Spring 3-1-2018

The Predictive Power of Out-of-School Community and Family Level Demographic Factors on District Level Student Performance on the New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy

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THE PREDICTIVE POWER OF OUT-OF-SCHOOL COMMUNITY AND FAMILY LEVEL DEMOGRAPHIC FACTORS ON DISTRICT LEVEL STUDENT PERFORMANCE ON THE NEW JERSEY PARCC IN ALGEBRA 1 AND GRADE 10 ENGLISH LANGUAGE ARTS/LITERACY

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Submitted in partial fulfillment of the
requirement of the degree of
Doctor of Education

Seton Hall University

February 2018

SETON HALL UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN SERVICES
OFFICE OF GRADUATE STUDIES

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Jamil Maroun, has successfully defended and made the required modifications to the text of the doctoral dissertation for the **Ed.D.** during this **Spring Semester 2018.**

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Abstract

The Predictive Power of Out-Of-School Community and Family Level Demographic Factors on District Level Student Performance on the New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy

The purpose of this study was to determine the predictive accuracy of community and family demographic variables, which are found through the use of the 2010 U.S. Census data, on the percentage of students at a district level who are Meeting or Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy. The results of this study support the past research and existing literature that has found out-of-school community and family demographics affect and predict how students will perform on state standardized assessments. Based on this study, we can conclude that out certain combinations of out-of- school variables found in the 2010 U.S. Census can be used to predict with accuracy the percentage of students at a district level who are Meeting or Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy.

Acknowledgements

As I attempt to write these acknowledgements, my thoughts keep returning to the traditional African proverb that says, “It takes a village to raise a child.” So many people have had such a tremendous impact on shaping my experience and I would not be here writing this dedication if it were not for your love and support. I would be negligent if I did not take the time to thank all of the people who helped shape who I am… So here we go.

I would like to express my gratitude to Dr. Luke Stedrak, my mentor, and Dr. Christopher Tienken, my reader. Thank you Dr. Stedrak for being a source of consistent and honest feedback that challenged and encouraged me to keep writing. I truly enjoyed our conversations and all of your support throughout this process! Thank you Dr. Tienken for your willingness to answer all my questions and inspiring me to research this topic.

I would also like to thank my readers Dr. Dale Caldwell and Dr. Brian Gatens. I am truly humbled and honored to have such incredibly passionate, dedicated, and caring educational professionals serving on this committee. You both are incredible role models, colleagues, and even better friends. I would not have been able to complete this doctorate without your support, guidance, and encouragement. Thank you and I look forward to the celebration.

I would like to thank all of the faculty and staff at Seton Hall University. Also, I would also like to thank all of the members of the Seton Hall Executive Ed. D. Cohort 19. Our time together was full of love, laughter, and joy. I appreciate all of our

conversations, in person and on Group Me, and will look back fondly on our experience together.

I want to take a moment and acknowledge all of the leaders in my life who have inspired, encouraged, taught, or challenged me to be a better student, employee, leader, or friend. The time you invested in me taught me many incredible life lessons that have continued to guide my personal philosophies. So, in no particular order, Trianna Slack, Margo Miller, Dr. Tim Blessing, Mike Berkowitz, Thomas Gentile (SINE PATRIA!), James Brown, Gordon Inverno, John D'Esposito, Art Wolfart, Billy Reybert, Patrick Mastorelli, Dr. Robert Rich, Michelle Vella, Dr. James McLaughlin, Dr. Buzzy Durkin, Melissa Stager, Monsignor Abouna Maroun Asmar, Joseph Chebli, Charbel O'jeil, Joe Pastva, Heimir Capati, Chris Howard, Paul Mongone, Ryan Soroka and the Destroyers, Albert Srour, George Tanios, Peter Helou, Ziad Hage, Joe Hage, Mike Barrood, Brandon Rodriquez and Brian Creighton. Thank you!

To my grandparents, my mother and father in law, my brothers and sisters in laws, my nieces and nephews, my aunts, uncles, cousins, extended family and close friends. Thank you for your support and love. Thank you for patience and understanding throughout this process and, really, my life. You have all provided me with such great examples of love, leadership, and service. I look forward to celebrating our futures together.

To Mr. Simon Kassas, thank you for taking me in and taking care of me when I moved to Reading. Your mentorship, guidance, and friendship reshaped my life path. You taught me to ask questions and take advantage of the opportunities provided to me. I hope to emulate the examples that you have set for me.

To Mrs. Winifred Schatzman, thank you for encouraging me to pursue education. Never a day goes by where I do not miss our morning chats, your advice, your support and your love. Thank you for being my best friend and I appreciate all that you have done for my family and I. You would have absolutely loved Nas and Sav.

To my brothers, Elie, Roukos and Joseph, and my sisters, Tacla and Rebekah, thank you. I am always humbled and inspired by all the incredible things that you are creating and accomplishing. My friends joke with me that I am the least interesting and successful of my siblings and they are right. Your accomplishments in your respective fields are incredible and are only dwarfed by your love for our families. I wish you a lifetime of success, happiness, and health. I look forward to our future memories, fights, fun, and family dinners. I love you all and am grateful for your support.

Dedication

I dedicate this dissertation to my wife Lisa. Thank you for your patience, support, kindness, more patience, sense of humor, and love. Thank you for bearing with me during all the days, nights, weekends, car-rides, missed parties and vacations that were impacted by this program and this paper. When I told you that I wanted to do this program, like with all my other great ideas, you did not hesitate to support me. Your love for our family is incredible and you are selfless. I cannot begin to express how much you inspire me to continue to aspire to greater and better things for our family. I am blessed to have met you, married you, and to have you as the mother of our children. I love you.

To my sons, Nassif and Savino, I am incredibly blessed and humbled to be your father. Words cannot began to express the love and hope that I have for your future. All that your mother and I do are for your success. You are both incredibly kind, caring, loving, and intelligent boys (or depending on when you read this, men) and the world is your oyster. I hope that this dissertation serves as an example to you that you can achieve any goal that you set for yourself. Be sure to value and cherish your education. Always work harder and push yourself to greatness. Be good to those who surround and are around you. Cherish your faith. Be forgiving of yourself and of others. Have fun. And, most importantly, love each other, your family, and whatever you end up doing.

Finally, I want to dedicate this dissertation to my parents, Nassif and Nawal. In 1976, my parents immigrated to the United States from Lebanon. Their homeland was decimated by a Civil War. They wanted to create a better life for each other and their future children. They barely spoke any English, neither completing their formal education. They had less than five hundred dollars and knew only one person in New

Jersey. My parents embraced the challenges they faced and aspired to achieve the American dream for their family. They opened a small restaurant and worked hard to make ends meet. They valued education; knowing that this would be the way out of poverty for me and my siblings. Growing up, I was keenly aware of my parent's struggles. I understood how much they sacrificed to give my siblings and a better life. Their experience motivated my siblings and I to understand that our education and our love of family would be our key to unlocking the American dream, a message our parents consistently professed to us. I want to thank my parents for their unwavering love and support throughout my life. My successes, and the success of my siblings, are a direct result of all your sacrifices, hard work, love and, for that, we are forever grateful.

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Abstract iv
Acknowledgements v
Dedication viii
List of Tables xiii

INTRODUCTION 1

Statement of the Problem 4
Purpose of the Study 6
Significance of the Study 7
Research Questions and Hypotheses 9
Study Design and Methodology 10
Unit of Analysis and Variables 11
Delimitations 12
Limitations 13
Definition of Key Terms 13

REVIEW OF LITERATURE 15

Federal Involvement in the American Public Education 16
History of High-Stakes Standardized Assessments and curriculum in American Public Schools 17
The Common Core State Standards and the New Jersey Learning Standards .. 27
Implementation of the PARCC 29
History of Standardized Assessments in New Jersey 31
TeachNJ 33
Structure of the PARCC 34
Scale Scores 37
Impact of High Stakes Standardized Assessments as Graduation Requirements 40
Conditional Standard of Error Measurements 41
Influence of Socioeconomic and Demographic Variables on High-Stakes Standardized Assessments 44
Predictive Studies on High-Stakes Standardized Assessments in NJ 45
Predictive Factors 47
Household income and student achievement 47
Lone-parent household and student achievement 50
Parental education level and student achievement 52
Theoretical Framework 53

METHODOLOGY 58

Research Design 58
Research Questions 59
Sample 60
Variables 61
Reliability 62

Validity 64
Instrumentation/Data Collection 65
Data Analysis 69
Chapter Summary 71

ANALYSIS OF THE DATA 73

Research Questions 73
Dependent Variables 74
Independent Variables 74
Procedure- Correlations 76
Procedure- Models of Best Fit Algebra 1 78
Algebra Example 1: Cinnaminson Township 79
Algebra Example 2: Sayreville Boro School District 80
Algebra Example 3: Collingswood Boro School District 81
Algebra Example 4: Livingston Township 81
Algebra Example 5: Hammonton Town 82
Summary of Predictive Power for Dependent Variable: Algebra 1 83
Research Questions and Answers for Dependent Variable: Algebra 1 83
Procedure- Models of Best Fit Grade 10 English Language Arts/Literacy 84
Grade 10 English Language Arts/Literacy Example 1: Glen Rock Boro 85
Grade 10 English Language Arts/Literacy Example 2: East Brunswick Township School District 86
Grade 10 English Language Arts/Literacy Example 3: North Plainfield Boro School District 87
Grade 10 English Language Arts/Literacy Example 4: Mahwah Township School District 88
Grade 10 English Language Arts/Literacy Example 5: Kearny Town School District 89
Summary of Predictive Power for Dependent Variable: Grade 10 English Language Arts/Literacy 89
Research Questions and Answers for Dependent Variable: Grade 10 English Language Arts/Literacy 90
Chapter Summary 91

CONCLUSIONS AND RECOMMENDATIONS 92

Recommendations for Policy 97
Recommendations for Practice 99
Recommendations for Future Study 102
Chapter Summary and Conclusions 103
REFERENCES 106
Appendix A- 2016 PARCC Algebra 1- New Jersey 122
Appendix B- 2016 PARCC Grade 10 English Language Arts/Literacy- New Jersey 129

List of Tables

Table 1. Threshold Scores and Scaling Constants for High School ELA 39

Table 2. Threshold Scores and Scaling Constants for High School Mathematics..... 39

Table 3. New Jersey Student Performance Scores on PARCC in Algebra 1 and English Language Arts/Literacy between 2014 and 2016 40

Table 4. Summary of ELA/L Test Reliability Estimates for Total Group..... 42

Table 5. Summary of Mathematics Test Reliability Estimates for Total Group 43

Table 6. New Jersey Lone-Parent Households Disaggregated by Race 50

Table 7. Names and Labels of Independent Variables 75

Table 8. Final Model Hierarchical Linear Regression for Algebra 1 79

Table 9. Final Standardized Coefficient Betas & Tolerance for Algebra 1..... 79

Table 10. Final Model Hierarchical Linear Regression for Grade 10 English Language Arts/Literacy 85

Table 11. Final Standardized Coefficient Betas & Tolerance for Grade 10 English Language Arts/Literacy 85

CHAPTER I

INTRODUCTION

The concept of standardization of curriculum has been an engrained trait within the fabric of public education in the United States for decades. Franklin Bobbitt (1913) argued that schools could operate more efficiently and economically if they borrowed from the management principles of business and industry. According to Bobbitt (1913), "education is a shaping process as much as the manufacture of steel rails" (p. 11). The "shaping" requires curriculum standards and standardized assessment to determine whether the product, student output, meets the curriculum standards. President Dwight D. Eisenhower's signed the National Defense Education Act in response to the Soviet launch of *Sputnik I,* the modern reform movement in public education has pushed to standardize the curriculum and assessment in public education systems throughout the United States. According to Tienken and Orlich (2013),

> American presidents since Eisenhower and/or their secretaries of education have used *Sputnik*, the reigning king of the modern school reform movement, as an instrument of fear or as a historical reminder of policy makers' belief that education is a national security priority, to push education reform. (p. 20).

The standardization movement continued to gain traction during the last two decades of the twentieth century, particularly after the release of *A Nation At Risk* (National Commission on Excellence in Education, 1983) that called into question the performance of American students on internationally benchmarked high-stakes standardized assessments. This report led to a variety of educational reforms and initiatives including President George H.W. Bush's *America 2000,* George W. Bush's *No Child Left Behind*

(NCLB), and President Barack Obama's *Race to the Top (RTTT).* These initiatives required annual standardized assessments to determine student proficiency to demonstrate evidence of student performance and educator effectiveness. According to Maylone (2002), President George W. Bush's education policies changed the way American schools were evaluated.

In 2009, New Jersey joined 47 other states, two territories, and the District of Columbia in signing a memorandum of agreement with the National Governors Association (NGA) and Council of Chief State School Officers (CCSSO) committing to a process, which claimed to be state-led, which would create the Common Core State Standards Initiative (CCSSI). The purpose of the CCSSI was to evaluate the state level standards and develop a series of "consistent, real-world learning goals… to ensure all students, regardless of where they live, are graduating high school prepared for college, career, and life ("Development Process," 2017) which would be known as Common Core State Standards (CCSS). In July 2010, The New Jersey State Board of Education unanimously adopted the CCSS, which were touted as "…a set of clear college- and career-ready standards for kindergarten through 12th grade in English language arts/literacy and mathematics." ("Frequently Asked Questions," 2017)

As New Jersey and other states adopted the CCSS, the "states needed high-quality assessments aligned to those standards that would test students of all achievement levels on what they are learning." ("About the Test," 2017). To meet this need, a consortium of 11 states (including New Jersey and the District of Columbia) came together to develop, adopt, and administer the Partnership for Assessment of Readiness for College and Careers (PARCC). Beginning in the 2014–2015 school year, the PARCC test would be

administered to more than eight million students nationwide to measure student performance against the CCSS.

On September 6, 2016, the State of New Jersey approved N.J.A.C. 6A:8-5.1 requiring "…all students (to) demonstrate proficiency in the high school end- of-course PARCC assessments in ELA 10 and Algebra I…" (Standards and Assessment, 2017) to graduate. These assessments would be administered to any student at the completion of an Algebra based course and at the end of the English/Language Arts 10 with students being required to achieve passing scores on the ELA 10 and Algebra 1 assessments, and have taken all end-of-course PARCC assessments. This continues New Jersey's tradition of using standardized assessments, such as the New Jersey High School Proficiency Assessment (HSPA), as a graduation requirement to determine student proficiency and mastery of the adopted curriculum standards. Researchers have found little evidence to support the use of high-stakes assessments as a measure of student achievement or as an influencer of increased graduation rates (Amrein & Berliner, 2002; Braun, 2004; Haney, Ray, & Bonilla, 2004; Heubert & Hauser, 1999; Marchant & Paulson, 2005; Rosenshine, 2003). However, researchers have found that student performance on high stakes standardized assessments commonly relate to factors outside of the control of educators (Sirin, 2005).

Researchers have determined that student performance on standardized assessments is often determined by student socioeconomic status (SES). The higher a student's SES, the more likely they will perform well on standardized assessments. According to Popham (1999), "if children come from advantaged families and stimulus-rich environments, then they are more apt to succeed on items in standardized

achievement test items than will other children whose environments don't mesh as well with what the tests measure." The use of high stakes standardized assessment as a graduation requirement causes a problem for students because it does not take into account where a student starts based on their socioeconomic status. This is why there is a need for further quantitative research to be conducted to determine whether community factors are predictors of student success in the state of New Jersey on the PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy.

Statement of the Problem

The de facto national standardization of public education curricula using the Common Core State Standards and the requirements of the Race to the Top competitive grant program have increased the pressure of bureaucrats and legislators to reward communities with higher levels of student performance on state mandated standardized assessments and punish communities with lower levels of student performance. In addition to the effect on local communities, New Jersey Governor Chris Christie, and his administration, continued New Jersey's tradition of using standardized assessments by requiring "…all students (to) demonstrate proficiency in the high school end- of-course PARCC assessments in ELA 10 and Algebra I…" to graduate. This creates a culture where community, school, teacher, and student success is based on how a student performs on standardized assessment with disregard for the various factors that have been proven to influence student performance.

Results from several empirical studies have demonstrated that as few as three socioeconomic factors are able to reliably predict student achievement on high-stakes standardized assessments (McCahill, 2015; Maylone, 2002; Turnamian, 2012). Maylone

(2002) analyzed district socioeconomic data to reliably predict Michigan Education Assessment Program (MEAP) scores. His study found that 56% of high school high-stakes standardized test data were explained by the percentage of lone-parent households, mean annual district household income, and the percentage of free- and reduced-lunch students in each high school community. Turnamian (2012) could reliably predict 60% of New Jersey school districts' grade 3 math NJASK and 52% of the grade 3 language arts scores within 10 points by examining the same three socioeconomic factors. In 2015, McCahill was able to repeat Turnamian's results on the grade 8 NJASK. Additional research has suggested that socioeconomic status of a student's family and community can be used to predict students' standardized test results. Results from these studies suggest student performance on high stakes standardized assessments can be predicted with a degree of accuracy based on student demographic and related community characteristics (Bernstein, 1971; Coleman et al., 1966; Jencks et al., 1972).

Based on results from previous studies, it appears the results from high-stakes standardized assessments do not accurately measure a student's scholastic proficiency, the quality of a classroom teacher, classroom instruction, or the quality of a school district (Tienken et al., 2017, p. 11). Policymakers often punish school districts that are performing poorly and reward schools that are achieving high scores on the high-stakes standardized assessment. In New Jersey, Administrative Code 6A:8-5.1 requires student to meet a level of proficiency on the Grade 10 ELA/L and Algebra 1 PARCC assessment to receive a diploma and graduate.

Authors of the PARCC claim that the assessment "helps ensure that all students, regardless of income, family background or geography, have equal access to a world-

class education that will prepare them for success after high school in college and/or careers" (About: Working Together to create a modern assessment, 2017). Student performance on the PARCC will impact policymakers' decisions and school performance data. Student achievement will be measured and, in the state of New Jersey, will have an impact on student graduation, teacher evaluation, state funding, and district perception. A need therefore exists for an empirical, quantitative analysis to determine the influence of out-of-school variables, such as median home income and other socioeconomic status variables on PARCC English Language Arts/Literacy and Mathematics scores and the predictive strength of such variables. While the influence of a district's socioeconomic variables has been researched to some degree at the state level using the NJASK, no research has been conducted about the predictive strength of district socioeconomic using the PARCC.

Purpose of the Study

The purpose of this study is to determine the predictive accuracy of community and family demographic variables, which are found through the use of the 2010 U.S. Census data, on the percentage of students at a district level who are Meeting or Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy. The PARCC claims that scores that meet or exceed expectations indicate that a student is "college or career ready" and the assessment should ensure that all students "regardless of income, family background or geography, have equal access to a world-class education that will prepare them for success after high school in college and/or careers" (Pearson, 2016, p. 7). Policymakers, bureaucrats, and the general public in New Jersey and elsewhere are under the assumption that high scores

on high stakes standardized assessments accurately can reflect the quality of students, teachers, schools, districts and a community. Finally, policymakers in New Jersey have required local school districts to use the PARCC as a graduation requirement for all students seeking to complete compulsory public education.

These assumptions, claims, and policy decisions run contrary to previous studies conducted in the state of New Jersey (McCahill, 2015, Turnamian, 2012: Maylone, 2002) that have proven that student performance on high stakes standardized assessments can be predicted by using out-of-school community characteristics or socioeconomic variables. No study like this has been conducted in New Jersey utilizing the PARCC and out of school community and family demographic factors. Therefore a study to determine the predictability of district level student performance on the PARCC would determine if the claims by the creators of the PARCC are accurate; provide more information to assist policymakers, bureaucrats, and the general public in determine the quality of students, teachers, schools, and communities; and, determine if the PARCC is an appropriate tool be utilized to determine student graduation eligibility.

Significance of the Study

According to the makers of the PARCC, the assessment should ensure that all students "regardless of income, family background or geography, have equal access to a world-class education that will prepare them for success after high school in college and/or careers" (Pearson, 2016, p. 7). Previous studies suggest that out-of-school socioeconomic and community-level variables have an impact on student performance on high-stakes standardized assessments (Alspaugh, 1991; Amato & Keith, 1991; Astone & McLanahan, 1991; Blau, 1999; Coleman et al., 1966; Dawson, 1991; Downey, 1995;

Hauser & Sewell, 1986; Wolfe & Haveman, 1995; Jencks et al., 1972; Payne & Biddle, 1999; Peterson & Zill, 1986; Plug & Vijverberg, 2005; Roscigno & Ainsworth-Darnell, 1999; Sirin, 2005). More recently, studies conducted by Turnamanian (2012), McCahill (2015), Fox (2015), and Wolfe (2015) have demonstrated that more than one-half of the variance of student performance on the high stakes standardized assessments on the New Jersey Assessment of Skills and Knowledge (NJASK) can be predicted at the district level by knowing three to five community demographic variables. These studies focused primarily on single state assessments, and as such, empirical data is needed to determine the predictive strength of community and family demographic characteristics on student performance on the multistate PARCC Assessment, specifically for students in the state of New Jersey. This study extended the research to explain how well community and family demographic factors found in the U.S. Census predict the percentage of students meeting or exceeding expectations on the 2016 PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy.

Results collected from this study may be used by litigators, legislators, bureaucrats, voters, and local educational leaders to evaluate the requirements that students in the state of New Jersey must meet and/or exceed proficiency on the PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy to graduate from high school. As currently constituted, this legislation runs contrary to the research that suggests that performance on high stakes standardized assessments can be predicted by three to five out of district SES factors. This means that students who live in communities with high rates of SES factors that negatively impact student performance on the high stakes standardized assessment, which research has shown to be in communities that tend to

have higher rates of minority, special needs, and financially disadvantaged students, are at a disadvantage as compared to students who attend schools in communities with low rates of negative SES factors.

In addition, the results from this study could be used to determine if the PARCC is an effective tool to measure student, teacher, school, district, and community effectiveness. The Department of Education uses the results of the PARCC in grades 3 to 8 to determine teacher effectiveness and as a factor in the School Report Card. Student performance on the PARCC and the school report cards are published and shared publicly, and these results are used by local education associations, the media, and for-profit entities to develop a narrative about the community's schools. Magazines and websites use the PARCC and School Report cards to rate schools, districts, and communities throughout the state. If the results of this study are consistent with previous studies' abilities to predict student performance, reliably and accurately on high stakes standardized assessments, communities with high rates of negative SES factors will be negatively impacted and communities with low rates of negative SES factors will be rewarded.

Research Questions and Hypotheses

This study examined four overarching research questions:

1. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores in Algebra 1 and out-of-school community characteristics or socioeconomic variables?
    - H_a1: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016

New Jersey PARCC test scores in Algebra 1.

2. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 at a district level?
3. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy and out-of-school community characteristics or socioeconomic variables?
    - H_a2: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy.
4. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy at a district level?

Study Design and Methodology

This was a correlational, explanatory, research design that was cross-sectional and used quantitative methods. The project used multiple linear regression modeling to determine whether out-of-school variables significantly predict 2016 New Jersey PARCC test scores in Algebra 1 and Grade 10 English Language Arts/Literacy. The study focused on community variables identified by Maylone (2002), Turnamian (2012), and McCahill (2015) and built upon their previous work. The strength of these variables' relationships has been shown to predict assessment scores. However, the current

relationship between out-of-school variables and the 2016 PARCC assessment is not currently known.

Unit of Analysis and Variables

The dependent variables for this study were New Jersey school district 2016 Grade 10 New Jersey PARCC assessment scores in English Language Arts/Literacy and the 2016 Algebra 1 New Jersey PARCC assessment scores in Mathematics. The variables were defined as the percentage of students in the population that achieved meeting expectations or exceeding expectations. Building on Maylone (2002), Turnamian (2012), and McCahill (2015), this study examined the following independent variables from the 2010 U.S. Census:

Household income, which is defined as:

- Employment status
- Percentage of annual household income under $25,000
- Percentage of annual household income under $35,000
- Percentage of annual household income above $200,000
- Percentage of family income under $25,000
- Percentage of family income under $35,000
- Percentage of family income above $200,000
- All families in poverty for 12 months
- All female households in poverty
- All people under poverty

Lone-parent households, which are defined as:

- Percentage of male households with no wife

- Percentage of female households with no husband
- Lone parent households, total

Parent level of education, which is defined as:

- Parents with less than a 9th grade education
- Percentage with no high school diploma
- Percentage that are high school graduates with some college education
- Percentage with a bachelor's degree
- Percentage with an advanced degree

Delimitations

The PARCC was administered in 2015–2016 to more than three million students in seven states: Colorado, Illinois, Maryland, Massachusetts, New Jersey, New Mexico, Rhode Island, and the District of Columbia. In New Jersey, the PARCC was administered to more than 800,000 students, according to the 2016 PARCC Technical Manual. Of those students, 105,056 participated in the PARCC Algebra 1 assessment (p. 235), and 86,398 participated in the PARCC Grade 10 ELA/L (p. 232). The study was delimited to tested students on the 2016 New Jersey PARCC test scores in Algebra 1 and Grade 10 English Language Arts/Literacy, as well as to communities in New Jersey that had complete 2010 census data available. The study also delimited to traditional local public school in the state of New Jersey that served primarily their local community, and as such, this study cannot be generalized to other schools outside of the state of New Jersey. Finally, the study was delimited to one form of standardized assessment, the PARCC, and did not account for other standardized assessments.

The research in this study attempted to make the following generalizations. First,

research conducted in this study was not to be correlated with PARCC data beyond that of the 2016 New Jersey test scores in Algebra 1 and Grade 10 English Language Arts/Literacy as these were the only test results that were examined. Second, the research data cannot be generalized to school districts outside of the state of New Jersey, as this was the only state that was examined in this study. Finally, data that were collected for this study were assembled from two main sources: New Jersey Statewide Assessment Reports- Spring 2016 PARCC Results published by the New Jersey Department of Education and United States Census Bureau Factfinder.

Limitations

The study was limited by the accuracy of the test scores that are reported to the New Jersey Department of Education, by the accuracy of the standardized test scores to accurately predict future success of students, and by the accuracy of the U.S. Census data reported for each New Jersey Community. The test data accuracy were limited by the administration of the standardized test within each school including room comfort such as lighting, noise during the test, and physical characteristics, student anxiety levels during and before the test, and other factors.

Definition of Key Terms

The following terms were defined in this study:

High-Stakes Test: "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).

No Child Left Behind (NCLB): President George W. Bush signed this legislation into law on January 8, 2002. The intent of the law was to ensure that all students have access to fair, equal and significant opportunities to a high-quality education. It mandated that all students would meet 100% proficiency on state academic standards by the year 2014 (Tanner & Tanner, 2007). NCLB was replaced in 2015 by the Every Student Succeeds Act (ESSA).

Partnership for Assessment of Readiness for College and Careers (PARCC): The assessment is used annually in 7 states and the District of Columbia in grades 3–11. Students in the following states took PARCC assessments in the 2015-2016 school year: Colorado, District of Columbia, Illinois, Maryland, Massachusetts, New Jersey, New Mexico, and Rhode Island.

Race to the Top (RTT): President Barack Obama's $4.35 billion competitive grant to reward innovation and reform in local education. The grant offered incentives to states willing to spur systemic education reform to improve teaching and learning in public education. RTT was designed to raise standards and align policies and structures with the goal of making every student in America College and career ready. RTT is the driving force behind states changing teacher evaluation system and New Jersey's usage of PARCC (Towe, 2012).

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

CHAPTER II

REVIEW OF LITERATURE

Standardization in the American education experience finds its roots in the early nineteenth century when Joseph Lancaster imported British education ideas that promoted packaged lessons which were then turn keyed, drilled, and monitored for instruction (Tanner & Tanner, 2007 p. 8). This "monitorial" approach, while not successful in practice early on, shaped the ideologies that would frame early American educational philosophies that would be rooted in control and industrial efficiency. Education reformers continued the practice of developing packaged curricula into the twentieth and twenty-first centuries.

As enrollment in American schools increased at the start of the twentieth century, business interests began to play a factor in the American education system. Schools could operate more efficiently and economically if they borrowed from the management principles of business and industry (Bobbitt, 1913). According to Bobbitt (1913), "education is a shaping process as much as the manufacture of steel rails" (p. 11). This "shaping" required educational standards and an end product those local education systems would produce and students would meet. Inherent in the end product would be an assessment to determine whether the product meets standards. Bobbitt's advocacy seems to have had two major lasting practices that have guided education policy over the last decade:

> First, business values and procedures are the model for educational administration, with the result that educational decisions tend to be made on economic rather than educational grounds. Second, education (and government)

> has turned to business and industry for the solution of pedagogical problems. (Tanner & Tanner, 2007 p. 50)

By focusing on the "business values," decision making in public education in the United States has become more centralized and test scores have become a dominant factor in identifying quality of students, teachers, schools, districts, and communities.

Federal Involvement in the American Public Education

The role of the federal government has evolved since the 1950s to include more intervention in state and local education systems. Initially, the American education system was made up of 50 independent, state-run education systems that were loosely tied together. However, various significant events have occurred which have brought the independent education systems closer together creating a de facto national education system. In 1958, President Dwight D. Eisenhower responded to *Sputnik*, the first artificial satellite to orbit the earth which was launched by the Soviet Union to justify the National Defense Education Act (NDEA) U.S.C. P.L. 85-864; 72 Stat. 1580, legislation that began the process of federal intervention in public education by providing financial support for higher education and focusing on mathematics, science, and foreign languages. According to Tienken and Orlich (2013),

> American presidents since Eisenhower and/or their secretaries of education have used *Sputnik*, the reigning king of the modern school reform movement, as an instrument of fear or as a historical reminder of policy makers' belief that education is a national security priority, to push education reform. (p. 20)

A decade later, the federal government introduced U.S.C.P.L. 89-10; 79 Stat. 27, the Elementary and Secondary Education Act of 1965 (ESEA), as part of Lyndon B.

Johnson's Great Society and "War on Poverty," which focused on providing funding to eliminate achievement gaps between minorities and whites living in the United States.

As part of the Civil Rights Act of 1964, the U.S. Department of Education commissioned sociologist, James Coleman and his colleagues to determine the "availability of equal education opportunities in public schools for minority groups…" and "detail the degree of segregation..." and understand the "relationship between student achievement, as measured by achievement test, and the kinds of schools they attend" (Coleman et al., 1966, p. 1). Their study, titled the *Equality of Educational Opportunity* report or better known as *The Coleman Report* (1966), found that "…academic achievement was less related to the quality of a student's school, and more related to the social composition of the school, the student's sense of control of his environment and future, the verbal skills of teachers, and the student's family background." This groundbreaking study concluded that it "… achievement appears to be not a consequence of effects of school variations at all, but of variations in family backgrounds of the entering student bodies" (Coleman et al., p. 296).

The role of the federal government in public education continued to grow in the 1970s and 1980s. The belief that American students were falling behind their worldwide peers led politicians in the 1970s to implement minimum competency testing in American schools (Berliner & Amrein, 2002, p. 3).

History of High-Stakes Standardized Assessments and curriculum in American Public Schools

The origins of high stakes standardized testing traces back to the Han Dynasty (206 BCE- 220 CE) in ancient China and the civil services exams utilized to choose

people to work in the government based on their merit rather family or social status (Zhao, 2014). These assessments required men to pass oral exams before being assigned a position in the government. Coupled with the invention of paper by Cai Lun in 105 CE, the Chinese civil service exam began to be administered simultaneously, lasting a few days and narrowed down the large body of the candidates to two percent (Russell, Madaus, & Higgins, 2009). The remaining two percent were then required to pass the oral examination in order to gain employment within the government.

From then on, standardized assessments were used by a variety of societies throughout history including the Qumran, who used oral exams to admit leaders and men into the community. Throughout the Middle Ages, as populations began to expand, European countries and industries began to use written standardized assessments to meet the needs of quantification. Weights, measures, and time needed to be created to be standardized for the global commerce to function and written assessments became a necessity to meet standardization (Russell et al., 2009). In 1792, William Farish introduced quantitative marks which precise mathematical measure of quality (p. 117).

In the United States, written exams with quantitative scores began to replace oral exams in the mid nineteenth century. Horace Mann, Secretary of the Massachusetts Board of Education, attempted to measure student attainment and rank, for the sake of comparison, the students enrolled in the Boston Public Schools which had seen an increase in the number of students. To do this, he replaced the oral exam with printed essay tests that could be measured and quantified. Mann "…pose(d) an identical set of questions simultaneously under similar conditions, in much less time, to a large number of students, thereby producing comparable scores" (p. 117). Mann, who is largely

credited with forming the common schools envisioned by Jefferson which would provide the citizenry of the United States "…educational opportunities that guarantee each individual a chance for optimal development (Tanner & Tanner, 2007, p. 4), felt his "mode of examination by printed questions and written answers… will constitute a new era in the history of… schools" (Russell et al., 2009, p. 117). His prediction was correct as the practice of high stakes written assessments spread throughout the country mirroring the practices of industrial capitalism which was developing based on the "commitment to uniformity, standardization, precision, clarity, quantification, and rational tactics" (Staudenmaier, 1989).

Mann's use of the written exams were the United States first example of using results from high stakes standardized assessments "bureaucratic, policy, and political purposes" (Russell et al., 2009, p. 118). Schools, districts, and communities throughout the United States began to adopt high stakes written assessments to measure student achievement. This coincided with the increase of students attending public schools in the United States which created a cycle for the increased need of high stakes standardized assessments to measure educational quality (Gallagher, 2003) throughout the nation.

As the United States entered into World War I, the Committee on Classification of Personnel was commissioned by the government from 1917 to 1919 to administer the first governmental standardized assessments. These assessments were developed for literate recruits, "Alpha Form," and illiterate recruits, "Beta Form." By 1919, these assessments were administered to over two million soldiers and soldiers were assigned positions based on their results with higher achievement resulting in higher raking positions (Solley, 2007). The success of the U.S. Army Alpha and Beta tests served as

the catalyst for nationwide standardized testing in American public schools (Wolfe, 2015). K-12 Public schools and colleges began to seek better ways to predict, diagnose, and explain student learning. According to Gallagher (2003, p. 88), "standardized tests were used to stratify students of different abilities into different curriculum paths, thereby restricting their academic and social choices."

In 1923, the Stanford Achievement Tests were published combining several content areas tests into one exam for elementary students. In 1929, the University of Iowa created the first version of the Iowa Test of Basic Skills, which would be administered statewide to measure student achievement (Gallagher, 2003). The Iowa tests was the most frequently used and commercially available achievement test in the nation (Peterson, 1983).

College officials began to clamor for a need to streamline the college admission process through the adoption of high stakes standardized assessments. A consortium of colleges came together in 1923 to form the College Entrance Examination Board (CEEB) in hopes of developing a set of common standards for student admission. The CEEB developed an assessment that would measure student intelligence and achievement for its member colleges. In 1925, this assessment was refined by Carl Brigham of Princeton and the new assessment would be known as the Scholastic Aptitude Test (SAT) and it would come to dominate college preparation and curriculum (Walsh & Betz, 1995). In 1947 the Educational Testing Service was established to oversee CEEB and in 1959 the American College Test was created to serve as an alternative to the SAT (Gallagher, 2003).

The use of high-stakes standardized assessments would continue to evolve in the United States throughout the 20th century. Enrollment in American public schools

continued to soar through the end of World War II and with the Baby Boom that followed. Total enrollment in the American public schools in 1870-71 was 7.6 million students and increased to 46 million students in 1969-1970 (Snyder, 1993). These increases, coupled with the cultural impact of the Cold War and the Civil Rights Movement, led American citizens and political leaders to be focused on Americans competitive positions in the world, particularly with regards to student's talents in leadership, academics, and managerial skills (Wigdor & Garner, 1982). According to Gallagher (2003), standardized tests were used to determine which students would be promoted, retained, assigned to remedial or special education, or receive academic honors; also, students would be placed in academic or vocational paths based on the performance on the assessments.

The passage of ESEA in 1965, under Title 1, mandated that American public schools were to administer high-stakes standardized assessments and submit their results to the federal government in order to qualify for Federal funds (Thorndike & Lohman, 1990). This marked the first time that federal dollars would be tied to standardized assessments and the use of national results by legislators, bureaucrats, policy makers, citizens, and educators to evaluate instructional programs systematically for improvement (Gallagher, 2003). In 1969, the National Assessment of Educational Progress (NAEP), also known as the "National Report Card," was expanded with the help of the federal government to measure student achievement throughout the nation.

The 1970s ushered in what became known as the "Era of Accountability." Standardization of educational experience, curriculum, and assessments became the rage as schools were viewed to be similar to corporations with student performance on high

stakes standardized assessments being the unambiguous bottom line that assured students were meeting minimum competencies (Walsh & Betz, 1995). Student performance on high-stakes assessments in the 1970s became the barometer in which communities were held accountable by and would be used determined funding, programing, and quality of schools (Gallagher, 2003). In 1974, Title 1 was restructured and expanded to include school improvement. By 1980, 33 states required minimum competency testing and over 200 million tests were administered annually to determine IQ and academic readiness (Gallagher, 2003).

In 1983, the National Commission on Education Excellence released *A Nation At Risk,* calling for an end to minimum competency testing to raise student achievement. The study questioned the poor performance of American students on internationally benchmarked high-stakes standardized assessments and argued that other countries will challenge the United States global supremacy unless changes were made. The release of the report continued the movement of public educational policy towards accountability. By the end of the 1980s, educational standards and standardized assessments were commonplace throughout the United States. In many of these states, serious penalties were attached to assessment to hold students, teachers, administrators, schools, districts, and communities accountable to meeting the standards.

In September 1989, President George H. W. Bush held a summit of the nation's governors in Charlottesville, VA with a focus on education. The purpose of this meeting was to draft a set of national educational goals to be reached by the year 2000 (WGBH, 2002). The goals, known as *America 2000*, were six national educational goals that required the use of annual high-stakes standardized assessments as a standard practice in

the American public school system. To monitor the progress of the states towards these goals a new national report card was released in 1991 (Gallagher, 2003). In 1994, President Bill Clinton signed into law Goals 2000: Educate America Act, (P.L. 103-227) which established eight national goals including the continued use of standardized assessments and the development of "voluntary" national educational standards (Heubert & Hauser, 1999). This legislations faced immediate political opposition from those who believed the federal government had overstepped its role in the public education by attempting to develop a national set of standards (WGBH, 2002).

In response to the federal defeat, a group of 40 governors and influential business leaders from various corporations in the United States met at an education summit in 1996 and pledged the two sides would work together to raise academic standards and achievement in public schools throughout the nation. Achieve, Inc., a nonprofit educational organization, was founded to meet the goals set at the summit (Review of the 1996 National Education Summit, 1996). Focusing on improving academic standards and student assessments, Achieve, Inc., began to work with the various states and stakeholders to develop a series of academic benchmarks and standards, which would be adopted by various states throughout the nation

In 2002, President George W. Bush signed into law *No Child Left Behind (NCLB)*, which was closely connected to *America 2000* by requiring schools to administer standardized testing annually in mathematics and reading for all students. Federal funds were tied to performance on these assessments and schools were punished financially for not meeting Adequate Yearly Progress Targets (AYPTs). NCLB required states that receive federal funds under ESEA to develop academic standards, to establish

an assessment system based on those standards, and to test students in reading and mathematics to determine if they are meeting the standards (Fowler, 2013). Qualitative data gleaned from standardized assessments would be used to hold students, teachers, administrators, schools, districts, and communities accountable for student performance. The rationale is that by attaching significant rewards or serious threats to student achievement on high-stakes assessments, educators will be prompted to work harder (Nichols, Glass, & Berliner, 2012). Additionally, sample populations in each state were to be tested annually in Grades 4 and 8 in reading and mathematics through the National Assessment of Educational Progress (NAEP; Tanner & Tanner, 2007). According to Maylone (2002), President W. Bush's education policies changed the way American schools were evaluated.

In 2008, Achieve, and its subsidiary companies, continued to work with the National Governors Association (NGA) and Council of Chief State School Officers (CCSSO) to develop a series of de facto national standards known as the Common Core State Standards. The CCSSO were marketed around rhetoric that they were intended to include rigorous content and application of knowledge through higher order thinking, be closely aligned with college and work readiness skills, capitalize on current state standards, and be internationally benchmarked and based on evidence and research (Tienken & Orlich, 2013).

In 2008, President Barack Obama introduced Race to the Top (RTT), a $4.35 billion competitive grant to reward innovation and reform in local education. With the implementation of these two policies, the federal government will begin to assume an unprecedented role in shaping the American public school system and the curriculum

implementation at state and local levels. According to RTT's grant application, it required states competing for the grant to adopt standards and assessments that prepare students to succeed in college and the workplace and to compete in the global economy" and to build "…data systems that measure student growth and success, and inform teachers and principals about how they can improve instruction" (U.S. Department of Education, 2009). States were required to adopt the Common Core State Standards, change teacher and principal evaluation processes to include the use of standardized test results, remove caps on the number of charter schools approved in a state, and increase the numbers of alternatively certified teachers and school administrators to have a chance to win the Race to the Top Funds (Toscano, 2013). According to the United States Department of Education (2009), Race to the Top would reward States that have demonstrated success in raising student achievement and have the best plans to accelerate their reforms in the future. These states offered models for others to follow and will spread the best reform ideas across their States, and across the country. In 2012, New Jersey was awarded $37,847,648 in RTT grant funds based in part on the educational reforms proposed by Governor Chris Christie.

Phelps (2011) research found the use of large scale and high stakes standardized assessments have a "positive effect" on student achievement. In his study, Phelps conducted a quantitative analysis of over 100 years of literature which included 177 studies and found that there was a positive effect, particularly when testing with feedback. Phelps (2002) also argued that high stakes standardized assessments provide a reliable and objective measure of student performance and is cost effective. Hanushek and Raymond (2004) found "the introduction of accountability systems into a state tend

to lead to larger achievement growth than would have occurred without accountability. Koretz (2008) contended that school leaders and communities can utilize test scores to identify trends and patters to make instructional decisions and recommends that high stakes assessments be used when making decisions on student achievement.

Standardized test results have been used as evidence of the failure of American public education and to justify radical and unwarranted policy changes affecting the structure and function of the schools (Tanner & Tanner, 2007). Unwarranted policy changes are often the result of the repeated failure to recognize and treat the three fundamental factors in the educative process in vital interdependence: (a) the nature of the learner, (b) social conditions and democratic ideals, and (c) the selection and organization of knowledge of subject matter in the development and implementation of the curriculum (Tanner & Tanner, 2007). Instead, these fundamental factors are often treated in isolation of one another or even in opposition to one another (Tanner & Tanner, 2007). Policies are often developed in waves of reaction and counter-reaction; and as a result, special interests are served at the expense of the wider social interest of democracy (Tanner & Tanner, 2007).

Various studies have found that high stakes standardized assessments and policies have had a negative impact on student achievement (Amrein & Berliner, 2002; Maylone, 2002; Tienken & Rodriguez, 2010). Zhao (2009) argued that high stakes standardized assessments limit the opportunities students have to grow and to develop various individual talents. School districts have shifted their focus to the tested subjects, mathematics, English, and Science, at the expense of the other areas.

Critics of high stakes standardized testing contend that the assessments are biased

in terms of social, racial, cultural, and communal background (Berliner & Biddle, 1995). The Coleman Report found the most important predictor of student achievement was the student's "general social context" or community factors (Coleman et al., 1966). Hanushek and Raymond (2004) demonstrated that socioeconomic status, gender, and race influenced student performance on standardized tests. Davis-Kean (2005) parental education levels have a significant influence on student performance on standardized assessments. Maylone (2002), Jones (2008), Turnamian (2012), Lynch (2015), and Angelillo (2015) all found that student performance on high stakes standardized assessments could be accurately and reliably predicated based on out of district community factors.

The Common Core State Standards and the New Jersey Learning Standards

The goals of created by Achieve in 1996 became reality in 2009 when 48 states, two territories, and the District of Columbia signed a memorandum of agreement with the NGA and CCSSO committing to a state-led process that would develop a series of academic standards in English Language Arts and Mathematics known as the Common Core State Standards Initiative (CCSSI). According to the National Governors Association and the Council of Chief State School Officers, the standards were created to ensure that all students graduate from high school with the skills and knowledge necessary to succeed in college, career, and life, regardless of where they live (Common Core State Standard Initiative, 2017).

As the states adopted the standards, they "needed high-quality assessments aligned to those standards that would test students of all achievement levels on what they are learning" (About: Working Together to create a modern assessment, 2017). The

establishment of the Common Core State Standards occurred on a state level but was coordinated by NGA essentially creating a de facto controversial national curriculum. In July 2010, The New Jersey State Board Of Education unanimously adopted the CCSS, which were touted as "…a set of clear college- and career-ready standards for kindergarten through 12th grade in English language arts/literacy and mathematics."

Common Core advocates claim that the CCSS provide a framework for higher-level skill development compared to previous state standards that have existed. They require students to produce evidence of the learning through products that emphasize the use of her level thinking skills (VanTassel-Baska, 2015). Supporters also claim the CCSS is designed to prepare student to analyze information and events critically and become problem solvers (March & Peters, 2015). Advocates also praise the commonality of the standards across the nation.

However, critics of the Common Core State Standards argues that the standards were not developed in a collaborative process, but rather behind closed doors with certain policy entrepreneurs, private Washington-based organizations, and organizations that would profit from the development of the standards and testing (Tienken & Zhao, 2010). They also contend the CCSS weakens local control from schools by overemphasizing specific tested subjects over others. The curricula developed in schools will be designed to reflect interpretations of the CCSS (Toscano, 2013). Teachers lose the ability to be creative and design meaningful and engaging lessons that is essential to student learning. According to Kern (2014), the Common Core State Standards were never field tested, and little to no research has been conducted to assess the positive and negative results from implementing the CCSS in K-12 Schools.

Public opinion of the Common Core State Standards in New Jersey reached a tipping point on May 28, 2015 when Governor Chris Christie criticized the standards and created a task force to investigate and revise the standards as needed. According to Christie, the CCSS was "…simply not working" (Arco, 2015). By May 2016, the state of New Jersey adopted new standards in English Language Arts/Literacy and Mathematics as part of the New Jersey Student Learning Standards (New Jersey Department of Education, 2017). The NJSLS maintained about 84% of the 1,427 Language Arts and mathematic standards as that make up the CCSS (Clark, 2016). According to Burns (2017), the revisions to the standards focused primarily on adding examples and word choices with no substantial changes to level of complex thinking (p. 36). The changes were primarily semantics and are strikingly similar to the original Common Core State Standards (Burns, p. 37).

This creates an inconsistent scenario in the state of New Jersey and its implementation of the PARCC. According to Tienken (2015), "This is political theater, nothing more. The directives coming out of the [New Jersey Department of Education] to school districts do not in any way signal a change of course related to Common Core. The directives superintendents are receiving signal business as usual." The state is using an assessment that was created to measure the CCSS, not student performance on the NJSLS. Either the state is assessing the students using the wrong tool or they are admitting that the changes in the NJSLS are minimal.

Implementation of the PARCC

As per the requirements stipulated in NCLB, and the 2015 reauthorization, known as the Every Student Succeeds Act (ESSA), an assessment was required to monitor

student understanding of the Common Core State Standards and in 2011, a consortium of 11 states and the District of Columbia came together to develop and adopt the Partnership for Assessment of Readiness for College and Careers (PARCC). The assessment was developed by Pearson Education, with assistance from Achieve, and funded by resources granted through the Race to the Top. The 2015 and 2016 PARCC Technical Manual's claims that the PARCC

> …develops and administers next-generation assessments that, compared to traditional K-12 assessments, more accurately measure student progress toward college and career readiness. The assessments are aligned to the Common Core State Standards (CCSS) and include both English language arts/literacy (ELA/L) assessments (grades three through eleven and mathematics assessments [and] grades three through eight, and high school; Pearson, 2016, p. 7).

According to PARCC officials, the assessments were designed to achieve several purposes including providing "…evidence to determine whether students are on track for college- and career-readiness…," provide the "…structure needed to access the full range of CCSS and measure the total breadth of student performance…," and "… to provide data to help inform classroom instruction, student interventions and professional development" (Pearson, 2016, p. 2). The PARCC website adds to this claim by stating that the assessment "...helps ensure that all students, regardless of income, family background or geography, have equal access to a world-class education that will prepare them for success after high school in college and/or careers" (About: Working Together to create a modern assessment, 2017). Through the use of the CCSS and the PARCC Assessment, New Jersey joined with the majority of the other states to adhere to a de

facto national set of standards, curriculum, and assessment.

In school year 2014-2015, the first administrations of the PARCC assessments were conducted in 11 states and the District of Columbia. In 2015-2016, the administration of the PARCC occurred in seven states, the Bureau of Indian Education, and the District of Columbia. The ELA/L PARCC was administered in 2015–2016 to a total of 3,339,882 students, including 828,566 in the state of New Jersey. Nationwide 87.5% of students took the Computer Based Test in ELA/L, including 99.6% of the students in the state of New Jersey (Pearson, 2016, p. 232). The Mathematics PARCC was administered in 2015–2016 to a total of 3,284,448 students, including 806,752 in the state of New Jersey. Nationwide 87.3% of students took the Computer Based Test in Mathematics, including 99.6% of the students in the state of New Jersey (Pearson, 2016, p. 236).

History of Standardized Assessments in New Jersey

The New Jersey Constitution was amended in 1875 to address the need for educational opportunity for all students. The amendment mandated that the state legislature was required to "… provide for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all children in the state between the ages of five and eighteen years." Throughout the twentieth century, the demand for a free public education in New Jersey continued to grow, and this led to the Public School Education Act (PSEA) of 1975. The PSEA was created "to provide to all children of New Jersey, regardless of socioeconomic status or geographic location, the educational opportunity which will prepare them to function politically, economically and socially in a democratic society" (Vespucci, 2001). This law was amended in 1976

"…to establish uniform standards of minimum achievement in basic communication and computational skills. This amendment also included the legal basis for the use of a test as a graduation requirement" (Historical Context, 2016).

In 1982 students enrolled in the third, sixth, and ninth grades were required to participate in the Minimum Basic Skills (MBS) testing program in Language Arts and Mathematics. Students in the ninth grade were required to pass the assessment in order to receive their high school diploma. In 1983, New Jersey adopted the Grade 9 High School Proficiency Test (HSPT9), an assessment in reading, writing, and mathematics, and in 1986 required passing as a graduation requirement. In 1988, the legislature modified its laws to require that students passed the High School Proficiency Test (HSTP11) in eleventh grade and added the Grade 8 Early Warning Test (EWT). By 1993, all students in the state of New Jersey were required to pass the HSTP11.

New Jersey State Board of Education adopted the Core Curriculum Content Standards (CCCS) in 1996 establishing "…statements of expectation of what all students should know and be able to do by the time they graduate from high school" (Historical Context, 2016). To assess students' abilities to meet these standards, three statewide standard assessments were developed and administered: the Elementary School Proficiency Assessment (ESPA), the Grade Eight Proficiency Assessment (ESPA), and the High School Proficiency Assessment (HSPA). All students in New Jersey in 2001 were required to "... pass all sections of the HSPA in order to receive a state-endorsed diploma. Students who cannot meet the testing requirement may be eligible for a Special Review Assessment (SRA), which allows for examples of student work to be considered in place of an exam to determine whether a student has met the academic requirements

for a high school diploma" (Historical Context, 2016).

With the adoption of the No Child Left Behind (NCLB) Act of 2001, on January 8, 2002, New Jersey education officials revised their standardized assessments to determine how well they met federal requirements. The New Jersey Assessment of Skills and Knowledge (NJASK) replaced the ESPA in third grade and would eventually expand to include testing of all students between third and eighth grade. The HSPA continued to be the one of the requirements for all students to attain a high school diploma. The HSPA would serve as the high stakes standardized assessment that all students in the state of New Jersey would be required to pass to earn a diploma until 2016, when it will be replaced by the PARCC.

TeachNJ

The Teacher Effectiveness and Accountability for the Children of New Jersey Act (TEACHNJ) or N.J.A.C. 6A:10-4.2, a bipartisan tenure reform legislation, was signed into law by Governor Chris Christie on August 6, 2012 (NJ Department of Education, 2013). The according to the legislation, the purpose of TEACHNJ is to raise student achievement by "…improving instruction through the adoption of evaluations that provide specific feedback to educators, inform the provision of aligned professional development, and inform personnel decisions" (Teacher Effectiveness, 2012). TEACHNJ required the State Board of Education to develop regulations that would require Local Education Associations (LEAs) to develop evaluation rubrics for teachers, principals, and vice/assistant principals that would be partially based on multiple objective measure of student learning that use student growth from one year's measure to the next year's measure which would be known as Student Growth Percentiles (SGPs).

According to the NJDOE (2012), SGPs measure how much a student has learned from one year to the next compared to students with a similar performance history from across the state. A teacher's effectiveness rating is then determined by taking the median SGP score of the teacher's "…one course or group within a course that falls within a standardized-tested grade or subject" (N.J.A.C. 6A:10-4.2).

The New Jersey State Board of Education adopted the Common Core State Standards (CCSS) in mathematics and English language arts/literacy in June 2010. In order to develop an assessment to measure students' competency in the CCSS, the state joined the Partnership for Assessment of Readiness for College and Careers (PARCC) consortium. In 2014, the PARCC replaced the NJASK and the HSPA. On May 6, 2016, the New Jersey Department of Education (NJDOE) announced that they settled with the Education Law Center and the American Civil Liberties Union, creating a "…process by which students can complete the state's long standing high school graduation test requirements." This settlement allowed on the State of New Jersey to approve N.J.A.C. 6A:8-5.1 requiring "…all students (to) demonstrate proficiency in the high school end-of-course PARCC assessments in ELA 10 and Algebra I…" to graduate. These assessments would be administered to any student at the completion of an Algebra based course and at the end of the English/Language Arts 10 with students being required to "…achieve passing scores... on the ELA 10 and Algebra 1 assessments, and have taken all end-of-course PARCC assessments."

Structure of the PARCC

According to PARCC, the assessments are designed to achieve several purposes including providing "…evidence to determine whether students are on track for college-

and career-readiness…" provide the "…structure needed to access the full range of CCSS and measure the total breadth of student performance…" and "… to provide data to help inform classroom instruction, student interventions and professional development" (p. 2). To meet their stated goals, the PARCC developers followed Claim Structures for ELA/L and Mathematics that were grounded in the Common Core State Standards. A Master Claim is "…the overall performance goal for the PARCC ELA/Literary Assessment System—students must demonstrate that they are college- and career-ready on tract to readiness as demonstrated through reading and comprehending of grade-level texts of appropriate complexity and writing effectively when using and/or analyzing resources." These Master Claims were supported by Major Claims, which require students to read and comprehend "…a range of sufficiently complex texts independently, and [write] effectively when using and/or analyzing sources." These major claims were supported by sub-claims, which "… further explicate what is measured on the PARCC assessment and include claims about student performance on the standards and evidences outlines in the PARCC evidence tables for reading and writing." The claims and evidence were grouped into five categories, including Vocabulary Interpretation and Use, Reading Literature, Reading Information Text, Written Expression, and Knowledge of Language and Conventions.

At each grade level, the ELA/L summative assessment consists of three task types: Literary Analysis, Research Simulation, and Narrative Writing. For performance-based tasks, students were "…asked to read or view one or more texts, answer comprehension and vocabulary questions, and write an extended response that requires them to draw evidence from text" (p. 15). The assessment also contains information and

literary reading passages with comprehension and vocabulary questions. In the mathematics assessments, each grade level included both short and extended-response questions that "focused on applying skills and concepts to solve problems that require demonstration of mathematical practices from the Common Core State Standards with a focus on modeling and reasoning with precision" (Pearson, 2016, p. 16). In addition, the test included "… performance-based short-answer questions focused on conceptual understanding, procedural skills, and application." Similar to the ELA/L assessments, the Mathematics assessments followed the Master Claim structure, which measured the "…degree to which a student is college- or career- ready or on track to being ready in mathematics. The students solve grade-level/course-level problems aligned to the Standards for Mathematical Content with connection to the Standards for Mathematical Practice" (Pearson, 2016, p. 16). The Sub Claims were grouped into 4 lower sub claims including "Major Content with Connection to Practices," "Additional and Supporting Content with Connections to Practices," "Highlighting Practices with Connections to Content: Expressing Mathematical Reasoning by constructing viable arguments, critiquing the reasoning of others, and/or attending to precision when making mathematical statements," and "Highlighted Practice with Connections to Content: Modeling/Applications by solving real-world problems by applying knowledge and skills articulated in the standards" (Pearson, 2016, p. 17).

The test items were developed using a variety of experts, including "assessment designers, psychometricians, managers, trainers, content providers, content experts, editors, artists, programmers, technicians, human scorers, advisors, and members of the PARCC Operational Working Groups" (Pearson, 2016, p. 17). The various developers

selected reading passages using the PARCC Passage Selection guidelines that provided "a text complexity framework, and guidance on the selecting of a variety of text types and passages that allow for a range of standards/evidences to be demonstrated to meet the PARCC claims" (Pearson, 2016, p. 18). The PARCC ELA/L tests are intended to utilize authentic texts that are grade-appropriate which were not "developed for the purposes of the assessment or to achieve a particular readability metric, but reflect the original language of the authors" (Pearson, 2016, p. 18). For both the PARCC ELA/L and Mathematics assessments, items were developed and analyzed to determine the "content accuracy, alignment to the standards, range of difficulty, adherence to universal design principles, (and) bias and sensitivity" (Pearson, 2016, p. 18). The items were then reviewed at a state level to ensure that biased or state-sensitive issues would be avoided. The PARCC Grade 10 ELA/L and Algebra I assessments consist of three sections each in the computer-based test format.

The development of the PARCC assessment and its structure is a significant departure from the previous paper based high stakes assessments administered in New Jersey like the HSPA. In addition to its complexity and digital nature, the PARCC is designed exclusively to measure student understanding of the Common Core State Standards. The structural design tests student comprehension relating to the master and sub claims.

Scale Scores

The PARCC ELA/L and mathematics assessments are "designed to measure and report results in categories called master claims and sub claims" (Pearson, 2016, p. 193) and "are expressed as various types of scales scores as well as by performance levels

used to describe how well students meet the academic standards for their grade level" (Pearson, 2016, p. 3). The performance levels are reported in five levels:

- Level 1: Did not yet meet expectations
- Level 2: Partially meets expectations
- Level 3: Approached expectations
- Level 4: Met expectations
- Level 5: Exceeded expectations

These levels represent a range of scores that measure the student performance on the PARCC question items, which were designed "to elicit evidence from students that support valid and reliable claims about which they are college and career ready or on track toward that goal and are making expected academic gains based on the Common Core State Standards (CCSS)."

The PARCC performance ranges were determined using threshold scores. These threshold scores were initially expressed as raw scores on the performance level setting forms. There are 201 points that make up the full summative score scale points in both ELA and mathematics. They had a range from 650, the lowest attainable score, to 850, the highest attainable score. A level two performance cut score is 700 and a level four performance cut score is 750. On the 2015–16 PARCC assessment, the level three cut score on the grade 10 ELA/L was 726 and the level three cut score on the Algebra I was 728.

Table 1

Threshold Scores and Scaling Constants for High School ELA

PARCC Assessment	Threshold Cut	Theta	Scale Score	*A*	*B*
Grade 9 ELA	Level 2 Cut	-1.1635	700	34.2174	739.8124
	Level 3 Cut	-0.4329	726		
	Level 4 Cut	0.2977	750		
	Level 5 Cut	1.5065	791		
Grade 10 ELA	Level 2 Cut	-0.8909	700	43.1280	738.4223
	Level 3 Cut	-0.3112	725		
	Level 4 Cut	0.2684	750		
	Level 5 Cut	1.2858	794		

Note. Copyright from PARCC. (2017). Final Technical Report for 2016 Administration. *Perason,* January 10, 2017.

Table 2

Threshold Scores and Scaling Constants for High School Mathematics

PARCC Assessment	Threshold Cut	Theta	Scale Score	*A*	*B*
Algebra 1	Level 2 Cut	-1.1781	700	31.5325	737.1490
	Level 3 Cut	-0.3853	728		
	Level 4 Cut	0.4075	750		
	Level 5 Cut	2.1651	805		

Note. Copyright from PARCC. (2017). Final Technical Report for 2016 Administration. *Perason,* January 10, 2017.

Once the student raw scores were converted, a normal distribution curve was created based on all the participants. The distribution allowed the framers of the PARCC to assign the cut scores for the assessment. In New Jersey, students performing at a 749

or lower were considered to be at Level 1, Level 2, or Level 3 and students above a 750 were conserved to be at Level 4 and Level 5. Over the three years of use, 57% of all students' performance on the PARCC in the state of New Jersey was in the range of Levels 1-3 while only 43% of all students performed between a Level 4 and 5. For student who participated on the New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy between 2014 and 2016, the average only 41% of the students were able to meet or exceed expectations.

Table 3

New Jersey Student Performance Scores on PARCC in Algebra 1 and English Language Arts/Literacy between 2014 and 2016

Year	Assessment	Valid Scores	Combined Levels 1/2/3	Combined Level 4/5	Median Scale Score
2014-2015	Algebra 1	91,740	64%	36%	735
2015-2016	Algebra 1	105,998	59%	41%	741
2016-2017	Algebra 1	110,215	58%	42%	742
2014-2015	English Language Arts- 10	71,659	63%	37%	733
2015-2016	English Language Arts- 10	84,921	55%	44%	743
2016-2017	English Language Arts- 10	85,598	54%	46%	745
	Average Score of all tests	89,035	59%	41%	

Note. Copyright from PARCC. (2017). Final Technical Report for 2016 Administration. *Perason,* January 10, 2017.

Impact of High Stakes Standardized Assessments as Graduation Requirements

Throughout the United States, school administrators are encouraged to make "data-driven" decisions based on the results of high-stakes standardized assessments (Booher-Jennings, 2005; Leithwood, Louis, Anderson, & Wahlstrom, 2004; Weiss, 1998). According to Tienken (2011), the "practice of using high school exit exams as the deciding factor on whether a student can receive a standard diploma began over 30 years ago in 1978," and in 2014, 27 states used an exit exam to determine graduation status for high school students. By 2018, the number of states using high school exit exams was

13. Research has found that high school graduation exams are "…more likely to be found in states with higher percentages of African American and Hispanics and lower percentages of Caucasians compared to the Nation" (Amrein & Berliner, 2002). In addition, these exams are more common in states with higher rates of poverty and lower level of student achievement. The use of these exams as a graduation requirement negatively impact minority students at higher rates.

The state of New Jersey mandated that all students must achieve passing scores on the ELA 10 and Algebra 1 PARCC assessment. Students who do not pass this assessment may be retained, placed in lower-level remediation courses, required to participate in test preparation courses, and may not receive a high school diploma. Not graduating from high school can cause a variety of negative life-long consequences that include lower earning potentials, high public medical costs, greater rates of incarceration, and greater use of the welfare system (Levin, 2009).

Conditional Standard of Error Measurements

Tienken (2011) identified Conditional Standard of Error Measurements (CSEM) as one major area of concern regarding the use of high-stakes standardized assessment to determine potentially life-altering decisions about students. The CSEM is an estimate of the amount of error the user of test results must consider when interpreting a score at a specific cut point or proficiency level or when making a high-stakes decision based on the test score (Harvill, 1991). Essentially, it is the positive or negative margin of error for each individual assessment result. If a student scored a 737 (Level 3–Approached expectations) on the PARCC assessment and the CSEM was 13 points, the results could vary between 724 (Level 2–Partially meets expectation) and 750 (Level 4–Met

Expectations). Economically disadvantaged students are more likely as a whole to be negatively impacted because of "misinterpretations of score results due to CSEM that cause them to be labeled as not proficient because they score closer to their state's proficiency cut score" (Tienken, 2011). Tienken (2011) estimated that "166,305 students were miscategorized at least once in an academic year as less than proficient on their statewide mandated LA test because of CSEM" and "164,982 students were categorized as less than proficient on their statewide mandated math test."

According to the PARCC Final Technical Report for 2016 Administration, the "standard error of measurement (SEM) quantifies the amount of error in the test scores. SEM is the extent by which test takers' scores tend to differ from the scores they would receive if the test were perfectly reliable." The average raw score SEM on the PARCC 2016 was a 6.24 of the maximum possible score on the Computer Based Test (CBT) administration of the English Language Arts/Literacy Grade 10 assessment and 3.91 of the maximum possible score on the Computer Based Test administration of the Algebra 1 assessment. The average scale score SEM was 11.96 points on the CBT administration of the English Language Arts/Literacy Grade 10 assessment and 10.19 points on the CBT administration of the Algebra 1 assessment.

Table 4

Summary of ELA/L Test Reliability Estimates for Total Group

Grade Level	Testing Mode	Number of Forms	Total Sample Size	Average Maximum Possible Score	Average Reliability	Average Raw Score SEM	Average Scale Score SEM
3	CBT	5	371,885	93	0.91	5.21	12.02
	PBT	3	98,738	94	0.91	5.46	12.24
4	CBT	5	377,022	106	0.91	5.78	10.59
	PBT	3	82,792	106	0.89	6.25	11.47
5	CBT	5	404,383	106	0.91	5.56	9.83
	PBT	3	50,081	106	0.89	6.07	10.37

6	CBT	5	402,155	121	0.92	6.28	8.79
	PBT	3	52,096	121	0.92	6.72	8.75
7	CBT	5	395,258	121	0.93	6.37	9.57
	PBT	3	53,335	121	0.92	6.92	10.97
8	CBT	5	388,964	121	0.93	6.43	10.05
	PBT	3	50,121	121	0.92	6.76	10.72
9	CBT	6	259,459	121	0.93	5.97	9.33
	PBT	3	14,606	121	0.92	6.66	10.70
10	CBT	6	183,504	121	0.93	6.24	11.96
	PBT	3	8,407	121	0.94	6.54	11.95
11	CBT	6	129,937	121	0.92	6.17	10.89
	PBT	3	6,045	121	0.91	6.55	12.12

Note. ELA grade 3 CBT test have a lower average maximum possible score due to a spoiled item. Copyright from PARCC. (2017). Final Technical Report for 2016 Administration. *Perason,* January 10, 2017

Table 5

Summary of Mathematics Test Reliability Estimates for Total Group

Grade Level	Testing Mode	Number of Forms	Total Sample Size	Average Maximum Possible Score	Average Reliability	Average Raw Score SEM	Average Scale Score SEM
3	CBT	7	375,519	66	0.93	3.46	9.03
	PBT	4	99,447	66	0.93	3.63	9.34
4	CBT	7	378,225	66	0.93	3.35	8.34
	PBT	4	84,410	66	0.93	3.56	8.88
5	CBT	7	405,033	66	0.92	3.56	8.64
	PBT	3	51,463	66	0.93	3.55	8.50
6	CBT	7	404,238	66	0.93	3.51	8.15
	PBT	3	51,856	66	0.93	3.61	8.16
7	CBT	7	382,190	66	0.92	3.34	8.19
	PBT	4	52,101	66	0.92	3.55	8.03
8	CBT	7	314,017	66	0.91	3.25	11.07
	PBT	4	44,484	66	0.91	3.58	12.11
A1	CBT	7	301,139	81	0.91	3.91	10.19
	PBT	4	19,605	81	0.92	3.77	10.28
GO	CBT	6	138,781	81	0.93	3.47	7.12
	PBT	3	5,156	81	0.93	3.65	7.35
A2	CBT	6	130,338	81	0.93	3.62	10.53
	PBT	2	7,839	81	0.91	3.86	11.52
M1	CBT	2	16,275	81	0.90	3.45	10.65
	PBT						
M2	CBT	2	4,313	80	0.86	3.27	10.84
	PBT	1	266	80	0.84	3.56	10.33
M3	CBT	1	2,142	81	0.92	3.79	11.36
	PBT	1	114	80	0.75	3.25	13.32

Note: A1= Algebra I, GO= Geometry, A2= Algebra II, M1= Integrated Mathematics I, M2= Integrated Mathematics II, M3= Integrated Mathematics III, M1 sample size was insufficient to report the results. A2 PBT and M3 PBT tests have lower average maximum possible scores due to spoiled item. Copyright from PARCC. (2017). Final Technical Report for 2016 Administration. *Perason,* January 10, 2017

Influence of Socioeconomic and Demographic Variables on High-Stakes Standardized Assessments

As part of the Civil Rights Act of 1964, the U.S. Department of Education commissioned James Coleman and his colleagues to determine the "availability of equal education opportunities in public schools for minority groups" and "detail the degree of segregation" and understand "the relationship between student achievement, as measured by achievement test, and the kinds of schools they attend" (Coleman et al., 1966). *The Equality of Educational Opportunity*, better known as the Coleman Report, was the largest study on public educational ever conducted. It included more than 640,000 children in Grades 1, 3, 6, 9, and 12, as well as more than 60,000 educators in approximately 4,000 schools with various socioeconomic backgrounds (Coleman et al., 1966). The study found that "schools account for approximately 10% of the variances in student achievement, whereas 90% of the variance in achievement was accounted for by student background characteristics" (Marzano, 2000).

In 1972, Jencks and his colleagues (1972) published *Inequality: A Reassessment of the Effects of Family and Schooling in America*. The study confirmed the findings of the Coleman Reports and determined that socioeconomic status was most influential on student outcome (Jencks et al., 1972). In 2005, Sirin conducted a follow-up meta-analysis of 74 independent studies published between 1990 and 2000 to determine the relationship between socioeconomic factors (SES) and academic achievement. Sirin

(2005) found a medium to strong relationship between socioeconomic variables and student achievement at the school level and reported "researchers must continue to assess student's SES as part of their understanding of family effects on academic performance" (p. 445). Research has shown consistently that a district's community demographic data significantly affect 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).

Predictive Studies on High-Stakes Standardized Assessments in NJ

In 2002, Nelson Maylone published *The Relationship of Socioeconomic Factors and District Scores on the Michigan Education Assessment Program Tests* analyzing the impact of socioeconomic status on student achievement in the Michigan Education Assessment Program (MEAP). His study (Maylone, 2002) found that 56% of high school high-stakes standardized test data were explained by three SES factors: percentage of students eligible for free or reduced lunch, the percentage of lone-parent households, and the mean household income. Maylone's study calls into question the use of high-stakes testing to create the various policies that negatively impact communities with high rates of poverty.

In New Jersey, Jones (2008) built upon the work of Maylone and created a predictive model for student achievement on the New Jersey High School Proficiency Exam (HSPA). Utilizing data published annually through the New Jersey School Report Card, Jones was able to analyze expected passing rate measured by HSPA versus its actual passing rates. Jones (2008) recommends that this analysis be used to determine if schools are failing to meet expectations, meeting expectations, or exceeding expectations.

Jones (2008) found that 8 of the 49 variables relevant to Language Arts accounted for 90% of the variability of student achievement on the HSPA11. Those variables included average verbal SAT score, student mobility rate, student attendance, percentage of LEP students, percentage of students with disabilities, percentage of budget revenues from state taxes, percentage of graduates who are undecided about post-graduation plans, and student attendance for Grade 11 (Jones, 2008).

In 2012, Turnamian conducted a study titled *The Value of NJ School District Demographic Data in Explaining School District NJ ASK Grade 3 Language Arts and Mathematics Scores,* which determined that student performance was explained by "lone-parent households, percentage of households with at least a bachelor's degree, percentage of economically disadvantaged families in a district explain 54% of 2009 NJ ASK Grade 3 Language Arts scores and 40% of 2009 NJ ASK Grade 3 Mathematics scores" (p. 205). Turnamian (2012) was also able to predict 52% of the third grade NJ ASK scores in English language arts within ten points by examining three community demographic variables.

Since 2012, researchers have consistently been able to replicate Turnamian's findings and have built upon his research. For example, Sackey (2014) examined the combination of 15 out-of-school community- and family-level demographic variables that best predict and account 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.

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.

Additional researchers in the state of New Jersey also built on the work of Turnamian (2012) consistently finding that student performance on the NJASK or HSPA could be accurately and reliably predicted based on the socioeconomic and community demographic data (Tienken et al., 2017). This study further demonstrated that student performance on standardized assessments is greatly influenced by factors beyond the control of the local education association, and that the use of the assessments for any other reason beyond diagnostic is biased and flawed. The impact of poverty on student achievement has been studied for decades by educational researchers. However, many bureaucrats continue to proclaim they are not convinced that poverty matters in terms of student achievement on state-mandated assessments, despite the number of extant studies that say otherwise (Tienken, 2012).

Predictive Factors

Household income and student achievement. The gaps between education and family income continues to widen in the United States. Increased income levels

positively impact overall academic achievement and student academic skills (Wolfe, 2016). According to the U.S. Census Bureau, the median household income in New Jersey between 2012 and 2016 was $73,702 (QuickFacts, 2017), making it the second wealthiest state in the country. Yet the disparity in household income in New Jersey varies significantly. Most of New Jersey's wealth is in Morris, Somerset, and Hunterdon counties, and those counties have only a few towns in which the median household income dips below $100,000, as measured by the most recent data from the U.S. Census Bureau (QuickFacts, 2017). The city of Camden is estimated to be the state's poorest, with a median income of just $26,214, followed by Penns Grove in Salem with a median household income of $27,615. It is estimated that 10.4% of New Jersey residents are considered to be living in poverty (QuickFacts, 2017).

Payne and Biddle (1999) noted

> poor children are uniquely handicapped for education ... poor homes provide little access to books, writing materials, computers, or other supports; poor students are more often distracted by diseases; they tend to live in neighborhoods affected by crime, decay, drugs and drug dealing; and their homes tend to be dysfunctional, with parents often incarcerated or disturbed. (Maylone, 2002, p. 66)

Education costs in New Jersey are supported by a system of taxes, mostly local property taxes, along with state-funded grants. "Because these funds are raised and spent locally, districts with higher property values have greater resources to fund their schools, even when poorer districts tax themselves at a proportionally higher rate" (Darling-Hammond, 2004, p. 216). When children grow up in poor neighborhoods, they are less likely to have high-quality schools, which play a key role in cognitive achievement (Rivkin, Hanushek,

& Kain, 2005).

Morrissey, Hutchinson, and Winsler (2014) conducted a longitudinal study using a cohort of students in Kindergarten to 4th grade to examine the relationship of student attendance, family income, and academic achievement. They found that students who received free lunch scored 18.3% and students who received reduced price lunch scored 6.2% lower grades than students who were paying full price for their meals. (Morrissey et al., 2014). They also found that third and fourth grade students who were receiving free and reduced lunch continued to or increased their lower scores on the high stakes standardized assessments over time leading to a "…cumulative, negative effect on student grades" (Morrissey et al., 2014).

According to Taylor and Piche (1991), minority and economically disadvantaged students are located in property-poor urban districts, which fare the worst in educational expenditures as a result of the school finance system. Research findings indicate that family socioeconomic status and the home environment impact cognitive achievement (Guo & Harris, 2000; Todd & Wolpin, 2003; Yeung, Linver, & Brooks-Gunn, 2002). The acquisition of basic skills during childhood in reading and mathematics is important to success as adults (Linver, Brooks-Gunn, & Kohen, 2002; Farkas, England, Vicknar, & Kilbourne, 1997; Hauser, Warren, Huang, & Carter, 2000; Kerckhoff, Raudenbush, & Glennie, 2001).

According to Desimone (1999), studies have shown that parental involvement varies according to parental social, racial/ethnic, and economic characteristics (Catsambis & Garland, 1997; Hoover-Dempsey, Bassler, & Brissie, 1987; Muller & Kerbow, 1993). Guo and Harris (2000) found that lower-SES children are exposed to poorer home

physical environments. Children received less cognitive stimulation, had poorer health and poorer quality housing, less safe living arrangements, and less consistent parenting styles. These inequalities related to socioeconomic status and the development of student skills are particularly significant due to the increased possibility of intergenerational transmission of disadvantage (Sastry & Pebley, 2010). Often referred to as the "cycle of poverty," families in disadvantaged communities are less likely able to move their children to higher-quality neighborhoods.

Lone-parent household and student achievement. Over the past half-century, the number of lone-parent households has increased. According to the U.S. Census Bureau, lone-parent households made up approximately 35% of the overall population in the United States in 2014. In the same year, 32% of children in New Jersey lived in lone-parent households. Disaggregated by race, a large disparity exists between non-Hispanic white, Hispanic or Latino, and African American families in the levels of lone-parent households.

Table 6

New Jersey Lone-Parent Households Disaggregated by Race

New Jersey Lone-Parent Households in 2014	Black or African American	# of Lone-Parent Households	198,000	175,000
		% of Lone-Parent Households	63%	64%
	Hispanic or Latino	# of Lone-Parent Households	154,000	238,000
		% of Lone-Parent Households	42%	49%
	Non-Hispanic White	# of Lone-Parent Households	186,000	176,000
		% of Lone-Parent Households	16%	19%

Total	# of Lone-Parent Households	564,000	612,000
	% of Lone-Parent Households	28%	32%

Note. Copyright from PARCC. (2017). Final Technical Report for 2016 Administration. *Perason,* January 10, 2017.

Jeynes (2005) finds family structure to be the single greatest predictor of academic achievement. According to Maylone, researchers established in the 1990s that students from a lone-parent household were less likely to complete high school or attend college (Amato & Keith, 1991; Coleman, 1988). Children from lone-parent households report lower educational expectations on the part of their parents, less monitoring of schoolwork, less overall supervision of social activities, and overall disengagement of parents from their children. Downey (1994) concluded that economic deprivation was the principal reason why children raised by single mothers performed poorly on standardized tests relative to children raised in two-parent homes. Downey (1994) explained that the family structure had less to do with academic deficiencies than with the reality many single female parents were living in poverty, which was the real root cause of their children's underperformance. The economic deprivation of single mothers did not hold true for single fathers, who had access to high-wage jobs (Downey, 1994).

Fram, Miller-Cribbs, and Van Horn (2007) conducted a study examining child, classroom, and school-level factors that influence academic achievement among public school children in the South. Their study utilized data from the early Childhood Longitudinal Study Kindergarten Cohort (eCLS-K) (National Center for Education Statistics, 2001). The study found that children from lone-parent households disproportionately attended high ethnic minority schools. They also found these children's mothers had lower levels of education and lived in households with lower

levels of education. According to McCahill (2015), the influence of lone-parent households on student achievement suggests that children have the most favorable academic outcomes if both of their parents exhibit high involvement in school.

Parental education level and student achievement. Parents' educational attainment is influential in predicting children's achievement (Bradley, Caldwell, & Corwyn, 2003; Desai & Alva, 1998; Jimerson, Egeland, & Teo, 1999; Linver et al., 2002; Yeung et al., 2002). Both income and education may have important influences on the ability of a family to provide their children with a stimulating home environment that encourages higher student achievement in school (Duncan & Brooks-Gunn, 1997). Research also suggests that the level of educational attainment by the parents may have a stronger influence than family income on child development. Duncan and Brooks-Gunn (1997) discovered that family income has a significant effect on children's outcomes at young ages, but that effect decreases over time. However, the impact of parents' educational attainment continued from early childhood into adolescence. Halle, Kurtz-Costes, and Mahoney (1997) found that parental expectations about student achievement are vital to success in math and reading.

In 2013, Potter and Roksa conducted a study on the relationship between family experiences and children's academic achievement using eighth-grade longitudinal data from the Early Childhood Longitudinal Study–Kindergarten Cohort (ECLS-K). They found that children with better-educated mothers scored higher on their math and reading assessments in kindergarten. Students with mothers who completed college outperformed children whose mothers had no or some college experience. They also found that more highly educated women are more likely to be married. Guryan, Hurst,

and Kearney (2008) found that more highly educated parents spend more time with their children and have fewer children.

Theoretical Framework

Urie Bronfenbrenner developed the *Ecological Systems Theory* (1974, 1976, 1977, 1979) in which he contends the explanation of a child's development is found in the child's environment and the child's interactions with the various economic, cultural, social, environmental, and political influences in that child's life. According to Bronfenbrenner, "...the understanding of human development demands going beyond the direct observation of behavior on the part of one or two persons in the same place; it requires examination of multiperson systems of interaction not limited to a single setting and must take into account aspects of the environment beyond the immediate situation containing the subject" (1977, p. 514). The Ecological Systems Theory served as the philosophical basis of the Head Start program, a federal child development program for low-income children and their families, launched as part of President Johnson's Great Society (Caldwell, 2017) and is widely accepted for having a broad impact many other theory related to child development and behavior (Jeronimus, Riese, Sanderman, & Ormel, 2014). The ecological environments known as Microsystems, Mesosystems, Exosystesm, Macrosystems, and Chronosystems, are "…conceived as a set of nested structures, each inside the other like a set of Russian dolls" (Gauvain & Cole, 1993, p. 39).

The Microsystem is the first system in the Ecological Systems Theory and it is the most intimate of the relationships in the child's development. It is "the complex of relations between the developing person and environment in an immediate setting

containing that person" (Bronfenbrenner, 1977, p. 514) such as the child's family, home or school. The interactions a child has with the various influences in its life such as parents, family, friends, teachers, classmates, and school environment it will have an influence on how the child will grow. The nurturing and supportive nature of the interactions and relationships will have an impact on the development of the child positively or negatively. In the case of this study, the microsystem is represented by the school and district that a child attends. The immediate relationships between the students, classmates, friends, and teachers have a direct impact on the child, its development, and their growth.

The next system is the Mesosystem. This system comprises the interactions of two or more of the microsystems. The relationship between the Microsystems influences in a child's life connect and create linkages which become evident in the Mesosystem. For example, if a child's parent's (microsystem) are positively actively involved in the child's school (microsystem) and have a positive working relationship with the child's teacher's (microsystem) in which they support the teacher and school, then the child's development is positively affected and will create harmony in the child's understanding of this Mesosystem. However, if the child's parent's (microsystem) are negatively and passively involved in the child's school (microsystem) and have a negative working relationship with the child's teacher's (microsystem) which is based on criticism and dislike, it will create conflicting emotions in the child and affect the child's development negatively. In this study an example of the mesosystem is found in the Parental Level of Education (Parents with less than a 9^{th} grade education, Percentage with no high school diploma, percentage that are high school graduates with some college education,

percentage that are high school graduates with some college educations, percentage with a bachelor's degree, and percentage with an advanced degree) because research suggests that the parental education influences parental involvement in their child's school and their perspective on education (Davis-Kean, 2005).

The third system is the Exosystem. This system is an extension of the mesosystem and it embraces other specific social structures that do not contain the developing person but, directly or indirectly, impact and influence the immediate settings in which that person is found (Bronfenbrenner, 1977, p. 515). Examples of an Exosystem in a child's development is the relationship between the child's parent and their employer, their parent's role in their neighborhood, and their family's relationship with their extended family. If a child's parents are unemployed, underemployed or have negative experiences at work, the parent's income is affected which has an effect on the child but is beyond the reach of the child. For this study, percentage of family income (under $25,000, under $35,000, and above $200,000) and employment status represent the exosystem for the child which has been found by researchers to influence student behavior and academic performance on high stakes standardized assessments (Caldwell, 2017; Tienken et al., 2017; Maylone, 2002).

The fourth system, known as the Macrosystem, is "…the overarching institutional patterns of the culture or subculture, such as the economic, social, educational, legal, and political systems, of which micro-, meso-, and exosystems are the concrete manifestations" (Bronfenbrenner, 1977, p. 515). It is the largest and most distant influences on a child's development is composed of the cultural and subcultural values which will come to dominate a child's ideas and beliefs. For example, a child who grows

up in an impoverished, violent, and crime invested inner city in which gang lifestyles are glorified will have a different set of cultural and subcultural values towards life, education, and government than a child who develops in an affluent, peaceful, and crimeless inner city. In this study, examples of Macrosystems would be Percentage of annual household income (under $25,000, under $35,000, and above $200,000) and poverty levels (all families in poverty for 12 months, all females' households in poverty, and all people under poverty). Household income, which refers to the combined income of every person in the household regardless of relationship, and poverty levels can potentially have a significant impact on the development of a child. The child's household's income and poverty level will determine the community, municipality, or city that the child will live in. This can potentially have a significant impact on the child's beliefs, ideas, customs, culture and subculture.

The final system is the Chronosystem which adds the third dimension of time to describe the changes and consistencies over time in the characteristic of the child and the environment in which the child lives such as moving, divorce, or untimely death. In this study, family structure such as lone parent households (percentage of male households with no wife, percentage of female households with no husband, lone parent households, total) was used to study the chronosystem in each of the school districts. Researchers have found that family structure has a significant influence on the success of a student at school (Evenhouse & Riely, 2004). Jeynes (2005) found family structure to be the single greatest predictor of academic achievement. According to Maylone, researchers established in the 1990s that students from a lone-parent household were less likely to complete high school or attend college (Amato & Keith, 1991; Coleman, 1988).

CHAPTER III

METHODOLOGY

This study examined the impact of family and community socioeconomic factors (i.e., lone-parent household, level of parental education, and household income levels) on student performance on the 2016 New Jersey Partnership for Assessment for College and Career scores in Algebra 1 and Grade 10 English Language Arts/Literacy. Beginning in 2014–15, hundreds of thousands of New Jersey students in grades 3 to 11 took the high-stakes standardized assessments known as PARCC. This study will analyze the results of the assessments and determine if there is any statistical relationship between family and community socioeconomic factors and student performance. If out-of-school variables are found to explain significant variance in district test scores or even predict a district's scores, as the existing literature suggests, the value of using the PARCC to measure the quality of in-school variables and teacher performance may be in question.

Research Design

This study utilized a non-experimental, correlational, explanatory cross-sectional design with quantitative methods. Multiple linear regression modeling was used to determine the statistical relationship between out-of-school variables and the 2016 New Jersey PARCC test scores in Algebra 1 and Grade 10 English Language Arts/Literacy. The study focused on community variables identified by Maylone (2002), Jones (2008), Turnamian (2012), and McCahill (2015) and built upon their work, as their work suggests these variables should predict assessment scores. However, the current relationship between out-of-school variables and the 2016 New Jersey PARCC test scores in Algebra 1 and Grade 10 English Language Arts/Literacy assessment is not currently known.

According to Kerlinger (1986), "…non-experimental quantitative research is more important than experimental research… (since) most social scientific and educational research problems do not lend themselves to experimentation, although many of them do lend themselves to controlled inquiry of the non experimental kind" (p. 359). Non-experimental research can be classified into three categories: descriptive, predictive, and explanatory (Johnson, 2001). Predictive non-experimental research studies test theories about a phenomenon and try to explain how or why the theory occurs and explains how the phenomenon operates by identifying that factors that cause the change. If no manipulations occur, then the term explanatory is applied. Cross sectional research uses data that are collected from research participants at a single time (Johnson, 2001).

In the case of this study, the researcher attempted to determine if there was a significant predictive relationship between the out of school socioeconomic variables and student performance on various sections in the 2016 New Jersey PARCC. This cross-sectional study will utilize data that was gathered at one time, i.e., the spring administration of the 2016 PARCC assessment. This study aimed to determine the relationship between two or more variables using quantitative methods at one time, making it non-experimental, quantitative, and correlational. Following a structure similar to previous researchers, multiple linear regression models were used to determine the statistical significance of out of school variables on student performance on the 2016 New Jersey PARCC test scores in Algebra 1 and Grade 10 English Language Arts/Literacy.

Research Questions

This study examined four overarching research questions:

1. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores in Algebra 1 and out-of-school community characteristics or socioeconomic variables?
    - H_a1: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016 New Jersey PARCC test scores in Algebra 1.
2. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 at a district level?
3. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy and out-of-school community characteristics or socioeconomic variables?
    - H_a2: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy.
4. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy at a district level?

Sample

The total available population for this study was 100% of the New Jersey schools that (a) tested high school students on the 2016 New Jersey PARCC test scores in

Algebra 1 and Grade 10 English Language Arts/Literacy, (b) reported valid test results that are published by the New Jersey Department of Education, (c) have complete census data available, and (d) are traditional local public schools that serve primarily their local community. According to the New Jersey Department of Education, there are 591 operating school districts with 2,505 schools in the state of New Jersey. A total of 737 schools in the state of New Jersey will administer the PARCC assessment to approximately 87,000 high school and middle school students. To provide an accurate accounting of the local community, it is the case that regional, charter, and special service schools will be excluded from the study. Only schools that served students in their local town or community were included in the study.

Variables

The dependent variables for this study were New Jersey school district 2016 Grade 10 New Jersey PARCC assessment scores in English Language Arts/Literacy and the 2016 Algebra 1 New Jersey PARCC assessment scores in Mathematics. These variables are defined as the percentage of students in the population that achieved meeting expectations or exceeding expectations. Building on Maylone (2002), Jones (2008), Turnamian (2012), Lynch (2015), and McCahill (2015), this study examined the following independent variables from the 2010 census:

Household income, which is defined as:

- Employment status
- Percentage of annual household income under $25,000
- Percentage of annual household income under $35,000
- Percentage of annual household income above $200,000

- Percentage of family income under $25,000
- Percentage of family income under $35,000
- Percentage of family income above $200,000
- All families in poverty for 12 months
- All female households in poverty
- All people under poverty

Lone-parent households, which are defined as:

- Percentage of male households with no wife
- Percentage of female households with no husband
- Lone parent households, total

Parent level of education, which is defined as:

- Parents with less than a 9th grade education
- Percentage with no high school diploma
- Percentage that are high school graduates with some college education
- Percentage with a bachelor's degree
- Percentage with an advanced degree

Reliability

As Gay, Mills, and Airasian (2009) noted:

> Reliability is the degree to which a test consistently measures what it is measuring. The more reliable a test is, the more confidence we have that the scores obtained from the test are essentially the same scores that would be obtained if the test were re-administered to the same test takers at another time or by a different person. If a test is unreliable … then the

> scores will likely be quite different every time the test is administered. (p. 158)

According to Benjamin and Pashler (2015), reliability can be described as "(If) a person taking the (same) test twice, or taking two different versions of the test, should not score markedly different across those occasions" (p. 2). The PARCC Technical Report defines reliability as the "extent to which differences in test scores reflect true differences in the knowledge, ability, or skill being tested rather than fluctuations due to chance" (Pearson, 2016, p. 75). The report provides full-tests reliability coefficients for the results ranging from 0 to 1, with the "higher the reliability coefficient for a set of scores, the more likely individuals would be to obtain very similar scores upon repeated testing occasions. The use of the reliability coefficient allows one test to be compared to another test; however, according to Koretz (2008), "it does not directly communicate to untrained users how much error is inherent in the score" (p. 158). The average reliability estimates for the CBT administration of the English Language Arts/Literacy Grade 10 assessment was a 0.93 and a 0.91 on the CBT administration of the Algebra 1 assessment.

The PARCC Technical Manual describes the "purpose of test validation is not to validate the test itself but to validate interpretations of the test scores for particular uses" (p. 119). They attempt to do this by gathering "evidence of validity based on both test content and on the internal structure of the tests" (Pearson, 2016, p. 119). The assessment was developed to "determine whether students are on track for college- and career-readiness" (Common Core State Standards, p. 2). The assessment claims to adhere to the "principles of evidence-centered design, in which the standards to be measured are identified, and the performance a student needs to achieve to meet those

standards is delineated in the PARCC evidence statements" (Common Core State Standards, p. 119). According to the PARCC Technical Manual, test items were analyzed using "PARCC College- and Career-Ready determinations (CCRD) in English Language Arts/literacy and mathematics (to) describe the academic knowledge, skills and practices students must demonstrate to show readiness for success in entry-level, credit-bearing college courses and relevant technical courses." In addition "the PARCC states determined that this level means graduating from high school and having at least a 75% likelihood of earning a grade of "C" or better in credit-bearing courses without the need for remedial coursework" (Pearson, 2016, p. 120).

This study used the data reported by the New Jersey Department of Education on the Partnership for Assessment of Readiness for College and Careers (PARCC) from 2016 to measure student academic proficiency. Currently, the PARCC claims to be an accurate and valid assessment. It is assumed the PARCC is a valid and reliable assessment and no evidence, at this point, exists to question this assumption. In terms of high-stakes standardized assessments, reliability is extremely important when graduation requirements exist. The more reliable a standardized assessment is deemed, the more likely the one-time participation of the assessment by the student can be seen as a valid score. If the assessment has a low reliability, then the performance of the students on the standardized assessment can been viewed as random and may not accurately reflect their comprehension of the expected standards and materials.

Validity

Validity is the ability of a test to measure what it is intended to measure (Salkind, 2010) and it "is the single most important criterion for evaluating achievement testing"

(Koretz, 2008, p. 215). More specifically, it is the ability of the standardized assessment to "describe a specific inference or conclusion based on a test score" (Koretz, 2008, p. 217) as intended by the designers of the assessment. As the PARCC Technical Manual describes, the "purpose of test validation is not to validate the test itself but to validate interpretations of the test scores for particular uses" (p. 119). They attempt to do this by gathering "evidence of validity based on both test content and on the internal structure of the tests" (Pearson, 2016, p. 119).

The assessment was developed to "determine whether students are on track for college- and career-readiness" (Common Core State Standards, p. 2). The assessment claims to adhere to the "principles of evidence-centered design, in which the standards to be measured are identified, and the performance a student needs to achieve to meet those standards is delineated in the PARCC evidence statements" (Common Core State Standards, p. 119). Test items were analyzed using "PARCC College- and Career-Ready determinations (CCRD) in English Language Arts/literacy and mathematics (to) describe the academic knowledge, skills and practices students must demonstrate to show readiness for success in entry-level, credit-bearing college courses and relevant technical courses." In addition, "the PARCC states determined that this level means graduating from high school and having at least a 75% likelihood of earning a grade of "C" or better in credit-bearing courses without the need for remedial coursework" (p. 120).

Instrumentation/Data Collection

This study analyzed district-level scores on the 2016 Grade 10 New Jersey PARCC assessment scores in English Language Arts/Literacy and the 2016 Algebra 1 New Jersey PARCC assessment scores in Mathematics in the selected New Jersey school

districts. The intent of this study was to determine the predictive accuracy between family and community socioeconomic factors identified by Maylone (2002), Jones (2008), Turnamian (2012), and McCahill (2015) and the 2016 Grade 10 New Jersey PARCC assessment scores in English Language Arts/Literacy and the 2016 Algebra 1 New Jersey PARCC assessment scores in Mathematics.

The dependent factors were collected through the use of excel files located on the New Jersey Department of Education website which included the publicly released 2016 New Jersey Statewide Assessment Reports for all students who participated in the PARCC Assessment from grades 3 to 11 in English Language Arts/Literacy and Mathematics. These data were then released by individual grade band through an Excel file providing the following information: County Code; County Name; District Code; District Name; School Code; School Name; District Factor Group; Subgroup; Subgroup Type; Registered to Test; Not Tested; Valid Scores; Mean Scale Score; Level 1 Percentage—Not Yet Meeting Expectations; Level 2 Percentage—Partially Meeting Expectations; Level 3 Percentage—Approaching Expectations; Level 4 Percentage—Meeting Expectations; Level 5 Percentage—Exceeding Expectations. For the purpose of this study, the data were modified to include County Name; District Name; School Name; District Factor Group; Subgroup; Valid Scores; Mean Scale Score, Level 4 Percentage—Meeting Expectations, and Level 5 Percentage—Exceeding Expectations. Also, Level 4 Percentage—Meeting Expectations and Level 5 Percentage—Exceeding Expectations were combined and considered to be "passing" the assessment.

All 18 of the independent factors, employment status; percentage of annual household income under $25,000; percentage of annual household income under

$35,000; percentage of annual household income above $200,000; percentage of family income under $25,000; percentage of family income under $35,000; percentage of family income above $200,000; all families in poverty for 12 months; all female households in poverty; all people under poverty; percentage of male households with no wife; percentage of female households with no husband, lone parent households, total; parents with less than a 9th grade education; percentage with no high school diploma; percentage that are high school graduates with some college education; percentage with a bachelor's degree; percentage with an advanced degree, were gathered from the 2010 U.S. Census Bureau, which was publicly available using American FactFinder and complied into a separate excel spreadsheet.

Since the databases published by the New Jersey Department of Education and American FactFinder were not presented in the format needed for this study, the data was reviewed and aligned to fit into one database. The steps required to complete the alignment of the data for this study were as follows:

1. Opening and downloading the appropriate databases for English Language Arts/Literacy and the 2016 Algebra 1 New Jersey PARCC published by the department of education.
2. Sort and delete database down to the district level.
    a. For Algebra 1:
        i. Sort by tab titled "District Name" then delete to leave only district level data.
        ii. Sort by tab titled "Subgroup type" then delete to leave only "District Totals".

iii. Sort by tabs titled “County” and “District” then delete to leave district level data.

b. For English Language Arts/Literacy 10:

i. Sort by tab titled “Subgroup” and delete all data not titled labeled “total” and “all students”.

3. Delete all regional and charter schools from the database.
4. Determine rates of students participating in the assessment by diving “Valid Scores” by “Registered to test” to determine participation rate.
5. Delete all districts with participation rates less than 60%.
6. Align U.S. Census data with PARCC data by matching district information with municipality information. If municipalities were missing from the U.S. Census data, they were removed from the spreadsheet.
7. Compare remaining districts to districts identified in previous studies to ensure that districts identified aligned to previous predictive studies conducted in New Jersey on high school high stakes standardized assessments, specifically Lynch’s (2015) *Predicting New Jersey High School Proficiency Test Results in Mathematics and Language Arts Using Community Demographic Data.* All the districts identified in the Lynch’s (2015) study were identified in this study.

In total, 159 districts made up the sample of districts included in the study for Algebra 1 and 146 districts made up the sample of districts included in the study for English Language Arts/Literacy 10. The difference between the districts included in the study for

Algebra 1 and English Language Arts/Literacy 10 occurred due to the lower participation rates in English Language Arts/Literacy 10.

Data Analysis

This study was conducted and the data were analyzed in a manner that was consistent with previous studies (Maylone, 2002; Jones, 2008; Turnamian, 2012; Lynch, 2015; Angelillo, 2015). The data were imported into SPSS and two separate multiple regression models were developed, one for each of the two dependent variables (i.e., 2016 Grade 10 New Jersey PARCC assessment scores in English Language Arts/Literacy and the 2016 Algebra 1 New Jersey PARCC assessment scores in Mathematics). Individual unstandardized coefficients were analyzed to determine if the independent variables included in the two regression models that were generated (i.e., lone-parent household, level of parental education, and household income levels) are statistically significant predictors of the dependent variables. According to Field (2009), a hierarchical regression model should meet the criteria specified by the formula (104+k) with *k* as the number of predictor variables in the study to have significant predictive power. This study required a minimum of 122 school districts which was met in both English Language Arts/Literacy 10 and Algebra 10.

The steps followed to complete the statistical review of the relationship between the dependent and dependent variables are as follows:

1. Import the data from the properly aligned Excel spreadsheets into SPSS to begin the correlational analysis. The first SPSS spreadsheet contained the dependent and independent variables related to the 2016 Grade 10 English Language Arts/Literacy English Language Arts/Literacy on the PARCC; and, the second

contained the dependent and independent variables related to the 2016 Algebra 1 on the PARCC.

2. Determine whether the dependent variables, the district level results on 2016 PARCC Grade 10 English Language Arts/Literacy English Language Arts/Literacy and 2016 PARCC Algebra 1, met the assumption of normality and examine the skewness of the data.
3. Determine the relationships and possible instances of multicollinearity between the independent and dependent variables by running Pearson Correlation matrices.
4. Using all the independent variables in the study, run simultaneous multiple regression models and correlation coefficient matrixes. This will determine the direction and strength of the relationship between the dependent and independent variables.
5. Determine if there was multicollinearity among the independent variables by running a variance inflation factor (VIF) analysis. A VIF greater than 4.000 suggest a potential threat to interpretation, and a VIF of 10.000 suggests multicollinearity (Kutner, Nachtsheim, & Neter, 2004; Rovai, Baker, & Ponton, 2014).
6. Conduct a series of linear regressions testing the dependent variables against various combinations of independent variables to determine the best model that accurately predicts the percentage of students at a district level Meeting Expectations or Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy. Extending the research of McCahill (2015), Turnamian (2012), and Maylone (2002), this study utilized

the predictive formula of $y_1=b_0 + (b_1*X_i) + (b_2*X_{ii})$ with *b* representing the unstandardized beta for the constant independent predictor variables and *X* representing the percentage of the variable in the community.

7. Subtract the predicted percentage for each district from the actual reported percentage of the district to determine if the difference was within the standard error and within the 95% confidence interval. The standard error of the estimate was used to make final determinations about the accuracy of each prediction. If the prediction was within the margin of error for the model, it was deemed accurate.
8. Calculate the percentage of students at a district level Meeting Expectations or Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy for each regression model to determine the model of best fit.

Chapter Summary

This chapter provided an understanding of the methodology, research design, research questions, sample, instrumentation, data collection method, data analysis technique, and reliability and validity of the data utilized in this study. Specifically, this study intends to assess the relationship between the various socio-economic factors beyond the control of a school district, as found in the 2010 U.S. Census data, and how that data can be used to predict student performance and outcomes on the 2016 Grade 10 New Jersey PARCC assessment scores in English Language Arts/Literacy and the 2016 Algebra 1 New Jersey PARCC assessment scores in Mathematics. The quantitative data will be analyzed using SPSS to compute a series of multiple linear regression models.

The results of this data will build on the work of Maylone (2002), Jones (2008), Turnamian (2012), Lynch (2015), and Angelillo (2015) and should be useful to bureaucrats, legislators, and school districts in determining policy.

CHAPTER IV

ANALYSIS OF THE DATA

The purpose of this study was to extend the research of McCahill (2015), Turnamian (2012), and Maylone (2002) and determine the predictive accuracy of community and family demographic variables, which are found through the use of U.S. Census data, on the percentage of students at a district level who are Meeting or Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy.

Research Questions

The research questions that drove this study were:

1. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores in Algebra 1 and out-of-school community characteristics or socioeconomic variables?
    - H_a1: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016 New Jersey PARCC test scores in Algebra 1.
2. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 at a district level?
3. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy and out-of-school community characteristics or socioeconomic variables?
    - H_a2: There is no statistically predictive relationship between

community characteristics or socioeconomic variables and the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy.

4. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy at a district level?

Dependent Variables

Utilizing the publicly released 2015-2016 PARCC database, available on the New Jersey Department of Education website, the dependent factor was a the combined district Level 4 (Meeting Expectations) and Level 5 (Exceeding Expectations) score of all the districts identified and had an opt-out rate above 60%. In New Jersey, students will be required to score a Meeting Expectations or Exceeding Expectations on the PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy to successfully meet the high school graduation requirements, which makes them eligible to graduate and earn a high school diploma.

Independent Variables

The independent variables found in the 2010 U.S. Census, listed below, were paired utilizing a correlational, explanatory, cross-sectional design with the dependent variables of student performance on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy determinate the if a predictive relationship existed. The variables were:

Household income, which is defined as:

- Employment status
- Percentage of annual household income under $25,000
- Percentage of annual household income under $35,000
- Percentage of annual household income above $200,000
- Percentage of family income under $25,000
- Percentage of family income under $35,000
- Percentage of family income above $200,000
- All families in poverty for 12 months
- All female households in poverty
- All people under poverty

Lone-parent households, which are defined as:

- Percentage of male households with no wife
- Percentage of female households with no husband
- Lone parent households, total

Parent level of education, which is defined as:

- Parents with less than a 9th grade education
- Percentage with no high school diploma
- Percentage that are high school graduates with some college education
- Percentage with a bachelor's degree
- Percentage with an advanced degree

Table 7

Names and Labels of Independent Variables

Variable	Label
Percentage of Population Employed	Employ Status

Percentage of Households Under $25,000	% House under 25K
Percentage of Households Under $35,000	% House under 35K
Percentage of Households Over $200,000	% House over 200K
Percentage of Families Under $25,000	% Family under 25K
Percentage of Families Under $35,000	% Family under 35K
Percentage of Families Over $200,000	% Family under 200K
Percentage of Families in Poverty for 12 Months	All Fams Pov 12 mnths
Percentage of Female Households in Poverty	Female House Pov
Percentage of All People Under Poverty	All People under Pov
Percentage of Male-Only Households, No Female	Lone Parent Male
Percentage of Female-Only Households, No Male	Lone Parent Female
Percentage of Lone-Parent Households	Lone Parent household (total)
Percentage of Population with less than 9th Grade Education	Less than 9th grade
Percentage of Population with No High School	No HS
Percentage of Population with Some College	Some College
Percentage of Population with Bachelor's Degree	BA
Percentage of Population with Advanced Degree	Advanced Degree

Procedure- Correlations

A database created in Microsoft Excel with the dependent and variables was input into SPSS. A correlational matrix was created to identify the independent variables that had the strongest relationship to the dependent variables. Also, this determined which independent variables might have high levels of multi-collinearity with each other.

The following independent variables exhibited the strongest (greater that +/-.650) statistically significant relationship to the dependent variable in Algebra 1: Percentage of Families Over $200,000- (.757), Percentage of Households Over $200,000- (.752), Percentage of Population with Advanced Degree- (.721), Percentage of Population with Bachelor's Degree- (.715), Percentage of Households Under $35,000- (-.655). Family income and post-secondary educational degree attainment proved to have the highest influence on student performance on the PARCC Algebra 1, while Percentage of Male-Only Households, No Female was the lowest statistically significant variable (-.382).

The following independent variables exhibited the strongest (greater that +/-.500) statistically significant relationship to the dependent variable in Grade 10 English Language Arts/Literacy: Percentage of Population with Bachelor's Degree- (.592), Percentage of Population with Advanced Degree- (.537), Percentage of Families Over $200,000- (.530), Percentage of Households Over $200,000- (.520), Percentage of Households Under $35,000- (.-.515). Family income and post-secondary educational degree attainment proved to have the highest influence on student performance on the PARCC Grade 10 English Language Arts/Literacy, while Percentage of Population Employed was the lowest statistically significant variable (-.206).

The best model in Algebra 1 was the combination of Percentage of Families Under $35,000 and Percentage of Families Over $200,000. This combination was statistically significant ($p<.000$) with an *R*-Square of .627 and an *F* of 130.980 . The standard error of the estimate was 11.473 and the VIF score for the model was 1.469. The unstandardized B for the constant was 36.757, the unstandardized B for the

Percentage of Families Under $35,000 was -.520, and the unstandardized B for the Percentage of Families Over $200,000 was .964.

The best model in Grade 10 English Language Arts/Literacy was the combination of Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree. This combination was statistically significant (p<.000) with an *R*-Square of .383 and an *F* of 44.295. The standard error of the estimate was 13.119 and the VIF score for the model was 1.281. The unstandardized B for the constant was 28.845, the unstandardized B for the Percentage of Female Households in Poverty was -.227, and the unstandardized B for the Percentage of Population with Bachelor's Degree was .974.

Procedure- Models of Best Fit Algebra 1

To determine the model that best fit, I conducted a series of linear regressions with testing the dependent variable against all 153 combinations of independent variables. This found there were 87 combinations of the two independent variables that were statistically significant and had standard deviations between 11.42 and 16.40. From there, the top two variable combinations with standard deviations under 12.00 were tested with a third variable to identify three variable combinations with standard deviations under 11.75. Once the best combinations were identified, the final regression equation (Maylone, 2002) of $y_1=b_0 + (b_1*X_i) + (b_2*X_{ii})$ with *b* representing the unstandardized beta for the constant independent predictor variables and *X* representing the percentage of the variable in the community. The standard error of the estimate was used to make final determinations about the accuracy of each prediction. If the prediction was within the margin of error for the model, it was deemed accurate. This equation was tested against the identified combinations with standard deviations under 11.73 to find the highest

prediction within the margin of error deemed accurate.

Table 8

Final Model Hierarchical Linear Regression for Algebra 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792[a]	.627	.622	11.47301

a. Predictors: (Constant), %Family under 200K, % Family under 35K

Table 9

Final Standardized Coefficient Betas & Tolerance for Algebra 1

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	36.757	2.667		13.783	.000		
	% Family under 35K	-.520	.110	-.280	-4.727	.000	.681	1.469
	%Family under 200K	.964	.095	.599	10.103	.000	.681	1.469

a. Dependent Variable: L4-L5

Algebra Example 1: Cinnaminson Township

In the Cinnaminson Township school district, the values for the two out-of-school variables (Percentage of Families Under $35,000 and Percentage of Families Over $200,000) were as follows:

A = Percentage of Families Under $35,000= 13.6

B = Percentage of Families Over $200,000= 10.7

Values are entered into Maylone's (2002) equation: (-0.52*13.6) + (0.964*10.7) +

36.757= 40.00

The equation results in a predicted score of 40.00 for the Cinnaminson Township School District in the area of Algebra 1 on the 2016 PARCC. The result suggests that 40% of students who participated in the 2016 PARCC Algebra 1 assessment within the Cinnaminson School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in the Cinnaminson Township School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1 assessment equaled 40%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (40 - 40 = -00).

Algebra Example 2: Sayreville Boro School District

In the Sayreville Boro School District, the values for the two out-of-school variables (Percentage of Families Under $35,000 and Percentage of Families Over $200,000) were as follows:

A = Percentage of Families Under $35,000= 12.3

B = Percentage of Families Over $200,000= 5.8

Values are entered into Maylone's (2002) equation: (-0.52*12.3) + (0.964*5.8) + 36.757= 35.95

The equation results in a predicted score of 35.95 for the Sayreville Boro School District in the area of Algebra 1 on the 2016 PARCC. The result suggests that 35.95% of students who participated in the 2016 PARCC Algebra 1 assessment within the Sayreville Boro School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in Sayreville Boro School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1

assessment equaled 30.10%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (35.95 – 30.10 = 5.85).

Algebra Example 3: Collingswood Boro School District

In the Collingswood Boro School District, the values for the two out-of-school variables (Percentage of Families Under $35,000 and Percentage of Families Over $200,000) were as follows:

A = Percentage of Families Under $35,000= 18.3

B = Percentage of Families Over $200,000= 6.7

Values are entered into Maylone's (2002) equation: (-0.52*18.3) + (0.964*6.7) + 36.757= 33.70

The equation results in a predicted score of 33.70 for the Collingswood Boro School District in the area of Algebra 1 on the 2016 PARCC. The result suggests that 33.70% of students who participated in the 2016 PARCC Algebra 1 assessment within the Collingswood Boro School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in Collingswood Boro School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1 assessment equaled 37.30%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (33.70 – 37.30 = 3.60).

Algebra Example 4: Livingston Township

In the Livingston Township School District, the values for the two out-of-school variables (Percentage of Families Under $35,000 and Percentage of Families Over $200,000) were as follows:

A = Percentage of Families Under $35,000= 3.9

B = Percentage of Families Over $200,000= 34

Values are entered into Maylone's (2002) equation: (-0.52*3.9) + (0.964*34) + 36.757= 67.51

The equation results in a predicted score of 67.51 for the Livingston Township School District in the area of Algebra 1 on the 2016 PARCC. The result suggests that 67.51% of students who participated in the 2016 PARCC Algebra 1 assessment within the Livingston School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in Livingston Township School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1 assessment equaled 56.20%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (67.51 – 56.20 = 11.31).

Algebra Example 5: Hammonton Town

In the Hammonton Town School District, the values for the two out-of-school variables (Percentage of Families Under $35,000 and Percentage of Families Over $200,000) were as follows:

A = Percentage of Families Under $35,000= 16.9

B = Percentage of Families Over $200,000= 5.8

Values are entered into Maylone's (2002) equation: (-0.52*16.9) + (0.964*5.8) + 36.757= 33.56

The equation results in a predicted score of 33.56 for the Hammonton Town School District in the area of Algebra 1 on the 2016 PARCC. The result suggests that 33.56% of students who participated in the 2016 PARCC Algebra 1 assessment within the Hammonton Town School District are predicted to score either Meeting Expectations

or Exceeding Expectations. The actual percentage of students in Hammonton Town School District that scored either Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 assessment equaled 56.20%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (33.56–44.80 = -11.24).

Summary of Predictive Power for Dependent Variable: Algebra 1

The final model utilized to predict scores on the 2016 PARCC in Algebra 1 was a hierarchical linear regression, with the independent variables Percentage of Families Under $35,000 and Percentage of Families Over $200,000. Utilizing the predictive formula [(-0.52*Y)+(0.964*X)+36.757=] where -0.52 is the unstandardized beta for Percentage of Families Under $35,000 and 0.964 is the unstandardized beta for Percentage of Families Over $200,000. This model was able to predict the percentage of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 in 119 of the 159 (75%) school districts in the sample within the standard error of the estimate of 11.47 points.

Research Questions and Answers for Dependent Variable: Algebra 1

This study pertaining to the dependent variable Algebra 1 was guided by the following research questions:

1. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores in Algebra 1 and out-of-school community characteristics or socioeconomic variables?
    - H_a1: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016

New Jersey PARCC test scores in Algebra 1.

- Answer: The null hypothesis is rejected. The combinations of independent variables, Percentage of Families Under $35,000 and Percentage of Families Over $200,000, were statistically significant predictors of student performance on the 2016 PARCC Algebra 1 assessment.

2. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 at a district level?
    - Answer: The Algebra 1 model was able to accurately predict the percentage of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 in 119 of the 159 (75%) school districts in the sample within the standard error of the estimate of 11.47 points.

Procedure- Models of Best Fit Grade 10 English Language Arts/Literacy

To determine the model that best fit, the researcher conducted a series of linear regressions with testing the dependent variable against all 153 combinations of independent variables. This found there were 72 combinations of the two independent variables that were statistically significant and had standard deviations between 13.11 and 15.56. From there, the top two variable combinations with standard deviations under 13.75 were tested with a third and fourth variable to identify three and four variable combinations with standard deviations under 13.50. Once the best combinations were identified, the final regression equation (Maylone, 2002) of $y_1=b_0 + (b_1*X_i) + (b_2*X_{ii})$

with *b* representing the unstandardized beta for the constant independent predictor variables and *X* representing the percentage of the variable in the community. The standard error of the estimate was used to make final determinations about the accuracy of each prediction. If the prediction was within the margin of error for the model, it was deemed accurate. This equation was tested against the identified combinations with standard deviations under 13.12 to find the highest prediction within the margin of error deemed accurate.

Table 10

Final Model Hierarchical Linear Regression for Grade 10 English Language Arts/Literacy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.618[a]	.383	.374	13.11999

a. Predictors: (Constant), BA, Female House Pov

Table 11

Final Standardized Coefficient Betas & Tolerance for Grade 10 English Language Arts/Literacy

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	28.845	4.603		6.266	.000		
	Female House Pov	-.227	.083	-.203	-2.726	.007	.780	1.281
	BA	.974	.146	.497	6.681	.000	.780	1.281

a. Dependent Variable: L4-L5

Grade 10 English Language Arts/Literacy Example 1: Glen Rock Boro

In the Glen Rock Boro school district, the values for the two out-of-school

variables (Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree) were as follows:

A = Percentage of Female Households in Poverty = 9.3 -2.1111

B = Percentage of Population with Bachelor's Degree = 34.8

Values are entered into Maylone's (2002) equation: (-.227*9.3) + (0.974*34.8) + 28.845= 60.63

The equation results in a predicted score of 60.40 for the Glen Rock Boro School District in the area of Grade 10 English Language Arts/Literacy on the 2016 PARCC. The result suggests that 60.63% of students who participated in the 2016 PARCC Grade 10 English Language Arts/Literacy assessment within the Glen Rock Boro School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in the Glen Rock Boro School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1 assessment equaled 60.40%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (60.63 – 60.40 = .23).

Grade 10 English Language Arts/Literacy Example 2: East Brunswick Township School District

In the East Brunswick Township School District, the values for the two out-of-school variables (Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree) were as follows:

A = Percentage of Female Households in Poverty = 17

B = Percentage of Population with Bachelor's Degree = 31

Values are entered into Maylone's (2002) equation: (-.227*17) + (0.974*31) + 28.845=

55.18

The equation results in a predicted score of 55.18 for the East Brunswick Township School District in the area of Grade 10 English Language Arts/Literacy on the 2016 PARCC. The result suggests that 55.18% of students who participated in the 2016 PARCC Grade 10 English Language Arts/Literacy assessment within the East Brunswick Township School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in the East Brunswick Township School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1 assessment equaled 60.90%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (55.18 – 60.90 = -5.72).

Grade 10 English Language Arts/Literacy Example 3: North Plainfield Boro School District

In the North Plainfield Boro School District, the values for the two out-of-school variables (Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree) were as follows:

A = Percentage of Female Households in Poverty = 22.6

B = Percentage of Population with Bachelor's Degree = 16.1

Values are entered into Maylone's (2002) equation: (-.227*22.6) + (0.974*16.1) + 28.845= 39.40

The equation results in a predicted score of 39.40 for the North Plainfield Boro School District in the area of Grade 10 English Language Arts/Literacy on the 2016 PARCC. The result suggests that 39.40% of students who participated in the 2016

PARCC Grade 10 English Language Arts/Literacy assessment within the North Plainfield Boro School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in the North Plainfield Boro School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1 assessment equaled 34.90%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (39.40 – 34.90 = 4.50).

Grade 10 English Language Arts/Literacy Example 4: Mahwah Township School District

In the Mahwah Township School District, the values for the two out-of-school variables (Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree) were as follows:

A = Percentage of Female Households in Poverty = 3.4

B = Percentage of Population with Bachelor's Degree = 32.1

Values are entered into Maylone's (2002) equation: (-.227*3.4) + (0.974*32.1) + 28.845= 59.34

The equation results in a predicted score of 59.34 for the Mahwah Township School District in the area of Grade 10 English Language Arts/Literacy on the 2016 PARCC. The result suggests that 59.34% of students who participated in the 2016 PARCC Grade 10 English Language Arts/Literacy assessment within the Mahwah Township School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in the Mahwah Township School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1 assessment equaled 72.30%. The margin of error for the predicted score was

calculated by subtracting the predicted from the actual score (59.34 – 72.30 = -12.96).

Grade 10 English Language Arts/Literacy Example 5: Kearny Town School District

In the Kearny Town School District, the values for the two out-of-school variables (Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree) were as follows:

A = Percentage of Female Households in Poverty = 24.6

B = Percentage of Population with Bachelor's Degree = 13.4

Values are entered into Maylone's (2002) equation: (-.227*24.6) + (0.974*13.4) + 28.845= 36.31

The equation results in a predicted score of 36.31 for the Kearny Town School District in the area of Grade 10 English Language Arts/Literacy on the 2016 PARCC. The result suggests that 36.31% of students who participated in the 2016 PARCC Grade 10 English Language Arts/Literacy assessment within the Kearny Town School District are predicted to score either Meeting Expectations or Exceeding Expectations. The actual percentage of students in the Kearny Town School District that scored either Proficient or Advanced Proficient on the 2016 PARCC Algebra 1 assessment equaled 23.20%. The margin of error for the predicted score was calculated by subtracting the predicted from the actual score (36.31 – 23.20 = 13.11).

Summary of Predictive Power for Dependent Variable: Grade 10 English Language Arts/Literacy

The final model utilized to predict scores on the 2016 PARCC in Grade 10 English Language Arts/Literacy was a hierarchical linear regression, with the independent variables Percentage of Female Households in Poverty and Percentage of

Population with Bachelor's Degree. Utilizing the predictive formula [(-0.227*Y) +(0.974*X)+28.845=] where -0.227 is the unstandardized beta for Percentage of Female Households in Poverty and 0.974 is the unstandardized beta for Percentage of Population with Bachelor's Degree. This model was able to predict the percentage of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy in 103 of the 147 (71%) school districts in the sample within the standard error of the estimate of 13.11 points.

Research Questions and Answers for Dependent Variable: Grade 10 English Language Arts/Literacy

This study pertaining to the dependent variable of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy was guided by the following research questions:

3. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy and out-of-school community characteristics or socioeconomic variables?
    - H_a2: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy.
    - Answer: The null hypothesis is rejected. The combinations of independent variables, Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree, were statistically significant predictors of student performance on the 2016

PARCC Algebra 1 assessment.

4. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy at a district level?

    - Answer: The 2016 PARCC Grade 10 English Language Arts/Literacy model was able to accurately predict the percentage of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy in 101 of the 147 (71%) school districts in the sample within the standard error of the estimate of 13.11 points.

Chapter Summary

This study utilized a non-experimental, correlational, cross-section design with multiple regression modeling to determine the statistical relationship between out of school variables and the percentages of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy and Algebra 1 on a district level. Extending on the research of McCahill (2015), Turnamian (2012), and Maylone (2002), 18 independent community demographic variables found in the 2010 U.S. Census data related to family and community income, community education levels, and lone-parent households. The dependent variables were the percentages of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy and Algebra 1 on a district level.

The final model utilized to predict scores on the 2016 PARCC in Algebra 1 was a

hierarchical linear regression, with the independent variables Percentage of Families Under $35,000 and Percentage of Families Over $200,000. Utilizing the predictive formula [(-0.52*Y)+(0.964*X)+36.757=] where -0.52 is the unstandardized beta for Percentage of Families Under $35,000 and 0.964 is the unstandardized beta for Percentage of Families Over $200,000. This model was able to predict the percentage of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 in 119 of the 159 (75%) school districts in the sample within the standard error of the estimate of 11.47 points.

The final model utilized to predict scores on the 2016 PARCC in Grade 10 English Language Arts/Literacy was a hierarchical linear regression, with the independent variables Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree. Utilizing the predictive formula [(-0.227*Y)+(0.974*X)+28.845=] where -0.227 is the unstandardized beta for Percentage of Female Households in Poverty and 0.974 is the unstandardized beta for Percentage of Population with Bachelor's Degree. This model was able to predict the percentage of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy in 103 of the 147 (71%) school districts in the sample within the standard error of the estimate of 13.11 points.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine the predictive accuracy of community and family demographic variables, which are found through the use of the 2010 U.S. Census data, on the percentage of students at a district level who are Meeting or

Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy. The results of this study support the past research and existing literature that has found out-of-school community and family demographics affect and predict how students will perform on state standardized assessments. Based on this study, we can conclude that out certain combinations of out-of- school variables found in the 2010 U.S. Census can be used to predict with accuracy the percentage of students at a district level who are Meeting or Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy.

The four overarching research questions that drove this study were:

1. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores in Algebra 1 and out-of-school community characteristics or socioeconomic variables?
    - H_a1: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016 New Jersey PARCC test scores in Algebra 1.
2. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 at a district level?
3. Is there a significant predictive relationship of the 2016 New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy and out-of-school community characteristics or socioeconomic variables?
    - H_a2: There is no statistically predictive relationship between community characteristics or socioeconomic variables and the 2016

New Jersey PARCC test scores on the Grade 10 English Language Arts/Literacy.

4. How accurately can out-of-school community characteristics or socioeconomic variables predict a student's Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy at a district level?

Through this study we are able to extend the research of McCahill (2015), Turnamian (2012), and Maylone (2002) who all found out-of-school factors to be predictors of student performance on state mandated high stakes standardized assessments. Maylone (2002) was able to predict how students would perform on the Michigan state mandated assessment (MEAP) in High School based on the communities mean annual district household income, percentage of lone-parent households, and percentage of high school student eligible for free or reduced lunch in 74% of the districts. Turnamaian (2012) was able to predict how students would perform on the 2009 NJ ASK 3 within 10 points in 52% of the districts in Language Arts and 60% of the districts in Mathematics. McCahill (2015) found the percentage of families with no high school diploma, percentage of families making $25,000 or less, and percentage of people with some college education accounted for 50% of the variance in NJ ASK 6 Math results and accurately predicted 67% of the school results. The proficiency results of the NJ ASK 7 Math were also correctly predicted at 72% accuracy by the percentage of families with BA, percentage of families making $200,000 or more, and percentage of households making $35,000 or less. This study is unique because it was the first of the

studies to have found that combinations of two out of district community factors were the models of best fit.

Bronfenbrenner's Ecological Theory explains that the development of a child is found in the child's environment and its various economic, cultural, social, and political influences (Bronfenbrenner, 1974). This study proves empirically that student performance at the district level on PARCC is predictive based out of school community factors rather than the individual academic abilities of the students. The 2016 Algebra 1 PARCC results were predicted in 119 of the 159 (75%) of the school districts within the standard error of 11.47 points based on the combination of the percentage of families under $35,000 and percentage of families over $200,000. The 2016 Grade 10 English Language Arts/Literacy PARCC results were predicted in 101 of the 147 (71%) of the school districts within the standard error of 13.11 points based on the combination of the percentage of female households in poverty and percentage of population with a Bachelor's Degree. Based on the findings of this study, factors that exist in the students Mesosystem (percentage of population with a Bachelor's Degree), Macrossystem (percentage of families under $35,000 and percentage of families over $200,000), Exosystem (percentage of female households in poverty), and Chronosystem (percentage of female households in poverty) are the predictive factors that determine student performance on the district level on the 2016 PARCC.

Researchers have found that out of district community factors, such as household income, parental education level, and family structure, have an impact on student academic achievement and overall development. Wolfe (2016) found that increased income levels positively impact overall academic achievement and student academic

skills. Payne and Biddle (1999) argued that poor children are uniquely handicapped for education since students coming from poorer homes have less access to books, writing materials, computers, and other supports. These students tend to live in communities that are affected by crime, decay, drugs, and drug dealing. Jeynes (2005) found that family structure was the greatest predictor of academic achievement. Fram et al.'s (2007) study found that children from lone-parent households disproportionately attended high ethnic minority schools and these children's mothers had lower levels of education and lived in households with lower levels of education. McCahill (2015) the influence of lone-parent households on student achievement suggests that children have the most favorable academic outcomes if both of their parents exhibit high involvement in school. Potter and Roksa (2013) found that children with better-educated mothers scored higher on their math and reading assessments in kindergarten; students with mothers who completed college outperformed children whose mothers had no or some college experience and they found that more highly educated women are more likely to be married. Guryan et al. (2008) found that more highly educated parents spend more time with their children and have fewer children. The results of this study combined with the research suggest that students coming from communities with higher rates of out of district community factors that can negatively or positively impact their educational and academic success are predictable on the PARCC.

The results on the PARCC are predictable based on the various out of district community variables; therefore, the PARCC is not an accurate measure of student academic achievement. It is also not an accurate measure of teacher, school, district, and community quality. Policymakers, bureaucrats, community members, school leaders,

teachers, and parents should no longer use the PARCC results in decision making related to students, teachers, schools, districts, and communities.

Recommendations for Policy

The results from this study and previous study suggest there is a disconnect between educational policy and empirical research regarding the predictability of student performance on high stakes standardized assessments based on out-of-school community factors. Policy makers, legislators, and bureaucrats should reconsider their support of legislation that utilizes high stakes standardized assessments and accountably determine the quality of students, schools, districts, and communities. This study, as well as other studies (Wolfe, 2016; McCahill, 2015; Turnamian, 2012; Maylone, 2002) have consistently proven that student performance on high-stakes standardized assessments can be accurately and reliably predicted based on out-of-school community factors found in the U.S. Census. Policy makers and bureaucrats should implement research based policies to increase student achievement and look to eliminate policies that predictive and biased. According to Tienken and Mullen (2015), "The results from commercially prepared tests would be used to inform, not punish: Just another data-point to triangulate the cognitive development of children" (p. 165).

Specifically, policy makers should change legislative code, N.J.A.C. 6A:8-5.1, which requires that "…all students demonstrate proficiency in the high school end- of-course PARCC assessments in ELA 10 and Algebra I…" to order to graduate. Based on the results of this study, districts (and thereby their individual students) results are predictive based on out-of-school community factors. If student performance can be predicted at a district level, students in communities that can have lower student

performance rates are disadvantaged compared to their peers in communities with higher student performance rates. To utilize the PARCC as a graduation requirement is not equitable.

The state of New Jersey should look to eliminate the use of the PARCC as a graduation requirement. Policymakers should look to find alternative ways to measure student performance, rather than utilize the PARCC to determine the ability of a student to graduate. The use of the PARCC, should it be continued, should be one of the factors that impact a student's ability to graduate or the results should control for the predictive nature of the standardized assessment. The utilization of high-stakes assessments as a requirement for graduation impacts post-secondary outcomes and creates barriers to higher education for individuals from disadvantaged backgrounds (Lynch, 2015).

The PARCC results should not be used to measure teacher effectiveness. Currently, the State of New Jersey utilizes student performance on the PARCC in 3rd to 8th grade to measure a teachers Student Growth Percentage. Based on the findings of this study, the PARCC does not determine how effective a teacher is or their impact on student performance. If the state continues to push to utilize student performance on the PARCC as a measure of teacher effectiveness, savvy educators may choose not to work in districts or communities in which student performance can be predicted to be negatively impacting the teachers overall performance and pay. The state of New Jersey should look to eliminate the use of the PARCC to measure teacher effectiveness.

The PARCC results should not be used to measure school or district quality. Based on the findings of the study, the PARCC does not measure whether a school is "good" or district is of high or low quality. Rather, this study indicates that student

performance can be predicted based on the out-of-school factors that exist in the district or community. The state of New Jersey, due the release of the State Report Card, negatively impacts communities that have factors that negatively impact student performance on high-stakes standardized assessments. Bronfenbrenner Ecological Theory suggests the child's development is impacted by the out of school community factors which have an impact on their performance on the high-stakes standardized assessments. Without taking this into consideration, communities that have the factors that positively predict student performance are advantaged compare to communities that have factors that negatively predict student performance. This creates a cycle where, figuratively speaking, the rich continue to get richer and the poor get poorer. By creating and publishing a School Report Card based on a standardized assessment which is predictive, a narrative will develop about a community that can positively or negatively impact their future success. The state of New Jersey should look to eliminate the use of the PARCC to measure school and district quality. The state should not include PARCC results on the School Report Card.

Recommendations for Practice

The results of this study prove that the PARCC has no practical value as a tool to inform teaching, therefore, the PARCC should not be used in the decision making process as it relates to student achievement. According to the makers of the PARCC, the assessment should ensure that all students "regardless of income, family background or geography, have equal access to a world-class education that will prepare them for success after high school in college and/or careers" (Pearson, 2016, p. 7). This claim has been proven to be false. Income (percentage of families under $35,000 and percentage of

families over $200,000), family background (percentage of female households in poverty and percentage of BA's), and geography (family income determines communities students live in) are all factors that could be combined to predict district performance on the PARCC in more than 70% of the districts in the state of New Jersey.

The makers of the PARCC also claim that the assessments are designed to achieve several purposes including providing "…evidence to determine whether students are on track for college- and career-readiness…" provide the "…structure needed to access the full range of CCSS and measure the total breadth of student performance…" and "… to provide data to help inform classroom instruction, student interventions and professional development" (p. 2). Educators need to understand that these claims are false. This study proves that the PARCC is predictive based on out of district community factors. Using the PARCC to "inform classroom instruction, student interventions, and professional development" would perpetuate the false narrative that the PARCC, and other high stakes standardized assessments, are effective tools to measure student achievement and the quality of a students, teachers, administrators, schools, districts, and communities. The ability to predict student performance based on out of district community factors which researchers have shown to be have a positive or negative impact on student achievement depending on the factor means that educators who use the results to inform their decision making are using biased and flawed data. The following are specific recommendations for practitioners:

- Districts, schools, and school leaders should be aware of the reporting minimums by the United States Department of Education and New Jersey

Department of Education and use the results of the PARCC to adhere only to reporting minimums.

- Districts, schools, school leaders, and principals should not use PARCC results in determining the quality of a teacher.
- Districts, schools, principals, teachers and other school staff should not use PARCC to determine student placement in any academic or social programs. This includes, and is not limited to, Advance Placement Courses, Honors Courses, Gifted and Talented Programs, Remediation Programs, Intervention Programs, Special Education Placements, After School Clubs, and Tutoring.
- Districts, schools, principals, teachers and other school staff should not use PARCC to guide curriculum discussions. Since the PARCC is predictive based on the out of district community factors, using the data to drive curricular discussions would not address the gaps in the local curriculum.
- Districts, schools, principals, teachers and other school staff should consider the economic divide when making decisions on student achievement.
- Districts, schools, principals, teachers and other school staff should advocate for the return of local control in public education.

Instead of using the PARCC results to drive decision making in a district, school leaders should focus on developing a greater trust for their teachers and staff to determine student achievement. In doing this, districts will need to invest in their teachers capacity

to develop and implement meaningful curriculum and assessments, create a culture that norms and audits the assessments in a collaborative manner, and utilizes the results of the assessments in meaningful ways to determine student achievement and inform decision making.

Districts should invest in the capacity of their staff by providing meaningful professional development that is focused on creating living curriculum that is developed locally and is a reflection of the materials that is being taught. Districts should also provide time, in the form of Professional Learning Communities and/or Common Planning Time for teachers in designing their assessments. Staff members should be trained on effective assessment development practices. These assessments should be normed and audited regularly to determine validity. Teachers should be provided time to review the results of the assessment in collaborative ways and they should then use the results of these assessments to determine student achievement, placement, and success.

Recommendations for Future Study

The purpose of this study was to determine the predictive accuracy of community and family demographic variables, which are found through the use of the 2010 U.S. Census data, on the percentage of students at a district level who are Meeting or Exceeding Expectations on the 2016 New Jersey PARCC in Algebra 1 and Grade 10 English Language Arts/Literacy. The results of this study support the past research and existing literature that has found out-of-school community and family demographics affect and predict how students will perform on state standardized assessments. However, this study could not provide all the answers related to community and family level demographic variables and student achievement. In order to continue to enhance

the literature and support empirical decision making in education, it is important that future studies are conducted such as those listed below.

- Replicate this study utilizing the PARCC results from 2016-2017 to confirm and support the findings of this study.
- Conduct a similar study utilizing PARCC results in various grade levels to determine which combination of out of district community and family level demographic variables, if any, predict student performance on the PARCC.
- Conduct a similar study on a national level, utilizing publicly available data from the other PARCC states to determine which combination of community and family-level demographic variables found in the United States Census data, if any, combine to predict student performance on the PARCC.
- Analyze the findings of this study to determine what districts over/under performed on their predicted results and design a study that determines what causes districts to over/under performance on the PARCC.
- Analyze this study controlling for the out-of-school community factors and determine if the results of the study would provide schools with meaningful information regarding student achievement.
- Recreate this study utilizing other high stakes assessments utilized throughout the United States, such as the ACT, SAT, and Smarter balance

Chapter Summary and Conclusions

The purpose of this study was determine the statistical relationship between out of school variables and the percentages of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy and Algebra

1 on a district level. Utilizing a non-experimental, correlational, cross-section design with multiple regression modeling, this study analyzed 18 independent community demographic variables found in the 2010 U.S. Census data related to family and community income, community education levels, and lone-parent households. The final model utilized to predict scores on the 2016 PARCC in Algebra 1 was a hierarchical linear regression, with the independent variables Percentage of Families Under $35,000 and Percentage of Families Over $200,000. Utilizing the predictive formula [(-0.52*Y)+(0.964*X)+36.757=] where -0.52 is the unstandardized beta for Percentage of Families Under $35,000 and 0.964 is the unstandardized beta for Percentage of Families Over $200,000. This model was able to predict the percentage of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Algebra 1 in 119 of the 159 (75%) school districts in the sample within the standard error of the estimate of 11.47 points.

The final model utilized to predict scores on the 2016 PARCC in Grade 10 English Language Arts/Literacy was a hierarchical linear regression, with the independent variables Percentage of Female Households in Poverty and Percentage of Population with Bachelor's Degree. Utilizing the predictive formula [(-0.227*Y) +(0.974*X)+28.845=] where -0.227 is the unstandardized beta for Percentage of Female Households in Poverty and 0.974 is the unstandardized beta for Percentage of Population with Bachelor's Degree. This model was able to predict the percentage of students Meeting Expectations or Exceeding Expectations on the 2016 PARCC Grade 10 English Language Arts/Literacy in 103 of the 147 (71%) school districts in the sample within the standard error of the estimate of 13.11 points.

The findings of this study support the findings from previous studies (Caldwell, 2017; Tienken et al., 2017; Wolfe, 2016; McCahill, 2015; Turnamian, 2012; Maylone, 2002) that were able to accurately and reliably predict student performance on high stakes standardized assessments based on out-of-school community factors. These findings support the findings of the Coleman Report (1966) that "…academic achievement was less related to the quality of a student's school, and more related to the social composition of the school, the student's sense of control of his environment and future, the verbal skills of teachers, and the student's family background." Bronfenbrenner's Ecological Theory *Ecological Systems Theory* also contends that the explanation of a child's development is found in the child's environment and the child's interactions with the various economic, cultural, social, environmental, and political influences in that child's life. The findings of this study prove that student performance on high stakes standardized assessments are predictive based on the various out of district factors that impact the development of the child and that are found in out-of-school factors.

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Appendix A- 2016 PARCC Algebra 1- New Jersey

COUNTY NAME	DISTRICT NAME	REG. TO TEST	NOT TESTED ** (See Below)	Opt Out Rate	MEAN SCALE SCORE	%L4-L5	Predicted Score	Diff	% Family under 35K	%Family under 200K
BERGEN	LEONIA BORO	*	*	N/A	765	**71.70**	**42.55**	**-29.15**	18.9	16.2
MORRIS	MOUNT OLIVE TWP	*	*	N/A	764	**70.30**	**42.41**	**-27.89**	8.6	10.5
BERGEN	WALLINGTON BORO	*	*	N/A	745	**53.50**	**26.79**	**-26.71**	21.4	1.2
OCEAN	POINT PLEASANT BEACH BORO	*	*	N/A	757	**60.90**	**36.60**	**-24.30**	16.8	8.9
BERGEN	FAIR LAWN BORO	*	*	N/A	762	**66.90**	**45.63**	**-21.28**	8.9	14
CAPE MAY	WILDWOOD CITY	*	*	N/A	734	**36.50**	**16.13**	**-20.37**	48.2	4.6
PASSAIC	POMPTON LAKES BORO	*	*	N/A	749	**58.00**	**37.89**	**-20.11**	10.8	7
BERGEN	HASBROUCK HEIGHTS BORO	*	*	N/A	758	**65.60**	**46.16**	**-19.44**	12.5	16.5
BERGEN	MAHWAH TWP	241	15	94%	769	**72.50**	**53.11**	**-19.40**	11.2	23
MORRIS	MADISON BORO	220	25	89%	774	**77.90**	**58.67**	**-19.23**	8.1	27.1
GLOUCESTER	PITMAN BORO	100	12	88%	750	**55.60**	**36.92**	**-18.68**	9.7	5.4
BERGEN	DUMONT BORO	*	*	N/A	753	**58.30**	**39.63**	**-18.67**	10.6	8.7
MIDDLESEX	MIDDLESEX BORO	*	*	N/A	749	**56.60**	**38.29**	**-18.31**	13	8.6
OCEAN	POINT PLEASANT BORO	229	11	95%	754	**58.20**	**40.55**	**-17.65**	9.2	8.9
MORRIS	KINNELON BORO	*	*	N/A	773	**81.00**	**64.36**	**-16.64**	8.1	33
CAMDEN	HADDONFIELD BORO	*	*	N/A	765	**77.90**	**61.75**	**-16.15**	8.1	30.3
BERGEN	RAMSEY BORO	259	85	67%	769	**77.00**	**61.09**	**-15.91**	4	27.4
SOMERSET	MANVILLE BORO	*	*	N/A	745	**47.20**	**31.31**	**-15.89**	15.3	2.6
BERGEN	PARAMUS BORO	325	44	86%	765	**64.80**	**48.97**	**-15.83**	7.1	16.5
CAMDEN	GLOUCESTER CITY	159	13	92%	740	**39.70**	**24.73**	**-14.97**	26.1	1.6

BERGEN	LYNDHURST TWP	*	*	N/A	749	**51.30**	**38.01**	**-13.29**	11.3	7.4
SOMERSET	HILLSBOROUGH TWP	643	36	94%	756	**63.80**	**51.35**	**-12.45**	5.3	18
WARREN	PHILLIPSBURG TOWN	460	16	97%	736	**32.70**	**21.04**	**-11.66**	34.3	2.2
ATLANTIC	HAMMONTON TOWN	*	*	N/A	743	**44.80**	**33.56**	**-11.24**	16.9	5.8
MORRIS	BUTLER BORO	*	*	N/A	750	**50.00**	**38.96**	**-11.04**	6.7	5.9
BERGEN	BERGENFIELD BORO	*	*	N/A	748	**53.60**	**42.56**	**-11.04**	10.9	11.9
HUDSON	UNION CITY	1014	40	96%	730	**26.60**	**16.15**	**-10.45**	42.6	1.6
SALEM	PENNSVILLE	*	*	N/A	740	**41.00**	**30.84**	**-10.16**	17.5	3.3
UNION	ROSELLE PARK BORO	*	*	N/A	742	**40.70**	**30.65**	**-10.05**	21.2	5.1
MIDDLESEX	NORTH BRUNSWICK TWP	471	11	98%	746	**45.40**	**36.96**	**-8.44**	13.7	7.6
CAMDEN	PENNSAUKEN TWP	*	*	N/A	737	**37.80**	**29.46**	**-8.34**	19.6	3
BERGEN	EMERSON BORO	*	*	N/A	753	**53.40**	**45.13**	**-8.27**	4.1	10.9
OCEAN	BARNEGAT TWP	237	16	93%	742	**40.70**	**32.67**	**-8.03**	14.9	3.8
BERGEN	WALDWICK BORO	*	*	N/A	754	**56.90**	**48.93**	**-7.97**	7	16.4
WARREN	HACKETTSTOWN	236	11	95%	742	**42.70**	**34.77**	**-7.94**	13.1	5
MONMOUTH	WALL TWP	332	52	84%	750	**55.00**	**47.28**	**-7.72**	12.2	17.5
MIDDLESEX	METUCHEN BORO	*	*	N/A	765	**61.20**	**53.77**	**-7.43**	7.7	21.8
MIDDLESEX	EAST BRUNSWICK TWP	753	96	87%	758	**57.00**	**49.79**	**-7.21**	7	17.3
ESSEX	CEDAR GROVE TWP	*	*	N/A	760	**67.40**	**60.31**	**-7.09**	3.1	26.1
SUSSEX	SPARTA TWP	233	13	94%	760	**65.50**	**58.75**	**-6.75**	5.9	26
ATLANTIC	EGG HARBOR TWP	640	20	97%	743	**41.10**	**34.44**	**-6.66**	14.1	5.2
BERGEN	FORT LEE BORO	459	33	93%	748	**48.30**	**41.78**	**-6.52**	17.6	14.7
HUDSON	BAYONNE CITY	768	49	94%	739	**35.70**	**29.40**	**-6.30**	24.9	5.8
MORRIS	ROXBURY TWP	369	28	92%	749	**50.40**	**44.57**	**-5.83**	7.6	12.2

UNION	WESTFIELD TOWN	514	61	88%	770	**76.40**	**70.66**	**-5.74**	4.5	37.6
OCEAN	PLUMSTED TWP	*	*	N/A	745	**42.50**	**36.84**	**-5.66**	10.4	5.7
BERGEN	LODI BOROUGH	*	*	N/A	737	**33.10**	**27.50**	**-5.60**	21.7	2.1
MIDDLESEX	SOUTH BRUNSWICK TWP	618	28	95%	755	**57.50**	**51.92**	**-5.58**	4.4	18.1
ATLANTIC	ATLANTIC CITY	591	41	93%	718	**16.90**	**11.66**	**-5.24**	52.9	2.5
SOMERSET	BERNARDS TWP	531	206	61%	776	**79.70**	**74.57**	**-5.13**	4.4	41.6
UNION	NEW PROVIDENCE BORO	*	*	N/A	765	**72.10**	**67.27**	**-4.83**	5.1	34.4
CAMDEN	HADDON TWP	178	46	74%	740	**41.00**	**36.58**	**-4.43**	12.4	6.5
MORRIS	DOVER TOWN	*	*	N/A	734	**33.20**	**28.92**	**-4.28**	17.3	1.2
UNION	SUMMIT CITY	339	42	88%	767	**74.40**	**70.26**	**-4.14**	8.8	39.5
BERGEN	RUTHERFORD BORO	371	27	93%	746	**46.80**	**43.05**	**-3.75**	12	13
CAMDEN	COLLINGSWOOD BORO	*	*	N/A	736	**37.30**	**33.70**	**-3.60**	18.3	6.7
GLOUCESTER	CLAYTON BORO	142	15	89%	733	**30.70**	**27.17**	**-3.53**	21.4	1.6
SALEM	PITTSGROVE TWP	*	*	N/A	738	**38.70**	**35.26**	**-3.44**	11.6	4.7
SUSSEX	NEWTON TOWN	167	15	91%	730	**29.60**	**26.20**	**-3.41**	26.8	3.5
MORRIS	PEQUANNOCK TWP	189	12	94%	747	**51.40**	**48.10**	**-3.30**	4.7	14.3
SOMERSET	MONTGOMERY TWP	438	11	97%	770	**75.70**	**72.45**	**-3.25**	3.1	38.7
MIDDLESEX	SOUTH PLAINFIELD BORO	*	*	N/A	740	**41.20**	**38.07**	**-3.13**	8.6	6
BURLINGTON	MAPLE SHADE TWP	*	*	N/A	735	**33.30**	**30.20**	**-3.11**	15.4	1.5
SALEM	SALEM CITY	126	16	87%	718	**17.30**	**15.20**	**-2.11**	46.1	2.5
MIDDLESEX	HIGHLAND PARK BORO	117	19	84%	745	**43.90**	**41.83**	**-2.07**	14.9	13.3
SUSSEX	VERNON TWP	376	14	96%	738	**39.80**	**37.88**	**-1.92**	9.7	6.4
BERGEN	CRESSKILL BORO	*	*	N/A	757	**62.40**	**60.54**	**-1.86**	8.4	29.2
CUMBERLAND	BRIDGETON CITY	*	*	N/A	717	**16.70**	**15.03**	**-1.67**	44.2	1.3

MORRIS	MONTVILLE TWP	*	*	N/A	762	**61.60**	**59.94**	**-1.66**	9	28.9
ESSEX	GLEN RIDGE BORO	*	*	N/A	770	**77.90**	**76.32**	**-1.58**	1.6	41.9
BERGEN	PALISADES PARK	*	*	N/A	729	**30.80**	**29.25**	**-1.55**	23.7	5
UNION	UNION TWP	600	22	96%	737	**37.20**	**36.28**	**-0.92**	12.6	6.3
HUDSON	WEST NEW YORK TOWN	*	*	N/A	726	**22.10**	**21.19**	**-0.91**	39.2	5
GLOUCESTER	WEST DEPTFORD TWP	*	*	N/A	739	**36.50**	**35.67**	**-0.83**	13.4	6.1
BERGEN	HACKENSACK CITY	541	29	95%	733	**30.50**	**29.79**	**-0.71**	23.4	5.4
GLOUCESTER	WOODBURY CITY	202	29	86%	732	**28.30**	**27.66**	**-0.64**	23.8	3.4
UNION	CRANFORD TWP	*	*	N/A	752	**55.90**	**55.27**	**-0.63**	6.3	22.6
BERGEN	PARK RIDGE BORO	*	*	N/A	760	**54.60**	**54.04**	**-0.56**	7	21.7
MIDDLESEX	CARTERET BORO	*	*	N/A	730	**30.40**	**30.06**	**-0.34**	21.6	4.7
BERGEN	RIDGEWOOD VILLAGE	547	178	67%	768	**76.20**	**75.97**	**-0.23**	4.3	43
BURLINGTON	CINNAMINSON TWP	265	28	89%	737	**40.00**	**40.00**	**0.00**	13.6	10.7
UNION	ROSELLE BORO	*	*	N/A	731	**29.70**	**30.28**	**0.58**	22.1	5.2
MIDDLESEX	SOUTH RIVER BORO	*	*	N/A	739	**32.50**	**33.12**	**0.61**	17.2	5.5
GLOUCESTER	GLASSBORO	131	16	88%	731	**27.80**	**28.88**	**1.08**	20.9	3.1
OCEAN	LACEY TWP	354	24	93%	733	**35.80**	**37.07**	**1.27**	12	6.8
GLOUCESTER	WASHINGTON TWP	595	58	90%	738	**39.30**	**40.86**	**1.56**	8.8	9
BURLINGTON	FLORENCE TWP	142	22	85%	737	**34.20**	**35.88**	**1.68**	13	6.1
BERGEN	ELMWOOD PARK	*	*	N/A	735	**34.00**	**35.69**	**1.69**	15.4	7.2
MERCER	LAWRENCE TWP	241	13	95%	740	**43.80**	**45.71**	**1.91**	11.7	15.6
ESSEX	MONTCLAIR TOWN	723	279	61%	751	**57.00**	**59.09**	**2.09**	11	29.1
SOMERSET	FRANKLIN TWP	*	*	N/A	741	**41.60**	**43.89**	**2.29**	8.9	12.2
UNION	SPRINGFIELD TWP	*	*	N/A	742	**43.80**	**46.29**	**2.49**	6.7	13.5

MIDDLESEX	NEW BRUNSWICK CITY	679	32	95%	720	**14.40**	**16.91**	**2.51**	42.8	2.5
MORRIS	JEFFERSON TWP	*	*	N/A	742	**39.20**	**42.34**	**3.14**	5.2	8.6
BERGEN	BOGOTA BORO	*	*	N/A	733	**30.40**	**33.67**	**3.27**	14.1	4.4
BERGEN	TENAFLY BORO	330	18	95%	761	**67.00**	**70.33**	**3.33**	5.7	37.9
MONMOUTH	OCEAN TWP	339	42	88%	742	**40.40**	**44.12**	**3.72**	10.5	13.3
HUDSON	SECAUCUS TOWN	*	*	N/A	745	**39.70**	**43.57**	**3.87**	11	13
ESSEX	MILLBURN TWP	374	79	79%	774	**79.60**	**84.37**	**4.77**	4.1	51.6
SOMERSET	SOMERSET HILLS REGIONAL	190	39	79%	747	**46.40**	**51.35**	**4.95**	5.3	18
ESSEX	NUTLEY TOWN	*	*	N/A	738	**38.10**	**43.31**	**5.21**	8.9	11.6
CAMDEN	AUDUBON BORO	*	*	N/A	733	**30.60**	**36.07**	**5.47**	9.1	4.2
ESSEX	WEST ORANGE TOWN	529	75	86%	742	**40.30**	**45.92**	**5.62**	13.7	16.9
HUDSON	WEEHAWKEN TWP	*	*	N/A	730	**28.60**	**34.25**	**5.65**	24.1	10.4
UNION	HILLSIDE TWP	277	11	96%	728	**22.60**	**28.35**	**5.75**	26	5.3
MIDDLESEX	SAYREVILLE BORO	700	19	97%	736	**30.10**	**35.95**	**5.85**	12.3	5.8
BURLINGTON	MOORESTOWN TWP	346	54	84%	761	**61.60**	**67.72**	**6.12**	4.6	34.6
SOMERSET	SOMERVILLE BORO	212	21	90%	732	**29.30**	**35.49**	**6.19**	11.7	5
HUDSON	HARRISON TOWN	*	*	N/A	724	**18.40**	**24.63**	**6.23**	27.4	2.2
MONMOUTH	HAZLET TWP	*	*	N/A	736	**35.00**	**41.28**	**6.28**	10.4	10.3
MONMOUTH	LONG BRANCH CITY	*	*	N/A	725	**23.90**	**30.33**	**6.43**	27.2	8
MONMOUTH	ASBURY PARK CITY	143	31	78%	704	**5.40**	**11.96**	**6.56**	53.8	3.3
HUDSON	KEARNY TOWN	629	54	91%	727	**21.70**	**28.72**	**7.02**	21.2	3.1
MIDDLESEX	DUNELLEN BORO	*	*	N/A	726	**28.70**	**36.03**	**7.33**	12.9	6.2
OCEAN	MANCHESTER TWP	272	30	89%	727	**23.90**	**31.72**	**7.82**	12.1	1.3
BERGEN	TEANECK TWP	349	30	91%	739	**40.40**	**48.29**	**7.89**	11.2	18
MIDDLESEX	OLD BRIDGE TWP	820	47	94%	734	**32.40**	**40.33**	**7.93**	11.3	9.8

SOMERSET	BOUND BROOK BORO	181	12	93%	726	**20.70**	**28.65**	**7.95**	23	4
BERGEN	SADDLE BROOK TWP	*	*	N/A	724	**27.20**	**35.16**	**7.96**	12.9	5.3
CAMDEN	LINDENWOLD BORO	249	29	88%	715	**15.00**	**23.12**	**8.12**	27.9	0.9
MONMOUTH	HOLMDEL TWP	267	35	87%	764	**63.40**	**71.53**	**8.13**	7.1	39.9
GLOUCESTER	PAULSBORO BORO	*	*	N/A	719	**9.60**	**17.78**	**8.18**	37.6	0.6
PASSAIC	HAWTHORNE BORO	157	12	92%	734	**31.70**	**39.93**	**8.23**	10.4	8.9
HUDSON	NORTH BERGEN TWP	720	12	98%	719	**16.50**	**24.87**	**8.37**	29.9	3.8
UNION	BERKELEY HEIGHTS TWP	*	*	N/A	752	**58.20**	**66.70**	**8.50**	3.4	32.9
BERGEN	NORTH ARLINGTON BORO	*	*	N/A	734	**27.20**	**35.71**	**8.51**	14.8	6.9
ESSEX	BELLEVILLE TOWN	495	11	98%	725	**24.40**	**32.94**	**8.54**	15.5	4.4
SUSSEX	HOPATCONG	*	*	N/A	737	**30.40**	**39.15**	**8.75**	8	6.8
CAPE MAY	OCEAN CITY	301	44	85%	732	**28.00**	**36.77**	**8.77**	17.4	9.4
GLOUCESTER	DEPTFORD TWP	383	19	95%	729	**24.70**	**33.61**	**8.91**	15.7	5.2
MORRIS	RANDOLPH TWP	440	12	97%	756	**56.30**	**65.26**	**8.96**	7.1	33.4
BERGEN	RIDGEFIELD PARK TWP	*	*	N/A	732	**28.00**	**37.05**	**9.05**	12.6	7.1
UNION	KENILWORTH BORO	*	*	N/A	731	**27.40**	**36.49**	**9.09**	12.2	6.3
CAPE MAY	MIDDLE TWP	*	*	N/A	723	**21.50**	**30.66**	**9.16**	17.1	2.9
MONMOUTH	KEYPORT BORO	*	*	N/A	730	**22.20**	**31.63**	**9.43**	15.6	3.1
BERGEN	CLIFFSIDE PARK BORO	*	*	N/A	728	**27.10**	**37.04**	**9.94**	18	10
MONMOUTH	NEPTUNE TWP	280	43	85%	723	**23.20**	**33.25**	**10.05**	18.6	6.4
ESSEX	VERONA BORO	182	19	90%	744	**46.60**	**56.98**	**10.38**	6.9	24.7
MONMOUTH	KEANSBURG BORO	*	*	N/A	715	**10.70**	**21.29**	**10.59**	30.3	0.3
PASSAIC	WEST MILFORD TWP	313	28	91%	731	**29.20**	**40.31**	**11.11**	8	8

BURLINGTON	DELRAN TWP	228	29	87%	736	**28.60**	**39.74**	**11.14**	8.9	7.9
ESSEX	LIVINGSTON TWP	473	62	87%	753	**56.20**	**67.51**	**11.31**	3.9	34
UNION	RAHWAY CITY	467	15	97%	720	**17.00**	**29.00**	**12.00**	19	2.2
BERGEN	GLEN ROCK BORO	213	21	90%	756	**60.40**	**72.55**	**12.15**	4.2	39.4
MONMOUTH	MANASQUAN BORO	*	*	N/A	730	**36.10**	**48.29**	**12.19**	11.2	18
MORRIS	MOUNTAIN LAKES BORO	*	*	N/A	759	**66.40**	**80.48**	**14.08**	2.5	46.7
BURLINGTON	PALMYRA BORO	71	12	83%	719	**13.60**	**28.25**	**14.65**	20.8	2.4
MORRIS	BOONTON TOWN	*	*	N/A	729	**25.20**	**40.68**	**15.48**	10.8	9.9
MIDDLESEX	SOUTH AMBOY CITY	93	20	78%	719	**17.80**	**33.39**	**15.59**	20	7.3
UNION	LINDEN CITY	527	26	95%	721	**15.00**	**31.29**	**16.29**	18.3	4.2
MERCER	EWING TWP	254	11	96%	728	**21.80**	**38.78**	**16.98**	10.2	7.6
BURLINGTON	WILLINGBORO TWP	182	26	86%	712	**14.10**	**31.17**	**17.07**	16.5	3.1
SOMERSET	NORTH PLAINFIELD BORO	*	*	N/A	725	**14.60**	**32.51**	**17.91**	16.7	4.6
BURLINGTON	BURLINGTON CITY	*	*	N/A	722	**20.40**	**40.14**	**19.74**	11.3	9.6
BURLINGTON	RIVERSIDE TWP	120	14	88%	716	**9.40**	**29.68**	**20.28**	17.5	2.1
CAMDEN	HADDON HEIGHTS BORO	136	13	90%	732	**25.20**	**48.32**	**23.12**	3.9	14.1
BERGEN	ENGLEWOOD CITY	269	29	89%	720	**12.90**	**40.16**	**27.26**	22	15.4
HUDSON	HOBOKEN CITY	*	*	N/A	728	**25.40**	**57.32**	**31.92**	19.4	31.8
BERGEN	MIDLAND PARK BORO	*	*	N/A	726	**9.30**	**46.57**	**37.27**	5.6	13.2

Appendix B- 2016 PARCC Grade 10 English Language Arts/Literacy- New Jersey

COUNTY NAME	DISTRICT NAME	SCHOOL NAME	REGISTERED TO TEST	NOT TESTED ** (See Below)	VALID SCORES	Opt Out Rate	MEAN SCALE SCORE	L4-L5	Predicted Score	Dif	Female House Pov	BA
SUSSEX	NEWTON TOWN	NEWTON HIGH SCHOOL	200	20	180	90%	754	**56.60**	**31.04**	**-25.56**	49.1	13.7
BERGEN	BOGOTA BORO	BOGOTA JR./SR. HIGH SCHOOL	*	*	70	N/A	755	**64.30**	**40.78**	**-23.52**	22.1	17.4
SUSSEX	VERNON TWP	VERNON TOWNSHIP HIGH SCHOOL	241	12	229	95%	757	**64.10**	**41.32**	**-22.78**	22.7	18.1
SOMERSET	MONTGOMERY TWP	MONTGOMERY HIGH SCHOOL	*	*	403	N/A	788	**85.40**	**62.94**	**-22.47**	0	35
ATLANTIC	HAMMONTON TOWN	HAMMONTON HIGH SCHOOL	*	*	315	N/A	756	**59.70**	**37.76**	**-21.94**	40.1	18.5
MIDDLESEX	HIGHLAND PARK BORO	HIGHLAND PARK HIGH SCHOOL	126	15	111	88%	769	**63.00**	**41.27**	**-21.73**	53.4	25.2
OCEAN	POINT PLEASANT BEACH BORO	POINT PLEASANT BEACH HIGH SCHOOL	*	*	121	N/A	761	**69.40**	**48.31**	**-21.09**	31.4	27.3
BERGEN	RUTHERFORD BORO	RUTHERFORD HIGH SCHOOL	180	24	156	87%	768	**73.70**	**53.89**	**-19.81**	15.8	29.4
MORRIS	MOUNT OLIVE TWP	MOUNT OLIVE HIGH SCHOOL	*	*	346	N/A	777	**73.70**	**54.51**	**-19.19**	16.5	30.2

MIDDLESEX	SOUTH PLAINFIELD BORO	SOUTH PLAINFIELD HIGH SCHOOL	*	*	267	N/A	763	**64.00**	**45.66**	**-18.34**	7	18.9
BERGEN	WALDWICK BORO	WALDWICK HIGH SCHOOL	126	28	98	78%	772	**74.50**	**56.21**	**-18.29**	0	28.1
WARREN	PHILLIPSBURG TOWN	PHILLIPSBURG HIGH SCHOOL	438	19	419	96%	745	**44.90**	**26.82**	**-18.08**	45.8	8.6
SOMERSET	SOMERVILLE BORO	SOMERVILLE HIGH SCHOOL	260	36	224	86%	766	**64.80**	**47.50**	**-17.30**	22.1	24.3
BERGEN	ELMWOOD PARK	MEMORIAL SENIOR HIGH SCHOOL	*	*	185	N/A	750	**57.30**	**40.02**	**-17.28**	25	17.3
UNION	SUMMIT CITY	SUMMIT HIGH SCHOOL	311	58	253	81%	775	**69.10**	**51.84**	**-17.26**	42	33.4
BERGEN	FAIR LAWN BORO	FAIR LAWN HIGH SCHOOL	*	*	357	N/A	774	**72.80**	**55.68**	**-17.12**	10.5	30
SUSSEX	SPARTA TWP	SPARTA HIGH SCHOOL	267	11	256	96%	768	**73.50**	**56.73**	**-16.77**	26.9	34.9
OCEAN	POINT PLEASANT BORO	POINT PLEASANT BOROUGH HIGH SCHOOL	*	*	228	N/A	760	**64.40**	**48.12**	**-16.28**	12.9	22.8
MORRIS	KINNELON BORO	KINNELON HIGH SCHOOL	*	*	167	N/A	772	**71.80**	**55.62**	**-16.18**	43.4	37.6
BERGEN	DUMONT BORO	DUMONT HIGH SCHOOL	*	*	193	N/A	766	**71.00**	**55.34**	**-15.66**	0	27.2

MONMOUTH	HAZLET TWP	RARITAN HIGH SCHOOL	*	*	225	N/A	752	**55.10**	**39.71**	**-15.39**	19.5	15.7
SOMERSET	MANVILLE BORO	MANVILLE HIGH SCHOOL	*	*	90	N/A	746	**48.90**	**34.85**	**-14.05**	19.9	10.8
MIDDLESEX	CARTERET BORO	CARTERET HIGH SCHOOL	*	*	248	N/A	741	**48.40**	**34.37**	**-14.03**	42.6	15.6
MIDDLESEX	DUNELLEN BORO	DUNELLEN HIGH SCHOOL	*	*	85	N/A	753	**56.50**	**42.96**	**-13.54**	23.2	19.9
MIDDLESEX	SOUTH RIVER BORO	SOUTH RIVER HIGH SCHOOL	*	*	136	N/A	751	**52.90**	**39.56**	**-13.34**	16.3	14.8
BERGEN	MAHWAH TWP	MAHWAH HIGH SCHOOL	217	33	184	85%	771	**72.30**	**59.34**	**-12.96**	3.4	32.1
BERGEN	BERGENFIELD BORO	BERGENFIELD HIGH SCHOOL	*	*	321	N/A	766	**66.30**	**53.44**	**-12.86**	11.8	28
HUDSON	UNION CITY	UNION CITY HIGH SCHOOL	*	*	839	N/A	738	**43.00**	**30.18**	**-12.82**	42.6	11.3
HUDSON	BAYONNE CITY	BAYONNE HIGH SCHOOL	589	33	556	94%	748	**50.20**	**37.41**	**-12.79**	38.2	17.7
ESSEX	CEDAR GROVE TWP	CEDAR GROVE HIGH SCHOOL	*	*	140	N/A	764	**68.60**	**57.94**	**-10.66**	7	31.5
UNION	LINDEN CITY	LINDEN HIGH SCHOOL	*	*	391	N/A	742	**45.30**	**34.71**	**-10.59**	24.8	11.8
UNION	SPRINGFIELD TWP	JONATHAN DAYTON HIGH SCHOOL	*	*	130	N/A	764	**67.70**	**57.19**	**-10.51**	0	29.1

MONMOUTH	WALL TWP	WALL HIGH SCHOOL	292	15	277	95%	757	**60.60**	**50.12**	**-10.48**	23.4	27.3
BERGEN	LYNDHURST TWP	LYNDHURST HIGH SCHOOL	*	*	191	N/A	750	**55.00**	**44.57**	**-10.43**	13.1	19.2
BERGEN	ENGLEWOOD CITY	DWIGHT MORROW HIGH SCHOOL/ACADEMIES@ENGLEWOOD	*	*	277	N/A	756	**55.60**	**46.24**	**-9.36**	33.2	25.6
OCEAN	PLUMSTED TWP	NEW EGYPT HIGH SCHOOL	*	*	118	N/A	747	**48.30**	**38.96**	**-9.34**	10.8	12.9
GLOUCESTER	WEST DEPTFORD TWP	WEST DEPTFORD HIGH SCHOOL	*	*	217	N/A	750	**53.00**	**44.06**	**-8.94**	14.5	19
MORRIS	DOVER TOWN	DOVER HIGH SCHOOL	*	*	263	N/A	740	**45.30**	**36.94**	**-8.36**	11.1	10.9
MIDDLESEX	SOUTH AMBOY CITY	SOUTH AMBOY MIDDLE/HIGH SCHOOL	*	*	76	N/A	745	**43.40**	**35.09**	**-8.31**	36.4	14.9
PASSAIC	POMPTON LAKES BORO	POMPTON LAKES HIGH SCHOOL	*	*	162	N/A	763	**65.40**	**57.38**	**-8.02**	0	29.3
BERGEN	LEONIA BORO	LEONIA HIGH SCHOOL	*	*	170	N/A	766	**65.30**	**57.30**	**-8.00**	15.8	32.9
ESSEX	NUTLEY TOWN	NUTLEY HIGH SCHOOL	314	11	303	96%	754	**57.50**	**49.56**	**-7.94**	19	25.7
BERGEN	EMERSON BORO	EMERSON JR SR HIGH	*	*	82	N/A	762	**65.80**	**58.45**	**-7.35**	0	30.4

MIDDLESEX	SAYREVILLE BORO	SAYREVILLE WAR MEMORIAL HIGH SCHOOL	406	12	394	97%	753	**51.30**	**44.26**	**-7.04**	19.2	20.3
BERGEN	SADDLE BROOK TWP	SADDLE BROOK MIDDLE/HIGH SCHOOL	*	*	99	N/A	752	**56.60**	**49.79**	**-6.81**	0	21.5
MIDDLESEX	METUCHEN BORO	METUCHEN HIGH SCHOOL	*	*	165	N/A	763	**64.80**	**58.21**	**-6.59**	7.1	31.8
ATLANTIC	ATLANTIC CITY	ATLANTIC CITY HIGH SCHOOL	418	14	404	97%	731	**34.40**	**27.98**	**-6.42**	51	11
UNION	CRANFORD TWP	CRANFORD HIGH SCHOOL	266	12	254	95%	757	**59.40**	**53.02**	**-6.38**	20.5	29.6
BERGEN	PARK RIDGE BORO	PARK RIDGE HIGH SCHOOL	93	11	82	88%	772	**68.30**	**61.96**	**-6.34**	0	34
BERGEN	RIDGEFIELD PARK TWP	RIDGEFIELD PARK JR SR HIGH SCHOOL	*	*	264	N/A	755	**54.60**	**48.35**	**-6.25**	17.9	24.2
GLOUCESTER	CLAYTON BORO	CLAYTON HIGH SCHOOL	112	12	100	89%	738	**34.00**	**28.25**	**-5.75**	48.1	10.6
MIDDLESEX	EAST BRUNSWICK TWP	EAST BRUNSWICK HIGH SCHOOL	670	151	519	77%	760	**60.90**	**55.18**	**-5.72**	17	31

BURLINGTON	FLORENCE TWP	FLORENCE TOWNSHIP MEMORIAL HIGH SCHOOL	*	*	80	N/A	758	**51.30**	**45.78**	**-5.52**	6.9	19
CAMDEN	HADDONFIELD BORO	HADDONFIELD MEMORIAL HIGH SCHOOL	194	16	178	92%	765	**69.10**	**64.36**	**-4.74**	4.9	37.6
HUDSON	WEST NEW YORK TOWN	MEMORIAL HIGH SCHOOL	*	*	474	N/A	733	**39.90**	**35.29**	**-4.61**	44.1	16.9
SOMERSET	BOUND BROOK BORO	BOUND BROOK HIGH SCHOOL	*	*	132	N/A	739	**42.40**	**37.98**	**-4.42**	19.4	13.9
MONMOUTH	KEYPORT BORO	KEYPORT HIGH SCHOOL	*	*	79	N/A	729	**40.50**	**36.33**	**-4.17**	33.1	15.4
BURLINGTON	MAPLE SHADE TWP	MAPLE SHADE HIGH SCHOOL	*	*	120	N/A	739	**42.50**	**38.44**	**-4.06**	29.8	16.8
MONMOUTH	HOLMDEL TWP	HOLMDEL HIGH SCHOOL	214	48	166	78%	757	**56.70**	**53.62**	**-3.08**	20	30.1
SOMERSET	FRANKLIN TWP	FRANKLIN HIGH SCHOOL	473	12	461	97%	755	**57.70**	**54.72**	**-2.98**	14.3	29.9
WARREN	HACKETTSTOWN	HACKETTSTOWN HIGH SCHOOL	*	*	205	N/A	749	**48.30**	**45.37**	**-2.93**	9.6	19.2
SOMERSET	HILLSBOROUGH TWP	HILLSBOROUGH HIGH SCHOOL	574	90	484	84%	758	**58.20**	**55.66**	**-2.54**	8	29.4

ESSEX	VERONA BORO	VERONA HIGH SCHOOL	162	62	100	62%	767	**61.00**	**58.64**	**-2.36**	6.9	32.2
MERCER	LAWRENCE TWP	LAWRENCE HIGH SCHOOL	319	14	305	96%	753	**51.80**	**49.56**	**-2.24**	22	26.4
HUDSON	SECAUCUS TOWN	SECAUCUS HIGH SCHOOL	*	*	125	N/A	748	**44.80**	**42.79**	**-2.01**	38.1	23.2
BERGEN	HACKENSACK CITY	HACKENSACK HIGH SCHOOL	*	*	414	N/A	743	**46.20**	**44.24**	**-1.96**	25.3	21.7
HUDSON	NORTH BERGEN TWP	NORTH BERGEN HIGH SCHOOL	*	*	585	N/A	735	**38.90**	**37.04**	**-1.86**	31.7	15.8
BERGEN	FORT LEE BORO	FORT LEE HIGH SCHOOL	231	32	199	86%	761	**57.20**	**55.94**	**-1.26**	23.5	33.3
MIDDLESEX	MIDDLESEX BORO	MIDDLESEX HIGH SCHOOL	*	*	159	N/A	747	**49.60**	**48.62**	**-0.98**	0	20.3
BERGEN	CRESSKILL BORO	CRESSKILL HIGH SCHOOL	*	*	143	N/A	765	**63.70**	**62.74**	**-0.96**	0	34.8
BURLINGTON	CINNAMINSON TWP	CINNAMINSON HIGH SCHOOL	214	38	176	82%	749	**51.10**	**50.32**	**-0.78**	5.8	23.4
MORRIS	MOUNTAIN LAKES BORO	MOUNTAIN LAKES HIGH SCHOOL	*	*	161	N/A	778	**77.00**	**76.47**	**-0.53**	0	48.9
SALEM	SALEM CITY	SALEM HIGH SCHOOL	*	*	66	N/A	714	**19.70**	**19.37**	**-0.33**	60.2	4.3
UNION	ROSELLE PARK BORO	ROSELLE PARK HIGH SCHOOL	*	*	155	N/A	742	**43.30**	**43.09**	**-0.21**	14.9	18.1

BERGEN	GLEN ROCK BORO	GLEN ROCK HIGH SCHOOL	207	15	192	93%	762	**60.40**	**60.63**	**0.23**	9.3	34.8
CAMDEN	COLLINGSWOOD BORO	COLLINGSWOOD HIGH SCHOOL	*	*	186	N/A	742	**46.20**	**46.48**	**0.28**	37.3	26.8
MIDDLESEX	OLD BRIDGE TWP	OLD BRIDGE HIGH SCHOOL	766	32	734	96%	746	**48.90**	**49.20**	**0.30**	11.6	23.6
UNION	BERKELEY HEIGHTS TWP	GOVERNOR LIVINGSTON HIGH SCHOOL	274	23	251	92%	760	**60.60**	**60.93**	**0.33**	5.4	34.2
MIDDLESEX	SOUTH BRUNSWICK TWP	SOUTH BRUNSWICK HIGH SCHOOL	767	70	697	91%	757	**58.30**	**58.84**	**0.54**	6.9	32.4
BERGEN	PALISADES PARK	PALISADES PARK JR-SR HIGH SCHOOL	*	*	109	N/A	737	**48.60**	**49.21**	**0.61**	39	30
MONMOUTH	MANASQUAN BORO	MANASQUAN HIGH SCHOOL	137	17	120	88%	744	**48.30**	**48.98**	**0.68**	45.6	31.3
CAMDEN	HADDON TWP	HADDON TOWNSHIP HIGH SCHOOL	148	35	113	76%	746	**48.70**	**49.63**	**0.93**	17	25.3
CAMDEN	PENNSAUKEN TWP	PENNSAUKEN HIGH SCHOOL	*	*	360	N/A	730	**36.40**	**37.34**	**0.94**	20.5	13.5
CAMDEN	GLOUCESTER CITY	GLOUCESTER CITY JR. SR. HIGH SCHOOL	*	*	116	N/A	716	**27.60**	**28.73**	**1.13**	37.4	8.6

MIDDLESEX	NORTH BRUNSWICK TWP	NORTH BRUNSWICK TOWNSHIP HIGH SCHOOL	439	19	420	96%	748	**50.70**	**51.92**	**1.22**	15.5	27.3
MORRIS	BUTLER BORO	BUTLER HIGH SCHOOL	*	*	125	N/A	751	**50.40**	**51.62**	**1.22**	7.8	25.2
BERGEN	WALLINGTON BORO	WALLINGTON JUNIOR SENIOR HIGH SCHOOL	*	*	79	N/A	737	**35.50**	**36.93**	**1.43**	44.2	18.6
UNION	HILLSIDE TWP	HILLSIDE HIGH SCHOOL	220	11	209	95%	739	**37.40**	**39.04**	**1.64**	27.6	16.9
UNION	NEW PROVIDENCE BORO	NEW PROVIDENCE HIGH SCHOOL	*	*	153	N/A	753	**51.70**	**53.62**	**1.92**	44.9	35.9
GLOUCESTER	DEPTFORD TWP	DEPTFORD TOWNSHIP HIGH SCHOOL	274	17	257	94%	733	**32.30**	**35.36**	**3.06**	36.5	15.2
MORRIS	PEQUANNOCK TWP	PEQUANNOCK TOWNSHIP HIGH SCHOOL	*	*	160	N/A	745	**52.60**	**56.05**	**3.45**	10.6	30.4
MIDDLESEX	NEW BRUNSWICK CITY	NEW BRUNSWICK HIGH SCHOOL	*	*	396	N/A	728	**30.60**	**34.10**	**3.50**	30.5	12.5
CAMDEN	LINDENWOLD BORO	LINDENWOLD HIGH SCHOOL	138	13	125	91%	727	**33.60**	**37.21**	**3.61**	24.1	14.2

CAMDEN	AUDUBON BORO	AUDUBON JUNIOR/SENIOR HIGH SCHOOL	162	13	149	92%	738	**37.60**	**41.55**	**3.95**	26.4	19.2
BERGEN	LODI BOROUGH	LODI HIGH SCHOOL	*	*	213	N/A	734	**32.90**	**37.04**	**4.14**	29.1	15.2
SOMERSET	NORTH PLAINFIELD BORO	NORTH PLAINFIELD HIGH SCHOOL	272	20	252	93%	731	**34.90**	**39.40**	**4.50**	22.6	16.1
UNION	ROSELLE BORO	ABRAHAM CLARK HIGH SCHOOL	*	*	162	N/A	731	**30.90**	**35.58**	**4.68**	32.1	14.4
BERGEN	HASBROUCK HEIGHTS BORO	HASBROUCK HEIGHTS HIGH SCHOOL	*	*	132	N/A	742	**47.70**	**52.61**	**4.91**	0	24.4
CAPE MAY	MIDDLE TWP	MIDDLE TOWNSHIP HIGH SCHOOL	*	*	170	N/A	725	**33.50**	**38.48**	**4.98**	21.9	15
BERGEN	PARAMUS BORO	PARAMUS HIGH SCHOOL	291	23	268	92%	746	**46.30**	**52.06**	**5.76**	23	29.2
MORRIS	MADISON BORO	MADISON HIGH SCHOOL	207	70	137	66%	750	**53.30**	**59.10**	**5.80**	3.6	31.9
CUMBERLAND	BRIDGETON CITY	BRIDGETON HIGH SCHOOL	*	*	252	N/A	707	**15.50**	**21.59**	**6.09**	54.7	5.3
BURLINGTON	PALMYRA BORO	PALMYRA HIGH SCHOOL	71	21	50	70%	722	**34.00**	**40.87**	**6.87**	32.4	19.9
MONMOUTH	ASBURY PARK CITY	ASBURY PARK HIGH SCHOOL	*	*	75	N/A	719	**21.30**	**28.49**	**7.19**	55.2	12.5

GLOUCESTER	PAULSBORO BORO	PAULSBORO HIGH SCHOOL	93	12	81	87%	721	**17.30**	**25.00**	**7.70**	46.1	6.8
MONMOUTH	KEANSBURG BORO	KEANSBURG HIGH SCHOOL	*	*	61	N/A	704	**19.60**	**27.77**	**8.17**	39.9	8.2
ATLANTIC	EGG HARBOR TWP	EGG HARBOR TOWNSHIP HIGH SCHOOL	586	19	567	97%	728	**34.00**	**42.30**	**8.30**	18.4	18.1
HUDSON	WEEHAWKEN TWP	WEEHAWKEN HIGH SCHOOL	*	*	63	N/A	740	**49.20**	**57.61**	**8.41**	14	32.8
BERGEN	MIDLAND PARK BORO	MIDLAND PARK JR./SR. HIGH SCHOOL	*	*	61	N/A	751	**50.90**	**59.43**	**8.53**	0	31.4
CAPE MAY	OCEAN CITY	OCEAN CITY HIGH SCHOOL	320	68	252	79%	737	**35.70**	**44.29**	**8.59**	37.1	24.5
SALEM	PENNSVILLE	PENNSVILLE MEMORIAL HIGH SCHOOL	*	*	117	N/A	709	**23.10**	**31.80**	**8.70**	44.9	13.5
OCEAN	BARNEGAT TWP	BARNEGAT HIGH SCHOOL	222	27	195	88%	726	**30.80**	**39.65**	**8.85**	17.2	15.1
BERGEN	TENAFLY BORO	TENAFLY HIGH SCHOOL	294	25	269	91%	746	**47.60**	**56.54**	**8.94**	20	33.1
CAPE MAY	WILDWOOD CITY	WILDWOOD HIGH SCHOOL	*	*	58	N/A	717	**24.20**	**33.67**	**9.47**	41.4	14.6
OCEAN	LACEY TWP	LACEY TOWNSHIP HIGH SCHOOL	300	31	269	90%	724	**31.20**	**41.12**	**9.92**	18	16.8

BURLINGTON	RIVERSIDE TWP	RIVERSIDE HIGH SCHOOL	*	*	103	N/A	711	**19.40**	**29.44**	**10.04**	40.7	10.1
MORRIS	RANDOLPH TWP	RANDOLPH HIGH SCHOOL	*	*	428	N/A	751	**50.20**	**60.53**	**10.33**	11.9	35.3
HUDSON	HARRISON TOWN	HARRISON HIGH SCHOOL	*	*	185	N/A	716	**25.40**	**35.84**	**10.44**	37.4	15.9
BERGEN	CLIFFSIDE PARK BORO	CLIFFSIDE PARK HIGH SCHOOL	*	*	285	N/A	734	**38.60**	**49.33**	**10.73**	26.9	27.3
MONMOUTH	LONG BRANCH CITY	LONG BRANCH HIGH SCHOOL	*	*	322	N/A	718	**23.60**	**34.60**	**11.00**	43.3	16
MORRIS	JEFFERSON TWP	JEFFERSON TOWNSHIP HIGH SCHOOL	251	12	239	95%	740	**42.70**	**53.86**	**11.16**	9.5	27.9
OCEAN	MANCHESTER TWP	MANCHESTER TOWNSHIP HIGH SCHOOL	269	23	246	91%	717	**24.80**	**36.47**	**11.67**	10.6	10.3
UNION	RAHWAY CITY	RAHWAY HIGH SCHOOL	297	22	275	93%	722	**25.80**	**38.11**	**12.31**	24.4	15.2
MORRIS	MONTVILLE TWP	MONTVILLE TOWNSHIP HIGH SCHOOL	300	15	285	95%	749	**47.40**	**59.80**	**12.40**	9.5	34
PASSAIC	WEST MILFORD TWP	WEST MILFORD HIGH SCHOOL	283	48	235	83%	731	**33.60**	**46.04**	**12.44**	15.2	21.2

SALEM	PITTSGROVE TWP	ARTHUR P SCHALICK HIGH SCHOOL	*	*	76	N/A	722	**23.70**	**36.47**	**12.77**	32.9	15.5
MONMOUTH	OCEAN TWP	OCEAN TOWNSHIP HIGH SCHOOL	287	87	200	70%	740	**40.00**	**52.89**	**12.89**	10.8	27.2
HUDSON	KEARNY TOWN	KEARNY HIGH SCHOOL	475	45	430	91%	716	**23.20**	**36.31**	**13.11**	24.6	13.4
UNION	KENILWORTH BORO	DAVID BREARLEY MIDDLE/HIGH SCHOOL	*	*	96	N/A	726	**25.00**	**38.54**	**13.54**	25.1	15.8
BURLINGTON	BURLINGTON CITY	BULINGTON CITY HIGH SCHOOL	*	*	129	N/A	722	**31.80**	**46.07**	**14.27**	18.1	21.9
GLOUCESTER	WOODBURY CITY	WOODBURY JR-SR HIGH SCHOOL	*	*	104	N/A	719	**25.00**	**39.32**	**14.32**	31.5	18.1
ESSEX	WEST ORANGE TOWN	WEST ORANGE HIGH SCHOOL	487	164	323	66%	734	**34.90**	**50.36**	**15.46**	20.2	26.8
BERGEN	TEANECK TWP	TEANECK HIGH SCHOOL	346	22	324	94%	731	**37.30**	**54.43**	**17.13**	18.6	30.6
ESSEX	BELLEVILLE TOWN	BELLEVILLE HIGH SCHOOL	*	*	350	N/A	724	**27.10**	**44.38**	**17.28**	20.4	20.7
MERCER	EWING TWP	EWING HIGH SCHOOL	*	*	129	N/A	727	**26.40**	**46.36**	**19.96**	15.5	21.6
MORRIS	BOONTON TOWN	BOONTON HIGH SCHOOL	*	*	140	N/A	736	**37.80**	**58.31**	**20.51**	5.8	31.6

BERGEN	NORTH ARLINGTON BORO	NORTH ARLINGTON HIGH SCHOOL	115	12	103	90%	731	**27.20**	**47.75**	**20.55**	7.7	21.2
MONMOUTH	NEPTUNE TWP	NEPTUNE HIGH SCHOOL	186	30	156	84%	711	**19.90**	**41.13**	**21.23**	24.4	18.3
UNION	UNION TWP	UNION SENIOR HIGH	544	25	519	95%	716	**21.20**	**45.54**	**24.34**	9.7	19.4
GLOUCESTER	WASHINGTON TWP	WASHINGTON TOWNSHIP HIGH SCHOOL	559	115	444	79%	719	**21.00**	**45.64**	**24.64**	20	21.9
GLOUCESTER	GLASSBORO	GLASSBORO HIGH SCHOOL	102	11	91	89%	717	**12.10**	**38.93**	**26.83**	38.4	19.3
MORRIS	ROXBURY TWP	ROXBURY HIGH SCHOOL	356	51	305	86%	722	**26.30**	**53.25**	**26.95**	13.9	28.3
GLOUCESTER	PITMAN BORO	PITMAN HIGH SCHOOL	108	29	79	73%	718	**16.40**	**45.14**	**28.74**	19.6	21.3
SUSSEX	HOPATCONG	HOPATCONG HIGH SCHOOL	115	12	103	90%	714	**14.60**	**45.61**	**31.01**	8.1	19.1
CAMDEN	HADDON HEIGHTS BORO	HADDON HEIGHTS JR-SR HS	157	24	133	85%	722	**23.30**	**60.05**	**36.75**	5.4	33.3
HUDSON	HOBOKEN CITY	HOBOKEN JUNIOR SENIOR HIGH SCHOOL	*	*	84	N/A	715	**20.30**	**61.39**	**41.09**	49.7	45