89.2083	4.4917
Vernon	63.9	58.4265	5.4735	67.1	70.2119	-3.1119
Voluntown	80.5	66.3651	14.1349	65.9	72.0453	-6.1453
Wallingford	74.2	71.7641	2.4359	76.3	77.2126	-0.9126
Waterbury	28	38.4167	-10.4167	42.7	47.3368	-4.6368
Waterford	83.3	74.7923	8.5077	86.5	79.261	7.239
Watertown	65.8	79.5673	-13.7673	80.7	81.8333	-1.1333
Westbrook	77.5	71.5939	5.9061	76.9	69.9718	6.9282
West Hartford	77.1	76.331	0.769	81.9	80.8694	1.0306
West Haven	48.3	60.2628	-11.9628	62.9	65.6265	-2.7265
Weston	90.9	97.1206	-6.2206	94.9	97.4609	-2.5609
Westport	93.2	90.1729	3.0271	91.4	93.771	-2.371
Wethersfield	78.6	71.7425	6.8575	75.2	77.3113	-2.1113
Wilton	94.4	95.5217	-1.1217	95.3	97.1304	-1.8304
Winchester	59.8	67.1894	-7.3894	75	71.5426	3.4574
Windham	29.2	31.02	-1.82	32.8	45.3256	-12.5256
Windsor	66.5	73.8936	-7.3936	64.9	79.4763	-14.5763
Windsor Locks	62.7	64.3801	-1.6801	68.1	71.4907	-3.3907
Wolcott	84.8	80.5233	4.2767	89.1	84.2701	4.8299
Woodstock	88.5	76.7045	11.7955	91.8	81.4319	10.3681