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# Florida School Indicator Report Data As Predictors Of High School Adequate Yearly Progress (ayp)

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# FLORIDA SCHOOL INDICATOR REPORT DATA AS PREDICTORS OF HIGH SCHOOL ADEQUATE YEARLY PROGRESS (AYP)

by

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ABSTRACT

The focus of this research was to identify variables reported in the 2008-2009 Florida School Indicator Report (FSIR) that had a statistical impact, positive or negative, on the likelihood that a school would achieve Adequate Yearly Progress (AYP) in reading or mathematics using the logistic regression technique. This study analyzed four broad categories reported by the FSIR to include academic, school, student, and teacher characteristics. FSIR and AYP data was collected for 468 Florida high schools that were categorized by the Florida Department of Education as presenting a comprehensive curriculum to grades 9-12 or grades 10-12.

It was determined in this study that academic data associated with ACT results and the grade 11 FCAT Science were effective predictors of a school's academic health in reading and mathematics. Student absenteeism showed the greatest impact on a school obtaining AYP in reading while the percentage of students qualifying for free and disabled populations within a school showed the greatest impact on a school obtaining AYP in mathematics. Teachers teaching out of field were identified as having a negative influence on AYP in reading and mathematics while a teacher's experience was considered a positive influence on AYP in mathematics only. Further research is necessary to fully explore the use of logistic regression as a predictive tool at the state, school district, and school level.

This dissertation is dedicated to my wife Donna. With her everything is possible.

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## LIST OF ACRONYMS/ABBREVIATIONS

| | |
|---|---|
| AP | Advanced Placement |
| AYP | Adequate Yearly Progress |
| ACT | American College Test |
| CELLA | Comprehensive English Learning Assessment |
| DDS | Developmental Scale Score |
| EAA | *Educational Accountability Act* |
| EEOA | *Equal Education Opportunity Act* |
| ELL | English Language Learner |
| EOC | End Of Course |
| ESEA | *Elementary and Secondary Education Act of 1995* |
| FCAT | Florida Comprehensive Assessment Test |
| FSIR | Florida School Indicator Report |
| HSCT | High School Competency Test |
| IASA | *Improving America's Schools Act* |
| LEA | Local Educational Agency |
| NCLB | *No Child Left Behind Act of 2001* |
| NAEP | National Assessment of Educational Progress |
| NGSSS | Next Generation Sunshine State Standards |
| SAT | Scholastic Aptitude Test |
| SPSS | Statistical Package for the Social Sciences |
| SSAT | State Student Assessment Test |
| SSS | Sunshine State Standards |
| SWD | Students with Disability |

# CHAPTER 1
# THE PROBLEM AND ITS CLARIFYING COMPONENTS

## Introduction

In 2002, a sweeping national reform initiative known as the No Child Left Behind (NCLB) Act of 2001 went into effect (No Child Left Behind [NCLB], 2002). The primary goal of this legislation was to ensure that all children performed at grade level within 12 years. NCLB was one of many reauthorizations of the nation's Elementary and Secondary Education Act of 1965 (ESEA). The primary goal of NCLB was to ensure that all public school students reach academic proficiency by 2014 (Springer, 2008). The NCLB (2002) statement of purpose asserted the following:

> …the purpose of this title is to ensure that all children have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at a minimum, proficiency on challenging State academic achievement standards and state academic assessments. (Section 1001).

This act directly focused on not only the general student population, but also its subgroups to include socioeconomically disadvantaged and minority students (Springer, 2008). NCLB planned to achieve this objective by modifying standards of teacher quality and accountability while simultaneously implementing literacy and school safety programs, flexible federal funding, and compensation of schools governed by federal performance criterion (United States Department of Education, 2007).

This federal law, driven by accountability reform, mandated that each state develop and implement state level academic standards (Ladner & Lips, 2009). States then tested students on an annual basis and presented evidence of academic proficiency. Using a calculation model known as Adequate Yearly Progress (AYP), the U.S. Department of Education monitored this goal of a proficient nation by 2014. AYP was a series of minimum goals defined by individual state agencies. School and districts were required to meet AYP minimum standards in order to avoid sanctions associated with failure (Springer, 2008). Schools not satisfying the NCLB mandates were required to implement specific interventions designed to provide learning opportunities for students identified as in need (Ladner & Lips, 2009).

With the introduction of NCLB and the focus on AYP, school leaders began looking for ways to increase the likelihood that their schools would show improvement (NCLB, 2002). In light of the economic pressures of the recession occurring in the first decade of 2000, administrators became increasingly selective in determining where they used school resources. Marzano (2003) suggested that many different variables affected a school's academic success and its ability to show learning gains. Given the pressures to improve, it became imperative for schools to identify and focus on factors which would contribute to meeting AYP, and to ignore extraneous factors.

## Purpose of the Study

The purpose of this study was to determine if the academic data included in the 2010 Florida School Indicator Report (FSIR) had the ability to predict whether a Florida public high school would attain AYP in reading and mathematics. A secondary purpose of the study was to determine if the addition of student and school demographic and socioeconomic data would play a contributing role in predicting whether a Florida public high school would attain AYP in reading and mathematics.

## Statement of the Problem

The prevalent method of determining a school's AYP incorporated the analysis of seven variables across a range of the ethnic and racial cultures within that school. The review of literature suggested that variables reported in the Florida School Indicator Report (FSIR) were also significant in influencing student performance. The purpose of this study was to determine if the use of these extra variables associated with the FSIR would allow educators to predict the chances that a school would achieve AYP. The researcher also attempted to determine which variables, if any, had the largest influence in obtaining AYP.

## Definition of Terms

The following definitions are provided to clarify the use of terminology used in this study.

Academic Data: Variable information provided by the Florida School Indicator Report (FSIR) that describes specific academic characteristics to include ACT, SAT and grade 11 FCAT science scores.

Adequate Yearly Progress: A rating criterion derived for all Florida schools by the Florida Department of Education following the requirements laid out by the No Child Left Behind Act of 2001. This rating was used to identify whether schools achieved minimum student academic performance requirements (Florida Department of Education, 2009b).

Binary data or Binary Variables: Categorical variables that have only two mutually exclusive categories. For example, a yes or no question has only two possible answers, yes or no (Field, 2009).

Charter Status: Information in the FSIR (2003) identifying schools based on their charter school status. For the purposes of this research, only non-charter schools were used.

Logistic Regression: A regression model used to determine the relationship between predictor variables and a dichotomous dependent variable (Field, 2009).

Florida Comprehensive Assessment Test (FCAT): A state mandated test "administered to students in Grades 3-11, which consisted of criterion-referenced tests (CRT) in mathematics, reading, science, and writing, which measured student progress toward meeting the Sunshine State Standards (SSS) benchmarks" (Florida Department of Education, 2004, p. 7).

Florida Achievement Levels: Pre-defined levels used to disaggregate students into learning achievement categories. Students could qualify to be grouped with 5 different categories, 1 being the lowest and 5 being the highest. Florida identified level 3 or above as academically proficient (Florida Department of Education, 2009a).

FCAT Developmental Scale Score (DSS): A scale score between 0 and 3000 used to longitudinally track student academic progress each year starting in the 3rd grade through the 11th grade. (Florida Department of Education, 2009b)

FCAT Learning Gains: The measure of a student's academic progress from year to year as determined by the results of the FCAT.

Florida School Grades: A school grade determined by several factors associated with the Florida A+ Accountability Plan, the FCAT being the major contributor to the determination of this grade.

No Child Left Behind (NCLB) Act of 2001: An ESEA reauthorization by President George W. Bush in 2001.

Predictor or Predictor Variable: Variable used to attempt to predict values of another variable known as an outcome variable. In this research, a predictor variable was considered to be any independent variable used in the determination of the likelihood that a school would make AYP (Field, 2009).

Primary Service Type: Information in the FSIR (Florida Department of Education, 2003) identifying several different student service types to include (a) adult education, (b) alternative education, (c) data reporting, (d) regular education (e) special education, (f) superintendent's office, and (g) vocational/technology education. For the purposes of this research, only schools identified as regular education were used (Florida Department of Education, 2003).

School Demographic Data: Variable information provided by the Florida School Indicator Report that described school specific characteristics to include graduation rate, incidences of violence on school grounds, suspension rates, school size, attendance, dropout rate, Title I school designation, and per pupil expenditures.

School Orientation: Information in the FSIR (2003) identifying school orientations in terms of the grades offered within that school. For the purpose of this research, the following configurations were used:

9-12 School Orientation: Schools that support ninth through 12th grade.

10-12 School Orientation: Schools that support 10th through 12th grade.

K-12 School Orientation: Schools that support kindergarten through 12th grade.

Pre-K -12 School Orientation: School Orientation – Schools that support Pre-K through 12th grade.

Pre-K, 9-12 School Orientation: Schools that support Pre-K programs as well as ninth through 12th grade.

School Type: Information obtained from the Florida School Indicator Report (FSIR) categorizing all schools into five groups: (a) adult, (b) combination, (c) elementary, (d) middle school and, (e) senior high school. For the purposes of this research, only schools identified as in the combination or senior high school categories were used.

Teacher Demographic Data: Variable information provided by the Florida School Indicator Report that described teacher specific characteristics including the college degree held by a teacher, teacher certification information, and the average years of teacher experience.

## Delimitations

This study was conducted to examine the potentially meaningful predictive relationships between academic, student, teacher and school data, and the ability of a school to achieve AYP. Delimitations for this research were as follows:

1. This study was delimited to public schools in the state of Florida. These schools were identified by the state as senior high, regular, or combined.
2. Charter, private, virtual, and home schools were not included in this study.
3. No schools were eliminated from this study based upon Title I status, free and reduced lunch rates, or minority ratios.
4. This study relied solely on the data obtained from the Florida Department of Education.

## Limitations

1. The results of this study were generalized to public high schools in Florida. No attempt was made to generalize findings to any other Florida or national population.

2. The accuracy of the data was dependent on the accuracy of the data provided by the Florida School Indicator Reports and the Florida A+ Accountability Plan for the 2008-2009 school year.
3. Statistical analyses of the data were limited to logistic regression and associated analyses required by logistic regression methods.

## Significance of the Study

Under the NCLB, all states were to develop a measure of student academic performance as well as monitor the academic growth of students. Florida's instrument of choice in 2008-2009 was the Florida Comprehensive Assessment Test (FCAT) along with the determination of Annual Yearly Progress (AYP).There had been few studies to identify the relative contributions of variables used in AYP calculations in determining a school's AYP in Florida. This study was conducted to contribute to the understanding of the variables used to predict AYP in Florida's high schools.

At the time of the study, the review of literature suggested that little or no empirical studies had been conducted to determine if variables designed to describe the current physical and academic make-up of a school or district, as provided by Florida School Indicator Report (FSIR), could be used to predict whether a school or district would meet AYP for that current year. Schools and districts could act upon predictor variables that are shown to most affect the chances of achieving AYP in the form of program remediation, professional development, or variable specific school wide reforms.

There existed a vast amount of research attempting to identify variables that contributed to student academic performance. As discussed in the review of literature in Chapter 2, it was suggested that some school and district variables, identified and supported by the research majority, directly or indirectly contributed to student academic performance. Other variables did not enjoy the same united support. In this study, the researcher sought to add to the existing body of knowledge by supporting or rejecting research claims of variable contribution to student academic performance and AYP using a logistic regression method. This was accomplished through the following actions taken in conducting the study:

1. Create a predictive model designed to identify variables that significantly contribute to successfully obtaining AYP.
2. Test prior research results of specific variables previously shown to significantly contribute to student performance.
3. Apply the use of logistic regression in the educational setting.
4. Assist state, district, and school-based administrators focus on predictor variables arranged in a hierarchical sequence of effectiveness, thereby increasing the likelihood that a school or district would achieve AYP.

## Research Questions

This research was driven by the following questions:

1. To what extent, if any, could data included in the 2008-2009 Florida Adequate Yearly Progress (AYP) calculation predict the likelihood that a

school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

2. To what extent, if any, did academic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?
3. To what extent, if any, did school demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?
4. To what extent, if any, did teacher demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

## Design of the Study

This research study was conducted using secondary data and regression techniques. Data acquired from the Florida Department of Education were analyzed using a regression technique suitable for categorical dependent variables in order to identify to what extent data included in the 2008-2009 Florida School Indicator Report (FSIR) contributed to the prediction of AYP in reading and mathematics.

Because the dependent variable had only two possible outcomes, meeting AYP requirements or not meeting AYP requirements, a logistic regression process was used to develop a predictive model using the following 2008-2009 predictor variables as follows:

1. percentage of students from each of the Florida AYP calculation subcategories showing proficiency in FCAT reading and mathematics;
2. the FCAT average mean developmental score of each subcategory for reading and mathematics;
3. percentage of students from each of the Florida AYP calculation subcategories showing proficiency in FCAT Writes;
4. the FCAT average mean score of each subcategory for the FCAT Writes;
5. the ACT and SAT composite test scores for each subcategory;
6. attendance as a percentage of enrollment;
7. graduation and dropout rates as reported by the FSIR;
8. incidents of crime and violence;
9. suspension rates as a percentage of the school's total population;
10. categorical percentage of teacher degree to include bachelor, masters, specialist and doctoral degree, as a percentage of the total teacher population;
11. teacher average years experience as a percentage of the total teacher population ;
12. per pupil expenditure;

13. school size; and

14. school stability/mobility rate.

## Organization of the Dissertation

This dissertation is divided into five chapters. Chapter 1 offers the reader an overview of the problems associated with AYP to be researched. Chapter 2 provides a synopsis of the relevant research on the topic of high stakes testing in the United States and Florida. Chapter 2 also provides an overview of the research on the variables associated with the Florida School Indicator Report and school grades in Florida. Chapter 3 focuses on the design of the study and offers a description of the methodology. Additionally, relevant statistical operations are discussed along with the procedures used to collect and analyze the data. Chapter 4 provides a detailed analysis of the results of the data including both descriptive and statistical analysis. Chapter 5 focuses on an interpretation of the data collected. Conclusions are linked to relevant literature and research in the field, and recommendations are made for further research in this area.

# CHAPTER 2
# LITERATURE REVIEW AND RELATED RESEARCH

## Introduction

NCLB had its origins rooted in a congressional act known as the Elementary and Secondary Education Act (ESEA) of 1965 (Democrats for Education Reform, 2009). ESEA was born out of President Lyndon Johnson's Great Society program, the central aim of which was to provide assistance to schools. More specifically, President Johnson created ESEA to help economically disadvantaged children (Linn, 2008).

Hess and Petrillo (2007) suggested that the implementation of ESEA affected elementary and secondary education incrementally since its inception. Linn (2006) stated that ESEA had little impact on student achievement. He suggested that for the first few decades ESEA focused primarily on the distribution of funds (Linn, 2008). Others suggested that the federal guidelines associated with the original ESEA were vague and unenforceable (Democrats for Education Reform, 2009).

The National Commission on Education released *A Nation at Risk,* "the most influential report on education over the past few decades (Amrein & Berliner, 2002, p. 3)." This report suggested that the U.S. shift from minimum competency tests and replace them with higher, more internationally competitive forms of high stakes test. In this 1983 educational study, it was argued "that schools in the United States were educationally performing far below other countries and, if the substandard trend continued, would reduce the United States international superiority" (Amrein & Berliner, 2002, p. 4; United States. National Commission on Excellence in Education, 1983).

*A Nation at Risk* generated great change in U.S. educational policy affecting the framework of education to this day. Amrein and Berliner stated that

> The National Commission on Education called for more rigorous standards and accountability mechanisms to bring the United States out of its purported educational recession. The Commission recommended that states institute high standards to homogenize and improve curricula and rigorous assessments be conducted to hold schools accountable for meeting those standards. The Commission and those it influenced intended to increase what students learn in schools (2002, p. 4).

In light of *A Nation at Risk*, most states developed educational standards and assessments to measure them (Education, 1983). Iowa and Nebraska were the only exceptions. Leverage was gained over schools and districts by the development of penalties to help motivate students, schools and districts to rise to these new standards (Amrein & Berliner, 2002).

The 1994 reauthorization in the form of the Improving America's School Act (IASA) of 1994 (ISIA, 1995) alongside President Bill Clinton's Goals 2000: Educate America Act (P.L. 103-227), written into law in 1994, changed the effectiveness of ESEA (Paris, 1994). IASA's reauthorization of ESEA extended ESEA for another five years (ISIA, 1995), while Clinton's Goals 2000 provided states with resources to identify and establish world-class academic standards and to measure student progress based on these standards (Paris, 1994). The 1994 Goals 2000 was the catalyst that shifted the emphasis to student achievement outcomes.

Goals 2000 and IASA (ISIA, 1995; Paris, 1994) initiated several changes to ESEA. States had already begun to develop their own rigorous academic standards. Goals 2000 necessitated comprehensive testing of all students at least once during Grades 3, 4, and 5, once again during Grades 6, 7, and 8, and once more in either the tenth or eleventh grades (Paris, 1994). These federal mandates obligated individual states to develop state improvement plans that included educational assessment, national curriculum alignment and graduation rate improvements.  Unfortunately, few states established clear goals, and there was a failure in reporting academic achievements of at-risk populations. States were still responsible for student achievement (Democrats for Education Reform, 2009) . However, due to ineffective penalties and sanctions spelled out in IASA and Goals 2000, schools and districts had little motivation to change their educational practices (Paris, 1994).

Following the path of presidents holding office after Johnson, President George W. Bush reauthorized ESEA in the form of Public Law 107-110 or the No Child Left Behind (NCLB) Act of 2001. Of all ESEA reauthorizations, NCLB afforded the greatest impact on America's educational system (Linn, 2008). According to Goertz (2001), NCLB mandated significant changes in IASA's and Clinton's Goals 2000's definitions of state, school district and school accountability (2001). NCLB required all states to define AYP in a very specific manner to include five major criteria. First, all public school students were to perform at high standards of academic achievement throughout the state. Second, the AYP formula for the state was to be statistically valid and reliable. Third, AYP's intention was the "facilitation of continuous and substantial academic improvement for all students" (NCLB, 2002, part A, Subpart 1, Sec. 1111, 2[c]). Fourth, measures of AYP centered primarily on academic assessments. Last, AYP included separate measures "for all schools, economically disadvantaged students, minority students, students with disabilities, and students with limited English proficiency" (NCLB, 2002, part A, Subpart 1, Sec. 1111, 2[c]).

NCLB also changed the frequency of student assessment (Democrats for Education Reform, 2009). With NCLB, it was compulsory for schools to test all students between third and eighth grades on a yearly basis and once again during their high school years between tenth and eleventh grade. Additionally, all states had to participate in the annual National Assessment of Educational Progress (NAEP) evaluation. Prior to this directive, very few schools or states participated in NAEP (Democrats for Education Reform, 2009).

In 2010, President Obama proposed the latest iteration of ESEA, A Blueprint for Reform: the Reauthorization of the Elementary and Secondary Education Act (ESEA), to the public (Department of Education, 2010). In this version of ESEA, the administration initiated several proposed changes for NCLB. The four focuses of the change were

> (a) to improve teacher and principal effectiveness, (b) provide information to families that help them evaluate and improve their children's schools, (c) implement college and career ready standards with appropriately aligned assessments, and (d) improve student learning and achievement in the lowest performing schools by providing intensive support and effective interventions (Department of Education, 2011, p. 3).

## Criticism of Adequate Yearly Progress (AYP)

Linn, Baker, and Betebenner (2002) noted that assessments and accountability requirements at the state level influenced the effectiveness of NCLB. At its inception, the majority of states had ambiguous student performance standards in place and were required to make major performance standard modifications. NCLB requirements did not lend themselves to state comparisons. The differences in rigor and cut scores of each state's assessment contributed to the disparity of in achievement of AYP among states. NCLB required that each state participate in NAEP which was considered to be the only comparable state-to-state assessment. On the other hand, critics maintained that NAEP standards exceeded reasonable expectations for all students (Linn, 2003).

Wenning, Herdman, and Smith (2002) agreed that NCLB was a solid step in the right direction and identified its authorization as a milestone in the federal role in education. Wenning et al. warned that NCLB possessed the negative potential of being a generalized regulation that neglected to take into account the demographic diversity of the nation's students (Bolt, Krentz, & Thurlow, 2002). The researchers suggested the expansion of measures contained in NCLB. They also suggested the use of longitudinal value-added methods of measurement as a means of calculating AYP as opposed to the academic snap shot required by NCLB. According to Sanders (2003), value added assessment was a statistical method that allowed the measurement of teacher contribution in the education of individuals. This method could show whether a student in a specific class made the expected amount of academic progress as well as associated this academic progress with the effectiveness or lack of effectiveness of the student's current teacher (Sanders, 2003). In a technical paper presented to the National Center on Educational Outcomes it was suggested that the term academic snapshot represented a description of student, school, school district, or state academic performance within a specific and longitudinally limited period of time (Bolt et al., 2002). This "snapshot in time" (p. 3), as Bolt et al. stated, compared learning gains and trends of the student, school, or school district within a limited time frame, without the ability for long term analysis. In agreement with Wenning et al., Sanders (2003) suggested that the result of a more proactive decision-making posture hinged on disaggregated views of student progress based on individual student progress once the foundation of value-added assessment was in place. According to Hanushek and Raymond (2005), the concentration of the NCLB assessment had little influence of socioeconomic status on the student, a condition that value-added assessment claimed to isolate and ultimately eliminate (Sanders, 2003).

Joftus and Maddox-Dolan (2003) directly linked AYP to dropout rates of U.S. schools by noting that the number of students failing to meet the rigorous NCLB standards increased. Additionally, many schools lacked the resources that enabled them to focus on remedial help for achievement of the NCLB AYP requirements.

Hanushek and Raymond (2005) suggested that federal and state sanctions created a gaming culture which compelled leaders to create the illusion of success through manipulation of the system. They stated that the nation's student achievement reflected the future of society and necessitated a very high priority for the correct implementation of NCLB's assessment plan.

Ladner and Lips (2009) stated that, due to the nonexistence of statistically significant student learning gains, NCLB followed previous federal interventions in terms of failure. According to Ladner and Lips, the reduction of standards and manipulation of pass rate thresholds became imminent for states, including Florida, to meet the NCLB deadline.

In contrast to their assessment of national reform, Ladner and Lips (2009) commended Florida for its massive reform initiative created to fulfill NCLB. They credited Florida as providing proof that states possessed the ability to improve student-learning gains. The authors asserted that the single most inhibiting factor for Florida's academic growth rested on NCLB's 2014 proficiency deadline.

In 2009, President Barack Obama and the Democratic majority party attempted to improve NCLB and student assessment for America (Pilotin, 2010). President Obama's administration earmarked over $4 billion in education in the form of educational stimulus funding under the authorization of the American Recovery and Reinvestment Act (ARRA) of 2009. ARRA spawned a new assessment program known as Race to the Top which was designed to motivate and support states in an effort to develop and implement educational reform.

As with many researchers of NCLB, Pilotin (2010) criticized annual testing as a means of identifying success and shortcomings of individual students. Likewise, annual testing was never designed as an evaluative tool to measure school quality. Pilotin also referenced the disparity in test quality and rigor between individual states using the National Assessment of Education Progress (NAEP) as the primary indicator of this misalignment. As with previous research, it was noted that annual standardized testing was the primary stimulus for a progressive narrowing of school curriculum. Social studies, art, and physical education were being sacrificed along the way replaced by more reading and mathematics. Pilotin reinforced the notion that the primary motivation of schools and school districts was the desire to avoid state and federal sanctions as well as public ridicule.

Pilotin's (2010) analysis suggested that President Obama that attempting to lead the nation down the path of national assessment. It was noted national testing was not a new endeavor. Pilotin stated that Presidents George W. Bush and Clinton proposed the idea of national testing in their NCLB and Goals 2000 Acts. Pilotin offered positive reasons for the implementation of a national test in terms of testing cost reduction and standard achievement flexibility. Pilotin stated that while the test would be generated as a national test following national standards, states would still retain the flexibility and control as to how their students would achieve these national standards.

Hanushek (2009), a major researcher in the fields of NCLB and AYP since their inception, stated that while the Unites States had shown increases in NEAP scores, it could not be determined whether NCLB and AYP were the primary causes. Hanushek suggested that even though there was some doubt as to the effectiveness of NCLB, over 70% of Americans favored the renewal of test-based accountability by the federal government. He further  stated that, in spite of all the criticism, test-based accountability was a part of the national culture and should be improved rather than eliminated.

## Florida High Stakes Testing

Joiner (2004) suggested that in order to comprehend accountability in Florida, one needed to understand the origin of Florida testing. Joiner purported that prior to 1968 Florida lacked any legal requirement for statewide assessment. The enactment in the same year of Florida Statute 229.551, known as the Educational Accountability Act (EAA), changed the testing requirements in Florida. EAA increased the involvement of the Florida Department of Education in the academic preparation of Florida school children. From the legislation that followed EAA, the Florida State Legislature created the Florida Statewide Assessment Program. The intent of this 1971 legislation required evaluation of a sample population of Florida students for statistical purposes but grew to include all students for selected grades. From 1971 through 1980, the Florida Statewide Assessment Program modified its responsibilities and generated 10 statewide tests.

Between 1971 and 1980, Florida school children experienced several different standardized tests including the Functional Literacy Test (Florida Department of Education, 2009c). This test became a requirement for high school graduation but quickly spread to the third, fifth, and eighth grades as an EAA literacy requisite. In 1979, the State Student Assessment Test (SSAT I & II) replaced the Functional Literacy Test. The first version of SSAT I and II assessed basic skills in reading, writing, and mathematics, and was administered in third, fifth, and eighth grades. The second version originated as an 11th-grade basic skills test for reading and mathematics. The Florida school system administered the SSAT for almost a decade. In 1990, the Florida High School Competency Test (HSCT) replaced the 1lth-grade SSAT.

## Legal Challenges

In 1974, the U.S. legislative assembly ratified the Equal Educational Opportunities Act (EEOA) that prohibited any state from denying an equal educational opportunity to individuals due to race, color, sex, or national origin (Berenyi, 2008). This included deliberate segregation of students or the continuation of preexisting segregated schools. EEOA affected almost every school in the nation, defying multi-generational tradition. Any state or school district receiving federal financial aid was prohibited from discriminating against students on the basis of race, sex, or national origin and faced possible civil actions if they did not comply.

One of the first court cases filed against Florida state-wide testing occurred in 1978 and was generated by the Dade County Florida chapter of the National Association for the Advancement of Colored People (NAACP) (Florida Department of Education, 2009d). This organization contested "the right to limit public access to the Functional Literacy Test" (para 1). This case was ultimately dropped before a ruling was determined.

A second Florida challenge, occurring in the same year, was filed by John Brady of Pinellas County who questioned the "legality of the scoring system used on the Florida comprehensive test" (Florida Department of Education, 2009d , para 2). In the case of *Brady v. Turlington* (1979), the court held that a Florida State Board of Education rule requiring students to pass a State Student Assessment Test before being awarded a diploma was not illegally retroactively applied. The court also held that the rule did not irremediably disadvantage students who failed the examination since they were permitted to retake it. The court found the rule to comply with due process requirements.

In another legal contest regarding the Florida test, Brady joined forces with Blount (Florida Department of Education, 2009d). They argued that

> the criteria were arbitrary and unfair, but the judge narrowed the case to whether or not the economic impact statement was correctly filed and refused to address the issues surrounding the test itself. On October 23, 1978, the hearing officer ruled in favor of the State Board of Education and permitted the scoring procedures adopted by the Board to be implemented (Para 5).

Though appealed, this decision was ultimately upheld by the District Court of Appeals.

In a significant Florida court case in 1979, Tampa Bay Area Legal Services questioned the constitutionality of the Florida Literacy Test. It was contested that the examination was administered without adequate lead-time. It was also insinuated that (a) the contents of the exam were not taught, (b) results stigmatized students who failed, (c) items were racially biased, and (d) the exam had not been checked for validity or reliability (Florida Department of Education, 2009d). In July of 1979 it was ruled that the test "did not provide adequate notice or time to correct the learning deficiencies of students" (Para 7). In an attempt to give Florida schools ample time to remediate their students, the Appeals Court upheld the use of the test but postponed its use as a graduation requirement for three years.

In its gradual development starting in 1972, the Florida Comprehensive Assessment Test (FCAT) has been the leading educational growth indicator in Florida public schools since 1998 (Florida Department of Education, 2009c). The actual FCAT development started in 1995 through an accepted recommendation of the Florida Department of Education to develop new statewide standards that would focus on reading, writing, mathematics, and critical thinking. These standards, known as the Sunshine State Standards (SSS), were developed and adopted by the Florida State Board of Education in conjunction with the 1996 Florida State Legislature's mandate that the standards be used in every public school in Florida. In 1997, field testing commenced before the FCAT's first official administration in 1998 to each grade levels 4, 5, 8, and 10 student enrolled in Florida's public schools. Unlike future FCAT administrations, the first one was not used as an accountability tool for students or schools. Rather, its purpose was to develop a baseline score for future administrations.

In 1999, students across Florida were given the second FCAT (Florida Department of Education, 2009c). As in the first version, the 1999 FCAT was administered to grades 4, 5, 8, and 10. Unlike the first examination administered in 1998, students were held academically accountable, and schools were assigned a grade based on the results of the students' scores. It was during this same year that Florida lawmakers enacted the Florida A+ Plan for Education (Florida Department of Education, 2004). In conjunction with the developing FCAT, accountability standards were increased for both students and educators demanding learning gains for all students as well as FCAT minimum pass scores. This Florida A+ Plan also provided for the inclusion of science assessments for grades 5, 8 and 11. The new mandate made the grade 10 FCAT results a component for high school graduation.

The administration of the 2000 FCAT followed the example of the previous year, holding schools accountable for the results for students in grades 4, 5, 8, and 10. However, the state expanded the students to be tested to include grades three through 10. Similar to the first FCAT in 1998, the new scores were used in establishing benchmarks for that year. Subsequent years would include grades three through 10 in the calculation of school grades.

In the previous year, 1999, 78 Florida public schools were awarded a grade of an "F" which indicated a low performing school and student population (Florida Department of Education, 2004). This was the first time that Florida public schools were graded on a five letter grading system from "A" to "F" where A schools were considered high performing schools and F schools were considered low performing. In the following school year, each of these schools improved their school letter grade at least one level. In this same year, only four schools earned a letter grade of an F, for the first time and there was a marked increase in the number of schools receiving an A rating.

It was not until 2001 that high school students were held accountable for their educational achievement (Florida Department of Education, 2009c). During this year, the state developed a minimal passing score that grade 10 students would have to achieve in order to receive a "regular" high school diploma. During the 2002 administration of the FCAT, all high school students were required to earn a score of 287 or higher in reading and a score of 295 or higher in mathematics to satisfy the state's minimum standards. The scores were adjusted the following year to 300 or higher for both reading and mathematics.

The FCAT, a criterion referenced test, was designed to identify a specific student's academic status using a predefined performance standard based on the Florida SSS (Florida Department of Education, 2009a). During each FCAT administration, students have been assigned an FCAT scale score for reading and mathematics ranging from a minimum score of 100 to a maximum score of 500 points (Florida Department of Education, 2004). Each year state educators have determined transitional scale score cut off scores for five different numerical categories ranging from category 1 to category 5. Categories 1 and 2 have been considered to be academically low performing, and categories 3 through 5 have been considered to be academically proficient. Based on their scale scores, students have been placed within one of these five categories indicating their levels of student proficiency in regard to the Sunshine State Standards.

Because the scale score ranging between100 and 500 has been used for each grade, no relevant comparison from year to year could be made. Learning gain information could not be gleaned by comparing successive year's results (Florida Department of Education, 2009a). Thus, the Department of Education converted student scale scores into developmental scale scores (DSS). The developmental scale scores were designed to track a student's cumulative academic progress from grade three through grade 10. This scale ranged from a low score of 86 in grade three to the highest score of 3008 in grade 10 for reading and a low score of 375 in grade three to a high score of 2709 in grade 10 for mathematics. These cumulative scores were designed to help parents, schools, and school districts compare learning levels and learning gains from year to year for individual students.

## Transition to FCAT 2.0

The first version of the Florida Comprehensive Assessment Test (FCAT), was introduced in 1995 as an assessment of students' abilities to compete in the global marketplace (Florida Department of Education, 2009c). It reflected a new set of Florida

State educational standards, the Sunshine State Standards, spawned from Blueprint 2000. The Sunshine State Standards thrived with limited modification for over a decade.

The Sunshine State Standards were revised in 2008 and refocused on standards in reading, mathematics, and science. This version, the Next Generation Sunshine State Standards (NGSSS), led to the second iteration of the FCAT known as FCAT 2.0. This updated version of the Florida Comprehensive Assessment Test had a 2011 release date. Starting in the 2010-2011 school year, Florida began the statewide transition to the Next Generation Sunshine State Standards as well as its companion, the Florida Comprehensive Assessment Test 2.0.

The FCAT 2.0, at the time of this research, like its predecessor, is a criterion reference test designed to measure student achievement based on the NGSSS. The first implementation of the FCAT 2.0 is scheduled for 2011, replacing the original FCAT in reading and mathematics for all grades three through ten. The science version of the FCAT 2.0 has been scheduled for administration to fifth- and eighth-grade students in 2012. Eleventh-grade science students will experience a new era of academic assessment in the form of end of course examinations. Because the FCAT 2.0 assessments existed to satisfy federal and state NCLB assessment accountability requirements, students enrolled in private schools were not administered the FCAT 2.0 examination. Home schooled students were also not required to participate in the FCAT 2.0, but were allowed to do so if they chose to use the results as a measure of their yearly progress.

The Florida Department of Education stated seven primary differences between the FCAT 2.0 and its predecessor FCAT (E. Smith, 2009):

1. Several items on the third and fourth grade FCAT 2.0 mathematics assessment required the use of rulers to answer questions.
2. The fourth grade FCAT 2.0 mathematics assessment would both multiple choice and gridded response type questions.
3. The fifth through eighth grade FCAT 2.0 mathematics assessment will use a different gridded response from that seen on the FCAT. The 7th and 8th grade response grids will also a negative answer grid choice.
4. The third through tenth grade FCAT 2.0 reading assessment will include a greater number of reading passages from the public domain including historical and classical works as reading topics.
5. The third through tenth grade FCAT 2.0 reading assessment will increase the frequency of inference and prior knowledge type questions.
6. The use of performance tasks will be discontinued as test items on the FCAT 2.0.
7. The 2011 FCAT 2.0 was administered and managed by NCS Pearsons and was administered primarily by computer.

<u>President Obama's Version of ESEA Reauthorization of 2010</u>

In 2010, President Barack Obama presented congress and the nation with his visions of ESEA (Department of Education, 2010). In his blueprint, Obama stressed four focal points including (a) teacher and administrator quality, (b) open and accurate academic information to families, (c) college and career ready standards implementation, and (d) a refocus of learning achievements in low performing schools. In a statement to the Committee on House Education and Labor, Secretary of the U.S. Department of Education Arne Duncan stated that it was the intention of President Obama's goal that every classroom in America have an effective teacher and every school an effective leader (Education Act Reauthorization, 2010). Duncan acknowledged the need for development and improvement of state assessments used to gauge the success or failure of career and college readiness standards. Duncan concluded that the Obama administration planned to provide intensive support and effective interventions to remediate faltering schools and districts.

In a March 14, 2010 article that appeared in *The Washington Post*, a staff writer (2010b) affirmed the continuation of yearly testing in reading and mathematics for all students but disclosed the consideration of scores from other subjects as measures of academic progress under the Obama blueprint. This blueprint authorized over $29 billion in aid delivered in the form of competitive grants. In a separate report, Anderson (2010a) suggested that state governors and superintendents develop a set of national educational standards in reading and mathematics respectively with the intent of individual state adoption and a growing momentum in the development of national curriculum standards.

Tienken (2010) criticized Obama's reauthorization proposal on several points. He suggested that legislatures reject the blueprint because of its socially and educationally regressive qualities, lack of quantifiable or qualifiable evidence, and because it fostered a two-tiered educational system.

Whitcomb, Borko, and Liston suggested that teacher quality was the primary key to President Obama's educational proposal (2009). They stressed that the development of existing and experienced teachers was essential for building the core foundation. Education was referred to as a learned skill that was developed over time and with the proper guidance. Recruiting and pairing only the best new teachers with effective experienced teachers would stimulate the educational change that President Obama sought.

Toch (2010) stated that President Obama has experienced great support from the U.S. Congress for his reauthorization of ESEA. Both congressional bodies praised the Administration's value-added assessment system proposed in this educational reform (Toch, 2010) and its ability to measure school and teacher performance while limiting the effect of external influences (Sanders, 2003). It was the intent of the Obama administration to maintain the NCLB generated AYP while evaluating school and teacher contribution to student achievement (Toch, 2010). The administration also proposed to focus on whole school improvement for low performing schools rather than spot improvement on deficient student populations within all schools.

Starting in 2011, and in conjunction with the strategies put forth in the Next Generation Sunshine State Standards, the Florida Department of Education initiated the first end-of-course (EOC) examinations offered in the state (Thrasher, Wise, Gaetz, & Richter, 2010). Computer-based examinations were proposed in Algebra 1, geometry, and biology. The Florida A+ Plan adopted these EOC examinations as a graduation requirement for students.

End of Course Examinations: Impact on Florida Education

In 2010, Senate Bill 4 (SB-4) was introduced, passed, and ultimately signed into law (Thrasher et al., 2010). SB-4 increased the high school graduation requirements and impacted students entering ninth grade for the 2010-2011 school year. Table 1 shows the proposed implementation of Florida's EOC examination schedule with the addition of history and civics as future graduation criterion. Table 2 presents the five-year timelines for implementation of the new requirements including end-of-course examinations for ninth grade cohorts.

Students who entered their ninth grade year during the 2010-2011 school year were required to complete four credits of mathematics that included both Algebra I and Geometry (Thrasher et al., 2010). As described in Table 2, all students enrolled in Algebra I were required to take a state standardized end-of-course examination (EOC). According to Florida's Bureau of K-12 Assessments, the Florida EOC is a component of Florida's Next Generation Strategic Plan "for the purpose of increasing student achievement and improving college and career readiness (Florida Department of Education, 2010a, p. 1)." Just as with the FCAT, the EOC's were aligned with the Next Generation Sunshine State Standards (NGSSS) as a criterion referenced assessment for specific high school courses.

Table 1

*Next Generation and Computer-Based Tests in Florida Transition Schedule*

| | 2009-2010 | 2010-2011 | 2011-2012 | 2012-2013 | 2013-2014 |
|---|---|---|---|---|---|
| FCAT | Reading (3-10)<br>Mathematics (3-10)<br>Science (5,8,11)<br>Writing (4,8,10)<br>Reading & Mathematics Retakes (fall, spring) | Science (5,8,11)<br>Writing (4,8,10)<br>Reading Retakes (fall, spring)<br>Mathematics (10)<br>Mathematics Retakes (fall, spring) | Writing (4,8,10)<br>Reading Retakes (fall, spring)<br>Mathematics Retakes (fall, spring) | Writing (4,8,10)<br>Mathematics Retakes (fall, spring) | Writing (4,8,10) |
| FCAT 2.0 | Reading (3-10) (FT)<br>Mathematics (3-8) (FT) | Reading (3-10) (B)<br>Mathematics (3-8) (B)<br>Science (5, 8) (FT) | Reading (3-6, 7, 8-10) (SS)<br>Reading Retake (fall)<br>Mathematics (3-8) (SS)<br>Science (5, 8) (B) | Reading (3-6, 7, 8-9, 10) Reading Retake (fall)<br>Mathematics (3-6, 7, 8)<br>Science (5, 8) (SS) | Reading (3-4, 5, 6, 7, 8-9, 10)<br>Reading Retake (fall)<br>Mathematics (3-5, 6-7, 8)<br>Science (5, 8) |
| End-of-Course | Algebra I (FT) | Algebra I (B)<br>Geometry (FT)<br>Biology (FT) | Algebra I (SS)<br>Geometry (B)<br>Biology (B)<br>US History (FT) | Algebra I<br>Geometry (SS)<br>Biology (SS)<br>US History (B)<br>Civics (FT) | Algebra I<br>Geometry<br>Biology<br>US History (SS)<br>Civics (B) |

*Source*. Office of Assessment (2010)
*Note*. Provision of end-of-course (EOC) assessments requires legislative action to allow use of EOCs instead of comprehensive assessments in high school. The Geometry and Civics EOCs are being added to the FCAT 2.0 contract through a pending contract amendment.
FT = Field test administration only; EOCs will be field tested in a sample of high schools only.
B = Baseline administration; a scale score will be reported; no developmental scale score or achievement levels will be available.
SS = Standards set; developmental scores, achievement levels, and passing scores will be reported for the first time.

Table 2

*Senate Bill 4: Florida Department of Education Reported Implementation Timeline for Requirements for Ninth-Grade Cohorts in Florida*

| 2010-2011 | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 |
|---|---|---|---|---|
| Algebra I EOC as 30% of student Grade | Algebra I EOC for credit | | | |
| Geometry credit for Graduation | Geometry EOC as 30% of student grade | Geometry EOC for credit | | |
| | Biology credit for graduation | | | |
| | Biology EOC as 30% of student grade | Biology EOC for credit | | |
| | | Algebra II credit for graduation | Algebra II EOC as 30% of student grade | Algebra II EOC for credit |
| | | | Chemistry or Physics AND equally rigorous course credit to graduate | |
| | | | Chemistry or Physics EOC as 30% of student grade | Chemistry or Physics EOC for credit |

*Source*. (Thrasher et al., 2010)

The results of this examination would count for 30% of the student's mathematics grade (Florida Department of Education, 2010b). For the following school year, students entering the ninth grade during the 2011-2012 school year and enrolled in Algebra I will be held to the same standards but also will be required to successfully pass the EOC examination to earn a mathematics course credit. Similarly, students who enter their ninth grade year during the 2011-2012 school year and enrolled in the required geometry course will also required to take an EOC examination. The results of this examination will account for 30% of the student's geometry grade. For the following school year, students who are scheduled to enter their ninth grade year during the 2012-2013 school year and enrolled in a geometry course will also held to the same standards, but will be required to successfully pass the EOC examination to earn a mathematics course credit.

Students who enter their ninth grade year during the 2011-2012 school year will be required to complete three credits of science (Thrasher et al., 2010). Biology is required to be one of the three science credit courses as well as a laboratory component in two of the three science courses. Students enrolled in a Biology I course in the 2011-2012 school year will be required to take a state standardized end-of-course examination (EOC). The results of this examination will count for 30% of the student's science grade. For the following school year, students entering their ninth grade year during the 2012-2013 school year will held to the same standards, but will also be required to successfully pass the Biology I EOC examination to earn a science course credit.

In addition to Algebra I and Geometry, students who entered their ninth grade year during the 2012-2013 school year will be required to take and pass an Algebra II end-of-course examination (Thrasher et al., 2010). Unlike the previous course requirements and their two step implementation timeline, students who enter ninth grade in the 2012-2013 school year will not only be required to take an Algebra II course as a graduation requirement but will also be required to take a state standardized EOC. The result of this examination will account for 30% of the student's mathematics grade and also require the student to successfully pass the examination to earn a mathematics course credit.

Students who enter their ninth grade year during the 2013-2014 school year will not only be required to complete and take an EOC examination for Biology I but will also be required to successfully complete and take an EOC examination for either chemistry or physics (Thrasher et al., 2010). As with the previous course criteria, the EOC examination would count for 30% of the student's grade. Success on the Chemistry or Physics EOC examination will be required to receive science credit.

Unlike the original FCAT examination, and similar to the FCAT 2.0, the EOC examinations will be administered via the computer (Florida Department of Education, 2010a). Considerations will be given to students with specific disabilities that preclude them from using the computer.

## Florida's Adequate Yearly Progress

Florida's Adequate Yearly Progress (AYP) originated with President Clinton's educational initiative, Goal 2000, and the next reauthorization of ESEA in the form of Improving America's School Act (IASA) of 1994 (ISIA, 1995; Paris, 1994). As reported by the Florida Department of Education (FLDOE), AYP became requisite for the federal NCLB initiative (Florida Department of Education, 2009a). Through NCLB, all states were directed to report on the performance of all public schools, school districts, and students who made annual yearly progress and who met the academic achievement standards of the respective states.

Following the guidelines established by NCLB (2002), each state developed a process of evaluating AYP. In Florida, the Florida Department of Education created an AYP evaluative process that targeted the performance and participation of various student subgroups on statewide assessment tests (Florida Department of Education, 2009b). Race, gender, economically disadvantaged, disability, and English language proficiency created the basis of these subgroups. As directed by NCLB, Florida Department of Education assessed all students in reading and mathematics. The Florida Comprehensive Achievement Test (FCAT) was utilized as the primary assessment tool, and alternate assessments were administered to students with disabilities. The Comprehensive English Language Learning Assessment (CELLA) was used to test all English language learners (Florida Department of Education, 2009e).

NCLB also mandated that “every public school and Local Education Agency (LEA) show Adequate Yearly Progress” (Florida Department of Education, 2009b, p. 2) toward the mastery of state generated proficiency goals. Furthermore, NCLB demanded the adoption of rigorous criteria for all students, maintenance of a common state standard, and inclusion of all eligible students in the AYP evaluative process. As a result, Florida based its AYP on the results of nine subgroups: African American, American Indian, Asian, Hispanic, white, economically disadvantaged, English language learners (ELL), students with disabilities (SWD), and the total student population from third to eleventh grade.

Moreover, the Florida Department of Education (Florida Department of Education, 2009b) identified economically disadvantaged students as those eligible to receive free or reduced priced lunch or attend a U.S. Department of Agriculture USDA-approved Provision 2 school. A Provision 2 school offered free breakfast, lunch, or both to the school's population. Florida's AYP calculations excluded specific subgroups if the subgroup's population was equal to or less than 30 students or if the subgroup represented less than 15% of the school's population of 100 students or more. The Florida Department of Education defined English language learners as any students who maintained a primary language other than English. Finally, Florida identified students with disabilities as all students with a certified disability other than gifted.

Florida's AYP used the following four measures to assess each subgroup: (a) the percentage of students tested and their proficiency in mathematics and reading, (b) school graduation rate, (c) school grade, and (d) student reading proficiency (Florida Department of Education, 2009b). The evaluation of the nine subgroups and these four measures comprised 36 of the 39 AYP criteria.

AYP dictated assessment of 95%, at minimum, of all students enrolled in Florida's public schools in both mathematics and reading (Florida Department of Education, 2009b). The determining factors for student eligibility included those involved in the October and February student counts known as Survey 2 and Survey 3 (Florida Department of Education, 2009e). The AYP calculation considered subgroups of ethnicity, English language learners, students with disabilities, and economically disadvantaged students included in February's Survey 3.

Predefined annual objectives based on the 2014 goal of 100% efficiency emerged for reading and mathematics proficiency for Florida (Florida Department of Education, 2009b). As shown in Table 3, Florida Department of Education (2009e) developed a staggered proficiency level for reading and mathematics. Florida's guidelines dictated that 65% of all students evaluated for reading proficiency demonstrate mastery by achieving a level 3 or above on the reading portion of the FCAT or a level 4 or above for students with disabilities evaluated by alternative assessment. During that same year, the guidelines called for 68% of all students tested in mathematics to show proficiency by achieving a level 3 or above on the mathematics portion of the FCAT or a level 4 or above for students with disabilities evaluated through alternative assessment. The predefined annual objectives were scheduled to increase until both reading and mathematics proficiencies reached 100% during the 2013-2014 school year. For the 2009-2010 school years, Florida expected 72% of all students in Florida to exhibit proficiency in reading and 74% proficiency in mathematics.

Table 3

*Florida Predefined Reading and Mathematics Proficiency Levels*

| School Year | Predefined Proficiency Levels | |
|---|---|---|
| | Reading | Mathematics |
| 2008-2009 | 65% | 68% |
| 2009-2010 | 72% | 74% |
| 2010-2011 | 79% | 80% |
| 2011-2012 | 86% | 86% |
| 2012-2013 | 93% | 93% |
| 2013-2014 | 100% | 100% |

*Source*. (Florida Department of Education, 2009e)

As stipulated in NCLB (2002), all states included graduation rate as a criterion to show AYP. To satisfy AYP in Florida, schools needed to attain a graduation rate of 85% or better (Florida Department of Education, 2009e). Only high school and county AYP calculations used this criterion. Florida Department of Education calculated the graduation rate by tracking all ninth through 12th grade enrollment in successively tracked years and subtracted any students within this population who transferred to another public, private, home school, or adult education program. Total counts excluded deceased students. According to the Florida Department of Education, the number of graduates for a particular year divided by the number of expected graduates determined the graduation rate. Schools that fell short of the 85% graduation rate had an alternative method of achieving AYP for graduation rate during the current year. Alternately, a school satisfied AYP by showing an improvement of at least 1% in graduation rate from the previous year.

NCLB mandated the use of one other evaluative criterion beyond proficiency and evaluative participation in reading and mathematics and graduation rates. This was ascertained by individual states. Florida chose to use two additional criteria in AYP evaluation. The first criterion was in the form of a writing assessment (Florida Department of Education, 2009e). In order to make AYP in this category in Florida, schools needed to demonstrate that 90% or more of their students wrote proficiently by achieving a level 3 or above on the writing portion of the FCAT or a level 4 or above for students with disabilities evaluated by an alternative assessment. Alternately, for schools that fell short of the 90% proficiency threshold, a 1% improvement in school writing proficiency, as compared to the previous year, sufficed. The last criterion Florida considered for a school's AYP was the school grade as calculated by Florida's A+ School Plan school grade program. The receipt of a D or F, as determined by the Florida A+ School Plan calculations, connoted a lack of AYP.

Florida schools that achieved all 39 criteria demonstrated AYP (Florida Department of Education, 2009b). If a school failed to meet AYP on any of the 39 criteria, it was ineligible to receive AYP status for that year. Under the provisions of NCLB, Florida schools that achieved AYP for all criteria except reading and mathematics proficiency still had an opportunity to earn AYP status. NCLB offered a condition known as Safe Harbor. A 10% decrease of non-proficient students, compared to the prior year's results in the deficient criterion, allowed Safe Harbor schools to achieve AYP.

Finally, NCLB allowed schools that satisfied the criteria of participation and graduation rate, but failed to meet the criteria of proficiency or safe harbor, to show AYP by utilizing NCLB's Growth Model (Florida Department of Education, 2009b). This model credited schools by tracking student performance over time to provide proof of learning gains. If the data indicated that a student improved at a rate consistent with the current year's goals, AYP applied for that student who was presumed to be on track to proficiency. This model tracked students with at least two years of assessment data who attended the same school for a complete academic year. In contrast, third graders needed only one academic year's worth of data to obtain proficiency status. Calculations for the Growth Model considered the difference between a student's baseline and target years to determine reduction of the difference by approximately one third. In other words, the student's academic growth could be measured by the difference from one year's growth and an expected growth outcome for one year. If the child and ultimately the cumulative school showed appropriate learning gains for that year, AYP was considered to be achieved.

## Florida School Grade and the Florida A+ Plan

Assignment of a letter grade to Florida public schools began in 1999 (Florida Department of Education, 2010b). During the next several years, the grading model used by Florida was enhanced to include the addition of student learning gains, and the disaggregation of low performing student populations was added to the overall school grade calculations. By 2002, the Florida A+ Accountability Plan improved enough to allow tracking of individual student learning gains based on FCAT results. Yearly testing began in third grade for Florida students and continued every year thereafter through 10th grade.

For Florida, the FCAT existed as the primary instrument for measuring learning gains for students (Florida Department of Education, 2009a). The school grade consisted of eight different student achievement measures with two additional conditions set forth by the Department of Education. Using a rating scale, ranging from one to five, schools accumulated points toward their school grades using specified criteria. One point was earned for each percentage of students meeting the following criteria: (a) proficiency rating of three or above on the FCAT reading; (b) proficiency rating of three or above on the FCAT mathematics; (c) proficiency rating of three or above on the FCAT science ; (d) met or exceeded the current year's cutoff score for the FCAT writing; (e) who experienced a learning gain in reading; (f) who experienced a learning gain in mathematics; (g) of the lowest performing students, who experienced a learning gain in reading; (h) of the lowest performing students, who experienced a learning gain in mathematics

The Florida Department of Education compared the cumulative school points to a predefined grade scale. Depending on their cumulative scores, schools and districts were awarded grades ranging from A to F. In 2009, the accumulated points resulted in the following scale used to determine school grades: (a) 525 or more = A, (b) 495-524 = B, (c) 435-494 = C, (d) 395-434 = D, and (e) less than 395 = F.

Unlike previous years, 2009 witnessed a modified grading schedule for high schools (Florida Department of Education, 2010c). Previously, a school grade had been based entirely on the results of the FCAT. In 2009 the Department of Education shifted the emphasis from the high school FCAT to include other factors. FCAT testing accounted for only 50% of the total school grade point accumulation, and 50% was based on non-FCAT components which includes: (a) graduation rate, (b) graduation rate of at-risk students, (c) accelerated curriculum participation, (d) accelerated curriculum performance, (e) postsecondary readiness of students in reading and mathematics, and (f) positive or negative variations in these annual assessments.

High schools were graded based on a 1600-point scale as opposed to their elementary or middle school counterparts who were graded based on an 800-point scale. The accumulated points resulted in the following scale used to determine school grades: (a) 1050 or more points= A, (b) 990-1049 points = B, (c) 870-989 points = C, (d) 790-869 points = D, and (e) less than 790 points = F.

Bracey (2009) suggested that the methods of accountability, predominantly based on achievement evaluations, needed cautious consideration. He believed that NCLB, by its evaluative and accountability design, possibly perpetuated bias against the very population targeted for assistance. Bracey identified NCLB's adverse effects on schools that served disadvantaged populations. Instead of achieving the goals of NCLB, sanctions placed on schools caused good teachers and administrators to leave the teaching profession. He suggested that variables beyond their control influenced their exit from the educational system.

In 2008, the Florida legislature reduced the impact of high stakes testing by reducing the influence FCAT scores had on a school's grade by 50% (Croft, 2010; Klos, 2010). Six new components comprised the remaining 50% as follows: (a) accelerated performance or points earned by students who participated in AP, IB, Dual Enrollment, AICE, and Industrial Certification programs; (b) accelerated participation or points earned by students' success while participating in AP, IB, dual enrollment, AICE, and industrial certification programs; (c) graduation rate; (d) at-risk graduation rate including students who received a 2 or below on the FCAT Reading or Mathematics in eighth grade; (e) readiness in mathematics including students who made 3 or higher on FCAT Mathematics or equivalent grade on SAT, ACT, or CPT; and (f) readiness in reading including students who made 3 or higher on FCAT Reading or equivalent grade on SAT, ACT, or CPT.

Schools that demonstrated a certain amount of growth in a specific category earned bonus points toward the school's grade (Croft, 2010; Klos, 2010). Conversely, schools lost points if they showed a certain amount of decline in any category. No matter how well a school performed in all categories, in order for that school to have earned an A grade, 75% of at-risk students needed to show adequate progress. Alternately, schools earned an A grade if they exhibited an increase in at-risk success of 1%, and that school was within 10 points of their 75% target. For schools that were more than 10 points below their 75% target, the new requirement called for demonstration of a 5% improvement over that of the previous year.

Even with this new accountability system, Florida sanctions toward low performing schools dominated the educational stage. Chiang (2009) stated that one of the common denominators among states was the use of both federal and state sanctions to pressure schools into improved performance. Local publicity about failing schools and the consequences of school vouchers compounded the situation via community stigma. Of all interventions offered to or mandated for schools, Chiang stated the greatest negative influences on a school's academic performance were the sanctions imposed by the federal, state, and local educational agencies. On the other hand, NCLB, designed to help schools, placed sanctions on the very same schools that needed state help the most. Figlio and Kenny (2009) suggested that once again, while NCLB's goals were honorable, the grading systems that most states had imposed on their low performing schools were counterproductive. They stated that schools functioned on other means in conjunction with federal, state, and district funds. A significant portion of school budgets had always come from the school's community. Figlio and Kenny stated that schools tagged with a grade of D or F experienced a significant reduction in community funding. The belief surfaced that community donors desired to withhold funds from a broken program. In reality, the school was not broken. It was very functional and in need of all support available including that of the community.

Florida School Indicator Report (FSIR) Variables: Theoretical Foundation

Theorists have generally divided external influences on student performance into two categories: Test scores and non-testing variables. Hanushek (1989) and Lamdin (1996) agreed that though there has been little agreement on the one true measure of educational output, test scores came closest to measuring student cognitive performance.

General student academic output has been influenced by many factors and can be divided into two groups: student and school input variables (Lamdin, 1996). Student input variables have ranged from natural ability, parental background as well as socioeconomic status. School input variables have included teacher-pupil ratio and per pupil expenditures as well as teachers' years of education and experience. Of these variables, only school input variables have been shown to be controlled directly by administration and staff of a school or district. It has not always been clear as to which variables have a measurable influence on student performance. As Lamdin (1996) and Hanushek (1989) suggested, not all variables are controllable, created equal, or have a significant effect on student performance.

The Florida School Indicator Report (FSIR) was a resource created by the Florida Department of Education to report on the performance, assessment, and educational environment variables collected from schools in the 67 school districts across Florida. The report allows comparisons among schools or districts on over 26 different performance indicators. Records, dating as early as 1997, were accessible from the FSIR website. For the purpose of this research, the FSIR data was divided into three sections: (a) student academic data, (b) teacher demographic data, and (c) school demographic data.

## Student Academic Data

<u>Secondary Achievement Tests: ACT, SAT, and AP Examinations</u>

The review of literature suggested that of all the indicators of student performance, individual high school grades had the greatest influence (Atkinson & Geiser, 2009; Darling-Hammond, 2004; Geiser, 2008; Rothstein, 2000). Also noted was the need for subjective observations of this variable in light of the large disparity in grade reporting, grade inflation, and the lack of a national standard for comparison (Geiser, 2008).

Geiser (2008) stated that second only to individual school grade performance, Advanced Placement (AP) testing was the strongest indicator. Geiser quickly pointed out that the actual result of the AP testing, not merely enrollment in AP classes, was a strong indicator. The ranking continued to include the Scholastic Aptitude Test II (SAT II) and the American College Test (ACT) as significant indicators of high school student achievement.

Although most researchers agreed that Advanced Placement, SAT, and ACT were significant snapshot indicators of student performance, the primary use of assessments as indicators produced serious side effects. Darling-Hammond (2004) found a growing indication that the focus of assessments narrowed and was directed at lower order skills. In addition, grade retention as a sanction, based on the results of assessments, showed no significance in achievement for students who were retained. Darling-Hammond (2004) also suggested that the use of these scores motivated schools to modify their populations as a means to achieve the highest possible score. This could be accomplished by false identification of exceptional education students or encouragement of at-risk students to withdraw from school.

Much of the research associated with the SAT and ACT were designed to measure academic potential in college. As stated earlier by Atkinson and Geiser (2009), student grades in high school were found to be the best predictor of academic success and readiness in college. Tests such as the SAT and ACT proved themselves to have value as a supplemental indicator to a student's secondary school record. It was noted that even though academic standards varied greatly between schools, school districts, and states, student grades continued to show a greater correlation to academic success in college.

The SAT or Scholastic Aptitude Test was introduced in 1926 (Atkinson & Geiser, 2009). This high stakes assessment developed into one of the two primary, post secondary assessment tests used in the United States. The SAT's counterpart, the ACT, was introduced to the public in 1959. Several differences were noted between the SAT and the ACT (Dorans, 1999). Traditionally, until 2000, the SAT was primarily the college entrance examination of choice for northeastern schools. The ACT was the popular choice for Midwest colleges. Table 4 illustrates several differences between the ACT and SAT college examinations.

Table 4

*General Differences Between the ACT and SAT College Entrance Examinations*

| American College Test (ACT) | Scholastic Aptitude Test (SAT) |
|---|---|
| Designed to measure what a student has learned in school | Designed to measure aptitude, reasoning and verbal ability |
| Content based | Critical thinking and problem solving |
| Includes a science reasoning test | Not entirely multiple choice |
| Mathematics section includes trigonometry | Tests vocabulary to a greater extent |
| Tests English grammar | Guessing is penalized |

*Source*. (Dorans, 1999)

After the days of Sputnik and the impact of the report, *A Nation at Risk*, advanced placement programs became increasingly popular (Handwerk, Tognatta, Coley, & Gitomer, 2008). Of the three tests, the ACT, SAT, and the Advanced Placement Examinations, only the AP Examination was shown to align with current college curriculum standards as well as incorporating many secondary education standards. Christiansen (2009), in a doctoral research study, sought to identify a relationship between student participation in AP programs at a school and school wide academic performance. It was surmised that AP participation, as well as AP performance, had a significant impact on school wide academic performance. Christiansen concluded that though AP participation was a significant contributor, the school's general socioeconomic status and the free and reduced lunch rate were of greater influence, nearly nullifying the AP influence.

## Teacher Quality

It has generally been understood that, of all variables and influences, teachers have the greatest effect on students' academic performance (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2008; Darling-Hammond, 1996; Ehrenberg & Brewer, 1994; Hanushek, 1971; Hanushek & Pace, 1995; Hanushek, Rivkin, Rothstein, & Podgursky, 2004; Harris & Sass, 2010, 2008; Kukla-Acevedo, 2009; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004; Sanders & Rivers, 1996; Sanders, S. Wright, & Horn, 1997). Boyd (2008) noted that though a statistical relationship between teacher quality and student academic achievement was identified there was great variation in teacher quality, and few of those characteristics consistently showed strong relationships to student achievement (Kukla-Acevedo, 2009).

Sanders and Rivers (1996) concluded that teacher quality accounted for over 50% of variations in student achievement. Using Sanders, Tennessee Value Added Assessment System (TVAAS), a statistical analysis of student achievement data and longitudinal association with teacher performance, it was found that there was a strong relationship between teacher effectiveness and student achievement, far greater than variables of class size and heterogeneity (Jordan, Mendro, & Weerasinghe, 1997; Sanders & Rivers, 1996; Sanders et al., 1997). Interestingly, it was noted that the impact of teacher quality on an individual student accumulated over the student's academic experience (Sanders & Rivers, 1996). It was presumed that a student assigned to several ineffective teachers in a row experienced lower than expected learning achievement. Sanders and Rivers (1996) stated that the academic recovery time of such students spanned several years of exposure to highly effective teachers.

Sanders and Rivers (1996) also reported that "minority students were more likely to be assigned [ineffective] teachers" (p. 6) and experience possible unrecoverable academic losses in the process Within a district, it has been common to have the least experienced teachers assigned to the poorest, lowest performing, and highest minority schools in a district while the more effective and experienced teachers migrate to higher performing schools.

## Out-of-Field Teachers and Teacher Certification

It has been suggested that nearly one-quarter of all newly hired educators in 1996 lacked the qualifications required to teach (Darling-Hammond, 1996). Darling-Hammond observed that almost 12% of these new teachers taught without any formal educational training, and 14% failed to meet the state standards required to teach. Of the nation's teachers during this time, 26% lacked even a minor in the subject taught. Furthermore, out-of-field teachers taught 57% of physical science students, 27% of mathematics students, and 21% of English students. The percentages were higher in disadvantaged schools.

According to the NCLB mandate, all states have been required to hire highly qualified teachers (Kane, Rockoff, & Staiger, 2008). One way to accomplish this was through a traditional teacher certification program coordinated by state educational leaders, universities, and school districts. Typically, prospective teachers have participated in college courses designed to train, expose, and develop pedagogical skills used in the classroom. Because of subject specific shortages, alternate certification programs have been introduced to allow individuals not formally trained in educational methods to gain certification. Kane et al. (2008) suggested that the focus on teacher certification might have been ill placed.

According to Darling-Hammond (2000), a teacher's depth of knowledge in a specific educational topic signified certification status. She noted that though certification requirements lacked consistency from state to state, the successful completion of state approved training for teacher certification appeared to be a common denominator among states. In light of periodic teacher shortages, many states initiated alternative paths to teacher certification by issuance of temporary or provisional licenses, post-baccalaureate programs for mid-career individuals, and short summer educational certification programs.

A large body of research, conducted between 1970 and 1990, suggested all untrained teachers, without formal academic training, produced a significantly reduced positive impact on student achievement and, in some cases, had a negative effect on student performance (Darling-Hammond, 2000). Researchers noted that poorly trained new teachers experienced less job satisfaction and demonstrated difficulty in development and implementation of effective educational plans. Many of these teachers experienced a much higher rate of job turnover or left the educational profession completely. Conversely, Kane (2008) stated that the initial certification of the teacher was statistically insignificant in test performance and that high turn-over of teachers resulted in a minimal negative effect on student academic quality.

Proponents of traditional certification standards stressed the acquisition of classroom management and pedagogical skills, those skills necessary for effective teaching and teacher success (Kukla-Acevedo, 2009). In contrast, opponents of the traditional certification standards and allies of alternate certification standards argued that content knowledge was the most important attribute and that classroom management and teaching strategies were products of a small learning curve. Nationally, disparities in teacher qualifications and certification standards of high quality teachers were a critical focus under NCLB and President Obama's reauthorization of ESEA (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2008).

Goldhaber and Brewer (2000) conducted research that provided relationships into the effect of teacher qualifications on student achievement. In their results, they concluded that standard or traditional teacher license holders had a statistically positive academic effect on student achievement within mathematics and science as opposed to private school certification or teachers not certified in the specific subject. However, teachers who held emergency certifications or alternative certifications for a specific topic fared as well as their traditionally certified counterparts. Emergency certifications were used during topic-specific shortages, allowing individuals to teach in a content area for which they were prepared while accumulating the required educational courses needed for a traditional teacher certificate. After the introduction of alternative certification programs, emergency certifications were no longer issued.

## Teacher Preparation and Teacher Degree

According to the data obtained from the National Center for Educational Statistics (Carnevale, Smith, & Strohl, 2010), education employed more than three million teachers with almost 40% holding a master's degree or higher in 2009. Goldhaber and Brewer (1996) also noted that over 60% of all school expenditures focused on instructional salaries and benefits. In most instances, level of degree a teacher held directly guided teacher salary. Surprisingly, prior researchers found little or no correlation between teacher degree and student performance (Aaronson, Barrow, & Sander, 2007; Clotfelter, Ladd, & Vigdor, 2006; Ehrenberg & Brewer, 1994; Goldhaber & Brewer, 1996; Hanushek et al., 2004; Summers & Wolfe, 1977).

Goldhaber and Brewer (1996), by aggregating data, found higher degrees held in mathematics or science generated a significant effect on student academic success in those specific subjects. Teachers holding a bachelor's or master's degree in mathematics positively affected student success on mathematics achievement examinations (Monk, 1994). On the other hand, having a bachelor's degree in mathematics education produced a negative academic effect on student achievement in mathematics. This was attributed to the fact that a majority of education majors have been drawn from the "lower portion of the mathematical ability distribution" (Goldhaber & Brewer, 2000, p. 139). In fact, educational majors and teachers with majors outside the educational discipline have been shown to have equal effects on student achievement (Harris & Sass, 2008).

In science, teachers holding a bachelor's degree in their respective field elicited positive academic achievement gains in their students. However, additional subject specific courses taken by science teachers did not show any measurable relationship with student performance in science (Goldhaber & Brewer, 2000; Monk & King, 1994). Likewise, science teachers earning master's or doctoral degrees in their topic and mathematics teachers earning doctoral degrees had no greater effect on their students' achievement than did bachelor's degree prepared teachers. Researchers implied a lack of transferability to other subjects for this teacher effect. Goldhaber and Anthony (2003) made a critical distinction in regard to teacher degree and academic proficiency in their observation that teacher academic proficiency was a measure of content knowledge and teaching methods.

Research has been largely limited to quantitative measures in determining teacher quality and effectiveness. Qualitative measurements such as caring, motivation, enthusiasm, and ability have been viewed as extremely subjective. Harris and Sass (2010) attempted to quantify these effects and their contribution to student achievement. They concluded that, though these qualities were important, none exhibited any individually significant relationship with student achievement nor did they find any value added relationships with student achievement. Researchers have suggested that theacher characteristics and their qualitative skills had little effect on student performance (Boyd et al., 2008; Clotfelter et al., 2006; Goldhaber, 2007; Kane et al., 2008).

Of all the quantifiably measurable qualities of teacher effectiveness, the following were significantly linked to student performance: (a) the college the teacher attended (Rice, 2003; Summers & Wolfe, 1977), (b) the teacher's measured communication skills, (c) verbal ability (Clotfelter et al., 2006; Hanushek, 1971), and (d) the teacher's ACT score when applying for college (Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005; Ferguson & Ladd, 1996). The most significant measurable teacher quality that elicited the most positive student achievement was the teacher's overall undergraduate grade point average (Harris & Sass, 2008; Kukla-Acevedo, 2009). This student effect continued for the first few years a teacher was in the profession and diminished over time.

Professional development based on pedagogical training has not proven to be effective across all disciplines. Harris and Sass (2008) suggested that pedagogical professional development in the elementary school produced no effect on student performance. In middle and high school mathematics, it was suggested that only subject matter professional development elicited positive academic achievement among their students. This supported the idea that mathematics teachers generated positive learning gains of their students through increased content familiarity.

## Teacher Experience

Darling-Hammond (2000), reporting on the results of prior researchers, stated that teacher experience often generated a positive influence on student performance. The degree of this positive effect was not always statistically consistent or linear. She suggested inexperienced teachers were less effective with regard to the stimulation of learning achievement. It was suggested that after five years, teacher effectiveness proved relatively equal, and that any disparity in teacher effectiveness was associated with individual teacher quality (Darling-Hammond, 2000; Kane et al., 2008). The conclusion drawn from Darling-Hammond suggested that all teachers with over five years teaching experience made relatively equal contributions to student performance. Reasons suggested for this included lack of continued education, and possible job burnout.

Boyd et al. stated that "the fact that students of first year teachers learned significantly less than students of more experienced teachers" (p. 3) seemed reasonable (Goldhaber, Gross, & Player, 2007; Hanushek, Kain, O'Brien, & Rivkin, 2005; Krieg, 2006). Researchers have demonstrated that first year teachers elicited significantly lower student achievement than did teachers with 10 to 15 years experience (Hanushek et al., 2005; Kane et al., 2008; Rockoff, 2004). As stated previously, most of the teaching proficiency gains occurred within the first four to five years of a teacher's professional initiation. It is at this critical time in teachers' careers that they can have the greatest and most long-lasting impact on student academic proficiency.

## School Demographic Data

There has been a wealth of literature linking student academic data such as the Florida FCAT as a principal indicator of student achievement. It has been suggested that though playing more of an associative role, the school's characteristics have been shown to be a positive influence in student success as well (Lee, Smith, & Croninger, 1997; Witte & Walsh, 1990). Others (Hanushek, 1986, 1989) have argued that there is little statistical proof to show the relationship between a student's school and personal academic performance.

One of the earliest and most familiar studies was the Equality of Educational Opportunity Study (EEOS) often referred to as the Coleman Report (Coleman et al., 1966). In this report, it was suggested that of all the variables associated with students' school performance, the socioeconomic status of the individual student's family was the dominant factor in student achievement. This relegated school characteristics to secondary importance (Konstantopoulos, Modi, & Hedges, 2001). Follow-up research has strengthened the position framed by the Coleman Report. Socioeconomic status has been statistically linked to test scores as well as the educational level achieved by a student's parents. Through continued research, other family factors such as the occupation of the students' parents, family size, family structure, and the type and quality of family residence have been shown to play a role in students' academic outcome (White, 1982).

The predominance of student driven or student situational variables affecting student academic performance has been undeniable. Since the 1966 Coleman Report, a great deal of research has been conducted to evaluate other variables that may have a secondary role to socioeconomic status (Cotton, 1996; Gregory, 1992; Jones, Toma, & Zimmer, 2008; Pittman & Haughwout, 1987; Rumberger & Larson, 1998; Schoggen & Schoggen, 1988; Walberg, 1994; Witte & Walsh, 1990) in predicting student academic success.

## School Size

There has been a notable shift in the size of the nation's public schools. Since 1940, there has been an overall national increase in student enrollment of over 70% in the last five decades (Jones et al., 2008; Walberg, 1994). This is not surprising given the nation's general population increase. During this time, however, there has also been a drastic decrease in the number of elementary and secondary schools. It has been suggested that the number of schools has declined by 69%. Several reasons were given as a possible motivator for this shift in the schoolhouse model including the 1957 launch of Sputnik that motivated the scientific education race, desegregation, and federal compliance with desegregation (Cotton, 1996).

In an early study, Cotton (1996) approached school size as a predictor of curriculum quality. In this case, Cotton suggested that curriculum quality was related to the diversity of curriculum topics. Cotton implied that larger schools supported a more diverse curriculum and that this positively affected student achievement. It was additionally deduced, however, that there was no significant association between school size and curriculum quality (Cotton, 1996; Walberg, 1994). Although larger schools supported a more diverse curriculum, the extra classes were not high-level courses within the realm of core classes but were introductory, extracurricular classes with little effect on overall student performance (Monk, 1992). It was also found that the relationship between the diversity of curriculum and school size was less apparent as the school increased in size. Researchers found that in order to increase curriculum variety by only 17%, the school would have to increase its student population by 100% (Pittman & Haughwout, 1987).

In Walberg's 1994 research, the popular argument that larger schools were more cost effective was broached and ultimately refuted. No reliable or statistically significant relationship was found between school size and the cost effectiveness of running a large or small school. In a prior mathematical analysis of school budget, it was found that the average per pupil cost decreased as school size increased, but only so far. There was a point of diminishing return where any increase in per pupil expenditure showed no effect on student achievement (McKenzie, 1983). Beyond that point, average per pupil cost began to increase. It was suggested that this increase was associated with the increased need of additional administrative and support staff required to run larger schools.

Contrasting findings produced a division in the literature regarding the effect of school size on student achievement (Walberg, 1994). Approximately half of the researchers found no significant difference between large and small schools in terms of effect on student performance. The remaining researchers found small schools contributed positively to student performance. Throughout the existing literature, there has been a lack of specificity as to what constitutes a small or large school in terms of numbers. It has been suggested that the optimum high school population ranges from 600 to 900 students (Fowler, 1992; Howley, Strange, & Bickel, 2000). In no instance, according to Walberg (1994), were large schools determined to have elicited greater positive student performance when compared to small schools. These findings were consistent in both urban and rural settings. It was deduced that small schools were always as good if not better than larger schools in terms of academic achievement. An even more substantially positive relationship was shown for minorities and students from lower socioeconomic groups (Cotton, 1996).

## Attendance

Lamdin noted that until 1993, the variable of attendance was neglected by researchers. Caldaras (as cited in Lamdin, 1996) conducted one of the earliest analyses of attendance. In this 1993 research, the attendance rate of an individual as well as the attendance rate of a school showed a positive influence on student performance. Lamdin corroborated the findings of Caldaras and implied that variables of average school attendance also exerted a positive influence on student performance. He asserted that resources should be focused on increasing attendance rates. Borland and Howsen (1998) conducted a follow-up analysis of Lamdin's study but included variables that measured a student's natural ability to learn. With this variable included, the researchers found that attendance neglected to significantly influence student performance.

Pinkus (2009) found a relationship between attendance and dropout rates. This research bolstered research conducted by Jones et al. (2008) suggesting that absenteeism, cutting classes, and truancy were indicators of potential dropouts. High absenteeism students were almost six times more likely to drop out of school. Simply put, the inability to "catch up" with missed curricula proved insurmountable. Jones et al. (2008) noted that this academic variable was considered so important that it was included in school report cards and a factor in determining AYP in many states.

## School Mobility and Dropout Rate

Student mobility is the term descriptive of a child leaving one school to attend another within the same school district or in another district within the country. In 1997, over 43 million families moved from one location to another (Engec, 2006), and 3% of all eighth graders had experienced at least two moves since their entry into the educational system. The U.S. population, considered one of the most mobile societies in recent times, faced a trade-off for such mobility according to Pribesh and Downey (1999) and that trade-off has manifested itself negatively in student achievement. Researchers (Rumberger & Larson, 1998; Rumberger & Palardy, 2005; Rumberger & Thomas, 2000; South, Haynie, & Bose, 2007) have agreed that highly mobile students experience declines in academic performance. As the mobility of a student increases during a certain school year, that student would be expected to experience decreased academic performance (Engec, 2006; Mehana & Reynolds, 1995).

It was also noted that, compared to non-mobile students, mobile students experienced a higher suspension rate (Engec, 2006; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993). There has been speculation as to when the negative discipline behavior manifested itself. Some researchers have suggested that this behavior was present even before a student moved from one school to another and was exacerbated by the added pressure to acclimate to a new learning environment.

Of the students who experienced at least one move within a school year, roughly 23% of them were forced to repeat that grade due to poor academic performance (Wood et al., 1993). Student mobility has also been shown to be an effective indicator in determining the effectiveness of school improvement plans (Wright, 1999). Plans that include initiatives that give special attention to transfer students and closely monitor their academic progress have shown positive results for new students as well as positive academic results for the school population as a whole (Engec, 2006).

Furthermore, researchers have noted a direct association between student mobility and dropout rates in America as evidenced by the declines in academic performance and reduced attachment to school in general. Highly mobile students have displayed weak academic performance as compared to their less mobile counterparts.

As with academic achievement, dropout rates have been influenced not only by individual choice but also by specific school cultural characteristics (Pittman & Haughwout, 1987; Witte & Walsh, 1990). Because of this similar association, school dropout statistics have been used as an inverse indicator of student performance, i. e., as the dropout rate increases, the general academic success of the school decreases. As with student mobility, student dropout rate has had a cause and effect relationship with academic performance (Rumberger & Larson, 1998). Both have been cited as eliciting a decline in social and academic engagement in school, thus polarizing individuals even further. This negative feedback loop has resulted in a progression from habitual truancy to dropping out of school all together.

Schools have been shown to play a part in this polarizing trend as well (Rumberger & Thomas, 2000). Dropout and transfer problems have been exacerbated by schools. The involuntary departures of problem students have negatively impacted the academic success of students through the act of transferring from one school to another or by not attending school at all. This act of passing a student to another school has had rippling effects on the accepting school by increasing school budgetary costs and reducing teacher student focus (Lash & Kirkpatrick, 1990). Although schools have become proactive in reducing student dropouts and transfers, it has been suggested that schools that have proven to be effective in student academic performance may not always be effective in significantly reducing student dropouts or transfers (Rumberger & Palardy, 2005). In contrast, schools that focus on reducing student dropout rates and student mobility may not be able to significantly increase student performance.

## Crime and Violence

Discipline within the school setting has been a constant challenge in the U.S. public school system. All too common issues such as violence, vandalism, and bullying have generated environments that have been unfavorable for learning and have affected student performance (Luiselli, Putnam, Handler, & Feinberg, 2005). According to these researchers, ongoing student discipline problems were predictive of future psychological and educational maladjustments. Though whole school disciplinary reform reduced the number of disciplinary incidences on campus and also improved student academic performance, a disparity in school-wide disciplinary reforms has remained. Reduction in school disciplinary issues did, however, positively affect student academic performance. Additionally, Bowen and Bowen (1999) found that as danger in the school and local community increased, academic performance decreased. They suggested that this inverse response to violence and crime occurred more in schools with African American and Hispanic populations than in schools with white populations. Similar relationships surfaced when considering community crime and violence. Though the violence and crime were not prevalent on campus, academic performance decreased, especially for minority and low socioeconomic populations.

### Per Pupil Expenditures

Hanushek (1989) concluded that there was no significant relationship between school expenditures and student performance. Later researchers (Hedges, Laine & Greenwald, 1994) analyzed and criticized Hanushek's results, overturning his previous findings. They determined that school expenditures had a significant influence on student performance. Hedges et al. independently examined per pupil expenditures. Their findings supported their criticism of Hanushek's prior analysis. In 1997, Hanushek published a literature review as a follow-up to his research on per pupil expenditures. He found that the existence of a strong relationship between student performance and per pupil expenditures was suggested in close to 400 studies reviewed (Hanushek, 1997). He explained that consideration of influencing family variables weighed considerably on the results. He also noted that simple resource modifications had little effect on improving student academic performance. To this point, Hanushek restated that there was no strong relationship between student performance and the amount of money a school spends on a per student basis.

## Summary

The literature related to the inception, criticism, legal development, and future plans for AYP nationally and within the state of Florida has been reviewed in this chapter. The researcher also delved into the standards and variables used by Florida in determining the health of a school, the district, and state school system in general. The chapter was concluded with a brief discussion of the variables, beyond those used in calculating AYP, that could be used as indicators of school academic success.

As evidenced by the criticism reported in this literature review, NCLB's mandated use of AYP and high stakes testing as an avenue for determining a school's academic health has generated spirited discussion, both positive and negative. While it has generally been agreed that the introduction and development of AYP has changed the educational landscape far more than any other initiative, there remains great speculation as to the extent of the learning gains. The debate has continued as to whether students across the nation have realized significant learning gains because of, or in spite of, NCLB and the mandated AYP school evaluation process.

The national AYP mandate and its associated summative evaluative instruments experienced an extensive and diverse legal and functional history starting with the authorization of ESEA and continuing to current times. The research and legal holdings suggested that AYP and the evaluative process have taken the form of an evolving document and process. A goal in that evolution has been to ensure the balance between educational evaluative necessity and to avoid violating student due process or civil rights.

As of this review of literature, Florida was experiencing an educational transition from NCLB's version of AYP to the reauthorization of ESEA by President Obama. The development of new, nationally aligned standards and an associated state assessment have led the transition from one AYP process to another to include new secondary school end of course exams for core classes. It was evident from the literature that this transition was met with cautious optimism from most experts in the field of national assessment.

Finally, this review of literature was focused on current thinking regarding measures or indicators of student achievement other than state assessment tests. Those variables, traditionally associated with school health and academic performance, were divided into three subgroups: student academic variables, teacher demographic variables, and school demographic variables.

Student academic variables consisted of ACT, SAT and AP student and school data. The review of literature revealed that the majority of the research associated with these alternative formative assessments focused on the level of college preparation and served as predictors of college success. The research, however, also alluded to the fact that these data could be used as a direct predictor of a school's current academic health.

Teacher demographic variables were described using measurable teacher characteristics such as experience, educational level, type of educational training, and placement. It was suggested that of all the variables associated with teaching were limited in their influence on student achievement. Of all the measurable teacher variables, only a teacher's overall college GPA showed a significant correlation with the teacher's students' academic success. This variable was followed by (a) teacher's type of college, (b) teacher's ACT college entrance score, and (c) measured communications skills. It was noted that these advantages were not permanent and diminished over a period of five years once in the teaching profession.

Finally, research associated with school demographic data was discussed. Variables associated with school demographics included school size, attendance, school stability, dropout rates, crime, and per pupil expenditures. It was noted that beginning with the 1966 Coleman Report, school based variables were ranked a distant second to students' socioeconomic status in influencing academic performance. Though these variables did not prove to be individual primary sources of influence, they were shown to be causal and interconnected to each other in their overall effect on one another and on student performance.

# CHAPTER 3
# METHODOLOGY

## Introduction

The purpose of this chapter is to describe the general methodological approach used in this research study. In this study, the impact that academic data included in the 2008-2009 Florida School Indicator Report (FSIR) had in predicting whether a Florida public high school would attain AYP in reading and mathematics was investigated. The impact of student, school, and socioeconomic demographic data in predicting whether a Florida public high school would attain AYP in reading and mathematics was also examined. The first section of this chapter contains the statement of the problem. The second section provides a discussion of the rationale for the use of logistic regression in the statistical analysis. The process and results of selecting a population and a sample are presented in the third section. In the final section, the procedures used in conducting the research and the data analyses performed for each of the research questions are explained. A summary concludes the chapter.

## Statement of the Problem

At the time of the present study, a school's AYP was determined by analyzing seven variables across a range of the ethnic and racial cultures within that school. It was suggested in the review of literature that variables reported in the Florida School Indicator Report (FSIR) were also significant in influencing student performance. This research sought to determine if the use of these extra variables associated with the Florida

School Indicator Report would allow educators to predict the chances that a school would achieve AYP. Four research questions were formulated to determine the impact that variables reported in the Florida School indicator report had on student achievement as measured by the achievement of Adequate Yearly Progress in reading and mathematics.

## Justification in the Use of Logistic Regression

Logistic regression was selected as the statistic to be used in analyzing the data in the present study. A review of literature related to logistic regression provided the rationale for its use.

According to Field (2009), logistic regression relies on a dependent variable that produces only two possible outcomes, a dichotomous or binary variable. This method enables the use of a combination of continuous or binary variables. The independent variables in logistic regression allow for a mix of numbers with a possible range such as a percentage and independent variables with only two or three categorical choices, e.g., male/female and left/right/up/down. Practitioners of logistic regression have noted that logistic regression requires fewer assumptions than ordinary least square (OLS) regression (Field, 2009; Hair, Tatham, Anderson, & Black, 1998; Hosmer & Lemeshow, 2000). Rather than creating a formula to predict a specific score, as in linear or multiple regression models, logistic regression models represent the probability of an event's occurrence. For example, given appropriate independent variables, logistic regression could be used to develop a model predicting the probability of a child's gender at birth or the probability a tree would fall to the left or the right.

Statisticians have suggested that under certain circumstances researchers consider the logistic regression method (Field, 2009; Hair et al., 1998; Hosmer & Lemeshow, 2000). The use of logistic regression has been viewed as appropriate when the dependent variable in a study was dichotomous, categorical, or discrete. Dichotomous dependent variables mean that only two possible choices or outcomes exist: yes or no, pass or fail, or most importantly for this study, achieving or not achieving AYP (Field, 2009). Logistic regression has also been considered to be appropriate when categorical dependent variables, such as the categories of freshman, sophomore, junior, and senior, have no number associated with them. Thus, logistic regression has been determined to be appropriate when categories have not been differentiated in terms of value or worth, merely in terms of dissimilarity, and discrete variables can be assigned only certain values such as zero or one. Logistic regression could also be considered when the assumption of normality and homoscedasticity prove unacceptable. This means that it should not be assumed that in an analysis, the data points would be distributed symmetrically in the shape of a bell curve or that the residual of a predictor variable would be consistent. In a simple sense, a residual is the distance between a perfect model and a real data point associated with a specific predictor variable. Table 5 presents the characteristics of logistic regression and ordinary least squares regression.

Table 5

*Characteristics of Logistic Regression and Ordinary Least Squares Regression*

| Characteristics | Logistic Regression | Ordinary Least Squares Regression |
|---|---|---|
| Dependent variable | Categorical | Continuous |
| Relationship | Logistic | Linear |
| Independent variable | Any type | Presumed continuous |
| Normality | Not assumed | Assumed |
| Homoscedasticity | Not assumed | Assumed |
| Dichotomous variables | Estimated Value between 0-1 | Estimated value not constrained to any range |
| Solution | Maximum likelihood method with possibly many iterations | Single ordinary least square step |

*Source*. Field (2009)

## Population and Sample

This study focused on the 67 public school districts located in the state of Florida as reported by the Florida Department of Education. Each school district in the state was confined to its respective county, and the school districts also comprised seven regions in Florida to include the northwest, north east, central, central east, central west, southwest and southeast regions of Florida.

Based on the Department of Education's identification, only secondary schools with a "regular" educational program area classification were used in this research. According to the Florida Department of Education, a school classified as regular was any school offering regular or basic instruction. This classification was in contrast to (a) exceptional education, (b) alternative education, (c) vocational/technical education, and (d) adult.

Of the schools meeting the educational program area criterion, only schools identified as either senior high schools or a combination school were considered for this research. A senior high school classification was any school providing regular instruction at one or more grade levels from grades 9-12. A combination school was defined as any school providing regular instruction in grade groupings that included more than one of the three major school configurations to include elementary schools with grades PK-6, middle/junior high schools with grades 6-8, and senior high school configurations. Only combination schools that included either grades 9-12 or 10-12 were used in this study.

Finally, only schools meeting the above criteria that had populations large enough to be given school grades by the Florida Department of Education were included in this study. When these criteria were applied, a total of 468 schools met the defined parameters of this study. Of the 468 schools, at least one school represented each of the 67 counties in Florida. A detailed listing of the schools and their eligibility number can be found in Appendix A.

## Research Questions

The following research questions were used to guide the study:

1. To what extent, if any, could data included in the 2008-2009 Florida Adequate Yearly Progress (AYP) calculation predict the likelihood that a school would

show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

2. To what extent, if any, did academic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?
3. To what extent, if any, did school demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?
4. To what extent, if any, did teacher demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

## Data Analysis

Prior to the data collection process, the researcher obtained IRB approval from the University of Central Florida (Appendix B). Once IRB approval was obtained, the researcher downloaded the 2008-2009 FSIR data from the Florida Department of Education's website at http://www.fldoe.org/eias/eiaspubs/fsir.asp.

Because the dependent variable had only two possible outcomes, meeting AYP requirements or not meeting AYP requirements in reading and mathematics as determined by the results of the FCAT reading and mathematics examination, a logistic regression analysis was performed to develop a predictive model using the following 2008-2009 predictor variables:

(a) the percentage of students that was tested for proficiency in FCAT reading and mathematics;

(b) the percentage of students from each of the Florida AYP calculation subcategories showing proficiency in FCAT reading and mathematics;

(c) the FCAT average mean score of each subcategory for the FCAT Writes;

(d) graduation rates as reported by the AYP calculations;

(e) the school's ACT and SAT test participation percentage;

(f) the school's ACT and SAT composite test scores;

(g) the school's 2008-2009 FCAT Science mean scale score;

(h) the school's October student count;

(i) absenteeism as a percentage of enrollment;

(j) student demographic percentages of the school;

(k) per pupil expenditure;

(l) in-school and out-of-school suspension rates as a percentage of the school's total population;

(m) stability rate;

(n) percentage of teachers teaching out-of-field;

(o) categorical percentage of teacher degree to include bachelor, masters, specialist and doctoral degree, as a percentage of the total teacher population; and

(p) teacher average years experience as a percentage of the total teacher population .

Once the data were accessed, the researcher entered all variable sets into the Statistical Package for Social Science (SPSS) 17. A case number randomly assigned by the statistical program was used to represent each of the 468 data sets. Prior to conducting the logistic regression analyses, the data were randomly divided into two sample groups of 234 data sets each. The first group was used as the test sample group, and the second group was used as a validation group.

Logistic regression requires that each predictor or independent variable has a significant number of data sets associated with it. This analysis requirement meshes well with NCLB requirements of reporting AYP variable data (Florida Department of Education, 2009b). Independent variables were checked to ensure that they satisfied the NCLB reporting criteria requiring samples of sufficient size so as (a) to permit accurate statistical comparison and (b) to avoid individual student identification within a small school population. After inputting all data into SPSS, descriptive statistics were generated for both dependent and independent variables. Ethnic subgroups were included or excluded as independent variables based on their numbers and the NCLB requirements. As suggested by Hair et al. (1998), any unreported scores based on these two criteria were replaced with the series mean score. The missing scores were replaced with the average of scores for that particular classification or variable.

Because logistic regression uses a binary dependent variable (Agresti, 2002, 2007; Collett, 2002; Cox & Snell, 1989; DeMaris, 1992; Hair et al., 1998; Miles & Shevlin, 2000), it requires that all variables show a good dispersion of data. This can be determined by examining the spread or range of the independent variable values. In this research, spread was analyzed for all independent variables. Any variables that showed complete separation were excluded from the logistic regression analysis. Complete separation describes a condition where a predictor variable shows a very narrow range of data sets.

According to Hair et al. (1998), a logistic regression dependent variable is required to be a dichotomous, categorical variable. Because schools in this study could have only two possible AYP outcomes, this criterion was satisfied. Hosmer and Lemeshow (2000) stated that logistic regression requires a large data population and suggested using a ratio of 10:1. This means that there should be at least 10 data sets for every variable included in the logistic regression analysis. Based on a population of 468 possible data sets representing all qualifying high schools in the state of Florida, this linear regression analysis had the potential of carrying 54 independent variables. The test and validation data sets each contained 234 data sets and could contain 23 variables each (Hosmer & Lemeshow, 2000). Pedhazur (1997) recommended that sample size be at least 30 times the number of predictors being considered. This would indicate that a maximum of 15 independent variables could be included in this analysis if the entire data set were used, and nine variables could be included for both the test and validation data sets. Hair et al. (1998) placed this ratio at 5:1. This indicated that for a population of 468, a maximum of 93 independent variables could be used for the entire data population, and a maximum of 46 independent variables could be used for both the test and validation data sets.

As suggested by Hair et al. (1998), the data population was divided into two groups. The first group was used as a test group that consisted of half of the qualified high school population. The second group was considered a validation group used to compare and validate the results from the test group. These groups were created by randomly dividing the data set into two independent groups. Because of this division, and using the sample size guidelines stipulated by Hosmer and Lemeshow (2000), it was suggested that the maximum number of independent variables in any single linear regression analysis should be no greater than 23.

According to Field (2009), the use of logistic regression carries several statistical assumptions. First, each independent variable must represent independent observations, and scores or values on each variable must represent the measurement of a single school. Second, the dependent variable, AYP, must represent both categories, and there must be schools that make AYP in the sample population as well as schools that do not make AYP. Lastly, logistic regression requires that all independent variables included in the logistic regression model represent a linear function of the log-odds (probability) of an event represented by the dependent variable. The logistic regression technique has been designed so that all independent variables included in the model represent the log-odds (probability) of an event (Hair et al., 1998). All variables were tested to determine if they met these assumptions as well as testing for collinearity. According to Hair et al. (1998), collinearity describes a situation where two or more independent variables share a close, near perfect relationship which leads to variable redundancy.

## Data Analysis for Research Question 1

To what extent, if any, can data included in 2008-2009 Florida Adequate Yearly Progress (AYP) calculation be used to predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

The variables used to calculate a school's AYP include the FCAT results for reading and mathematics as well as the participation rate associated with each test. Graduation rates, as well as the results from the FCAT Writes were also used. Following is a complete list of predictor variables considered for this research question:

1. FCAT Reading Percent Participation Total
2. FCAT Reading Percent Participation White
3. FCAT Reading Participation Black
4. FCAT Reading Participation Hispanic
5. FCAT Reading Participation Asian
6. FCAT Reading Participation American Indian
7. FCAT Reading Participation Economically Disadvantaged
8. FCAT Reading Participation  English Language Learner
9. FCAT Reading Participation Students with Disabilities

10. FCAT Reading Proficiency Total

11. FCAT Reading Proficiency White

12. FCAT Reading Proficiency Black

13. FCAT Reading Proficiency Hispanic

14. FCAT Reading Proficiency Asian

15. FCAT Reading Proficiency American Indian

16. FCAT Reading Proficiency Economically Disadvantaged

17. FCAT Reading Proficiency Students with Disabilities

18. FCAT Mathematics Percent Participation Total

19. FCAT Mathematics Percent Participation White

20. FCAT Mathematics Participation Black

21. FCAT Mathematics Participation Hispanic

22. FCAT Mathematics Participation Asian

23. FCAT Mathematics Participation American Indian

24. FCAT Mathematics Participation Economically Disadvantaged

25. FCAT Mathematics Participation  English Language Learner

26. FCAT Mathematics Participation Students with Disabilities

27. FCAT Mathematics Proficiency Total

28. FCAT Mathematics Proficiency White

29. FCAT Mathematics Proficiency Black

30. FCAT Mathematics Proficiency Hispanic

31. FCAT Mathematics Proficiency Asian

32. FCAT Mathematics Proficiency American Indian

33. FCAT Mathematics Proficiency Economically Disadvantaged

34. FCAT Mathematics Proficiency Students with Disabilities

35. FCAT Writing Proficiency Total

36. FCAT Writing Proficiency White

37. FCAT Writing Proficiency Black

38. FCAT Writing Proficiency Hispanic

39. FCAT Writing Proficiency Asian

40. FCAT Writing Proficiency American Indian

41. FCAT Writing Proficiency Economically Disadvantaged

42. FCAT Writing Proficiency Students with Disabilities

43. Graduation Rate Total

The likelihood of making AYP in reading and mathematics were evaluated independently, each with a logistic regression process called "Forced Entire" logistic regression method that requires that all variables be entered into the model at the same time (Cox & Snell, 1989; Field, 2009; Hosmer & Lemeshow, 2000). This method identifies all variables that have a statistical influence over a school's attainment of AYP in reading and mathematics respectively. Through this process, variables are identified as having an effect on the dependent variable. They also account for any suppressor effect that would be ignored by other entry methods such as the forward stepwise method that runs a high risk of experiencing the suppressor effect and a Type II error (Field, 2009). Suppressor effect describes a situation for a variable that alone has no real significant effect. Combined with another variable, however, it has a significant effect on the dependent variable. Once independent variables have been identified as not contributing to the prediction of AYP in reading or mathematics, they are removed and the forced entire method is repeated.

This process was used in this analysis for the test group and repeated using the validation sample set. The results of the analysis of the validation sample set were analyzed and compared to the results of the test group to validate or question the test results.

## Data Analysis for Research Question 2

To what extent, if any, does academic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

The academic data reported in the 2008-2009 FSIR included ACT and SAT participation and mean scores, and FCAT reading, mathematics, and science scores. The process previously described for Research Question 1 was repeated, and the results were analyzed. Following is a complete list of predictor variables considered for this research question:

1. ACT Percentage Taken
2. ACT School Mean Score
3. SAT Percentage Taken
4. SAT School Mean Score

5. FCAT Reading 9th Grade MSS
6. FCAT Reading 9th Grade Score of 3 and Above Percentage
7. FCAT Reading 10th Grade MSS
8. FCAT Reading 10th Grade Score of 3 and Above Percentage
9. FCAT Mathematics 9th Grade MSS
10. FCAT Mathematics 9th Grade Score of 3 and Above Percentage
11. FCAT Mathematics 10th Grade MSS
12. FCAT Mathematics 10th Grade Score of 3 and Above Percentage
13. FCAT Science 11th Grade MSS
14. FCAT Science 11th Grade Score of 3 and Above Percentage

## Data Analysis for Research Question 3

To what extent, if any, does school demographic data included in 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

The school demographic data reported in the 2008-2009 FSIR included student subgroup demographics, school size, absenteeism, per pupil expenditure, in- and out-of-school suspension, and stability rate. The process previously described for Research Question 1 was repeated, and the results were analyzed. Following is a complete list of predictor variables considered for this research question:

1. Total Membership
2. Absences over 21 Days

3. Population White Percentage
4. Population Black Percentage
5. Population Hispanic Percentage
6. Population Asian Percentage
7. Population American Indian Percentage
8. Population Multicultural Percentage
9. Population Disabled Percentage
10. Population Gifted Percentage
11. Population Free and Reduced Lunch Percentage
12. Population English Language Learners Percentage
13. Population Migrant Percentage
14. Population Female Percentage
15. Population Male Percentage
16. Per Pupil Expenditure
17. In School Suspension Numbers
18. Out of School Suspension Numbers
19. Stability Rate

## Data Analysis for Research Question 4

To what extent, if any, does teacher demographic data included in 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

The teacher quality data reported in the 2008-2009 FSIR include teacher out of field statistics, teacher degree statistics and teacher experience statistics. The process previously described for Research Question 1 was repeated, and the results were analyzed. Following is a complete list of predictor variables considered for this research question:

1. Teacher Out of Field Percentage
2. Teacher Percentage with Bachelor's Degree
3. Teacher Percentage with Master's Degree
4. Teacher Percentage with Specialist Degree
5. Teacher Percentage with Doctorate Degree
6. Teacher Experience

## Summary

This chapter has described the methodology and procedures used to answer the four research questions that guided this study. This study sought to determine the influence that variables provided by the Florida School Indictor Report (FSIR) had in predicting a school's chance of showing Annual Yearly Progress (AYP). The study focused on four general groups of variables including academic data, school and student demographic data, and teacher characteristics data. The sample population was narrowed based on course offerings, grade configuration, and population. The population was divided into a test group and validation group for analysis. For the purpose of this study, logistic regression was used in analyzing the data.

Chapter 4 contains an analysis of the data in the form of tables and narratives organized around the four research questions. Conclusions, recommendations, and implications of this study based on the findings are presented in Chapter 5.

# CHAPTER 4
# ANALYSIS OF THE DATA

## Introduction

This study was designed to determine if the variables included in the 2008-2009 Florida School Indicator Report (FSIR) could be used to predict whether a Florida public high school would attain Adequate Yearly Progress (AYP) in reading and mathematics. School data were gathered from 468 high schools in Florida that satisfied the research requirement. Predictive relationships between a school making AYP in reading and mathematics and the FSIR report variables were analyzed using a logistic regression method. This research contributed to the body of knowledge concerning the impact of variables not associated with the AYP calculation had on student achievement and a school's AYP success. Public-available datasets obtained from the Florida Department of Education website were the sources of data for the study.

## Descriptive Statistics

### Descriptive Statistics of the Dependent Variable

The dependent variables used in this research were based on the percentage of students within a school that achieved the AYP benchmark of 65% proficiency in reading and 68% proficiency in mathematics. Schools that obtained a school score of 65% or above in reading were identified as having obtained AYP in reading for the 2008-2009 school year. Likewise, schools that obtained a score of 68% or better in mathematics were identified as having obtained AYP in mathematics for the 2008-2009 school year.

Of the 468 schools qualifying for inclusion in this research, 50 schools (11%) satisfied the 2008-2009 state proficiency standard of 65% student proficiency in reading. This result was based on the state's annual objective for reading. For the 2008-2009 school year, the state required that at least 65% of all students in each subgroup be reading at or above grade level (Florida Department of Education, 2009b). This reading proficiency level was determined by a student scoring at a level 3 or above on the reading FCAT. This would indicate that 418 schools (89%) failed to show 65% of their student populations could read at or above grade level. Table 6 displays a summary of these results.

Table 6

*Adequate Yearly Progress (AYP) in Reading: Florida Public Schools*

| Descriptor | Frequency | Percentage |
|---|---|---|
| Reading AYP attained | 50 | 10.7 |
| Reading AYP not attained | 418 | 89.3 |
| Total | 468 | 100.0 |

Of the 468 schools qualifying for inclusion in this research, 247 (53%) of the schools satisfied the 2008-2009 state proficiency standard of 68% student proficiency in mathematics. This result was based on the state's annual objective for mathematics. For the 2008-2009 school year, the state required that at least 68% of all students in each subgroup be at grade level in mathematics (Florida Department of Education, 2009b). The mathematics proficiency level was determined by a student scoring at a level 3 or above on the mathematics FCAT. This indicated that 221 (47%) schools, failed to show 68% of their students to be proficient in mathematics. Table 7 presents a summary of these results.

Table 7

*Adequate Yearly Progress (AYP) in Mathematics: Florida Public Schools*

| Descriptor | Frequency | Percent |
|---|---|---|
| Mathematics AYP attained | 247 | 52.8 |
| Mathematics AYP not attained | 221 | 47.2 |
| Total | 468 | 100.0 |

## Descriptive Statistics of the Independent Variables

The independent variables used in this research were grouped in four categories to include variables associated with (a) data included in the 2008-2009 Florida Adequate Yearly Progress (AYP) calculation, (b) academic data included in the 2008-2009 Florida School Indicator Report (FSIR), (c) school demographic data included in the 2008-2009 Florida School Indicator Report (FSIR), and (d) teacher characteristic data included in the 2008-2009 Florida School Indicator Report (FSIR).

According to the Florida Department of Education, every school in Florida must show Adequate Yearly Progress (AYP) stating:

> NCLB requires that every public school and every school district (Local Education Agency) make adequate yearly progress toward state proficiency goals.

> All public schools must be held to the same criteria, and all eligible students must be included in the determination of AYP. (2009b, p. 2)

Variables Associated with AYP Calculation

Reading participation refers to the percentage of students within a school and a school's subcategories that were tested using the FCAT Reading or an alternative assessment tool (Florida Department of Education, 2009b). Florida has required that 95% of students and each subcategory of students in a school participate. Table 8 indicates that participation ranged from a minimum of 87% to a maximum of 100%. The subcategory students with disabilities had the largest standard deviation (2.28) and the lowest mean participation rate (96.9%). This was almost two percentage points below the rest of the series.

In this research, ethnic subgroups were included or excluded as independent variables based on their numbers and the NCLB requirements. As suggested by Hair et al. (1998), any unreported ethnic scores based on these two criteria were replaced with the series mean score. For this research, the AYP variable for the subcategory, American Indian, was disqualified for use as an independent or predictor variable because no data were supplied by the state concerning American Indian participation in the FCAT Reading.

Table 8

*Adequate Yearly Progress (AYP) Variables: FCAT Reading Participation Percentages (N=468)*

| Descriptors | Mean | Standard. Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Total | 98.669 | 1.1237 | 94.0 | 100.0 |
| White | 98.715 | 1.2884 | 91.0 | 100.0 |
| Black | 98.525 | 1.3485 | 92.0 | 100.0 |
| Hispanic | 98.709 | 1.2225 | 93.0 | 100.0 |
| Asian | 99.657 | .4494 | 93.0 | 100.0 |
| Economically disadvantaged | 98.325 | 1.4019 | 93.0 | 100.0 |
| English language learners | 98.730 | .9506 | 92.0 | 100.0 |
| Students with disabilities | 96.915 | 2.3767 | 87.0 | 100.0 |

*Note*: FCAT = Florida Comprehensive Assessment Test. None of the variables qualified to be used in the current research due to their lack of dispersion.

Logistic regression requires that all variables show a good dispersion of data. This dispersion was determined by examining the spread or range of the independent variable values variable (Agresti, 2002, 2007; Collett, 2002; Cox & Snell, 1989; DeMaris, 1992; Hair et al., 1998; Miles & Shevlin, 2000). If a variable did not show dispersion, that variable was disqualified for use as an independent or predictor variable and excluded from the logistic regression analysis. The reading percentage of participation showed a maximum range of 13 percentage points. The variables associated with reading percentage of participation shown in Table 8, though comprising a sufficiently large sample (n = 468), did not satisfy the requirement of dispersion required when using logistic regression as an analysis tool. Based on the dispersion requirement, the variables associated with reading percentage of participation were disqualified for use as independent variables in this research and were removed.

Reading proficiency refers to the percentage of students within a school and a school's subcategories that were tested using the FCAT Reading or an alternative assessment tool. During the 2008-2009 school year, schools were to show that at least 65% of all their students within each subcategory were reading at or above grade level (Florida Department of Education, 2009b). Table 9 indicates that reading proficiency ranged from a minimum of 8% in the subcategory of economically disadvantaged students to a maximum of 93% in white population. It should be noted that each subcategory showed a very large standard deviation ranging from 10.5 to 12.5 deviations. Ethnic subgroups were included or excluded as predictor variables based on their numbers and the NCLB requirements. Unreported ethnic scores were replaced with the series mean score (Hair et al., 1998). For this research, the AYP variables for the subcategories American Indian, English Language Learners (ELL), and Students with Disabilities (SWD) were disqualified for use as predictor variables in this research, because no data were supplied by the state concerning participation in the FCAT Reading. The subcategory, Asian, was disqualified for use as a predictor variable in this research due to minimal representation (n = 10) (Hair et al., 1998; Hosmer & Lemeshow, 2000). Total Reading Proficiency was removed because these data were used in the direct determination of making AYP in reading and thus violating the assumption of independence. Table 9 identifies all variables associated with FCAT Reading that qualified for use as predictor variables in this research.

Table 9

*Adequate Yearly Progress (AYP Variables: FCAT Reading Percentage of Proficiency (N=468)*

| Descriptor | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| White | 55.328 | 11.9674 | 26.0 | 93.0 |
| Black | 26.887 | 10.5196 | 9.0 | 86.0 |
| Hispanic | 37.594 | 10.8241 | 14.0 | 91.0 |
| Economically disadvantaged | 34.678 | 12.5315 | 8.0 | 86.0 |

*Note.* FCAT = Florida Comprehensive Assessment Test

Mathematics participation refers to the percentage of students within a school and a school's subcategories that were tested using the FCAT Mathematics or an alternative assessment tool (Florida Department of Education, 2009b). Florida has required that 95% of all students and each subcategory of students in a school participate. Table 10 indicates that mathematics participation ranged from a minimum of 87% to a maximum of 100%. The subcategory of students with disabilities had the largest standard deviation (2.49) and the lowest mean participation rate of 96.7%. As in reading participation, this was almost two percentage points below the rest of the mathematics participation series. Ethnic subgroups were included or excluded as independent variables based on their numbers and the NCLB requirements, and any unreported ethnic scores were replaced with the series mean score (Hair et al., 1998). The AYP variable for the subcategory of American Indian was disqualified for use as a predictor variable in this research, because no data were supplied by the state concerning American Indian participation in the FCAT Mathematics.

Mathematics percentage of participation showed a maximum range of 13 percentage points. As with reading percentage of participation, mathematics percentage of participation possessed a sufficiently large sample (n = 468) but failed to show sufficient dispersion (Agresti, 2002, 2007; Collett, 2002; Cox & Snell, 1989; DeMaris, 1992; Hair et al., 1998; Miles & Shevlin, 2000). Based on the dispersion requirement, these variables were disqualified for use as predictor variables in this research.

Table 10

*Adequate Yearly Progress (AYP) Variables: FCAT Mathematics Participation Percentages(N=468)*

| Descriptors | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Total | 98.600 | 1.1891 | 93.0 | 100.0 |
| White | 98.650 | 1.2886 | 91.0 | 100.0 |
| Black | 98.455 | 1.4283 | 92.0 | 100.0 |
| Hispanic | 98.584 | 1.3534 | 91.0 | 100.0 |
| Asian | 99.611 | .4712 | 93.0 | 100.0 |
| Economically disadvantaged | 98.211 | 1.4631 | 93.0 | 100.0 |
| English language learners | 98.567 | 1.0845 | 90.0 | 100.0 |
| Students with disabilities | 96.658 | 2.4888 | 87.0 | 100.0 |

*Note*: FCAT = Florida Comprehensive Assessment Test. None of the variables qualified to be used in the current research due to their lack of dispersion.

Mathematics proficiency refers to the percentage of students within a school and a school's demographic subcategories that were tested using the FCAT mathematics or an alternative assessment tool. During the 2008-2009 school year, schools were to show that at least 68% of all their students within each subcategory were performing at or above grade level in mathematics (Florida Department of Education, 2009b). Table 11 indicates that reading proficiency ranged from a minimum of 11% in the subcategory of economically disadvantaged to a maximum of 94% in white population. Though not showing distribution as extreme as reading proficiency, mathematics proficiency subgroups showed a very large standard deviation ranging from 8.1 to 10.9 deviations. Also, the black subgroup showed a range similar to the economically disadvantaged subgroup with a minimum of 13 and a maximum of 94. Ethnic subgroups were included or excluded as predictor variables based on their numbers and the NCLB requirements. Unreported ethnic scores were replaced with the series mean score (Hair et al., 1998). For this research, the AYP variables associated with mathematics proficiency for the subcategories of Asian, American Indian, English Language Learners (ELL), and Students with Disabilities (SWD) were disqualified for use as predictor variables because no data were supplied by the state concerning participation in the FCAT Reading. Total Mathematics Proficiency was removed because these data were used in the direct determination of making AYP in Mathematics. This violated the assumption of independence. Table 11 identifies all variables associated with FCAT Mathematics that qualified for use as predictor variables in this research.

Table 11

*Adequate Yearly Progress (AYP): FCAT Mathematics Proficiency Percentages (N=468)*

| Descriptors | Mean | Standard. Deviation | Minimum | Maximum |
|---|---|---|---|---|
| White | 78.477 | 8.3183 | 37.0 | 94.0 |
| Black | 50.371 | 9.6962 | 13.0 | 94.0 |
| Hispanic | 65.236 | 8.0818 | 35.0 | 94.0 |
| Economically disadvantaged | 60.059 | 10.8555 | 11.0 | 93.0 |

Note. FCAT = Florida Comprehensive Assessment Test.

In the calculation of a school's 2008-2009 AYP, Florida dictated that schools needed to show a 1% improvement in the percentage of students that obtain a writing score of level 3.0 or better (Florida Department of Education, 2009b). For students with disabilities (SWD) who were administered an alternative examination, a score of level 4.0 was required to be realized. Lastly, a school could satisfy the AYP writing requirement if the school's students performed at a 90% writing proficiency rate. Table 12 indicates that the writing proficiency ranged from a minimum of 33% in the subcategory of students with disabilities (SWD) to a maximum of 94% in the white population. Of all the included writing subgroups, English language learners and students with disabilities showed the greatest variation with a standard deviation of 6.3 and 9.0 respectively. Ethnic subgroups were included or excluded as independent variables based on their numbers and the NCLB requirements. Unreported ethnic scores were replaced with the series mean score (Hair et al., 1998). For this research, the AYP variables for the subcategories of Black, Asian, and American Indian were disqualified for use as predictor variables in this research, because no data were supplied by the state concerning their participation in the FCAT Writing examination. Although ethnic subcategories of writing proficiency have been used in assessing safe harbor and growth model provisions, they have not been used for direct AYP calculations. The subcategory of writing proficiency total was directly used in the calculation of a school's AYP. For this reason, it was used as a predictor variable in this research. All other subcategories associated with AYP writing proficiency were disqualified for use as predictor variables because they were not included in the calculation of a school's AYP.

Table 12

*Adequate Yearly Progress (AYP) Variables: Writing Proficiency Percentages (N=468)*

| Descriptor | Mean | Standard. Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Total | 89.165 | 3.3186 | 72.0 | 94.0 |
| White | 90.085 | 2.4185 | 76.0 | 94.0 |
| Hispanic | 86.525 | 3.7732 | 70.0 | 94.0 |
| Economically disadvantaged | 86.801 | 4.3563 | 72.0 | 94.0 |
| English language learners | 71.217 | 6.3365 | 34.0 | 94.0 |
| Students with disabilities | 72.333 | 9.0427 | 33.0 | 94.0 |

Note: Only the variable "Total" writing proficiency was used as an independent variable for this research.

The graduation rate used in AYP calculations was different from the graduation rate reported by the state of Florida. The primary difference was the types of diplomas offered and counted as well as the number of years considered. A school has been required to show a 1% increase in graduation rate for all qualified diplomas issued between the previous two years. Of the qualifying subcategories, students with disabilities (SWD) showed the greatest variance, ranging from a maximum of 92% graduation rate to a minimum of only 8% graduation rate. All the remaining categories showed a 94% graduation rate with varying minimal graduation rates ranging from 28% to 39%. Table 13 provides a summary of these results. As with writing proficiency, ethnic subcategories within graduation rate have been used in assessing safe harbor and growth model provisions. They have not, however, been used in direct AYP calculations. For this research, only the total AYP graduation rate which was used in the calculation of AYP was used as a predictor variable.

Table 13

*Adequate Yearly Progress (AYP) Variables: Graduation Rate (N=468)*

| Descriptors | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Total | 77.010 | 10.4973 | 28.0 | 94.0 |
| White | 81.314 | 8.1789 | 28.0 | 94.0 |
| Black | 68.577 | 8.4518 | 39.0 | 94.0 |
| Hispanic | 70.728 | 8.7034 | 35.0 | 94.0 |
| Economically disadvantaged | 67.861 | 9.7052 | 31.0 | 94.0 |
| English language learners | 67.861 | 9.7052 | 31.0 | 94.0 |
| Students with disabilities | 49.688 | 12.5148 | 8.0 | 92.0 |

*Note*. Only the variable “Total” graduation rate was used as an independent variable for this research.

Florida School Indicator Report (FSIR): Academic Variables

The Florida School Indicator Report offered a wide variety of school information including five sets of achievement data. The first was the American College Test (ACT), an aptitude test that has generally been used as an admissions test for college. The FSIR reported the percentage of students that took the ACT as compared to the school's population during the 2008-2009 school year. The FSIR ACT report also included the 2008-2009 mean score of all students who completed the examination. Similarly, the Scholastic Aptitude Test (SAT) was another popular examination given to grade 12 students for use in college placement and admissions. The 2008-2009 FSIR reported the mean score of all the students who completed the SAT exam and the percentage of students as a percentage of the total population of the school.

Table 14 displays a summary of ACT and SAT variables that were used in this research. Similar percentages of student populations were revealed in the FSIR data with about 10% of a school's population taking the ACT and 8% taking the SAT.

Table 14

*Florida School Indicator Report (FSIR) Academic Data (N=468)*

| Descriptor | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| ACT percentage participation[a] | 10.204 | 3.3806 | .1 | 21.3 |
| ACT school mean[a] | 19.179 | 2.0267 | 14.8 | 26.9 |
| SAT percentage participation[a] | 7.884 | 4.6776 | .1 | 29.4 |
| SAT school mean[a] | 1,446.399 | 112.1866 | 1094.0 | 1,831.0 |
| FCAT Reading 9 mean scale score | 316.492 | 16.5844 | 262.0 | 375.0 |
| FCAT Reading 9 percentage 3 and above | 46.917 | 14.9320 | 8.0 | 92.0 |
| FCAT Reading 10 mean scale score | 306.491 | 20.8759 | 243.0 | 379.0 |
| FCAT Reading 10 percentage 3 and above | 37.050 | 15.3126 | 3.0 | 91.0 |
| FCAT Mathematics 9 mean scale score | 313.338 | 16.7717 | 253.0 | 378.0 |
| FCAT Mathematics 9 percentage 3 and above | 68.505 | 13.3461 | 18.0 | 100.0 |
| FCAT Math10 mean scale score | 327.748 | 13.5694 | 291.0 | 376.0 |
| FCAT Mathematics 10 percentage 3 and above | 69.779 | 13.1012 | 18.0 | 100.0 |
| FCAT Science11 mean scale score[a] | 303.426 | 19.6136 | 249.0 | 384.0 |
| FCAT Science 11 percentage 3 and above | 36.825 | 14.9445 | 5.0 | 100.0 |

*Note*: FCAT = Florida Comprehensive Assessment Test.
[a]Only ACT and SAT % participation, ACT and SAT mean scores, and FCAT Science mean scale scores were used as predictor variables in this research.

The FSIR also supplied FCAT results for reading, mathematics, and science. Mean scale scores and passing percentages were reported for each. The logistic regression method of analysis used in this research, while flexible, assumes that cases of data are not related. The FCAT results for both reading and mathematics, however, were directly related to the calculation of AYP in reading and mathematics. Since AYP in reading and mathematics were used as dependent variables in this research, the FSIR FCAT Reading and Mathematics mean scale scores could not be used as independent variables and were disqualified for use as predictor variables in this research. Similarly, school percentages of students scoring 3 or above on the FCAT Reading and Mathematics were also disqualified as predictor variables in this research. The FSIR reported FCAT Science did not violate the assumption of independence and was used as a predictor variable for this research. The FSIR reported the mean scale score for all students who completed the 2008-2009 FCAT Science as well as the percentage of students that scored 3 or above within that school. Because the FCAT Science mean scale score was used to directly determine the percentage of students earning a score of 3 or above, only the FCAT mean scale score was used in this analysis. Table 14 shows a summary of FCAT results as reported by the 2008-2009 FSIR.

FSIR: School Demographic Data

The 2008-2009 Florida School Indicator Report offered several reports that described various school related variables that include total membership, absenteeism, population demographics, per pupil expenditures, in and out of school suspension, and stability rate. Total membership refers to the total number of students who attended a school during the October 2008 student count. The FSIR report on absenteeism reported the percentage of students within a school population that were absent 21 days or more during the 2008-2009 school year. Table 15 shows a summary of total membership and absenteeism used in this research.

Table 15

*Florida School Indicator Report (FSIR) Demographic Data (N=468)*

| Descriptors | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Total membership | 1,782.37 | 896.562 | 52.0 | 4,385.0 |
| Absences 21+ days | 12.558 | 7.2254 | .0 | 41.5 |
| Population percentages | | | | |
| White | 50.829 | 27.8282 | .0 | 98.6 |
| Black | 22.494 | 21.8155 | .0 | 99.1 |
| Hispanic | 21.625 | 22.5867 | .0 | 96.8 |
| Asian | 2.163 | 2.0160 | .0 | 13.0 |
| American Indian | .297 | .3443 | .0 | 4.9 |
| Multicultural | 2.590 | 1.5850 | .0 | 10.0 |
| Disabled | 12.353 | 5.0294 | .0 | 36.9 |
| Gifted | 5.057 | 6.3952 | .0 | 45.8 |
| Free and reduced lunch | 40.832 | 18.8856 | 1.1 | 100.0 |
| English language learners | 6.052 | 6.5593 | .0 | 35.3 |
| Migrant | .603 | 3.0929 | .0 | 40.8 |
| Female | 50.162 | 5.2442 | .0 | 100.0 |
| Male | 49.838 | 5.2442 | .0 | 100.0 |
| Per pupil expenditure | $142.057 | $61.7814 | $2.0 | $327.0 |
| In-school suspension totals | 319.149 | 235.6045 | 1.0 | 1,168.0 |
| Out-of-School suspension totals | 214.976 | 163.8122 | 1.0 | 1,042.0 |
| Stability rate | .941 | .0354 | .8 | 1.0 |

*Note.* Total membership, Asian, American Indian, Multicultural population percentages, and stability rate were not used as predictor variables in the current research.

The population demographic report separates a school student population into subcategories to include (a) race, (b) ethnicity, (c) gender, (d) English language learners, (e) gifted, (f) disabled, and (g) free-reduced price lunch. The FSIR reported the relative percentages of each subcategory in terms of the total population of the school. Table 15 shows the average percentages by subcategories. Asian, Multicultural and American Indian Population Percentage variables failed to satisfy the logistic regression criterion of sample size and dispersion and were disqualified for use as predictor variables in this research. Because the predictor variable total membership was the sum of all the ethnic subcategory population percentages, it was disqualified for use in this research as it violated the assumption of independence required by a logistic regression analysis.

The 2008-2009 FSIR also reported average per pupil expenditure, in- and out-of-school suspension numbers as well as the stability rate of a school. According to the Florida Department of Education (2009b), a school's stability rate was defined as the percentage of students who were counted during the October student count and were also present during the February student count. Table 15 shows a summary of the 2008-2009 FSIR report on per pupil expenditures, in- and out-of-school suspension, and school stability rates. Stability rate was not included in this research because it failed to show a significant distribution that was required in logistic regression analysis.

Teacher Characteristics Data

The 2008-2009 Florida School Indicator Report offered reports that described various teacher related variables including teacher out-of-field status, teacher degree information as well as teacher experience within a school. The FSIR reported the total percentage within a school's teacher population that was teaching in a course different from what their state certification allowed. The FSIR also reported the percentage different degrees held within a school's teacher population that included Bachelors, Masters, Specialist and Doctorate degrees. Finally, the 2008-2009 reported on the average years of teaching experience the total teacher population reflected for each school used in this research. Table 16 summarizes these statistics. All variables associated with teacher quality data qualified for use as predictor variables in this research.

Table 16

*Florida School Indicator Report: Teacher Quality Data (N=468)*

| Teacher Percentages | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Out-of-field | 6.016 | 7.0404 | .0 | 49.6 |
| Bachelor's degree | 60.240 | 15.2619 | .0 | 100.0 |
| Master's degree | 33.212 | 11.8847 | .0 | 100.0 |
| Specialist degree | 1.755 | 2.7394 | .0 | 16.7 |
| Doctoral degree | 2.019 | 3.2842 | .0 | 50.0 |
| Years of experience | 12.912 | 3.2677 | 2.4 | 27.7 |

## Research Question 1

To what extent, if any, can data included in 2008-2009 Florida Adequate Yearly Progress (AYP) calculation be used to predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

In order to answer Research Question 1, a logistical regression was used. Logistic regression is used when outcome variables are categorical in nature and the predictor variables are either continuous or categorical. In this research, the dependent variables were binary categorical variables in which there were only two possible outcomes: either a school made AYP for reading or mathematics, respectively or did not.

In contrasting linear regression, where the goal is to predict a Y value from one or several predictor variables, $X_N$, the logistic regression technique sets out to determine the probability of a binary event occurring in the presence of known predictor variables $X_N$. When one predictor variable is present, the simplest form of binary regression, the logistic regression equation that predicts the probability that an event will occur, is represented by the following equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1)}}$$

In this equation, P(Y) represents the probability of an event occurring, e is the base of natural log, $b_n$ represents the continuous or categorical predictor variable, $x_n$ represents the weighted impact or coefficient of the predictor, and $b_0$ represents the constant in the equation (Field, 2009). In this research, several predictor variables were used to predict the probability that the binary event, making AYP or not in reading or mathematics respectively, were used. In order to accommodate the presence of more than one significant predictor variable, the logistic regression equation was modified as follows:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

In the modified equation, $b_n$ represented all significant continuous or categorical predictor variables, $x_n$ represented the weighted impact or coefficient of the each of the predictors, and $b_0$ represented the constant in the equation (Field, 2009).

The logistic regression equation expresses the non-linear relationship of the binary (categorical) dependent variable by employing the logarithmic transformation that avoids the violation of the assumption of linearity by transforming linear regression terms into logarithmic terms known as the logit (Field, 2009). The derived logistic regression equation predicts the likelihood that an event will happen. In this research, the event was either making AYP or not in reading or mathematics respectively. Values of predictor variables were placed in the expression as well as assigned coefficients that accounted for individual variable impact.

This research employed the SPSS “entire” logistic regression method that places all variables in the model at the same time and then identifies the predictor variables as either having a significant impact or not on the accurate prediction of making AYP in reading or mathematics respectively. The entire sample population was randomly split to form two equal sample groups, one identified as the test group and the other identified as the validation group.

To address Research Question 1, two separate logistic regression analyses were conducted using the test group to determine the how well variables associated with the calculation of a school’s AYP would predict AYP in reading and mathematics respectively.

## Reading Analysis for Test Group: AYP Calculation Data

A logistic regression using the “Entire” method was employed to determine to what extent, if any, data included in 2008-2009 Florida Adequate Yearly Progress (AYP) calculation could be used to predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading with accuracy greater than could be expected by chance.

The initial -2 log-likelihood of the analysis was 159.051 (n = 234). This represented the base model that described the fit of the logistic regression model before any predictor variables are added. The -2 log-likelihood (-2LL) is an analog of the linear regression's residual sum of squares and gives an indication of how many unexplained observations are in the model. Larger numbers indicate a poor fit of the model. As seen in Table 17, when including only the constant $b_0$ (-2.123), the base model correctly predicted schools included in the test group to make AYP in reading approximately 89.3% of the time.

Table 17

*Test Group AYP Variables: Logistic Regression Model's Predictive Power With Constant Only for AYP in Reading (N=234)*

| | Predicted AYP in Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 209 | 0 | 100.0 |
| Yes | 25 | 0 | .0 |
| Overall percentage | | | 89.3 |

*Note*. AYP = Adequate Yearly Progress.

Improvement of the model can be determined by determining the chi-square statistic of the analysis:

$$\chi^2 = 2[LL(New) - LL(Base)]$$

The base equation reported a chi-square statistic of 128.451 ($p < .001$, df = 10). This value indicated that the coefficients associated with the calculation of AYP not introduced into the base model were significantly different from zero. Adding one or more of these variables would have a statistical effect on the predictive power of the base model predicting if a school made AYP in reading correctly 89% of the time. If this value was found to be insignificant ($p > .05$), none of the variables would have made any significant contribution to the base model.

Statistics of the new model, one with variables associated with the calculation of a school's AYP included, resulted in a -2LL of 39.973. The -2LL value has an approximate chi-square distribution which makes it possible to compare values of a model that includes predictor variables against results of a model that includes only a constant. As stated previously, the larger the -2LL, the poorer is the fit represented by the model (Field, 2009). The -2LL of the model, when only the constant was present, was 159.051. When the model included significant variables associated with the calculation of a school AYP, the model generated a -2LL of 35.973. The reduction in the -2LL indicated that, because of these variables, the predictive power of the model improved. The model's chi-square statistic was used to determine the amount of improvement the variables associated with AYP calculations had in comparison to the predictive model that used a constant alone.

The chi-square statistic was reported to be , $\chi^2(10, N = 243) = 123.08$. This value suggested that the overall model was significantly better in predicting if a school would make AYP in reading with the addition of variables associated with calculating a school's AYP than it was with only the constant included. Chi-square can be considered an analog to the F-Test for the linear regression model (Field, 2009).

Accordingly, the model that included variables associated with calculating a school's AYP correctly predicted a school's making AYP in reading approximately 97% of the time as opposed to only 89.3% of the time when using the base coefficient in the predictive model. The results of this analysis are displayed in Table 18.

Table 18

*Test Group AYP Variables: Logistic Regression Model's Predictive Power with Predictor Variables Included for AYP in Reading (N=234)*

| | Predicted AYP in Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 208 | 1 | 99.5 |
| Yes | 5 | 20 | 80.0 |
| Overall percentage | | | 97.4 |

Table 19 lists the predictor variables associated with the calculation of a school's AYP. The table identifies the estimates for the coefficients for the predictors included in the model as well as their significance. The β -value represents the coefficients in the logistic regression equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

The critical Wald statistic, shown on Table 19, has a chi-square distribution and identifies whether the β coefficient for the predictor variable is significantly different from zero. If the predictor β coefficient is significantly different from zero, the predictor variable makes a significant contribution to the model's ability to predict an outcome Y (Field, 2009), in this case, a school making AYP in reading. As shown in Table 19, the only predictor variable that had a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in reading was *reading proficiency White*.

Two logistic regression analog to linear or multiple regressions $R^2$ were reported. The first was derived by Cox and Snell (1989) and is based on the log-likelihood of the model [LL(New)] and the log-likelihood of the original model [LL(baseline)] as well as the sample size of the model:

$$R_{CS}^2 = 1 - e^{[-\frac{2}{n}(LL(New) - (LL(Baseline))]}$$

It has been criticized (Field, 2009; Hosmer & Lemeshow, 2000) that this $R^2$ analog, by its design, never reaches zero and was modified by Nagelkerke in 1991 to account for this discrepancy:

$$R_N^2 = \frac{R_{CS}^2}{1 - e^{\left[\frac{2(LL(Baseline))}{n}\right]}}$$

For the purpose of this study, the $R^2$ analog Nagelkerke $R_N^2$ was considered. The $R_N^2$ was reported to be .829. This would indicate that the overall model that included the significant variable, *reading proficiency White,* explained approximately 83% of the variations in the dependent variable.

Table 19 identifies the odds ratio, $e^{\beta}$, of each predictor variable. The $e^{\beta}$ indicates the change in odds resulting from one unit of change in the predictor variable if all other variables are held constant (Field, 2009). If the $e^{\beta}$ is greater than 1, the probability of an event happening increases, i.e., the probability that a school will make AYP in reading increases. If the $e^{\beta}$ is less than 1, the probability of making AYP in reading decreases. For example, the predictor variable, *reading proficiency White,* has an $e^{\beta}$ of 1.354. This suggests that with all other variables held constant (statistically controlled), for every unit of change in the predictor variable *reading proficiency White,* the statistical odds that a school will attain AYP in reading would increase by 35%. In the case of *reading proficiency White*, one unit would equate to a 1% increase in reading proficiency in a school's White population. Similarly, the predictor variable, *graduation rate total,* has an $e^{\beta}$ of 1.058. This suggests that with all other variables held constant for every unit of change in the predictor variable, *graduation rate total,* the statistical odds that a school will attain AYP in reading would increase by about 6%. In the case of *graduation rate total,* one unit would equate to a 1% increase in the graduation rate of a school's total population.

The Wald statistic determines if the coefficient β is significantly different from zero (Field, 2009). A Wald statistic that identifies that the coefficient is not significantly different from zero indicates that a unit change in a predictor variable will have no effect, positively or negatively, on the overall model. The only predictor variable that showed statistical significance from zero at an alpha level of .05 was *reading proficiency White* (Wald $\chi^2 = 5.731$, $p < .05$, $e^{\beta} = 1.354$). A complete listing of the results of the logistic regression analysis for the variables associated with the calculation of a school's AYP can be found in Table 19.

Table 19

*Test Group: Logistic Regression Results for Reading Adequate Yearly Progress (AYP) Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Reading proficiency | | | | | | |
| White | .303 | .127 | 5.731 | 1 | .017* | 1.354 |
| Black | .100 | .102 | .964 | 1 | .326 | 1.105 |
| Hispanic | .026 | .117 | .049 | 1 | .825 | 1.026 |
| Economically disadvantaged | .110 | .093 | 1.399 | 1 | .237 | 1.117 |
| Mathematics proficiency | | | | | | |
| White | -.016 | .125 | .016 | 1 | .900 | .985 |
| Black | -.071 | .105 | .457 | 1 | .499 | .932 |
| Hispanic | -.081 | .146 | .310 | 1 | .578 | .992 |
| Economically disadvantaged | .041 | .113 | .130 | 1 | .718 | 1.042 |
| Writing proficiency total | -.144 | .219 | .426 | 1 | .512 | .866 |
| Graduation rate total | .057 | .066 | .742 | 1 | .389 | 1.058 |
| Constant | -14.305 | 20.614 | .482 | 1 | .488 | .000 |

*Wald statistic $p < .05$

A Press's Q statistic was used to determine if the predictive power of the logistic regression model was statistically better than chance (Hair et al., 1998). As seen in Figure 1, the Press's Q statistic, associated with the model and using all significant variables considered in the calculation of a school's AYP to determine the likelihood of a school making AYP in reading, was 210.45. The critical value of the Press's Q statistic was 6.63

at an alpha level of .01. This suggests that results from the model that included all significant variables associated with the calculation of AYP were better than what could be expected by chance.

$$Press's\ Q = \frac{[N - (nK)]^2}{N(K - 1)} = \frac{[234 - (227.96 \times 2)]^2}{234(2 - 1)} = 210.45$$

*Figure 1*. Press's Q Statistic for Research Question 1 (Reading)

Additionally, the logistic regression analysis provides key information for the development of a predictive equation that, when combined with predictor variable data specific to a school, predicts the likelihood that a school would make AYP in reading. Once calculated, a school would be able to observe the impact an increase or decrease of a specific predictor variable would have on a school's likelihood of making AYP in reading.

The logistic regression predictive equation derived to answer Research Question 1 for obtaining AYP in reading is as follows:

$$P(Y) = \frac{1}{1 + e^{-((-14.305)+(1.354)(RPW))}}$$

As an example, if a school reported that 55% of the white population showed proficiency in reading, according to the logistic regression predictive model, the likelihood of the school's making AYP in reading would be approximately 91.3%. By increasing proficiency of the school's white population by 1% in reading proficiency, the likelihood of a school making AYP in reading would increase to 93.4%, rising to 99% as the school's white population approached the 65% reading standard required to make AYP in reading.

## Reading Analysis for Validation Group: AYP Calculation Data

In order to validate the test model, a logistic regression analysis using the same variables was performed using the validation sample. As with the test model, the initial -2 log-likelihood of the analysis was 159.051 ($n = 234$) with a 89.3 predictive success rate when including only the constant (-2.123) in the predictive model.

The base equation reported a chi-square statistic of 128.104 ($p < .001$, $df = 10$). This indicates that the coefficients not introduced into the base model were significantly different from zero. By adding one or more of these variables to the logistic regression model, there was a statistical effect on the predictive power of the model to determine if a school made AYP in reading.

The -2LL of the model, when only the constant was present, was 159.051. When the model included significant variables associated with the calculation of a school AYP, the model generated a -2LL of 37.014. The reduction in the -2LL indicated that, because of the addition of these predictor variables, the predictive power of the model improved. The chi-square statistic, $\chi^2$ (10, N = 243) = 122.037, $p < .001$, indicated that the overall model was significantly better than it was with only the constant included and can be considered an analog to the F-Test for the linear regression model. This result follows the same pattern as the test sample chi-square, $\chi^2$ (10, N = 243) = 123.08, $p < .05$.

As seen in Table 20, the model that included variables associated with calculating a school's AYP correctly predicted a school's making AYP in reading approximately 97% of the time with only a slight difference from the test group's predictive power of 97.2.

Table 20

*Validation Group: Logistic Regression Model With Predictor Variables Included for Adequate Yearly Progress (AYP) in Reading (N=234)*

| | Predicted AYP in Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 207 | 2 | 99.9 |
| Yes | 5 | 20 | 80.0 |
| Overall percentage | | | 97.0 |

Nagelkerke $R_N^2$ was reported at .824 (test sample $R_N^2$ = .829). This would indicate that the overall model explained approximately 82% of the variations in the dependent variable.

Table 21 indicates that the only predictor variables that showed a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in reading were *reading proficiency White* (Wald $\chi^2$ = 13.089, $p < .001$, $e^\beta$ = 1.291 ) and *reading proficiency economically disadvantaged* (Wald $\chi^2$ = 5.466, $p < .05$, $e^\beta$ = 1.277). Similar to the test group, holding all other variables constant and changing the predictor variable, *reading proficiency White,* by one unit, the likelihood of a school's making AYP in reading would improve by approximately 29%. The predictor variable, *reading proficiency economically disadvantaged*, though not shown to be significant in the test group, was determined to be significant in the validation group. Increasing the reading proficiency of the economically disadvantaged population of a school would increase the likelihood of a school's making AYP in reading by approximately 28%.

Table 21

*Validation Group: Logistic Regression Results for Reading Adequate Yearly Progress (AYP) Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Reading proficiency | | | | | | |
| White | .255 | .071 | 13.089 | 1 | .000* | 1.291 |
| Black | -.036 | .090 | .159 | 1 | .690 | .965 |
| Hispanic | .000 | .085 | .000 | 1 | .991 | .999 |
| Economically disadvantaged | .245 | .105 | 5.466 | 1 | .019* | 1.277 |
| Mathematics proficiency | | | | | | |
| White | .069 | .088 | .603 | 1 | .437 | 1.071 |
| Black | .093 | .126 | .548 | 1 | .459 | 1.098 |
| Hispanic | .099 | .096 | 1.053 | 1 | .305 | 1.104 |
| Economically disadvantaged | -.119 | .099 | 1.433 | 1 | .231 | .888 |
| Writing proficiency total | -.316 | .209 | 2.288 | 1 | .130 | .729 |
| Graduation rate total | .021 | .053 | .156 | 1 | .693 | 1.021 |
| Constant | -11.692 | 18.137 | .416 | 1 | .519 | .000 |

* Wald statistic $p < .05$

Table 22 presents a comparison of the regression analysis of both the test and validation groups. It shows the predictor variable, *reading proficiency White,* as having the most significant impact on a school's attainment of AYP in reading. It should be noted that the predictor variable, *reading proficiency economically disadvantaged,* was shown to be significant in the validation group but did not show similar significance in the test group. It should also be noted that both predictor variables, *reading proficiency White* and *reading proficiency economically disadvantaged,* showed the greatest predictive power ($e^{\beta}$) among the variables associated with the calculation of a school's AYP.

Table 22

*Comparison of Test and Validation Groups: Reading Adequate Yearly Progress (AYP) Predictor Variables (N=234)*

| Descriptors | β (T) | Sig. (T) | $e^{\beta}$ (T) | β (V) | Sig. (V) | $e^{\beta}$ (V) |
|---|---|---|---|---|---|---|
| Reading proficiency | | | | | | |
| White | .303 | .017* | 1.354 | .255 | .000* | 1.291 |
| Black | .100 | .326 | 1.105 | -.036 | .690 | .965 |
| Hispanic | .026 | .825 | 1.026 | .000 | .991 | .999 |
| Economically disadvantaged | .110 | .237 | 1.117 | .245 | .019* | 1.277 |
| Mathematics proficiency | | | | | | |
| White | -.016 | .900 | .985 | .069 | .437 | 1.071 |
| Black | -.071 | .499 | .932 | .093 | .459 | 1.098 |
| Hispanic | -.081 | .578 | .992 | .099 | .305 | 1.104 |
| Economically disadvantaged | .041 | .718 | 1.042 | -.119 | .231 | .888 |
| Writing proficiency total | -.144 | .512 | .866 | -.316 | .130 | .729 |
| Graduation rate total | .057 | .389 | 1.058 | .021 | .693 | 1.021 |
| Constant | -14.305 | .488 | .000 | -11.692 | .519 | .000 |

*Wald statistic $p < .05$

*Note*. (T) = Test Group Analysis Results, (V) = Validation Group Analysis Results

Mathematics Analysis for Test Group: AYP Calculation Data

To analyze the second component of Research Question 1, a second logistic regression using the “Entire” method was used to determine the extent to which, if any, data included in the 2008-2009 Florida Adequate Yearly Progress (AYP) calculation could be used to predict the likelihood that a school would show Adequate Yearly Progress (AYP) in mathematics with accuracy greater than could be expected by chance.

The initial -2 log-likelihood of the analysis was 323.965 (n = 234) and represented the base model that described the fit of the logistic regression model before any predictor variables were added. As seen in Table 23, when including only the constant (.086), the base model could correctly predict schools included in the test group making AYP in mathematics approximately 52.1% of the time.

Table 23

*Test Group: Logistic Regression Model's Predictive Power With Constant Only for Adequate Yearly Progress (AYP) in Mathematics (N=234)*

| | Predicted AYP in Mathematics | | |
|---|---|---|---|
| Observed AYP Mathematics | No | Yes | Percentage Correct |
| No | 0 | 112 | 0 |
| Yes | 0 | 122 | 100 |
| Overall percentage | | | 52.1 |

The base equation reported a chi-square statistic of $\chi^2$ (10, N = 243) = 114.819, p < .001 and indicated that the coefficients associated with the calculation of AYP that were not introduced into the base model were significantly different from zero. Adding one or more of these variables would have had a statistical effect on the power of the base model in predicting if a school made AYP in mathematics.

The statistical model that contained variables associated with the calculation of a school's AYP obtained a -2LL of 136.655. The -2LL value has an approximate chi-square distribution which makes it possible to compare values of a model that includes predictor variables against results of a model that includes only a constant. The larger the -2LL, the poorer is the fit the model represents. The -2LL of the model, when only the constant was present, was 323.965. When the model included significant variables associated with the calculation of a school's AYP, the model generated a -2LL of 136.655. The reduction in the -2LL indicated that, because of these variables, the predictive power of the model improved.

The chi-square statistic was reported to be $\chi^2(10, N = 243) = 187.310, p < .001$ and suggested that the overall model with the addition of variables associated with calculating a school's AYP was significantly better in predicting if a school would make AYP in mathematics than it was with only the constant included.

Accordingly, the model that included variables associated with calculating a school's AYP correctly predicted a school's making AYP in reading approximately 88% of the time as opposed to only 52% of the time when only using the base coefficient in the predictive model as described in Table 24.

Table 24

*Test Group: Logistic Regression Model's Predictive Power with Predictor Variables Included for Adequate Yearly Progress (AYP) in Mathematics (N=234)*

| | Predicted AYP in Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 99 | 13 | 88.4 |
| Yes | 15 | 107 | 87.0 |
| Overall percentage | | | 88.0 |

The Nagelkerke's $R_N^2$ was reported to be .735 and indicated that the overall model including the significant variables, *reading proficiency White*, *mathematics proficiency White, mathematics proficiency economically disadvantaged,* and *graduation rate total,* explained approximately 74% of the variations in the dependent variable of a school making AYP in mathematics.

Table 25 lists the predictor variables associated with the calculation of a school's AYP. The table identifies the estimates for the coefficients for the predictors included in the model as well as their significance. The β -value represents the coefficients in the logistic regression equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

The critical Wald statistic, shown on Table 25, has a chi-square distribution and identifies whether the β coefficient for the predictor variable was significantly different from zero. As shown in Table 25, four predictor variables associated with the calculation of a school's AYP showed a significant influence ($p < .05$) on predicting the likelihood of a school making AYP in mathematics, including *reading proficiency White*, *mathematics proficiency White, mathematics proficiency economically disadvantaged,* and g*raduation rate total*.

Table 25 identifies the odds ratio, $e^{\beta}$, of each predictor variable. If the $e^{\beta}$ is greater than 1, the probability of an event happening increases. If the $e^{\beta}$ is less than 1, the probability of making AYP in mathematics decreases.

The Wald statistic determines if the coefficient β is significantly different from zero. A Wald statistic that identifies that the coefficient is not significantly different from zero indicates that a unit change in a predictor variable will have no effect, positively or negatively, on the overall model. In this analysis, the predictor variable, *reading proficiency White* (Wald $\chi^2 = 7.646$, $p < .05$, $e^{\beta} = .893$), was considered to have a significant impact on the prediction of a school's making AYP. In contrast to the previous analysis indicating that the predictor variable, *reading proficiency White,* had a positive impact on the attainment of reading AYP, this same variable showed a negative impact on the attainment of mathematics AYP. The analysis suggested that with all other variables held constant, for every unit change of 1% increase in the predictor variable, *reading proficiency White,* the statistical odds that a school would attain AYP in reading would decrease by approximately 11%.

In contrast to the predictor variable, *reading proficiency White*, the predictor variables, *math proficiency White* (Wald $\chi^2 = 2.979$, $p < .001$, $e^{\beta} = 1.398$), *mathematics proficiency economically disadvantaged* (Wald $\chi^2 = 9.321$, $p < .05$, $e^{\beta} = 1.222$), and *graduation rate total* (Wald $\chi^2$ = 9.348, $p < .05$, $e^\beta$ = 1.110) were identified as having a positive impact on the attainment of AYP in mathematics. The analysis suggested that by insuring that all other variables were held constant, for every unit change of the predictor variable, *mathematics proficiency White,* the statistical odds that a school would attain AYP in reading would increase by roughly 40%. With similar controls, the predictor variables, *mathematics proficiency economically disadvantaged* and *graduation rate total,* would increase the likelihood that a school would make AYP in mathematics by 22% and 11% respectively. A complete listing of the results of the logistic regression analysis for the variables associated with the calculation of a school's AYP can be found in Table 25.

A Press's Q statistic was used to determine if the predictive power of the logistic regression model was statistically better than chance. The Press's Q statistic associated with the model using all significant variables associated with the calculation of a school's AYP to determine the likelihood of making AYP in mathematics was 135.41. The critical value of the Press's Q statistic was 6.63 with an alpha level of .01. This suggests that results from the model that included all significant variables associated with the calculation of AYP were better than what could be expected by chance.

Table 25

*Test Group: Logistic Regression Results for Mathematics Adequate Yearly Progress (AYP) Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Reading proficiency | | | | | | |
| White | -.113 | .041 | 7.646 | 1 | .006* | .893 |
| Black | .028 | .043 | .429 | 1 | .513 | 1.028 |
| Hispanic | .066 | .042 | 2.493 | 1 | .114 | 1.068 |
| Economically disadvantaged | .057 | .044 | 1.665 | 1 | .197 | 1.058 |
| Mathematics proficiency | | | | | | |
| White | .335 | .070 | 22.979 | 1 | .000* | 1.398 |
| Black | -.110 | .050 | 4.889 | 1 | .057 | .896 |
| Hispanic | .053 | .069 | .607 | 1 | .436 | 1.055 |
| Economically disadvantaged | .201 | .066 | 9.321 | 1 | .002* | 1.222 |
| Writing proficiency total | .027 | .078 | .120 | 1 | .730 | 1.027 |
| Graduation rate total | .104 | .034 | 9.348 | 1 | .002* | 1.110 |
| Constant | -45.460 | 8.730 | 27.115 | 1 | .000 | .000 |

* Wald statistic $p < .05$

Additionally, the logistic regression analysis provides key information for the development of a predictive equation that, when combined with predictor variable data specific to a school, predicts the likelihood that a school would make AYP in mathematics. Once calculated, a school would be able to observe the impact an increase or decrease of a specific predictor variable would have on a school’s likelihood of making AYP in mathematics.

The logistic regression predictive equation derived to answer Research Question 1 for obtaining AYP in reading is as follows:

$$P(Making\ AYP\ in\ Reading) = \frac{1}{1 + e^{-((-45.460)-(.113)(RPW)+(.335)(MPW)+(.201)(MPED)+(.104)(GRT))}}$$

As an example, suppose a school reported that 25% of the white population showed proficiency in reading, 75% mathematical proficiency within the white population, 70% mathematical proficiency within the socioeconomically disadvantaged population, and a 98% graduation rate for the entire school population. According to the logistic regression predictive model, the likelihood of the school's making AYP in mathematics would be approximately 75%. Keeping all other variables constant and increasing proficiency of the school's white population by 1% in mathematics proficiency would increase the likelihood of a school's making AYP in mathematics to 81%.

## Mathematics Analysis for Validation Group: AYP Calculation Data

In order to validate the test model, a logistic regression analysis using the same variables was conducted using the validation sample. The initial -2 log-likelihood of the analysis was 323.298 (n = 234) with a 53.4% (Test group = 52.1%) predictive success rate when including only the constant (.137) in the predictive model.

The base equation reported a chi-square statistic of $\chi^2$ (10, N = 243) = 140.02, $p < .001$. This indicated that the coefficients not introduced into the base model were significantly different from zero. Adding one or more of these variables to the logistic regression model would have a statistical effect on the power of the model in predicting if a school made AYP in mathematics.

The -2LL of the model when only the constant was present was 323.398. When the model included significant variables associated with the calculation of a school's

AYP, the model generated a -2LL of 97.042. The reduction in the -2LL indicated that, because of the addition of these predictor variables, the predictive power of the model improved.

The chi-square statistic, $\chi^2$ (10, N = 243) = 226.26, p < .001, indicated that the overall model, with the addition of variables associated with calculating a school's AYP, was significantly better in predicting a school's AYP than it was with only the constant. This result follows the same pattern as the test sample chi-square, $\chi^2$ (10, N = 243) = 123.08, p < .05.

As displayed in Table 26, the model that included variables associated with calculating a school's AYP correctly predicted a school's making AYP in mathematics approximately 91% of the time with only a slight difference from the test group's predictive power of 88%.

Table 26

*Validation Group: Logistic Regression Model's Predictive Power With Predictor Variables Included for Mathematics (N=234)*

| | Predicted AYP in Mathematics | | |
|---|---|---|---|
| Observed AYP Mathematics | No | Yes | Percentage Correct |
| No | 98 | 11 | 89.9 |
| Yes | 10 | 115 | 92.0 |
| Overall percentage | | | 91.0 |

Nagelkerke $R_N^2$ was reported at .833 (test sample $R_N^2$ = .824). This would indicate that the overall model explained approximately 83% of the variations in the dependent variable.

According to Table 27, the only predictor variables that had a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in mathematics were *mathematics proficiency White* (Wald $\chi^2 = 17.299$, $p < .001$, $e^{\beta} = 1.483$ ) and *mathematics proficiency economically disadvantaged* (Wald $\chi^2 = 16.846$, $p < .001$, $e^{\beta} = 1.496$). Similar to the test group, holding all other variables constant, and changing the predictor variable, *mathematics proficiency White,* by one unit, the likelihood of a school's making AYP in reading would improve by approximately 48%. The predictor variable, *mathematics proficiency economically disadvantaged*, was also considered significant in the test group. Increasing the mathematical proficiency of the economically disadvantaged population of a school would increase the likelihood of a school's making AYP in reading by approximately 50%.

Table 27

*Validation Group: Logistic Regression Results for Mathematics Adequate Yearly Progress (AYP) Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Reading proficiency | | | | | | |
| White | -.083 | .046 | 3.208 | 1 | .073 | .920 |
| Black | .048 | .043 | 1.237 | 1 | .266 | 1.049 |
| Hispanic | -.016 | .061 | .066 | 1 | .797 | .985 |
| Economically disadvantaged | -.020 | .073 | .077 | 1 | .781 | .980 |
| Mathematics proficiency | | | | | | |
| White | .394 | .095 | 17.299 | 1 | .000* | 1.483 |
| Black | -.145 | .065 | 5.067 | 1 | .054 | .865 |
| Hispanic | -.003 | .069 | .001 | 1 | .970 | .997 |
| Economically disadvantaged | .403 | .098 | 16.846 | 1 | .000* | 1.496 |
| Writing proficiency total | .108 | .112 | .928 | 1 | .335 | 1.114 |
| Graduation rate total | .047 | .044 | 1.117 | 1 | .294 | 1.048 |
| Constant | -55.935 | 12.165 | 21.143 | 1 | .000* | .000 |

* Wald statistic $p < .05$

Table 28 presents a comparison of the regression analysis of both the test and validation groups. This comparison shows that for both groups the predictor variables, *mathematics proficiency White* and *mathematics proficiency economically disadvantaged,* had the most significant impact on a school's attainment of AYP in mathematics. It should be noted that the predictor variable, *reading proficiency White*, was shown to be negatively significant in the test group but failed to show similar significance in the validation group. It should also be noted, that though not significant in either group, the $e^{\beta}$, the predictive power of the predictor variable, showed similar negative influences in the attainment of AYP in mathematics. Similarly, the predictor variable, *graduation rate total,* showed significance in the test group but failed to show similar significance within the validation group. However, the $e^{\beta}$ for both groups, the predictive power of the predictor variable, showed similar positive influences in the attainment of AYP in mathematics.

Table 28

*Comparison of Test and Validation Groups: Mathematics Adequate Yearly Progress (AYP) Predictor Variables (N=234)*

| Descriptors | β (T) | Sig. (T) | $e^{\beta}$ (T) | β (V) | Sig. (V) | $e^{\beta}$ (V) |
|---|---|---|---|---|---|---|
| Reading proficiency | | | | | | |
| White | -.113 | .006* | .893 | -.083 | .073 | .920 |
| Black | .028 | .513 | 1.028 | .048 | .266 | 1.049 |
| Hispanic | .066 | .114 | 1.068 | -.016 | .797 | .985 |
| Economically disadvantaged | .057 | .197 | 1.058 | -.020 | .781 | .980 |
| Mathematics proficiency | | | | | | |
| White | 335 | .000* | 1.398 | .394 | .000* | 1.483 |
| Black | -.110 | .057 | .896 | -.145 | .054 | .865 |
| Hispanic | .053 | .436 | 1.055 | -.003 | .970 | .997 |
| Economically disadvantaged | .201 | .002* | 1.222 | .403 | .000* | 1.496 |
| Writing proficiency total | .027 | .730 | 1.027 | .108 | .335 | 1.114 |
| Graduation rate total | .104 | .002* | 1.110 | .047 | .294 | 1.048 |
| Constant | -45.460 | .000 | .000 | -55.935 | .000* | .000 |

*Note.* (T) = Test group analysis results, (V) = Validation group analysis results.
*Wald statistic $p < .05$

Research Question 2

To what extent, if any, does academic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

To address Research Question 2, separate logistic regression analyses were conducted using the test group to determine how well academic variables reported in the 2008-2009 Florida School Indicator Report (FSIR) would predict AYP in reading and mathematics respectively. The entire sample population was randomly split to form two equal sample groups, one identified as the test group and the other identified as the validation group.

Reading Analysis for Test Group: FSIR Academic Data

A logistic regression using the "Entire" method was used to determine to what extent, if any, academic data included in the 2008-2009 Florida School Indicator Report (FSIR) predicted the likelihood that a school would show Adequate Yearly Progress (AYP) in reading with accuracy greater than could be expected by chance.

The initial -2 log-likelihood of the analysis of 159.051 (n = 234) represents the base model that describes the fit of the logistic regression model before any predictor variables are added. The -2 log-likelihood (-2LL) is an analog of the linear regression's residual sum of squares and gives an indication of how many unexplained observations are in the model. The larger the number, the poorer is the fit of the model. When including only the constant $b_o$ (-2.123), the base model can correctly predict those schools included in the test group making AYP in reading approximately 89.3% of the time.

Improvement of the model can be determined by determining the chi-square statistic of the analysis, $\chi^2 = 2[LL(New) – LL(Base)]$. The base equation reported a chi-square statistic of $\chi^2$ (5, N = 243) = 71.12, $p < .001$. This indicated that coefficients associated with academic data reported in the 2008-2009 FSIR not introduced into the base model were significantly different from zero. Adding one or more of these variables would have a statistical affect on the predictive power of the base model, predicting if a school made AYP in reading correctly 89% of the time.

Statistics of the new model, one with variables associated with academic data reported in the 2008-2009 FSIR, obtained a -2LL of 87.931. It should be remembered that the -2LL value has an approximate chi-square distribution which makes it possible to compare values of a model that includes predictor variables against results of a model that includes only a constant. The larger the -2LL, the poorer fit the model represents. The -2LL of the model, when only the constant was present, was 159.051. When the model included significant academic variables reported in the 2008-2009 FSIR, the model generated a -2LL of 87.931. The reduction in the -2LL indicated that, because of these variables, the predictive power of the model improved.

The chi-square statistic was reported to be $\chi^2$(5, N = 243) = 123.08, $p < .05$ and suggests that the overall model, with the addition of academic variables reported by the 2008-2009 FSIR, was significantly better in predicting if a school would make AYP in reading than it was with only the constant included.

Accordingly, the model that included academic variables reported by the 2008-2009 FSIR correctly predicted a school's making AYP in reading approximately 93% of the time as opposed to 89.3% of the time when using only the base coefficient in the predictive model as described in Table 29.

Table 29

*Test Group FSIR Academic Data: Logistic Regression Model's Predictive Power With AYP Reading Predictor Variables Included (N=234)*

| | Predicted AYP Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 3 | 1 | 98.6 |
| Yes | 14 | 11 | 44.0 |
| Overall percentage | | | 92.7 |

Note. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

Table 30 lists the academic variables reported by the 2008-2009 FSIR. The table identifies the estimates of the coefficients for the predictors included in the model as well as their significance. The β -value represents the coefficients in the logistic regression equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

The critical Wald statistic shown on Table 30 has a chi-square distribution and identifies whether the β coefficient for the predictor variable is significantly different from zero. If the predictor β coefficient is significantly different from zero,the predictor variable makes a significant contribution to the model's ability to predict an outcome Y, in this case, a school's making AYP in reading. The only predictor variables that showed a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in reading were *ACT percentage participation* and *FCAT Science 11 mean scale score*.

The Nagelkerke $R_N^2$ was reported to be .531. This would indicate that the overall model that included the significant variables, *ACT percentage participation* and *FCAT Science 11 mean scale score*, explained approximately 53% of the variations in the dependent variable.

Table 30 identifies the odds ratio, $e^{\beta}$, of each predictor variable. The $e^{\beta}$ indicates the change in odds resulting from one unit of change in the predictor variable if all other variables are held constant. It should be remembered that if the $e^{\beta}$ is greater than 1, the probability of an event happening increases. If the $e^{\beta}$ is less than 1, the probability of making AYP in mathematics decreases.

For, the predictor variable, *ACT percentage participation* (Wald $\chi^2 = 3.908$, $p < .05$, $e^{\beta} = .817$), with all other variables held constant (statistically controlled), it was suggested that for every unit of change in the predictor variable, *ACT percentage participation*, the statistical odds that a school would attain AYP in reading would decrease by approximately 18%. In the case of the predictor variable, *FCAT Science 11 mean scale score* (Wald $\chi^2 = 12.667$, $p < .001$, $e^{\beta} = 1.108$), with all other variables held constant, it was suggested that for every unit of change in the predictor variable, *FCAT Science 11 mean scale score,* the statistical odds that a school would attain AYP in reading would increase by about 11%. In the case of *FCAT Science 11 mean scale score*, one unit would equate to a 1% increase in mean scale score average of the entire school population that took the FCAT Science. A complete listing of the results of the logistic regression analysis for the variables associated with the calculation of a school's AYP can be found in Table 30.

Table 30

*Test Group FSIR Academic Variables: Logistic Regression Results of Reading AYP Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| ACT percentage participation | -.203 | .102 | 3.908 | 1 | .048* | .817 |
| ACT school mean | .615 | .389 | 2.492 | 1 | .114 | 1.849 |
| SAT percentage participation | -.004 | .080 | .002 | 1 | .964 | .996 |
| SAT school mean | -.007 | .006 | 1.228 | 1 | .268 | .993 |
| FCAT Science 11 MSS | .103 | .029 | 12.667 | 1 | .000* | 1.108 |
| Constant | -34.816 | 7.545 | 21.296 | 1 | .000* | .000 |

*Note*. MSS = mean scale score, FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
* Wald statistic $p < .05$

A Press's Q statistic was used to determine if the predictive power of the logistic regression model was statistically better than chance. The Press's Q statistic associated with the model using all significant academic variables reported by the 2008-2009 FSIR to determine the likelihood of a school making AYP in reading was 161.083. The critical value of the Press's Q statistic was 6.63 at an alpha level of .01. This suggests the predictive model of a school's attainment of AYP in reading by using academic variables reported by the 2008-2009 FSIR was greater than expected by chance.

Additionally, the logistic regression analysis provides key information for the development of a predictive equation that, when combined with predictor variable data specific to a school, predicts the likelihood that a school would make AYP in reading. Once calculated, a school would be able to observe the impact an increase or decrease of a specific predictor variable would have on a school's likelihood of making AYP in reading.

The logistic regression predictive equation derived to answer Research Question 1 for obtaining AYP in reading is as follows:

$$P(Making\ AYP\ in\ Reading) = \frac{1}{1 + e^{-((-34.816)-(.203)(ACTP)+(.103)(FCATSMSS))}}$$

As an example, suppose a school reported that 8% of the school's population took the ACT and that the average mean scale score of FCAT Science for the school was 340. According to the logistic regression predictive model, the likelihood of the school's making AYP in reading would be approximately 57%. Increasing a school's FCAT science mean scale score by a single point would increase the likelihood of a school's making AYP in reading to 60%.

## Reading Analysis for Validation Group: FSIR Academic Data

In order to validate the test model, a logistic regression analysis using the same variables was conducted using the validation sample. As with the test group, the initial -2 log-likelihood of the analysis was 159.051 (n = 234) with an 89.3% predictive success rate when including only the constant $b_0$ (-2.123) in the predictive model.

The base equation reported a chi-square statistic of $\chi^2$ (5, N = 243) = 64.45, p < .001. This indicated that the coefficients not introduced into the base model were significantly different from zero. Adding one or more of these variables to the logistic regression model would have a statistical effect on the predictive power of the model's predicting if a school made AYP in reading.

The -2LL of the model, when only the constant was present, was 159.051. When including significant academic variables reported in the 2008-2009 FSIR, the model generated a -2LL of 86.303. The reduction in the -2LL indicated that, because of the addition of these predictor variables, the predictive power of the model has improved. The chi-square statistic, $\chi^2$ (5, N = 243) = 72.75, p < .001, indicated that the overall model was significantly better with the addition of academic variables reported in the 2008-2009 FSIR than with only the constant in predicting if a school would make AYP in reading. This result follows the same pattern as the test sample chi-square, $\chi^2$ (5, N = 243) = 71.12, p < .001.

As seen in Table 31 the model that included academic variables reported in the 2008-2009 FSIR correctly predicted a school's making AYP in reading approximately 94% of the time with only a slight difference from the test group's predictive power of 92%.

Table 31

*Validation Group FSIR Academic Variables: Logistic Regression Model's Predictive Power With AYP Reading Predictor Variables Included (N=234)*

| | Predicted AYP Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 207 | 2 | 99.0 |
| Yes | 12 | 13 | 52.0 |
| Overall percentage | | | 94.0 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

As shown in Table 32, the only predictor variable that showed a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in reading was *FCAT Science 11mean scale score* (Wald $\chi^2 = 19.616$, $p < .001$, $e^{\beta} = 1.190$) . Similar to the test group, holding all other variables constant and changing the predictor variable *FCAT Science 11 mean scale score* by one unit, the likelihood of a school making AYP in reading would improve by approximately 19%. Nagelkerke $R_N^2$ was reported at .542 (test sample $R_N^2 = .531$). This would indicate that the overall model explained approximately 54% of the variations in the dependent variable.

Table 32

*Validation Group FSIR Academic Variables: Logistic Regression Results for AYP Reading Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| ACT percentage participation | -.051 | .098 | .274 | 1 | .602 | .950 |
| ACT school mean | -.038 | .357 | .011 | 1 | .916 | .963 |
| SAT percentage participation | -.071 | .067 | 1.143 | 1 | .285 | .931 |
| SAT school mean | -.007 | .007 | .891 | 1 | .345 | .993 |
| FCAT Science 11 MSS | .174 | .039 | 19.616 | 1 | .000* | 1.190 |
| Constant | -45.257 | 8.941 | 25.623 | 1 | .000* | .000 |

*Note*. MSS = mean scale score, FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
* Wald statistic $p < .05$

Table 33 presents a side-by-side comparison of the regression analysis of both the test and validation groups and shows the predictor variable, *FCAT Science 11 mean scale score,* as having the most significant impact on a school's attainment of AYP in reading. It should be noted that the predictor variable, *ACT percentage participation,* was shown to be significant in the test group but failed to show similar significance in the validation group. Though not considered significant in the validation group, both groups showed that the variable, *ACT percentage participation*, had a negative influence on the attainment of AYP in reading. It should also be noted that all variables but *FCAT Science 11 mean scale score* and *ACT percentage participation* had a negative impact on the attainment of reading AYP in the test group. ACT Mean Score had a negative influence on reading AYP attainment in the validation group.

Table 33

FSIR Academic Variable Comparison of Test and Validation Groups' AYP Reading Predictor Variables *(N=234)*

| Descriptors | β (T) | Sig. (T) | $e^{\beta}$ (T) | β (V) | Sig. (V) | $e^{\beta}$ (V) |
|---|---|---|---|---|---|---|
| ACT percentage participation | -.203 | .048* | .817 | -.051 | .602 | .950 |
| ACT school mean | .615 | .114 | 1.849 | -.038 | .916 | .963 |
| SAT percentage participation | -.004 | .964 | .996 | -.071 | .285 | .931 |
| SAT school mean | -.007 | .268 | .993 | -.007 | .345 | .993 |
| FCAT Science 11 MSS | .103 | .000* | 1.108 | .174 | .000* | 1.190 |
| Constant | -34.816 | .000* | .000 | -45.257 | .000* | .000 |

*Note*. MSS = mean scale score, T = test group, V = validation group, FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
* Wald statistic $p < .05$

Mathematics Analysis for Test Group: FSIR Academic Data

To analyze the second component of Research Question 2, a second logistic regression using the “Entire” method was used to determine the extent, if any, that academic data included in the 2008-2009 Florida School Indicator Report (FSIR) predicted the likelihood that a school would show Adequate Yearly Progress (AYP) in mathematics with accuracy greater than could be expected by chance?

The initial -2 log-likelihood of the analysis was 323.965 (n = 234) and represented the base model that described the fit of the logistic regression model before any predictor variables were added. When including only the constant (.086), the base model correctly predicted schools included in the test group making AYP in reading approximately 52% of the time.

The base equation reported a chi-square statistic of $\chi^2$ (5, N = 243) = 60.92, p < .001 and indicated that the coefficients associated with academic data reported in the 2008-2009 FSIR but not introduced into the base model were significantly different from zero. Adding one or more of these variables would have a statistical affect on the predictive power of the base model in determining if a school made AYP in mathematics.

The statistical model that contained academic variables reported in the 2008-2009 FSIR obtained a -2LL of 249.890. The -2LL value has an approximate chi-square distribution which makes it possible to compare values of a model that includes predictor variables against results of a model containing only a constant. It should be remembered that the larger the -2LL, the poorer is the fit of the model. The -2LL of the model, when only the constant was present, was 323.965. When the model included significant variables associated with academic data reported in the 2008-2009 FSIR, it generated a -2LL of 249.890. The reduction in the -2LL indicated that, because of these variables, the predictive power of the model improved.

The chi-square statistic was reported to be $\chi^2$(10, N = 243) = 187.310, p < .001. This suggested that the overall model in predicting whether the addition of variables associated with academic data reported by the 2008-2009 FSIR was significantly better in predicting if a school will make AYP in mathematics than with only the constant included. Accordingly, the model that included variables associated with academic data reported by the FSIR correctly predicted a school's making AYP in reading approximately 77% of the time as opposed to only 52% of the time when only using the base coefficient in the predictive model. Table 34 presents these results.

Table 34

*Test Group FSIR Academic Variables: Logistic Regression Model's Predictive Power With AYP Mathematics Predictor Variables Included (N=234)*

| | Predicted AYP Mathematics | | |
|---|---|---|---|
| Observed AYP Mathematics | No | Yes | Percentage Correct |
| No | 85 | 27 | 75.9 |
| Yes | 26 | 96 | 78.7 |
| Overall percentage | | | 77.4 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

Table 35 lists the academic predictor variables reported in the 2008-2009 FSIR. The table identifies the estimates for the coefficients of the predictors included in the model as well as their significance. The β -value represents the coefficients in the logistic regression equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

The critical Wald statistic, shown on Table 35, has a chi-square distribution and identifies whether the β coefficient for the predictor variable is significantly different from zero. As shown in Table 35, the only academic predictor variable reported in the 2008-2009 FSIR that showed a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in mathematics was *ACT school mean* (Wald $\chi^2 = 13.371$, $p < .001$, $e^{\beta} = 1.934$). However, the Nagelkerke's $R_N^2$ was reported to be .362. This would indicate that the model that included the predictor variable, *ACT school mean*, would explain only 36% of the variance in the dependent variable of making AYP in mathematics.

Table 35 identifies the odds ratio, $e^{\beta}$, of each predictor variable. If the $e^{\beta}$ is greater than 1, the probability of an event happening increases. If, on the other hand, the $e^{\beta}$ is less than 1, the probability of making AYP in mathematics decreases. This suggested that by keeping all other variables constant and varying the predictor variable, *ACT school mean*, by one unit, the likelihood of a school's making AYP in mathematics increased by 93%. A complete listing of the results of the logistic regression analysis for the variables associated with academic data reported by the 2008-2009 FSIR can be found in Table 35.

Table 35

*Test Group FSIR Academic Variables: Logistic Regression Results for Mathematics AYP Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| ACT percentage participation | .018 | .052 | .125 | 1 | .724 | 1.019 |
| ACT school mean | .660 | .180 | 13.371 | 1 | .000* | 1.934 |
| SAT percentage participation | .062 | .043 | 2.055 | 1 | .152 | 1.063 |
| SAT school mean | -.004 | .033 | 1.602 | 1 | .202 | .996 |
| FCAT Science 11 MSS | .002 | .014 | 2.571 | 1 | .109 | 1.023 |
| Constant | -14.590 | 3.409 | 18.319 | 1 | .000* | .000 |

*Note*. MSS = mean scale score. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
* Wald statistic $p < .05$

A Press's Q statistic was used to determine if the predictive power of the logistic regression model was statistically better than chance. The Press's Q statistic associated with the model, using all significant variables associated with academic data reported in the 2008-2009 FSIR, resulted in the likelihood of a school's making AYP in mathematics being 70.06. The critical value of the Press's Q statistic was 6.63 at an alpha level of .01. This suggested that results from the model that includes all significant variables associated with the calculation of AYP were better than what could be expected by chance.

Additionally, the logistic regression analysis provided key information for the development of a predictive equation that, when combined with predictor variable data specific to a school, predicts the likelihood that a school would make AYP in mathematics. Once calculated, a school would be able to observe the impact an increase or decrease of a specific predictor variable would have on a school's likelihood of making AYP in reading.

The logistic regression predictive equation derived to answer Research Question 1 for obtaining AYP in mathematics is as follows:

$$P(Making\ AYP\ in\ Mathematics) = \frac{1}{1 + e^{-((-14.590)+(.660)(ACTM))}}$$

In creating an example for this equation, suppose a school reported that its ACT school mean was 19.179. According to the logistic regression predictive model, the likelihood of the school's making AYP in mathematics would be approximately 13%. By keeping all other variables constant and increasing the school's ACT mean score by one point, the likelihood of a school making AYP in mathematics could be increased to 22%.

Mathematics Analysis for Validation Group: FSIR Academic Data

In order to validate the test model, a logistic regression analysis using the same variables was conducted using the validation sample. The initial -2 log-likelihood of the analysis was 323.298 (n = 234) with a 53.4% (Test group = 52.1%) predictive success rate when including only the constant $b_0$ (.137) in the predictive model.

The base equation reported a chi-square statistic of $\chi^2$ (5, N = 243) = 63.20, p < .001. This indicated that the coefficients not introduced into the base model were significantly different from zero. Adding one or more of these variables to the logistic regression model would have a statistical effect on the power of the model to predict if a school made AYP in mathematics.

The -2LL of the model, when only the constant was present, was 323.298. When the model included significant variables associated with academic data reported in the 2008-2009 FSIR, the model generated a -2LL of 244.043. The reduction in the -2LL indicated that, because of the addition of these variables, the predictive power of the model has improved. The chi-square statistic, $\chi^2$ (5, N = 243) = 79.26, p < .001, indicated that the overall model was significantly better in its predictive power with the addition of variables associated with academic data reported in the 2008-2009 FSIR than with only the constant. This result follows the same pattern as did the test sample chi-square, $\chi^2$ (5, N = 243) = 74.075, p < .001.

As seen in Table 36, the model that included variables associated with academic data reported by the 2008-2009 FSIR correctly predicted a school's making AYP in reading approximately 81% of the time with only a slight difference from the test group's predictive power of 77%.

Table 36

*Validation Group FSIR Academic Variables: Logistic Regression Model's Predictive Power With AYP Mathematics Predictor Variables Included (N=234)*

| | Predicted AYP Mathematics | | |
|---|---|---|---|
| Observed AYP Mathematics | No | Yes | Percentage Correct |
| No | 83 | 26 | 76.1 |
| Yes | 18 | 107 | 85.6 |
| Overall percentage | | | 81.2 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

As displayed in Table 37, the only predictor variables that show a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in mathematics were *ACT school mean* (Wald $\chi^2 = 10.621$, $p < .05$, $e^{\beta} = 1.923$ ) and *FCAT Science 11 mean scale score* (Wald $\chi^2 = 3.840$, $p < .05$, $e^{\beta} = 1.032$). Similar to the test group, holding all other variables constant and changing the predictor variable, *ACT Mean Score*, by one unit, the likelihood of a school making AYP in reading would improve by approximately 92%. The predictor variable, *FCAT Science 11 mean scale score*, did not impact the model as much. By increasing the *FCAT Science 11 mean scale score* of a school by one unit, the likelihood of a school's making AYP in mathematics would increase by a little more than 3%. The Nagelkerke $R_N^2$ was reported at .384 (test sample $R_N^2 = .362$). This would indicate that the overall model explained only 38% of the variations in the dependent variable.

Table 37

*Validation Group FSIR Academic Variables: Logistic Regression Results for AYP Mathematics Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| ACT percentage participation | .060 | .052 | 1.350 | 1 | .245 | 1.062 |
| ACT school mean | .654 | .201 | 10.621 | 1 | .001* | 1.923 |
| SAT percentage participation | .012 | .041 | .090 | 1 | .764 | 1.012 |
| SAT school mean | -.004 | .003 | 1.963 | 1 | .161 | .996 |
| FCAT Science 11 MSS | .031 | .016 | 3.840 | 1 | .050* | 1.032 |
| Constant | -17.280 | 3.661 | 22.276 | 1 | .000 | .000 |

*Note*. MSS = mean scale score. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
* Wald statistic $p < .05$

Table 38 presents a side-by-side comparison of the regression analysis of both test and validation groups. This comparison indicates that for both test and validation groups the predictor variable, *ACT School mean*, had the most significant impact on a school's attainment of AYP in mathematics. It should be noted that the predictor variable, *FCAT Science 11 mean scale score*, was shown to be significant in the test group but failed to show similar significance in the validation group. It should also be noted, that while not significant in both groups, the $e^{\beta}$, the predictive power of the variable, *FCAT Science 11 mean scale score*, showed similar positive influences in the attainment of AYP in mathematics.

Table 38

*FSIR Academic Variable Comparison of Test and Validation Groups' AYP Mathematics Predictor Variables (N=234)*

| Descriptors | β (T) | Sig. (T) | $e^{\beta}$ (T) | β (V) | Sig. (V) | $e^{\beta}$ (V) |
|---|---|---|---|---|---|---|
| ACT percentage participation | .060 | .245 | 1.062 | .018 | .724 | 1.019 |
| ACT school mean | .654 | .001* | 1.923 | .660 | .000* | 1.934 |
| SAT percentage participation | .012 | .764 | 1.012 | .062 | .152 | 1.063 |
| SAT school mean | -.004 | .161 | .996 | -.004 | .202 | .996 |
| FCAT Science 11 MSS | .031 | .050* | 1.032 | .002 | .109 | 1.023 |
| Constant | -17.280 | .000* | .000 | -14.590 | .000* | .000 |

*Note*. MSS = mean scale score, T = test group, V = validation group. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
* Wald statistic p < .05

## Research Question 3

To what extent, if any, did school demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

To address Research Question 3, separate logistic regression analyses were conducted using the test group to determine how well school demographic data reported by the 2008-2009 Florida School Indicator Report (FSIR) would predict AYP in reading and mathematics respectively. To answer this question, the entire sample population was randomly split to form two equal sample groups, one identified as the test group and the other identified as the validation group.

Reading Analysis for Test Group: FSIR School Demographics

A logistic regression using the “Entire” method was used to determine to what extent, if any, school demographic data included in the 2008-2009 FSIR could predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading with accuracy greater than could be expected by chance.

The initial -2 log-likelihood of the analysis of 159.051 ($n = 234$) represented the base model that describes the fit of the logistic regression model before any predictor variables are added. The -2 log-likelihood (-2LL) is an analog of the linear regression’s residual sum of squares and gives an indication of how many unexplained observations are in the model. The larger the number, the poorer is the fit of the model. When including only the constant $b_o$ (-2.123), the base model could correctly predict test-group school’s making AYP in reading approximately 89.3% of the time.

Improvement of the model can be achieved by determining the chi-square statistic of the analysis, $\chi^2 = 2[LL(New) – LL(Base)]$. The base equation reported a chi-square statistic of $\chi^2$ (13, N = 243) = 66.82, $p < .001$. This indicated that coefficients associated with school demographic data reported in the 2008-2009 FSIR, but not introduced into the base model, were significantly different from zero. Adding one or more of these variables would have a statistical effect on the power of the base model to predict a school’s making AYP in reading correctly 89% of the time.

Statistics of the new model, one with variables associated with school demographic data reported in the 2008-2009 FSIR, obtained a -2LL of 72.721. It should be remembered that the -2LL value has an approximate chi-square distribution which makes it possible to compare values of a model that includes predictor variables against results of a model containing only a constant. The larger the -2LL, the poorer is the fit represented by the model. The -2LL of the model, when only the constant was present, was 159.051. When the model included significant school demographic variables reported in the 2008-2009 FSIR, the model generated a -2LL of 72.721. The reduction in the -2LL indicated that, because of these variables, the predictive power of the model improved.

The chi-square statistic was reported to be $\chi^2(13, N = 243) = 86.33, p < .05$. This suggested that the overall model, with the addition of school demographic variables reported by the 2008-2009 FSIR, was significantly better in predicting if a school would make AYP in reading than it was with only the constant included. Accordingly, the model that included school demographic variables reported by the 2008-2009 FSIR correctly predicted a school's making AYP in reading approximately 94% of the time as opposed to only 89% of the time when only using the base coefficient in the predictive model as described in Table 39.

Table 39

*Test Group FSIR School Demographic Data: Logistic Regression Model's Predictive Power With AYP Reading Predictor Variables Included (N=234)*

| | Predicted AYP Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 205 | 4 | 98.1 |
| Yes | 11 | 14 | 56.0 |
| Overall percentage | | | 93.6 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

Table 40 lists the school demographic variables reported by the 2008-2009 FSIR. The table identifies the estimates for the coefficients for the predictors included in the model as well as their significance. The β -value represents the coefficients in the logistic regression equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

The critical Wald statistic, shown on Table 40, has a chi-square distribution and identifies whether the β coefficient for the predictor variable is significantly different from zero. If the predictor β coefficient is significantly different from zero, the predictor variable makes a significant contribution to the model’s ability to predict an outcome Y, in this case, a school’s making AYP in reading. The predictor variables that showed a significant influence ($p < .05$) on predicting the likelihood of a school making AYP in reading were *absent 21+ days, gifted,* and *out-of-school suspension.*

The Nagelkerke $R_N^2$ was reported to be .626. This would indicate that the overall model that included the significant variables, *absent 21+ days, gifted,* and *out-of-school suspension*, explained approximately 63% of the variations in the dependent variable.

Table 40 identifies the odds ratio, $e^{\beta}$, of each predictor variable. The $e^{\beta}$ indicates the change in odds resulting from one unit of change in the predictor variable if all other variables are held constant. It should be remembered that if the $e^{\beta}$ is greater than 1, the probability of an event happening increases. If, however, the $e^{\beta}$ is less than 1, the probability of making AYP in mathematics decreases.

For, the predictor variable, *absent 21+ days* (Wald $\chi^2 = 6.130$, $p < .05$, $e^{\beta} = .846$), it was suggested that with all other variables held constant (statistically controlled), for every unit of change in the predictor variable, *absent 21+ days*, the statistical odds that a school would attain AYP in reading would decrease by approximately 16%. Similarly, holding all other variables constant and changing the predictor variable, *out-of-school suspension*, by 1% would decrease the probability a school's attaining AYP in reading by less than 3%. In the case of the predictor variable, *gifted* (Wald $\chi^2 = 9.827$, $p < .05$, $e^{\beta} = 1.227$), it was suggested that with all other variables held constant, for every unit of change the predictor variable, *gifted*, the statistical odds that a school would attain AYP in reading would increase by about 23%. A complete listing of the results of the logistic regression analysis for the variables associated with the calculation of a school's AYP can be found in Table 40.

Table 40

*Test Group FSIR School Demographic Variables: Logistic Regression Results for AYP Reading Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Absent 21+ days | -.167 | .067 | 6.130 | 1 | .013* | .846 |
| Population percentage | | | | | | |
| White | -.103 | .135 | .582 | 1 | .446 | .902 |
| Black | -.144 | .156 | .858 | 1 | .354 | .866 |
| Hispanic | -.158 | .145 | 1.196 | 1 | .274 | .854 |
| Disabled | .036 | .068 | .284 | 1 | .594 | 1.037 |
| Free and reduced lunch | -.013 | .027 | .239 | 1 | .625 | .987 |
| Gifted | .205 | .065 | 9.827 | 1 | .002* | 1.227 |
| English language learners | .049 | .111 | .190 | 1 | .663 | 1.050 |
| Migrant | .084 | .134 | .396 | 1 | .529 | 1.088 |
| Male | -.011 | .084 | .017 | 1 | .896 | .989 |
| Per pupil expenditure | .003 | .007 | .133 | 1 | .715 | 1.003 |
| In-school suspension # | .002 | .002 | .518 | 1 | .472 | 1.002 |
| Out-of-school suspension # | -.024 | .006 | 14.377 | 1 | .000 | .976 |
| Constant | -1.843 | 13.767 | .740 | 1 | .390 | .000 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald statistic $p < .05$

A Press's Q statistic was used to determine if the predictive power of the logistic regression model was statistically better than chance. The Press's Q statistic associated with the model, using all significant school demographic variables reported by the 2008-2009 FSIR to determine the likelihood of a school making AYP in reading, was 177.95. The critical value of the Press's Q statistic was 6.63 at an alpha level of .01. This suggested that the predictive model of a school's attainment of AYP in reading by using school demographic variables reported by the 2008-2009 FSIR was greater than expected by chance.

The logistic regression analysis provides key information for the development of a predictive equation that, when combined with predictor variable data specific to a school, predicts the likelihood that a school would make AYP in reading. Once calculated, a school would be able to observe the impact an increase or decrease of a specific predictor variable would have on a school's likelihood of making AYP in reading.

The logistic regression predictive equation derived to answer Research Question 1 for obtaining AYP in reading is as follows:

$$P(Making\ AYP\ in\ Reading) = \frac{1}{1 + e^{-((-1.843)-(.167)(AB21)+(.205)(PGIFT)-(.024)(OSS))}}$$

As an example of the use of this equation, suppose a school reported that 12% of the student population had been absent over 21 days, that the school's population consisted of about 5% gifted students and reported that there were 214 out-of-school suspensions issued within the school year. According to the logistic regression predictive model, the likelihood of the school's making AYP in reading would be approximately 40%. Decreasing a school's absenteeism rate by a single percentage point would increase the likelihood of a school's making AYP in reading to 47%.

Reading Analysis for Validation Group: FSIR School Demographics

In order to validate the test model, a logistic regression analysis using the same variables was conducted using the validation sample. As with the test group, the initial -2 log-likelihood of the analysis was 159.051 (n = 234) with an 89.3% predictive success rate when including only the constant $b_0$ (-2.123) in the predictive model.

The base equation reported a chi-square statistic of $\chi^2$ (13, N = 243) = 101.11, p < .001. This indicated that the coefficients not introduced into the base model were significantly different from zero. Adding one or more of these variables to the logistic regression model would have a statistical effect on the power of the model to predict a school's making AYP in reading.

The -2LL of the model, when only the constant was present, was 159.051. When including significant school demographic data reported in the 2008-2009 FSIR, the model generated a -2LL of 48.453. The reduction in the -2LL indicated that, because of the addition of these predictor variables, the predictive power of the model improved. The chi-square statistic, $\chi^2$ (13, N = 243) = 110.60, p < .001, indicated that the overall model with the addition of school demographic data reported in the 2008-2009 FSIR was significantly better than with only the constant. This result follows the same pattern as the test sample chi-square, $\chi^2$ (5, N = 243) = 86.33, p < .001.

The results of the analysis are displayed in Table 41. The model, that included school demographic data reported in the 2008-2009 FSIR, correctly predicted a school's making AYP in reading approximately 94% of the time with only a slight difference from the test group's predictive power of 92%.

Table 41

*Validation Group FSIR School Demographic Data: Logistic Regression Model's Predictive Power With AYP Reading Predictor Variables Included (N=234)*

| | Predicted AYP Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 208 | 1 | 99.0 |
| Yes | 6 | 19 | 76.0 |
| Overall percentage | | | 97.0 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

As shown in Table 42, the only predictor variables that showed a significant influence ($p < .05$) on predicting the likelihood of a school making AYP in reading were a*bsent 21+ days* (Wald $\chi^2 = 7.980$, $p < .05$, $e^{\beta} = .723$)*, Black population percentage* (Wald $\chi^2 = 6.210$, $p < .05$, $e^{\beta} = .682$)*, Hispanic population percentage* (Wald $\chi^2 = 7.100$, $p < .05$, $e^{\beta} = .654$), and *per pupil expenditure* (Wald $\chi^2 = 4.831$, $p < .028$, $e^{\beta} = .977$). As evident in the results, all of the variables reported to be significant showed a negative influence on a school's likelihood of making AYP in reading. This would indicate that with an increase in any one of the significant populations, the likelihood of a school's making AYP in reading would diminish by approximately 32% on average. It should also be noted that increasing the predictor variable, *per pupil expenditure*, would affect the probability of making AYP in reading by about 1%. Finally, the Nagelkerke's $R_N^2$ was reported to be .764. This would indicate that the model that included the significant predictor variables would explain approximately 64% of the variance in the dependent variable of making AYP in reading.

Table 42

*Validation Group FSIR School Demographic Data: Logistic Regression Results for AYP Reading Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Absent 21+ days | -.325 | .115 | 7.980 | 1 | .005* | .723 |
| Population percentage | | | | | | |
| White | -.045 | .152 | 5.175 | 1 | .053 | .908 |
| Black | -.383 | .154 | 6.210 | 1 | .013* | .682 |
| Hispanic | -.424 | .159 | 7.100 | 1 | .008* | .654 |
| Disabled | -.146 | .156 | .885 | 1 | .347 | .864 |
| Free and reduced lunch | .072 | .065 | 1.249 | 1 | .264 | 1.075 |
| Gifted | -.083 | .050 | 2.683 | 1 | .101 | .921 |
| English language learners | .117 | .146 | .645 | 1 | .422 | 1.124 |
| Migrant | .255 | .277 | .843 | 1 | .359 | 1.290 |
| Male | -.103 | .060 | 2.991 | 1 | .084 | .902 |
| Per pupil expenditure | -.014 | .011 | 4.831 | 1 | .028* | .987 |
| In-school suspension # | -.001 | .003 | .244 | 1 | .621 | .999 |
| Out-of-school suspension # | -.011 | .006 | 3.079 | 1 | .079 | .989 |
| Constant | 47.372 | 16.827 | 7.925 | 1 | .005* | 3.743 |

FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald statistic $p < .05$

Table 43 presents a side-by-side comparison of the regression analysis of both the test and validation group shows the predictor variable, *absent 21+ days*, as having the most significant impact on a school's attainment of AYP in reading. In fact, a*bsent 21+ days* was the only variable validated by both the test and validation groups. It should be noted that the predictor variable, *gifted*, though showing a positive significance in predicting AYP in reading in the test group, did not show significance in the validation group. It should also be noted that *gifted,* though not significant, showed a negative influence on a school's making AYP in reading.

Table 43

*FSIR School Demographic Comparison of Test and Validation Groups: AYP Reading Predictor Variables (N=234)*

| Descriptors | β (T) | Sig. (T) | $e^{\beta}$ (T) | β (V) | Sig. (V) | $e^{\beta}$ (V) |
|---|---|---|---|---|---|---|
| Absent 21+ days | -.167 | .013* | .846 | -.325 | .005* | .723 |
| Population percentage | | | | | | |
| White | -.103 | .446 | .902 | -.045 | .053 | .908 |
| Black | -.144 | .354 | .866 | -.383 | .013* | .682 |
| Hispanic | -.158 | .274 | .854 | -.424 | .008* | .654 |
| Disabled | .036 | .594 | 1.037 | -.146 | .347 | .864 |
| Free and reduced lunch | -.013 | .625 | .987 | .072 | .264 | 1.075 |
| Gifted | .205 | .002* | 1.227 | -.083 | .101 | .921 |
| English language learners | .049 | .663 | 1.050 | .117 | .422 | 1.124 |
| Migrant | .084 | .529 | 1.088 | .255 | .359 | 1.290 |
| Male | -.011 | .896 | .989 | -.103 | .084 | .902 |
| Per pupil expenditure | .003 | .715 | 1.003 | -.014 | .028* | .987 |
| In-school suspension # | .002 | .472 | 1.002 | -.001 | .621 | .999 |
| Out-of-school suspension # | -.024 | .000 | .976 | -.011 | .079 | .989 |
| Constant | -1.843 | .390 | .000 | 47.372 | .005* | 3.743 |

*Note.* T = test group, v = validation group. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald statistic $p < .05$

Mathematics Analysis for Test Group: FSIR School Demographics

To analyze the second component of Research Question 3, a second logistic regression using the "Entire" method was used to determine to what extent, if any, school demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) could be used to predict the likelihood that a school will show Adequate Yearly Progress (AYP) in mathematics with accuracy greater than could be expected by chance.

The initial -2 log-likelihood of the analysis was 323.965 (n = 234). This represented the base model that described the fit of the logistic regression model before any predictor variables were added. When including only the constant (.086), the base model correctly predicted schools included in the test group making AYP in reading approximately 52% of the time.

The base equation reported a chi-square statistic of $\chi^2$ (13, N = 243) = 87.25, $p < .001$ and indicated that the coefficients associated with school demographic data reported in the 2008-2009 FSIR not introduced into the base model were significantly different from zero. Adding one or more of these variables would have a statistical effect on the power of the base model in predicting whether a school would make AYP in mathematics.

The statistical model that contained school demographic data, reported in the 2008-2009 FSIR, obtained a -2LL of 212.216. The -2LL value has an approximate chi-square distribution which makes it possible to compare values of a model that includes predictor variables against results of a model that contains only a constant. It should be remembered that the larger the -2LL, the poorer is the fit of the model. The -2LL of the model, when only the constant was present, was 323.965. When the model included significant variables associated with school demographic data reported in the 2008-2009 FSIR, it generated a -2LL of 212.216. The reduction in the -2LL indicated that, because of these variables, the predictive power of the model improved.

The chi-square statistic was reported to be $\chi^2(13, N = 243) = 111.750, p < .001$. This suggested that the overall model was significantly better with the addition of variables associated with school demographic data reported by the 2008-2009 FSIR than with only the constant included. Accordingly, the model that included variables associated with school demographic data reported by the FSIR correctly predicted a school's making AYP in reading approximately 83% of the time as opposed to only 52% of the time when only using the base coefficient in the predictive model. Table 44 presents these results.

Table 44

*Test Group FSIR School Demographic Data: Logistic Regression Model's Predictive Power With AYP Mathematics Predictor Variables Included (N=234)*

| | Predicted AYP Mathematics | | |
|---|---|---|---|
| Observed AYP Mathematics | No | Yes | Percentage Correct |
| No | 88 | 24 | 78.6 |
| Yes | 15 | 107 | 87.7 |
| Overall percentage | | | 83.3 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

Table 45 lists the school demographic predictor variables reported in the 2008-2009 FSIR. The table identifies the estimates for the coefficients of the predictors included in the model as well as their significance. The β -value represents the coefficients in the logistic regression equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

The critical Wald statistic, shown on Table 45, has a chi-square distribution and identifies whether the β coefficient for the predictor variable is significantly different from zero. According to Table 45, the only school demographic predictor variables reported in the 2008-2009 FSIR showing a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in mathematics were *disabled* (Wald $\chi^2 = 6.757$, $p < .05$, $e^{\beta} = .865$), *free and reduced lunch* (Wald $\chi^2 = 5.687$, $p < .05$, $e^{\beta} = .963$), *per pupil expenditure* (Wald $\chi^2 = 6.734$, $p < .05$, $e^{\beta} = 1.012$), and *ACT school mean* (Wald $\chi^2 = 13.371$, $p < .001$, $e^{\beta} = 1.934$). However, the Nagelkerke's $R_N^2$ was reported to be .507. This would indicate that the model that included the significant predictor variables would explain approximately 51% of the variance in the dependent variable of making AYP in mathematics.

Table 45

*Test Group FSIR School Demographic Data: Logistic Regression Results of AYP Mathematics Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Absent 21+ days | -.028 | .028 | .956 | 1 | .328 | .973 |
| Population percentage | | | | | | |
| White | .050 | .073 | .476 | 1 | .490 | 1.051 |
| Black | .017 | .076 | .047 | 1 | .828 | 1.017 |
| Hispanic | .049 | .074 | .437 | 1 | .509 | 1.050 |
| Disabled | -.145 | .056 | 6.757 | 1 | .009* | .865 |
| Free and reduced lunch | .065 | .044 | 2.201 | 1 | .138 | 1.067 |
| Gifted | -.037 | .016 | 5.687 | 1 | .017* | .963 |
| English language learners | -.060 | .053 | 1.299 | 1 | .254 | .942 |
| Migrant | -.323 | .331 | .950 | 1 | .330 | .724 |
| Male | .016 | .061 | .069 | 1 | .792 | 1.016 |
| Per pupil expenditure | .012 | .005 | 6.734 | 1 | .009* | 1.012 |
| In-school suspension # | .000 | .001 | .014 | 1 | .907 | 1.000 |
| Out-of-school suspension # | .000 | .001 | .455 | 1 | .500 | .999 |
| Constant | -2.298 | 7.161 | .103 | 1 | .748 | .100 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald statistic $p < .05$

Table 45 identifies the odds ratio, $e^{\beta}$, of each predictor variable. If the $e^{\beta}$ is greater than 1, the probability of an event happening increases. If the $e^{\beta}$ is less than 1, the probability of making AYP in mathematics decreases. This suggested that by keeping all other variables constant and varying the predictor variable, *disabled*, by one unit, the likelihood of a school's making AYP in mathematics would decrease by approximately

14%. A similar negative influence can be seen with the predictor variable, *free and reduced lunch.* By keeping all other variables constant and varying the predictor variable, *free and reduced lunch*, by one unit, the likelihood of a school's making AYP in mathematics would decrease by approximately 4%. In contrast, by keeping all other variables constant and varying the predictor variable, *per pupil expenditure*, by one unit, the likelihood of a school making AYP in mathematics would increase by a little more than 1%. A complete listing of the results of the logistic regression analysis for the variables associated with school demographic data reported by the 2008-2009 FSIR can be found in Table 45.

A Press's Q statistic was used to determine if the predictive power of the logistic regression model was statistically better than chance. The Press's Q statistic associated with the model, using all significant variables associated with school demographic data reported in the 2008-2009 FSIR to determine the likelihood of a school making AYP in mathematics, was 104.06. The critical value of the Press's Q statistic is 6.63 at an alpha level of .01. This suggested that results from the model that included all significant variables associated with the calculation of AYP were better than what was expected by chance.

Additionally, the logistic regression analysis provides key information for the development of a predictive equation that, when combined with predictor variable data specific to a school, predicts the likelihood that a school would make AYP in mathematics. Once calculated, a school would be able to observe the impact an increase or decrease of a specific predictor variable would have on a school's likelihood of making AYP in reading.

The logistic regression predictive equation derived to answer Research Question 1 for obtaining AYP in mathematics is as follows:

$$P(Making\ AYP\ in\ Mathematics) = \frac{1}{1 + e^{-(-(.145)(PDP)-(.037)(PFRL)+(.012)(PPE))}}$$

As an example of the use of the equation, suppose a school reported its disabled population as 12% and had a free and reduced lunch population of about 41%. This school also reported a per pupil expenditure of approximately $142. According to the logistic regression predictive model, the likelihood of the school's  making AYP in mathematics would be approximately 18%. Keeping all other variables constant and somehow decreasing the school's free and reduced lunch population by half would increase the likelihood of a school's making AYP in mathematics to 32%.

### Mathematics Analysis for Validation Group: FSIR School Demographic Data

In order to validate the test model, a logistic regression analysis using the same variables was conducted using the validation sample.  The initial -2 log-likelihood of the analysis was 323.298 (n = 234) with a 53.4% (Test group = 52.1%) predictive success rate when including only the constant $b_0$ (.137) in the predictive model.

The base equation reported a chi-square statistic of $\chi^2$ (13, N = 243) = 104.80, p < .001. This indicated that the coefficients not introduced into the base model were significantly different from zero. Adding one or more of these variables to the logistic regression model would have a statistical effect on the power of the model in predicting if a school would make AYP in mathematics.

The -2LL of the model, when only the constant was present, was 323.298. When the model included significant variables, associated with school demographic data reported in the 2008-2009 FSIR, the model generated a -2LL of 186.464. The reduction in the -2LL indicated that, because of the addition of these variables, the predictive power of the model improved. The chi-square statistic, $\chi^2$ (13, N = 243) = 136.83, $p < .001$, indicated that the predictive power of the overall model, with the addition of variables associated with school demographic data reported in the 2008-2009 FSIR, was significantly better than with only the constant.

As seen in Table 46 the model, that included variables associated with school demographic data reported by the 2008-2009 FSIR, correctly predicted a school's making AYP in reading approximately 82% of the time with only a slight difference from the test group's predictive power of 83%.

Table 46

*Validation Group FSIR School Demographic Data: Logistic Regression Model's Predictive Power With AYP Mathematics Predictor Variables Included (N=234)*

| Observed AYP Mathematics | Predicted AYP Mathematics | | |
|---|---|---|---|
| | No | Yes | Percentage Correct |
| No | 85 | 24 | 78.0 |
| Yes | 19 | 106 | 84.8 |
| Overall percentage | | | 81.6 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

According to Table 47, the only predictor variables that showed a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in mathematics were *free and reduced lunch* (Wald $\chi^2 = 12.264$, $p < .05$, $e^{\beta} = .941$ ), *English language learner* (Wald $\chi^2 = 4.667$, $p < .05$, $e^{\beta} = .894$), *per pupil expenditure* (Wald $\chi^2 = 8.340$, $p < .05$, $e^{\beta} = 1. 012$), and *in-school suspension* (Wald $\chi^2 = 4.643$, $p < .05$, $e^{\beta} = .998$). *English language learner* had the greatest impact on the prediction of obtaining AYP in mathematics. This result suggested that a single unit increase of 1% would decrease the likelihood that a school would make AYP in mathematics by approximately 11%. Predictor variables, *free and reduced lunch* and *in-school suspension*, showed a similar but lesser impact. The likelihood of a school's making AYP in mathematics was decreased by 6% and less than 1% respectively. Of all the significant variables identified only *per pupil expenditure* had a positive influence on the attainment of AYP in mathematics, but only by about 1%. The Nagelkerke $R_N^2$ was reported at .591 (test sample $R_N^2$ = .362). This indicated that the overall model explained roughly 60% of the variations in the dependent variable.

Table 47

*Validation Group FSIR School Demographic Data: Logistic Regression Results of AYP Mathematics Predictor Variables (N=234)*

| Descriptors | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Absent 21+ days | -.028 | .034 | 1.159 | 1 | .282 | .964 |
| Population percentage | | | | | | |
| White | .050 | .079 | 1.128 | 1 | .288 | .920 |
| Black | .017 | .083 | 2.386 | 1 | .122 | .880 |
| Hispanic | .049 | .075 | .545 | 1 | .461 | .946 |
| Disabled | -.145 | .052 | .024 | 1 | .876 | .992 |
| Free and reduced lunch | .065 | .031 | 2.963 | 1 | .085 | .948 |
| Gifted | -.037 | .017 | 12.264 | 1 | .000* | .941 |
| English language learners | -.060 | .052 | 4.667 | 1 | .031* | .894 |
| Migrant | -.323 | .290 | 2.134 | 1 | .144 | .655 |
| Male | .016 | .032 | .251 | 1 | .616 | .984 |
| Per pupil expenditure | .012 | .004 | 8.340 | 1 | .004* | 1.012 |
| In-school suspension # | .000 | .001 | 4.643 | 1 | .031* | .998 |
| Out-of-school suspension # | .000 | .001 | .911 | 1 | .340 | .999 |
| Constant | -2.298 | 7.495 | 2.814 | 1 | .093 | 288208.423 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald statistic $p < .05$

Table 48 presents a side-by-side comparison of the regression analysis of both test and validation groups. This comparison indicated that both test and validation groups showed the predictor variables, *free and reduced lunch* and *per pupil expenditure,* as having a significant impact on a school's attainment of AYP in mathematics. It should be noted that *free and reduced lunch* and *per pupil expenditure* showed consistent negative and positive impacts respectively on the attainment of AYP in mathematics. The predictor variable, *disabled*, had a negative impact in both the test and validation groups but showed significance only in the test group. Similarly, predictor variables *English language learner* and *in-school suspension*, also had a negative impact on the attainment of AYP in mathematics for both the test and validation groups but achieved significance only in the validation group.

Table 48

*FSIR School Demographic Variables: Comparison of Test and Validation Groups' AYP Mathematics Predictor Variables (N=234)*

| Descriptors | β (T) | Sig. (T) | $e^{\beta}$ (T) | β (V) | Sig. (V) | $e^{\beta}$ (V) |
|---|---|---|---|---|---|---|
| Absent 21+ days | -.037 | .328 | .973 | -.037 | .282 | .964 |
| Population percentage | | | | | | |
| White | -.084 | .490 | 1.051 | -.084 | .288 | .920 |
| Black | -.128 | .828 | 1.017 | -.128 | .122 | .880 |
| Hispanic | -.055 | .509 | 1.050 | -.055 | .461 | .946 |
| Disabled | -.008 | .009* | .865 | -.008 | .876 | .992 |
| Free and reduced lunch | -.053 | .138 | 1.067 | -.053 | .085 | .948 |
| Gifted | -.061 | .017* | .963 | -.061 | .000* | .941 |
| English language learners | -.112 | .254 | .942 | -.112 | .031* | .894 |
| Migrant | -.423 | .330 | .724 | -.423 | .144 | .655 |
| Male | -.016 | .792 | 1.016 | -.016 | .616 | .984 |
| Per pupil expenditure | .012 | .009* | 1.012 | .012 | .004* | 1.012 |
| In-school suspension # | -.002 | .907 | 1.000 | -.002 | .031* | .998 |
| Out-of-school suspension # | -.001 | .500 | .999 | -.001 | .340 | .999 |
| Constant | 12.571 | .748 | .100 | 12.571 | .093 | 288208.423 |

Note. T = test group, v = validation group. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald statistic p < .05

## Research Question 4

To what extent, if any, does teacher demographic data included in 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

To address Research Question 4, separate logistic regression analyses were conducted using the test group to determine how well teacher demographic data reported by the 2008-2009 Florida School Indicator Report (FSIR) would predict AYP in reading and mathematics respectively. For this analysis, the entire sample population was randomly split to form two equal sample groups, one identified as the test group and the other identified as the validation group.

### Reading Analysis Test Group: FSIR Teacher Demographics

A logistic regression using the "Entire" method was used to determine to what extent, if any, teacher demographic data included in the 2008-2009 FSIR predicted the likelihood that a school would show Adequate Yearly Progress (AYP) in reading with accuracy greater than could be expected by chance.

The initial -2 log-likelihood of the analysis of 159.051 (n = 234) represents the base model that describes the fit of the logistic regression model before any predictor variables are added. The -2 log-likelihood (-2LL) is an analog of the linear regression's residual sum of squares and gives an indication of how many unexplained observations are in the model. The larger the number, the poorer is the fit of the model. When including only the constant $b_o$ (-2.123), the base model correctly predicted AYP in reading for schools included in the test group approximately 89.3% of the time.

Improvement of the model can be determined by determining the chi-square statistic of the analysis, $\chi^2 = 2[LL(New) – LL(Base)]$. The base equation reported a chi-square statistic of $\chi^2$ (6, N = 243) = 11.766, p < .067. This indicated that coefficients associated with teacher demographic data reported in the 2008-2009 FSIR, not introduced into the base model, were not significantly different from zero. Different from previous research question analyses, adding one or more of these variables would have no statistical affect on the power of the base model in predicting a school's making AYP in reading correctly 89% of the time.

Statistics of the new model, one with variables associated with teacher demographic data reported in the 2008-2009 FSIR, obtained a -2LL of 145.900. It should be remembered that the -2LL value has an approximate chi-square distribution which makes it possible to compare values of a model that includes predictor variables against results of a model that includes only a constant. The larger the -2LL, the poorer is the fit represented by the model. The -2LL of the model, when only the constant was present, was 159.051. When the model included significant teacher demographic variables reported in the 2008-2009 FSIR, the model generated a -2LL of 145.900. The reduction in the -2LL indicated that, because of these variables, the predictive power of the model had improved. The improvement of the model, while numerically different, failed to show a statistical difference. This implied that the model that included only the constant was sufficient in predicting the likelihood that a school would make AYP in reading.

The chi-square statistic was reported to be $\chi^2(6, N = 243) = 13.15, p < .05$ and suggested that the overall model in predicting whether the addition of teacher demographic variables reported by the 2008-2009 FSIR is significantly better in predicting if a school will make AYP in reading than it was with only the constant included. This is in contradiction to the original chi-square results indicating that there was no significant difference. A complete analysis was conducted to determine if any predictor variable was considered significant in a school's attainment of AYP in reading.

As shown in Table 49, the model that included teacher demographic variables reported by the 2008-2009 FSIR correctly predicted a school's making AYP in reading approximately 89.3% of the time, the same predictive strength associated with the predictive model that included only the coefficient. This result supported the original chi-square assumption that there was no significant difference in predictive power if the predictor variables associated with teacher demographics were included or not.

Table 49

*Test Group FSIR Teacher Demographic Data: Logistic Regression Model's Predictive Power With AYP Reading Predictor Variables Included (N=234)*

| | Predicted AYP Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 1 | 4 | 99.5 |
| Yes | 24 | 1 | 4.0 |
| Overall percentage | | | 89.3 |

Note. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

Table 50 lists the teacher demographic variables reported by the 2008-2009 FSIR. The table identifies the estimates for the coefficients for the predictors included in the model as well as their significance. The β -value represents the coefficients in the logistic regression equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

The critical Wald statistic, shown on Table 50, has a chi-square distribution and identifies whether the β coefficient for the predictor variable is significantly different from zero. If the predictor β coefficient is significantly different from zero then the predictor variable makes a significant contribution to the model's ability to predict an outcome Y. According to Table 50, and ignoring for the moment the claim of insignificance, the only predictor variable that indicated a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in reading was t*eachers out-of-field.*

The Nagelkerke $R_N^2$ was reported to be .111. This would indicate that the overall model that included the significant variable, *teachers out-of-field*, explained approximately 11% of the variations in the dependent variable. This supported the claim of insignificance in this analysis.

Table 50 identifies the odds ratio, $e^\beta$, of each predictor variable. The $e^\beta$ indicates the change in odds resulting from one unit of change in the predictor variable if all other variables are held constant. It should be remembered that if the $e^\beta$ is greater than 1, the probability of an event happening increases. If the $e^\beta$ is less than 1, the probability of making AYP in mathematics decreases.

For, the predictor variable, *teachers out-of-field* (Wald $\chi^2 = 4.161$, $p < .05$, $e^\beta =$ .888), it was suggested that with all other variables held constant (statistically controlled), for every unit of change in the predictor variable, *teachers out-of-field*, the statistical odds that a school would attain AYP in reading would decrease by approximately 11%. No other variables showed a significant Wald statistic. It should be remembered that the model that included the predictor variable, *teachers out-of-field*, was considered not to be significant in predicting a school's ability to make AYP. A complete listing of the results of the logistic regression analysis for the variables associated with the calculation of a school's AYP can be found in Table 50.

Table 50

*Test Group FSIR Teacher Demographic Variables: Logistic Regression Results of AYP Reading Predictor Variables (N=234)*

| Percentage of Teachers | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Out-of-field | -.119 | .058 | 4.161 | 1 | .041* | .888 |
| Bachelor's degree | -.018 | .014 | 1.754 | 1 | .185 | .982 |
| Master's degree | .009 | .015 | .369 | 1 | .543 | 1.009 |
| Specialist degree | -.111 | .092 | 1.453 | 1 | .228 | .895 |
| Doctorate degree | .083 | .119 | .486 | 1 | .486 | 1.087 |
| Average Years of Experience | -.025 | .066 | .145 | 1 | .703 | .975 |
| Constant | -.552 | 1.439 | .147 | 1 | .701 | .576 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
* Wald Statistic $p < .05$

A Press's Q statistic was used to determine if the predictive power of the logistic regression model was statistically better than chance. The Press's Q statistic associated with the model, using all significant teacher demographic variables reported by the 2008-2009 FSIR to determine the likelihood of a school making AYP in reading, was 144.54. The critical value of the Press's Q statistic is 6.63 at an alpha level of .01. This suggested the predictive model of a school's attainment of AYP in reading, using teacher demographic variables reported by the 2008-2009 FSIR, was greater than expected by chance. The inclusion of teacher demographic data proved not to be significant in the prediction of a school's likelihood of making AYP in reading. The Press's Q statistic identified that the initial model that only used a constant could predict a school's likelihood of making AYP in reading.

Reading Analysis for Validation Group: FSIR Teacher Demographics

In order to validate the test model, a logistic regression analysis using the same variables was conducted using the validation sample. As with the test group, the initial -2 log-likelihood of the analysis was 159.051 (n = 234) with an 89.3% predictive success rate when including only the constant $b_0$ (-2.123) in the predictive model.

The base equation reported a chi-square statistic of $\chi^2$ (6, N = 243) = 17.12, p < .05. In contrast to the test group, the validation group chi-square indicated that the coefficients not introduced into the base model were significantly different from zero. Adding one or more of these variables to the logistic regression model would have a statistical effect on the power of the model in predicting if a school made AYP in reading.

The -2LL of the model, when only the constant was present, was 159.051. When including significant teacher demographic data reported in the 2008-2009 FSIR, the model generated a -2LL of 144.058. The reduction in the -2LL indicated that, because of the addition of these predictor variables, the predictive power of the model improved. The chi-square statistic, $\chi^2$ (6, N = 243) = 14.99, p < .05, indicated that the overall model was significantly better with the addition of teacher demographic data reported in the 2008-2009 FSIR than with only the constant.

As seen in Table 51, the model that included teacher demographic data reported in the 2008-2009 FSIR correctly predicted a school's making AYP in reading approximately 89.3%, the same as the model that included only the constant.

Table 51

*Validation Group FSIR Teacher Demographic Data: Logistic Regression Model's Predictive Power With AYP Reading Predictor Variables Included (N=234)*

| | Predicted AYP Reading | | |
|---|---|---|---|
| Observed AYP Reading | No | Yes | Percentage Correct |
| No | 208 | 1 | 99.5 |
| Yes | 24 | 1 | 4.0 |
| Overall percentage | | | 89.3 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

According to Table 52, the only predictor variable that showed a significant influence ($p < .05$) on predicting the likelihood of a school making AYP in reading was *teachers with doctorate degree.* This would indicate that with an increase of *teachers with doctorate degree*, the likelihood of a school's making AYP in reading would increase by approximately 9%.

Table 52

*Validation Group FSIR Teacher Demographic Data: Logistic Regression Results for AYP Predictor Variables (N=234)*

| Percentage of Teachers | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Out-of-field | -.093 | .054 | 2.941 | 1 | .086 | .911 |
| Bachelor's degree | -.015 | .014 | 1.085 | 1 | .297 | .985 |
| Master's degree | .016 | .018 | .738 | 1 | .390 | 1.016 |
| Specialist degree | .008 | .070 | .015 | 1 | .903 | 1.009 |
| Doctorate degree | .083 | .039 | 4.636 | 1 | .031* | 1.087 |
| Average Years of Experience | -.134 | .082 | 2.693 | 1 | .101 | .875 |
| Constant | .091 | 1.523 | .004 | 1 | .953 | 1.095 |

FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald Statistic $p < .05$.

Table 53 presents a side-by-side comparison of the regression analysis of both the test and validation groups and shows the predictor variable, *teachers out-of-field*, as having the most significant impact on a school's attainment of AYP in reading in the test group but not the validation group. The validation group identified *teachers with doctorate degree* as having the most impact on the attainment of AYP in reading. It should be noted that both the test and validation groups suggested that the predictive model would not be improved with the addition of predictor variables associated with teacher demographic data.

Table 53

*FSIR Teacher Demographic Comparison of Test and Validation Groups: AYP Reading Predictor Variables (N=234)*

| Percentage of Teachers | β (T) | Sig. (T) | $e^{\beta}$ (T) | β (V) | Sig. (V) | $e^{\beta}$ (V) |
|---|---|---|---|---|---|---|
| Out-of-field | -.119 | .041* | .888 | -.093 | .086 | .911 |
| Bachelor's degree | -.018 | .185 | .982 | -.015 | .297 | .985 |
| Master's degree | .009 | .543 | 1.009 | .016 | .390 | 1.016 |
| Specialist degree | -.111 | .228 | .895 | .008 | .903 | 1.009 |
| Doctorate degree | .083 | .486 | 1.087 | .083 | .031* | 1.087 |
| Average Years of Experience | -.025 | .703 | .975 | -.134 | .101 | .875 |
| Constant | -.552 | .701 | .576 | .091 | .953 | 1.095 |

*Note.* T = test group, V = validation group. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress. Test group Chi-square not significant.
*Wald statistic $p < .05$

Mathematics Analysis for Test Group: FSIR Teacher Demographics

To analyze the second component of Research Question 4, a second logistic regression using the "Entire" method was used to determine to what extent, if any, that teacher demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) would predict the likelihood that a school would show Adequate Yearly Progress (AYP) in mathematics with accuracy greater than could be expected by chance.

The initial -2 log-likelihood of the analysis was 323.965 (n = 234). This represented the base model that described the fit of the logistic regression model before any predictor variables were added. When including only the constant (.086), the base model correctly predicted schools included in the test group making AYP in reading approximately 52% of the time.

The base equation reported a chi-square statistic of $\chi^2$ (6, N = 243) = 24.01, p < .05. This indicated that the coefficients associated with teacher demographic data reported in the 2008-2009 FSIR but not introduced into the base model were significantly different from zero. Adding one or more of these variables would have a statistical effect on the power of the base model in predicting if a school made AYP in mathematics.

The statistical model that contained teacher demographic data reported in the 2008-2009 FSIR obtained a -2LL of 297.673. The -2LL value has an approximate chi-square distribution which makes it possible to compare values of a model that include predictor variables against results of a model that include only a constant. It should be remembered that the larger the -2LL, the poorer is the fit of the model. The -2LL of the model, when only the constant was present, was 323.965. When the model included significant variables associated with teacher demographic data reported in the 2008-2009 FSIR, it generated a -2LL of 297.673. The reduction in the -2LL indicated that, because of these variables, the predictive power of the model improved.

The chi-square statistic was reported to be $\chi^2$(6, N = 243) = 26.29, p < .001. This suggested that the overall model with the addition of variables associated with teacher demographic data reported by the 2008-2009 FSIR was significantly better in predicting if a school will make AYP in mathematics than with only the constant included.

Accordingly, the model that included variables associated with teacher demographic data reported by the FSIR correctly predicted a school's making AYP in reading approximately 67.1% of the time as opposed to only 52% of the time when only using the base coefficient in the predictive model. Table 54 presents these results.

Table 54

*Test Group FSIR Teacher Demographic Data: Logistic Regression Model's Predictive Power With AYP Mathematics Predictor Variables Included (N=234)*

| | Predicted AYP Mathematics | | |
|---|---|---|---|
| Observed AYP Mathematics | No | Yes | Percentage Correct |
| No | 65 | 47 | 58 |
| Yes | 30 | 92 | 75 |
| Overall percentage | | | 67.1 |

FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

Table 55 lists the teacher demographic predictor variables reported in the 2008-2009 FSIR. The table identifies the estimates for the coefficients of the predictors included in the model as well as their significance. The β -value represents the coefficients in the logistic regression equation:

$$P(Y) = \frac{1}{1 + e^{-(b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots)}}$$

The critical Wald statistic, shown in Table 55, has a chi-square distribution and identifies whether the β coefficient for the predictor variable is significantly different from zero. According to Table 55, the only teacher demographic predictor variables reported in the 2008-2009 FSIR that showed a significant influence ($p < .05$) on predicting the likelihood of a school's making AYP in mathematics were *teachers out-of-*

*field* (Wald $\chi^2$ = 10.744, $p < .05$, $e^{\beta}$ = .921) and *teacher average experience* (Wald $\chi^2$ = 3.953, $p < .05$, $e^{\beta}$ = 1. 088). However, the Nagelkerke's $R_N^2$ was reported to be .142. This would indicate that the model that included the significant predictor variables would explain approximately 14% of the variance in the dependent variable of making AYP in mathematics.

Table 55 identifies the odds ratio, $e^{\beta}$ of each predictor variable. If the $e^{\beta}$ is greater than 1, the probability of an event happening increases. If the $e^{\beta}$ is less than 1, the probability of making AYP in mathematics decreases. This suggested that by keeping all other variables constant and varying the predictor variable, *teachers out-of-field*, by one unit, the likelihood of a school's making AYP in mathematics would decrease by approximately 14%. A complete listing of the results of the logistic regression analysis, for the variables associated with teacher demographic data reported by the 2008-2009 FSIR, can be found in Table 55.

A Press's Q statistic was used to determine if the predictive power of the logistic regression model was statistically better than chance. The Press's Q statistic associated with the model, using all significant variables associated with teacher demographic data reported in the 2008-2009 FSIR to determine the likelihood of a school making AYP in mathematics, was 26. The critical value of the Press's Q statistic is 6.63 at an alpha level of .01. This suggested that results from the model that includes all significant variables associated with the calculation of AYP were better than what could be expected by chance.

Table 55

*Test Group FSIR Teacher Demographic Data: Logistic Regression Results for AYP Mathematics Predictor Variables (N=234)*

| Percentage of Teachers | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Out-of-field | -.082 | .025 | 10.744 | 1 | .001* | .921 |
| Bachelor's degree | .000 | .011 | .003 | 1 | .955 | .999 |
| Master's degree | .015 | .013 | 1.360 | 1 | .244 | 1.015 |
| Specialist degree | -.093 | .053 | 3.067 | 1 | .080 | .911 |
| Doctorate degree | .131 | .079 | 2.697 | 1 | .101 | 1.139 |
| Average Years of Experience | .084 | .042 | 3.953 | 1 | .047* | 1.088 |
| Constant | -1.067 | 1.092 | .955 | 1 | .329 | .344 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald statistic p < .05.

Additionally, the logistic regression analysis provides key information for the development of a predictive equation that, when combined with predictor variable data specific to a school, predicts the likelihood that a school would make AYP in mathematics. Once calculated, a school would be able to observe the impact an increase or decrease of a specific predictor variable would have on a school's likelihood of making AYP in reading.

The logistic regression predictive equation derived to answer Research Question 1 for obtaining AYP in mathematics is as follows:

$$P(Making\ AYP\ in\ Mathematics) = \frac{1}{1 + e^{-(-1.067)-(.082)(TOOF)+(.084)(TEXP))}}$$

As an example of equation's usefulness, suppose a school reported that 6% of the classes were being taught by out- of-field teachers and the average teaching experience of the schools teacher population was 13 years. According to the logistic regression predictive model, the likelihood of the school's making AYP in mathematics would be approximately 64%. By keeping all other variables constant and somehow decreasing the number of classes taught by out-of-field teachers would increase the likelihood of a school's making AYP in mathematics to 70%.

Mathematics Analysis for Validation Group: FSIR Teacher Demographic Data

In order to validate the test model, a logistic regression analysis using the same variables was conducted using the validation sample. The initial -2 log-likelihood of the analysis was 323.298 (n = 234) with a 53.4% (Test group = 52.1%) predictive success rate when including only the constant $b_0$ (.137) in the predictive model.

The base equation reported a chi-square statistic of $\chi^2$ (6, N = 243) = 23.49, $p < .05$. This indicated that the coefficients not introduced into the base model were significantly different from zero. Adding one or more of these variables to the logistic regression model would have a statistical effect on the power of the model in predicting a school's achievement of AYP in mathematics.

The -2LL of the model, when only the constant was present, was 323.298. When the model included significant variables associated with teacher demographic data reported in the 2008-2009 FSIR, the model generated a -2LL of 298.676. The reduction in the -2LL indicated that, because of the addition of these variables, the predictive power of the model improved. The chi-square statistic, $\chi^2$ (6, N = 243) = 24.62, p < .001, indicated that the overall model, with the addition of variables associated with teacher demographic data reported in the 2008-2009 FSIR, was significantly better in predicting a school's making AYP in reading than the model with only the constant.

As seen in Table 56 the model that included variables associated with teacher demographic data reported by the 2008-2009 FSIR correctly predicted a school's making AYP in reading approximately 62.4% of the time with only a slight difference from the test group's predictive power of 67%.

Table 56

*Validation Group FSIR Teacher Demographic Data: Logistic Regression Model's Predictive Power With AYP Mathematics Predictor Variables Included (N=234)*

| | Predicted AYP Mathematics | | |
|---|---|---|---|
| Observed AYP Mathematics | No | Yes | Percentage Correct |
| No | 54 | 55 | 49.5 |
| Yes | 33 | 92 | 73.6 |
| Overall percentage | | | 62.4 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.

According to Table 57, the only predictor variables that showed a significant influence (p < .05) on predicting the likelihood of a school's making AYP in mathematics were *teachers out-of-field* (Wald $\chi^2$ = 7.925, p < .05, $e^\beta$ = .935 ), and *teacher experience* (Wald $\chi^2$ = 6.269, p < .05, $e^\beta$ = 1.135). *Teacher experience* had the greatest impact on the prediction of obtaining AYP in mathematics. It was suggested that a single unit of increase, would increase the likelihood that a school would make AYP in mathematics by approximately 14%. Predictor variable, *teachers out-of-field* revealed a negative effect on the attainment of AYP in mathematics with a 7% negative effect for every unit increase in the number of classes taught by *teachers out-of-field*. The Nagelkerke $R_N^2$ was reported at .133 (test sample $R_N^2$ = .142). This would indicate that the overall model explained roughly 13% of the variations in the dependent variable.

Table 57

*Validation Group FSIR Teacher Demographic Data: Logistic Regression Results for AYP Mathematics Predictor Variables (N=234)*

| Percentage of Teachers | β | S.E. | Wald | df | Sig. | $e^{\beta}$ |
|---|---|---|---|---|---|---|
| Out-of-field | -.067 | .024 | 7.925 | 1 | .005* | .935 |
| Bachelor's degree | .007 | .010 | .469 | 1 | .494 | 1.007 |
| Master's degree | .015 | .013 | 1.358 | 1 | .244 | 1.015 |
| Specialist degree | -.092 | .055 | 2.813 | 1 | .094 | .912 |
| Doctorate degree | .021 | .034 | .404 | 1 | .525 | 1.022 |
| Average Years of Experience | .127 | .051 | 6.269 | 1 | .012* | 1.135 |
| Constant | -1.868 | .999 | 3.496 | 1 | .062 | .154 |

*Note*. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
Wald statistic $p < .05$.

Table 58 presents a side-by-side comparison of the regression analysis of both test and validation groups. This comparison shows that both test and validation groups showed the predictor variables, *teachers out-of-field* and *teacher average experience*, as having a significant impact on a school's attainment of AYP in mathematics. It should be noted that *teachers out-of-field* showed a negative impact on the attainment of AYP in mathematics in both the test and validation groups. Conversely, *teacher experience* showed a positive impact on AYP mathematics attainment. All other variables associated with teacher demographics failed to show any significant influence on the attainment of AYP in mathematics.

Table 58

*FSIR Teacher Demographic Comparison of Test and Validation Groups for AYP Mathematics Predictor Variables (N=234)*

| Percentage of Teachers | β (T) | Sig. (T) | $e^{\beta}$ (T) | β (V) | Sig. (V) | $e^{\beta}$ (V) |
|---|---|---|---|---|---|---|
| Out-of-field | -.082 | .001* | .921 | -.067 | .005* | .935 |
| Bachelor's degree | .000 | .955 | .999 | .007 | .494 | 1.007 |
| Master's degree | .015 | .244 | 1.015 | .015 | .244 | 1.015 |
| Specialist degree | -.093 | .080 | .911 | -.092 | .094 | .912 |
| Doctorate degree | .131 | .101 | 1.139 | .021 | .525 | 1.022 |
| Average Years of Experience | .084 | .047* | 1.088 | .127 | .012* | 1.135 |
| Constant | -1.067 | .329 | .344 | -1.868 | .062 | .154 |

Note. T = test group, V = validation group. FSIR = Florida School Indicator Report, AYP = Adequate Yearly Progress.
*Wald statistic $p < .05$

## Summary

This chapter has presented a summary of the analysis of data gathered. Data associated with the calculation of a school's AYP, academic data, school demographic data, and teacher characteristic data reported in the FSIR were collected and analyzed. Logistic regression was used to determine if each category had variables that could help in the prediction of a school's attaining AYP in reading and mathematics respectively greater than that attributed to chance. Each category was analyzed for variables that contributed in the prediction of AYP in reading and mathematics, respectively, using a test group followed by a validation group. The results were compared for consistency. A summary and discussion of the findings is presented in chapter 5. Discussion has been linked to a review of relevant research and literature. Conclusions and recommendations are also offered and presented.

# CHAPTER 5
# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## Introduction

In 2002, a new term, Adequate Yearly Progress (AYP), was coined. It was inspired by the early educational goals of the Elementary and Secondary Education Act (ESEA) of 1965, the influential findings of the National Commission's 1983 report *A Nation at Risk*, and the efforts of the Improving America's School Act (ISIA) of 1994. More recently, the ideology of President Bill Clinton and his Goals 2000: Educate America Act of 1994, and the enacted educational mandates of President George W. Bush's No Child Left Behind (NCLB) Act of 2001 contributed to the concept of AYP.

Since its implementation in 2002, AYP has demanded the attention of every state, school district, and public school across the United States. Through the federally mandated NCLB, AYP required states, school districts, and public schools to monitor the academic performance of students and to "ensure that all children have a fair, equal, and significant opportunity to obtain a high quality education" (NCLB, 2002, Section 1001). As a result of NCLB's AYP, each state developed academic standards, tested these standards across the state's racial educational spectrum, monitored the academic progress of these ethnic subgroups, and reported the results of school districts and schools. Schools that failed to meet predefined AYP educational goals were required to implement interventions with the intent to successfully satisfy their state's AYP standards (Ladner & Lips, 2009). Past research suggested that beyond summative assessment tools there have been many different variables that affect a school's academic success and its ability to show learning gains in core subjects such as reading and mathematics (Marzano, 2003). Given the motivation to avoid public ridicule and state-driven interventions, it became imperative for state, school district, and public school leaders to be able to identify and focus on factors that contributed to meeting AYP and to lessen the emphasis placed on less effective factors.

Florida's primary measurement tool for AYP has been the Florida Comprehensive Achievement Test (FCAT) for reading and mathematics. The Florida Department of Education has also used a collective report known as the Florida School Indicator Report (FSIR) to report on other school, student, and teacher characteristics. The reported results of the 2008-2009 FCAT of reading and mathematics as well as the reported school, student, and teacher characteristics within the FSIR of the same year have been examined in the current study. The question of whether any of these reports had predictive qualities in determining if a school made AYP was examined.

## Purpose of the Study

The calculation of a Florida school's AYP incorporated the analysis of seven variables across a range of the ethnic and racial cultures within that school. The review of literature suggested that variables reported in the Florida School Indicator Report (FSIR) were also significant in influencing student performance. The purpose of this study was to determine if the use of variables associated with the FSIR would allow educators to predict the chances that a school would achieve AYP. The researcher also attempted to determine which variables, if any, had the largest influence in obtaining AYP. The first research question focused on the identification and ranking of variables that were statistically significant in terms of their influence in a school's AYP. The second research question inspected whether results from assessments other than the FCAT reading and mathematics had the ability to predict a school's AYP achievement. The third and forth research questions sought to identify school or teacher characteristics that showed significant influences on a school's making AYP.

Chapter 2 presented a summary of literature reviewed related to the historical progression leading up to NCLB and the national AYP directive. Also summarized was the development of Florida's FCAT and its role in AYP calculations for Florida school districts and schools. The chapter was concluded with (a) a description of school, student, and teacher characteristics reported annually in the FSIR and (b) a summary of associated research reporting the relative influence specific characteristics have on student achievement.

Chapter 3 contained a description of the general methodological approach used in this research study and a brief introduction to and justification for the use of logistic regression. The primary goal of this study was to identify easily obtainable student, school, and teacher characteristics that showed a predictive quality in a school's making AYP in reading or mathematics respectively. The four questions that guided this research were:

1. To what extent, if any, could data included in the 2008-2009 Florida Adequate Yearly Progress (AYP) calculation predict the likelihood that a school would

show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

2. To what extent, if any, did academic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?
3. To what extent, if any, did school demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?
4. To what extent, if any, did teacher demographic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school would show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

## Data and Demographics

This study was focused on identified schools within the 67 public school districts of Florida that were identified by the Florida Department of Education as having (a) offered "regular" or basic instruction, (b) contained a school configuration of grades 9-12 or 10-12 and (c) maintained a population large enough for a school to qualify for a school grade. Of all the public schools in Florida, only 468 schools qualified for inclusion in this study. These 468 schools and their associated characteristics were entered into the Statistical Package for Social Science (SPSS) 17, rendered anonymous, and randomized. The data were divided into two independent groups. The first group was used as the test group, and the latter was used to validate the findings of the test group results.

## Review of Data Analysis

Chapter 3 also included a general description of the research process used in this research which included a statistical process known as logistic regression. This technique has been generally associated with biological science research but has increasingly been used within the social science research community (Hosmer & Lemeshow, 2000).

Research Question 1 sought to identify academic measures associated with the calculation of a school's AYP in terms of their impact on the making of AYP in reading and mathematics respectively. Using the sample cases included in the test group, a logistic regression was conducted to identify which variables used to calculate a school's AYP had the greatest effect on the prediction that a school would make AYP in reading and mathematics correspondingly. The analysis was repeated with the sample cases included in the validation group, and the findings were compared for similarities. Analysis for Research Questions 2, 3, and 4 were conducted in similar fashion but focused on student academic data, school characteristics, and teacher characteristics in that order.

## Summary and Discussion of the Findings

This section offers a summary of and reflection on the results of the analysis presented in Chapter 4. This section has been structured around the four research questions that were used to guide the current research. The results, based on the data analyses, provided information as to which AYP calculation or FSIR reported variables had an impact on the possibility that a school would make AYP in reading or mathematics respectively.

### Research Question 1

To what extent, if any, can data included in 2008-2009 Florida Adequate Yearly Progress (AYP) calculation be used to predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

#### Reading Analyses

The analyses of the data collected to answer this research question was performed twice, once for an independent analysis of the impact that data included in the AYP calculation had on a school's probability of making AYP in reading; and a second time for the school's probability of making AYP in mathematics. Tables 19, 21, and 22 present a summary of the variables used in the calculation of a school's AYP and their associated impact on a school's likelihood of making AYP in reading. Tables 19 and 21 contain the results of the logistic regression administered to the test group and validation groups respectively. A side-by-side comparison of both test and validation group is displayed in Table 22. The results indicated that of all the variables associated with the calculation of AYP only the reading proficiency of the white student population had any significant influence on a school's making AYP in reading. It should be noted that although not considered statistically significant, the results indicated that the reading proficiency of the economically disadvantaged population had a similar influence on a school's making AYP in reading followed closely by the black population. It was also indicated (Table 15) that the white population occupied approximately 50% of the entire test group sample with Hispanic and black populations comprising a little less than 25% each. The logistic regression analysis predicted a variable's impact in terms of one unit of change. It was, therefore, reasonable to assume that a single percentage change in the white population would have a larger influence than the same percentage increase of a population less than half the size. In general, focusing on the improvement of the majority population would generate the greatest improvement. It was a reasonable assumption that this focus would have collateral effects on minority populations interacting academically with the general population of the school.

Tables 17 and 18 were used to illustrate a comparison of predictive power of the logistic regression model before and after the variables associated with the calculation of AYP were included. This comparison suggested that the predictive model generated by the inclusion of the percentage of a school's white population that showed proficiency in reading correctly predicted a school's making AYP in reading 97% of the time. It should be noted that because this result was most likely associated with the majority population of the state's sample, this model most likely reflected the majority population in general and not the white population's proficiency in reading. Finally, a Press's Q statistics reported that the predictive power of the logistic regression model was significantly better than one could expect by chance alone.

Mathematics Analyses

Tables 25, 27, and 28 present a summary of the data analysis for variables used in the calculation of a school's AYP as well as the associated impact on a school's likelihood of making AYP in mathematics. Tables 25 and 27 display the results of the logistic regression analysis for the test and validation groups, respectively. A side-by-side comparison of both test and validation group results were displayed in Table 28. The results indicated that the mathematical proficiency of the white population had the largest impact on a school's attainment of AYP in mathematics, followed by the economically disadvantaged population. Graduation rate was also considered to have a significant impact on a school's attainment of AYP in mathematics. Caution should be exercised in interpreting this variable as significant. It may be more appropriate to consider graduation rate as a byproduct of the achievement of the white and economically disadvantaged populations of the school. It should be noted that these two groups made up the majority of the total population (Table 15). It seems reasonable to infer that affecting an improvement in mathematics proficiency across these demographic subgroups would cause the greatest effect on a school's making AYP. It would also be reasonable to assume the same type of collateral improvement in minority demographics as well. It was interesting to note that reading proficiency of the white population was also considered to have a significant positive impact on a school's chances of making AYP in mathematics.

Because standardized tests focus on application of mathematics, it could be interpreted in order to be successful and show learning gains, a student must first be able to interpret the question before a successful solution could be attempted. The results displayed in Table 28 also suggest that there was no correlation between a school's mathematics or writing proficiency and a school's improving its chance of making AYP in reading. Finally, though not considered significant, it was suggested that an improvement in the minority black and Hispanic populations in both reading and mathematics would either increase or maintain chances of a school's making AYP in mathematics.

Tables 23 and 24 illustrate a comparison of predictive power of the logistic regression model before and after the variables associated with the calculation of AYP were included. This comparison suggests that the predictive model generated by the inclusion of the percentage of a school's white and economically disadvantaged populations that show proficiency in mathematics predicted a school's making AYP in reading correctly 88% of the time. It should be noted that because this result is most likely associated with the majority population of the state's sample, this model reflects the majority population, that just happens to be white or economically disadvantaged, having an impact on a school's proficiency in mathematics.

A Press's Q statistics reported that the predictive power of the logistic regression model was significantly better than one could expect by chance alone. This indicated that the model generated by this analysis would be of practical use to school districts and public schools.

## Research Question 2

To what extent, if any, does academic data included in the 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

### Reading Analyses

Tables 30, 32, and 33 contain a summary of the data analysis for academic results reported by the 2008-2009 Florida School Indicator Report (FSIR) and the associated impact on a school's likelihood of making AYP in reading. Tables 30 and 32 describe the results of the logistic regression analysis for the test and validation groups respectively. A side-by-side comparison of both test and validation groups is displayed in Table 33. The results indicated that of all the academic variables, FCAT Science 11 mean scale score (MSS) showed the largest impact on a school's attainment of AYP in reading. The Grade 11 FCAT Science has been constructed to test a student's higher reasoning skills, incorporating analysis, and synthesis skills. Proficiency in these skills incorporates reading skills for successful interpretation and completion. It is not clear as to the cause and effect relationship between a student's reading skill and FCAT Science 11 mean scale score (MSS). Does this predictive model reflect an increase in a school's attainment of AYP in reading by improving a school's FCAT Science 11 mean scale score (MSS) or does the improvement of a school's FCAT Science score reflect an improvement in a school's reading proficiency? It would be speculated that the latter is most likely the case.

The academic variable, ACT percentage participation, may also hold a similar but opposite relationship with a school's attainment of AYP in reading. This variable shows a negative relationship, that is, as one increases the other tends to decreases. Table 33 indicates that as ACT percentage participation increases, the likelihood of a school's making AYP in reading decreases. Table 14 indicates that the average percentage of students taking the ACT was roughly 10% with a maximum of 21%. It was indicated in Table 6 that there was less than 20% AYP proficiency among the sample population. It was, therefore, concluded that the majority of the students taking the ACT were college bound and with higher reading achievement. As the number of ACT participants increase, there is a higher likelihood that less able students taking the examination are included. This assumption was reflected in the negative relationship between AYP participation and the prediction that a school will make AYP in reading. It is not reasonable to assume that merely reducing the number of students taking the ACT would have a positive effect on a school's chance of making AYP in reading. It should be noted that neither SAT participation nor SAT school means failed to show any impact on a school's chances of making AYP in reading.

## Mathematics Analyses

Tables 35, 37, and 38 present a summary of the data analysis of academic results reported by the 2008-2009 Florida School Indicator Report (FSIR) and the associated impact on a school's likelihood of making AYP in mathematics. Tables 35 and 37 contain the results of the logistic regression for both the test and validation groups respectively. A side-by-side comparison of both test and validation groups is displayed in Table 38. The results indicate that of all academic variables, ACT school mean, and

FCAT Science 11 mean scale score (MSS) show the largest impact on a school's attainment of AYP in mathematics. The reasons for this relationship may be that grade 11 FCAT Science has been constructed to test a student's higher reasoning skills and incorporating analysis and synthesis skills. Proficiency in these skills incorporates reading skills for successful interpretation and completion. It is not clear as to the cause and effect relationship between a student's reading skill and FCAT Science 11 mean scale score (MSS). Does this predictive model reflect an increase in a school's attainment of AYP in reading by improving a school's FCAT Science 11 mean scale score (MSS) or does the improvement of a school's FCAT Science score reflect an improvement in a school's reading proficiency? It would be speculated that the latter is most likely the case. Similar to reading proficiency, the SAT participation or SAT school mean had no significant impact on a school's chances of making AYP in mathematics.

## Research Question 3

To what extent, if any, does school demographic data included in 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

### Reading Analyses

Tables 40, 42, and 43 present a summary of the data analysis for school demographic information reported by the 2008-2009 Florida School Indicator Report (FSIR) and the associated impact on a school's likelihood of making AYP in reading. Tables 40 and 42 present the results of the logistic regression analysis for the test and validation groups, respectively. A side-by-side comparison of both test and validation groups is displayed in Table 43. The analysis indicated that absenteeism had a strong negative effect on a school's attainment of AYP in reading. This finding was determined to be reasonable. In order for a child to improve academically, regular attendance is a must. As absenteeism increases, the general population's overall proficiency decreases, in this case in reading. It is interesting to note that the analysis suggests that the gifted population had a strong positive effect on a school's making AYP in reading. This may be directly associated with the gifted curriculum structure that tends to lean toward reading, group problem solving, and communication skills. Interestingly there was no indication that per pupil expenditure or variance in discipline policies among the school populations had any impact on a school's chances of making AYP in reading.

Mathematics Analyses

Tables 45, 47, and 48 present a summary of the data analysis of academic results reported by the 2008-2009 Florida School Indicator Report (FSIR) and the associated impact on a school's likelihood of making AYP in mathematics. Tables 45 and 47 display the results of the logistic regression analysis for the test and validation groups. A side-by-side comparison of both test and validation groups is displayed in Table 48. According to the results, the disabled and gifted population both showed a negative impact on a school's attainment of AYP in mathematics. Of the two, a school's gifted population showed the biggest impact. It should be cautioned that a generalized use of the word disabled should not be used. There are many different levels of disabled which span the spectrum of student academic performance and ability. However, the majority of the disabled population has been characterized as having some deficiency in ability to process information. It would seem logical to assume that for a school with a high proportion of cognitively disabled students, the likelihood of that school's making AYP in mathematics would diminish. It is surprising to note that though the gifted population of a school showed a positive impact on a school's making AYP in reading, the same could not be said for AYP in mathematics. As stated previously, the negative impact shown by the gifted population may be directly associated with the gifted curriculum structure. Per pupil expenditures were considered a positive influence, but the analysis suggested that this impact was very small. It was also interesting to note that attendance, a school's population breakdown, socioeconomic level, per pupil expenditure, or a school's discipline practices showed no significant effect on a school's chances making

AYP in mathematics. This was in contrast to a school's chances of making AYP in reading where these variables did have a significant effect.

## Research Question 4

To what extent, if any, does teacher demographic data included in 2008-2009 Florida School Indicator Report (FSIR) predict the likelihood that a school will show Adequate Yearly Progress (AYP) in reading and mathematics respectively with accuracy greater than could be expected by chance?

### Reading Analyses

Tables 50, 52, and 53 present a summary of the data analysis of teacher characteristic data reported by the 2008-2009 Florida School Indicator Report (FSIR) and the associated impact on a school's likelihood of making AYP in reading. Tables 50 and 52 describe the results of the logistic regression analysis for the test and validation groups. A side-by-side comparison of both test and validation groups is displayed in Table 53. Out-of-field teachers were predicted to be of greatest influence in a school's pursuit of AYP in reading. This finding was supported in the current literature which suggests that the higher the population of out-of-field teachers, the greater the negative impact on the student population as a whole (Darling-Hammond, 2000). It was suggested by data presented in Table 16 that there were a wide range of conditions, ranging from 0% to almost 50%, related to a school's out-of-field teacher population. It should also be noted that teacher degree or experience had no significant effect on a school's chances of making AYP in reading.

Mathematics Analyses

Tables 55, 57, and 58 present a summary of the data analysis of teacher characteristics information results reported by the 2008-2009 Florida School Indicator Report (FSIR) and the associated impact on a school's likelihood of making AYP in mathematics. Tables 55 and 57 describe the results of the logistic regression analysis for the test and validation groups, respectively. A side-by-side comparison of both test and validation groups is displayed in Table 58. As with reading, out-of-field teachers played an almost equally negative role in a school's making AYP in mathematics. The review of literature suggested that for most academic course work considered not technical in nature, experience beyond five years has little to no effect on a student's academic outcome (Darling-Hammond, 2000; Kane et al., 2008). Of exception would be the curriculum of mathematics and science. It was indicated in the literature that years of experience played an important role in a student's academic education in these subjects. This was supported by the results shown on Table 58.

Of interest is the lack of significance a teacher's degree had on student achievement.  At the time of this research, many Florida school districts compensated a teacher's salary based on the level of advanced degree a teacher earned regardless of how significant the degree was to the topic the teacher taught. The results of the current research suggests that this practice may not be advantageous in the pursuit of student achievement.

Relationship of Current Study to Prior Research

Since the implementation of NCLB and AYP, states have focused on standardized assessments as a gauge of student achievement. Wenning et al. (2002) identified these types of assessments as a "snapshot in time" (Bolt et al., 2003, p. 3) suggesting that these assessments, such as the FCAT reading and mathematics, were not accurate indicators for all student populations all of the time. Pilotin (2010) continued by stating that these once-a-year assessments were designed to measure individual student formative progress and were never designed as a measure of school quality. In 2003, Marzano suggested that many different variables affected a student's and school's academic success. He summarized decades of researchers' observations ' as to variables that were or were not significant in the academic advancement of students.

As one example, Geiser (2008) and Atkinson and Geiser (2009) identified that ACT and SAT scores were effective in the prediction of student academic proficiency in reading and mathematics. The results of the current research were in partial agreement with Geiser's findings. The ACT was an effective predictor in reading and mathematics proficiency, but the present research did not support Geiser's SAT claim. Geiser (2008) also stated that AP testing results and individual student grades were far better indicators of mathematics and reading proficiency. Because the current study was limited to the publically accessed information presented in the 2008-2009 FSIR, the researcher was unable to test Geiser's findings.

Conflicting views were cited as to how school characteristics affected student academic performance. It was suggested that schools and their associated characteristics play a large role in student achievement (Lee, Smith, & Croninger, 1997; Witte & Walsh, 1990). In contrast, Hanushek (1986, 1989) presented findings that suggested little association between school characteristics and student academic achievement. The findings in the current study tended to favor Hanushek's position. Of all the school characteristic data presented by the FSIR, none was found to be influential in a student's academic achievement. Only one variable presented as a marginal exception. The variable, per pupil expenditure, showed significance in student performance. This effect was so slight, however, that great gain in student expenditure would have to be realized to elicit small academic learning gains. This duality was reflected in the polar opinions of two researchers. Hanushek (1989) found no connection, and Hedges et al. (1994) detected an effective medium in terms of affecting academic performance but also admitted to diminishing returns as a school increased spending.

The student variable of attendance has been previously shown to be a positive influence on a student's academic performance by numerous researchers (Jones et al., 2008; Lamdin, 1996; Pinkus, 2009). This finding held true in the present research. As the average percentage of days missed increased within a school in the test population, that school's likelihood of making AYP in either reading or mathematics was reduced by almost 25%.

Certain student variables are beyond the school's control, such as the socioeconomic status of the student's family. Unfortunately this variable, studied in the now famous *Coleman Report* (Coleman et al. 1966), has been identified to be one of the greatest factors affecting a student's academic performance in school (Cotton, 1996;

Gregory, 1992; Jones et al., 2008; Pittman & Haughwout, 1987; Rumberger & Larson, 1998; Schoggen & Schoggen, 1988; Walberg, 1994; Witte & Walsh, 1990). In this study the variable, free and reduced lunch, an indicator of the school's student population's socioeconomic level, was considered a significant negative factor in both reading and mathematics student achievement.

Many researchers have agreed that, next to socioeconomic status, the teacher in the classroom leverages the greatest influence on student academic performance (Boyd et al., 2008; Darling-Hammond, 1996; Ehrenberg & Brewer, 1994; Hanushek, 1971; Hanushek & Pace, 1995; Hanushek et al., 2004; Harris & Sass, 2010, 2008; Kukla-Acevedo, 2009; Rivkin et al., 2005; Rockoff, 2004; Sanders & Rivers, 1996; Sanders et al., 1997). Kukla-Acevedo (2009) noted, however, that regardless of the impact imparted by teachers on student achievement, few teacher qualities have shown consistent relationships. Sanders and Rivers (1996) commented on the importance of a student's exposure to many different teacher characteristics over the course of a student's academic career that affects academic performance.

Research has been conducted on a myriad of teacher characteristics, most of which have not been reported on the FSIR. Of the FSIR characteristics evaluated within this study, out-of-field teacher status proved to be of greatest impact on a student's academic performance. This finding was supported by Darling-Hammond's (1996) prior research.

It was surprising to find that years of teaching experience, beyond three years, was not considered a factor in student achievement in reading (Aaronson et al., 2007;

Clotfelter et al., 2006; Ehrenberg & Brewer, 1994; Goldhaber & Brewer, 1996; Hanushek et al., 2004; Summers & Wolfe, 1977). In mathematics, however, teacher experience was a significant influence in mathematics academic achievement. Prior researchers identified mathematics and science as technical subjects and found that the longer the teacher was exposed to topic specific training, the more effective that teacher was at eliciting student academic gains (Goldhaber & Brewer, 1996; Hanushek & Pace, 1995; Monk, 1994). As with teacher experience, it was determined in the current research that proportions of different degrees held by the teaching population of a school had no significant impact on student achievement in reading or mathematics. This finding was partially supported by prior researchers who suggested that advanced degrees of a school's teaching force in all subjects other than mathematics had no influence on a student's achievement. However, prior researchers also suggested that mathematics teachers with master's degrees did significantly influence a student's mathematics success (Goldhaber & Brewer, 1996; Hanushek & Pace, 1995; Monk, 1994). In the current research, this was not found to be the case. It should be noted that in this study, the researcher did not attempt to differentiate degrees held by teachers by the classes degree holders taught.

## Conclusions

This research sought to determine the impact that academic and non academic characteristics of a school had on a school's goal to show Adequate Yearly Progress (AYP) in reading and mathematics. 2008-2009 academic results were obtained from both AYP calculation results and the Florida School Indicator Report (FSIR), both provided by the Florida Department of Education. Student, school, and teacher demographic information was collected from the 2008-2009 FSIR. The data were gathered from 468 public high schools regarded as providing a regular curriculum. Based on the results of the logistic regression and subsequent analyses, the following conclusions are offered.

1. Variables included in the calculations of a school's AYP could be used to predict the likelihood a school would make AYP in reading and mathematics with an accuracy of 97% and 88% respectively; much greater than expected by chance.
2. It was concluded that of all the variables associated with the calculation of a school's AYP, the white population showed the greatest influence in increasing or decreasing a school's chance of making AYP in reading and mathematics respectively. It could be speculated, however, that the analysis was not reflecting on a specific race but rather the major population within a school or school district. On average, the white population was typically the dominant race. Black and Hispanic populations though averaging approximately half that of the white population individually, showed influence on the making of AYP in reading or mathematics but not to the level of significance held by the dominant white population.
3. Academic data included in the 2008-2009 FSIR could be used to predict the likelihood a school would make AYP in reading and mathematics with an accuracy of 94% and 77% respectively; greater than expected by chance.

4. When considering academic data outside the realm of AYP calculations, only the American College Test (ACT) and the Grade 11 Science FCAT had any impact on a school's making AYP, and this was only in the attainment of AYP in mathematics. The data indicated that increases in both ACT and Science FCAT scores would elicit an increase in mathematics proficiency. Though both of these variables showed significant influence, it is not reasonable to assume a school could improve a student's score on the ACT or Science FCAT. It is more reasonable to assume that these assessments could be used as an indicator of a school's academic health in mathematics, gauging proficiency in mathematical analysis and applied mathematics through the sciences.
5. School demographic data included in the 2008-2009 FSIR could be used to predict the likelihood a school would make AYP in reading and mathematics with an accuracy of 97% and 83% respectively; greater than by chance.
6. It was concluded that, with the exception of school attendance, most school and student demographic information reported in the Florida School Indicator Report (FSIR) were not predictive of a school's making AYP in reading or mathematics. Poor attendance was a negative influence on student learning in reading and mathematics and could be assumed to be a secondary indicator in the prediction of a school's making AYP. It is implied that, by improving a school's attendance, students are in the classrooms engaging in meaningful

learning. It is this learning that leads to gains in reading and mathematical proficiency.

7. Teacher characteristics included in the 2008-2009 FSIR could be used to predict the likelihood a school would make AYP in reading but requires only a constant and at an 89% accuracy rate.
8. Teacher characteristics included in the 2008-2009 FSIR could be used to predict the likelihood a school would make AYP in mathematics with an accuracy of 67%, slightly better than chance alone.
9. It was concluded that teachers teaching out-of-field impacted reading and mathematics proficiency more than any other teacher population characteristic provided by the FSIR. The presence of out-of-field teachers in the teacher population reduced a school's ability to realize learning gains in reading and mathematics.
10. It was concluded that teachers' years of experience impacted mathematics proficiency. Although it was not possible to differentiate teaching topics, teachers' years of experience was considered a significant indicator in mathematics. This was not true for reading. The current research study was conducted to investigate average years of experience of the entire teacher population. Therefore, caution should be exercised in interpreting the extent of impact teacher experience had on mathematics. It would not be reasonable to assume, for example, that teachers' years of experience in foreign language or physical education would impact mathematics proficiency within a school. A

follow-up analysis would be required to determine the impact that mathematics teachers' years of experience had on mathematics proficiency.

11. It was concluded that the use of logistic regression could be used successfully in predicting the likelihood of a school's making AYP in reading and mathematics respectively. The results of the Press's Q statistic indicated that each of the analyses showed a better than chance predictive quality.

## Implications for Practice

In a 2007 study conducted by Gaught, it was identified that school house administrators did not have the time to closely examine all the data associated with their schools. Instead, these administrators tended to focus on the FCAT results as the primary indicator of their school's academic health and progress. It was speculated that administrators would develop school improvement plans based on this limited analysis, dedicating sparse school resources in an effort to bolster their schools' chances for academic improvements.

The results of this current research were based on an analysis of state wide academic, school, student and teacher information reported in the Florida School Indicator Report (FSIR). Information provided by all Florida high schools that were considered to offer a "regular" curriculum to the general student population was used in the analysis. Using a logistic regression analysis, the researcher was able to successfully predict a school's chances of making AYP with a success rate better than could be attributed to chance. The predictive success rate ranged from a low of 67% to a high of 97 % accuracy.

Secondly, this research was able to identify which variables had an associative effect on a school's chances of making AYP in reading and mathematics respectively. In other words, this research was able to identify characteristics reported in the FSIR that, if increased or decreased, would also cause an increase or decrease in a school's chances of attaining AYP in reading or mathematics.

In addition to identifying characteristics that affected a school's chances of making AYP, variables were also ranked in terms of the amount of influence each had on a school's making AYP in reading or mathematics. Based on the current research, administrators would be able to narrow their focus to those academic, school, student, or teacher characteristics that have been shown to have the greatest effect on reaching their AYP goals in reading and mathematics. When forced to decide where financial, administrative, teacher, or support staff resources should be focused, the administrator will be able to rely on a numerical probability of success as well as a predictive value of the impact of such efforts. The following suggestions are offered:

1. At the time of this research, FCAT 11th Grade Science was being phased out. The results of the current study suggest that transitioning from FCAT 11th Grade Science to ACT mean score as a school indicator for mathematics proficiency would be a reasonable decision.
2. Administrators should question the use of SAT scores for purposes other than college entrance.

3. Administrators should re-evaluate current classroom scheduling practices. The findings in this study suggest that demographic proportions within a school and classroom have a significant effect on minority populations in reading and mathematics achievement.
4. If reading achievement is a high priority in a school, administrators are advised to implement aggressive attendance/truancy programs in school to increase reading achievement.
5. For schools with a significantly high gifted population, it is suggested that gifted programs focusing a greater amount of contact time on mathematical interpretation and problem solving for this population be developed.
6. Discipline programs within a school need not be changed for the sake of reading and mathematics improvement. The current research findings did not indicate that such a change would result in any significant change in student achievement. However, a school must continue to present a safe and secure environment for learning in general to take place.
7. Outside of programs that directly relate to identified improvement variables, a general increase in school funding to elicit the improvement of a school's reading and mathematics proficiency is not warranted.
8. An increased focus on reducing out-of-field teachers in reading and mathematics is advisable.
9. It is suggested that administrators modify hiring practices at the school level for reading. In this study, teaching experience beyond five years or degree

beyond minimum had no influence in reading. In contrast, modifications in hiring mathematics teachers are also warranted to employ more experienced teachers and those with master's degrees.

10. School districts should consider modifying the pay schedule practices at the school level. It is suggested districts should move away from the "time in service" and degree stipend mindset toward a performance based system.

## Recommendations for Future Research

In reflecting on the literature associated with variables affecting a student's academic performance, it is clear that the home condition of the student elicits the largest impact. It has also been shown that not all summative assessments are equally adept in determining a student's or a school's proficiency in reading or mathematics. Similarly, the literature also suggests that there are specific student, teacher, or school characteristics that, when present or absent, affect a student's ability to improve academically. The researcher intentionally analyzed a very general high school population and as such, the results of this study should be generalized at best. The results of this research should not be trivialized in the name of generality but rather looked at as a starting point to narrow the generalities to match the population of interest. Based on the findings in the current research as well as existing literature, the following recommendations for further research are made in regard to predicting AYP.

1. An inspection of the descriptive statistics show major difference between different ethnic categories in both reading and mathematics. The current

research was designed to determine which characteristics within a school would contribute to the attainment of AYP in reading or mathematics respectively. It is suggested that further analysis be conducted for each of the four major ethnic groups (white, black, Hispanic, and economically disadvantaged) including a comparative analysis of the results within the four groups.

2. This study specifically focused on Florida high schools offering what the state considers a “regular” curriculum. However, Florida AYP calculations are generated from assessment results starting as early as third grade. Expanding this study to the elementary and middle school levels would contribute to the body of knowledge regarding what academic, student, teacher, or school characteristics affect student achievement in reading and mathematics and ultimately a school’s ability to achieve AYP in each.
3. In light of NCLB’s AYP mandate, every state in the union has been required to show AYP. Expansion of this study using academic, student, teacher, and school characteristics from other states would be beneficial as would replicating this study in other states at the elementary, middle, and high school levels.
4. During the current research it was noted that different school regions and school districts had different ethnic population proportions. Further analysis based on the current research is warranted to determine if the difference in a dominant racial population would have a significant impact on the types of

student, school, or teacher characteristics that would impact the reading and mathematics proficiency between state regions or school districts.

5. This research was generalized over the entire state including only schools that contained grades 9 through 12 offering general student education. Further analysis at the school level would generate relationships specific for that school. Student variables could potentially be expanded to include class, the analysis of multiple year trends of the student, general and ethnic populations, specific teacher trends, school intervention/remedial program participation, scholastic and club participation, and regional economic indexes.
6. The current research used logistic regression as the primary analysis tool in regard to the attainment of AYP in reading and mathematics respectively as two separate outcomes. Similar research could be conducted using other binary, pass or fail, yes or no, met or not met standards, variables within the school or district. An example of the use of these characteristics is the likelihood of a student's graduating based on class grades, attendance, scholastic participation, or discipline. Another example pertains to an analysis of a student's likelihood of being successful in obtaining a passing score in a specific class based on prior academic performance. This latter example could be further refined to include a specific teacher teaching the course in question.

## Summary

With the advancement of data storage and data acquisition, school, teacher, and student information have become increasingly available, and it is sometimes difficult to determine which of the multitude of characteristics plays a role in student achievement. Past research, as reported in this study, has suggested that, under general or specific circumstances, certain characteristics impact student achievement more than others or sometimes not at all. In the advent of the No Child Left Behind (NCLB) Act of 2001, education has become fixated on the attainment of Adequate Yearly Progress (AYP). This quantitative study focused specifically on the identification of variables reported in the Florida School Indicator Report (FSIR) that had an impact, positively or negatively, on the likelihood that a school would achieve AYP in reading and mathematics respectively. This study reflected results of research using a broad and generalized Florida public school population, and the results add to the existing body of research devoted to the identification of variables affecting student achievement. The ACT and the defunct (as of 2011) Grade 11 FCAT Science proved to be effective indicators of school academic health in reading and mathematics at the high school level, Improvement in these indicators positively impacted a school's ability to make AYP in reading and mathematics. Of the school demographic characteristics reported by the FSIR, absenteeism was shown as having the greatest impact on reading AYP. Disabled and free and reduced lunch populations had the greatest impact on AYP in mathematics. The percentage of out-of-field teachers were shown to affect the attainment of AYP in both reading and mathematics, but teachers' years of experience affected only mathematics

AYP. It is understood that certain variables are not in the school or school district administrator's control. Once the variables that are directly or indirectly controllable by a school or school district administrator are identified to be most impacting, appropriate attention and support can then be focused to achieve a school's goal. This research has provided a way for administrators to predict influence.

# APPENDIX A
# ELIGIBLE SCHOOLS INCLUDED IN STUDY

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| ALACHUA | EASTSIDE HIGH SCHOOL | 9-12 | SHS | Regular | 1941 | D |
| ALACHUA | F. W. BUCHHOLZ HIGH SCHOOL | 9-12 | SHS | Regular | 2466 | B |
| ALACHUA | GAINESVILLE HIGH SCHOOL | 9-12 | SHS | Regular | 2117 | D |
| ALACHUA | HAWTHORNE MIDDLE/HIGH SCHOOL | 6-12 | SHS | Regular | 473 | D |
| ALACHUA | LOFTEN HIGH SCHOOL | 6-12 | SHS | Regular | 349 | C |
| ALACHUA | NEWBERRY HIGH SCHOOL | 9-12 | SHS | Regular | 622 | C |
| ALACHUA | SANTA FE HIGH SCHOOL | 9-12 | SHS | Regular | 1275 | B |
| BAKER | BAKER COUNTY SHS SCHOOL | 9-12 | SHS | Regular | 1519 | D |
| BAY | A. CRAWFORD MOSLEY HIGH SCHOOL | 9-12 | SHS | Regular | 2186 | B |
| BAY | BAY HIGH SCHOOL | 9-12 | SHS | Regular | 1374 | D |
| BAY | DEANE BOZEMAN SCHOOL | P-K-12 | COMB | Regular | 1419 | B |
| BAY | J.R. ARNOLD HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1478 | A |
| BAY | RUTHERFORD HIGH SCHOOL | 9-12 | SHS | Regular | 1560 | C |
| BRADFORD | BRADFORD HIGH SCHOOL | 9-12 | SHS | Regular | 1023 | D |
| BREVARD | ASTRONAUT HIGH SCHOOL | 9-12 | SHS | Regular | 1401 | B |
| BREVARD | BAYSIDE HIGH SCHOOL | 9-12 | SHS | Regular | 2986 | B |
| BREVARD | COCOA BEACH JUNIOR/SHS SCHOOL | 7-12 | SHS | Regular | 1586 | A |
| BREVARD | COCOA HIGH SCHOOL | 9-12 | SHS | Regular | 1283 | D |
| BREVARD | EAU GALLIE HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1884 | B |
| BREVARD | EDGEWOOD JR/SR HIGH SCHOOL | 7-12 | SHS | Regular | 953 | A |
| BREVARD | MELBOURNE SHS SCHOOL | 9-12 | SHS | Regular | 2311 | B |
| BREVARD | MERRITT ISLAND HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1629 | B |
| BREVARD | PALM BAY SHS SCHOOL | 9-12 | SHS | Regular | 2546 | B |
| BREVARD | ROCKLEDGE SHS SCHOOL | 9-12 | SHS | Regular | 1333 | A |
| BREVARD | SATELLITE SHS SCHOOL | P-K, 9-12 | COMB | Regular | 1351 | B |
| BREVARD | SPACE COAST JUNIOR/SHS SCHOOL | 7-12 | SHS | Regular | 2084 | A |
| BREVARD | TITUSVILLE HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1530 | B |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| BREVARD | VIERA HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2054 | A |
| BREVARD | WESTSHORE JUNIOR/SHS SCHOOL | 7-12 | SHS | Regular | 967 | A |
| BROWARD | BLANCHE ELY HIGH SCHOOL | 9-12 | SHS | Regular | 2293 | D |
| BROWARD | BOYD H. ANDERSON HIGH SCHOOL | 9-12 | SHS | Regular | 2709 | D |
| BROWARD | BROWARD VIRTUAL EDUCATION | 6-12 | SHS | Regular | 433 | B |
| BROWARD | CHARLES W FLANAGAN HIGH SCHOOL | 9-12 | SHS | Regular | 3318 | B |
| BROWARD | CITY OF CORAL SPRINGS CHARTER | 6-12 | SHS | Regular | 1644 | A |
| BROWARD | CITY/PEMBROKE PINES CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 1746 | A |
| BROWARD | COCONUT CREEK HIGH SCHOOL | 9-12 | SHS | Regular | 2505 | D |
| BROWARD | COOPER CITY HIGH SCHOOL | 9-12 | SHS | Regular | 2374 | B |
| BROWARD | CORAL GLADES HIGH SCHOOL | 9-12 | SHS | Regular | 2418 | A |
| BROWARD | CORAL SPRINGS HIGH SCHOOL | 9-12 | SHS | Regular | 2520 | D |
| BROWARD | CYPRESS BAY HIGH SCHOOL | 9-12 | SHS | Regular | 3918 | B |
| BROWARD | DEERFIELD BEACH HIGH SCHOOL | 9-12 | SHS | Regular | 2612 | C |
| BROWARD | DILLARD HIGH SCHOOL | 9-12 | SHS | Regular | 1967 | D |
| BROWARD | EAGLE ACADEMY CHARTER SCHOOL | 6-12 | SHS | Regular | 622 | D |
| BROWARD | EVERGLADES HIGH SCHOOL | 9-12 | SHS | Regular | 3267 | C |
| BROWARD | FORT LAUDERDALE HIGH SCHOOL | 9-12 | SHS | Regular | 1863 | C |
| BROWARD | HALLANDALE HIGH SCHOOL | 9-12 | SHS | Regular | 1697 | C |
| BROWARD | HOLLYWOOD HILLS HIGH SCHOOL | 9-12 | SHS | Regular | 2207 | D |
| BROWARD | INTERNATIONAL SCHOOL OF BROWARD | 6-12 | SHS | Regular | 171 | A |
| BROWARD | J. P. TARAVELLA HIGH SCHOOL | 9-12 | SHS | Regular | 2991 | B |
| BROWARD | MARJORY STONEMAN DOUGLAS HIGH SCHOOL | 9-12 | SHS | Regular | 3382 | B |
| BROWARD | MCARTHUR HIGH SCHOOL | 9-12 | SHS | Regular | 2439 | C |
| BROWARD | MIRAMAR HIGH SCHOOL | 9-12 | SHS | Regular | 3125 | C |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| BROWARD | MONARCH HIGH SCHOOL | 9-12 | SHS | Regular | 2284 | B |
| BROWARD | NORTHEAST HIGH SCHOOL | 9-12 | SHS | Regular | 2311 | C |
| BROWARD | NOVA HIGH SCHOOL | 9-12 | SHS | Regular | 2213 | A |
| BROWARD | PARKWAY ACADEMY | 9-12 | SHS | Regular | 546 | D |
| BROWARD | PIPER HIGH SCHOOL | 9-12 | SHS | Regular | 2948 | C |
| BROWARD | PLANTATION HIGH SCHOOL | 9-12 | SHS | Regular | 2563 | C |
| BROWARD | POMPANO BEACH HIGH SCHOOL | 9-12 | SHS | Regular | 1290 | A |
| BROWARD | SOMERSET ACADEMY CHARTER HIGH | 9-12 | SHS | Regular | 601 | A |
| BROWARD | SOUTH BROWARD HIGH SCHOOL | 9-12 | SHS | Regular | 2380 | B |
| BROWARD | SOUTH PLANTATION HIGH SCHOOL | 9-12 | SHS | Regular | 2720 | D |
| BROWARD | STRANAHAN HIGH SCHOOL | 9-12 | SHS | Regular | 1966 | C |
| BROWARD | WEST BROWARD HIGH SCHOOL | 9-12 | SHS | Regular | 2042 | B |
| BROWARD | WESTERN HIGH SCHOOL | 9-12 | SHS | Regular | 3350 | C |
| CALHOUN | ALTHA PUBLIC SCHOOL | P-K-12 | COMB | Regular | 671 | A |
| CALHOUN | BLOUNTSTOWN HIGH SCHOOL | 6-12 | SHS | Regular | 464 | D |
| CHARLOTTE | CHARLOTTE HIGH SCHOOL | 9-12 | SHS | Regular | 2226 | D |
| CHARLOTTE | LEMON BAY HIGH SCHOOL | 9-12 | SHS | Regular | 1591 | B |
| CHARLOTTE | PORT CHARLOTTE HIGH SCHOOL | 9-12 | SHS | Regular | 2290 | A |
| CITRUS | CITRUS HIGH SCHOOL | 9-12 | SHS | Regular | 1829 | C |
| CITRUS | CRYSTAL RIVER HIGH SCHOOL | 9-12 | SHS | Regular | 1438 | D |
| CITRUS | LECANTO HIGH SCHOOL | 9-12 | SHS | Regular | 1980 | C |
| CLAY | CLAY HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1533 | D |
| CLAY | FLEMING ISLAND HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2367 | A |
| CLAY | KEYSTONE HEIGHTS JUNIOR/SHS | 7-12 | SHS | Regular | 1439 | B |
| CLAY | MIDDLEBURG HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2247 | B |
| CLAY | ORANGE PARK HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2789 | C |
| CLAY | RIDGEVIEW HIGH SCHOOL | 9-12 | SHS | Regular | 2033 | B |
| COLLIER | BARRON COLLIER HIGH SCHOOL | 9-12 | SHS | Regular | 1875 | A |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| COLLIER | EVERGLADES CITY SCHOOL | P-K-12 | COMB | Regular | 167 | C |
| COLLIER | GOLDEN GATE HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1552 | C |
| COLLIER | GULF COAST HIGH SCHOOL | 9-12 | SHS | Regular | 2285 | A |
| COLLIER | IMMOKALEE HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1515 | D |
| COLLIER | LELY HIGH SCHOOL | 9-12 | SHS | Regular | 1586 | C |
| COLLIER | NAPLES HIGH SCHOOL | 9-12 | SHS | Regular | 1892 | C |
| COLLIER | PALMETTO RIDGE HIGH SCHOOL | 9-12 | SHS | Regular | 2017 | C |
| COLUMBIA | COLUMBIA HIGH SCHOOL | 9-12 | SHS | Regular | 2038 | D |
| COLUMBIA | FORT WHITE HIGH SCHOOL | 6-12 | SHS | Regular | 1429 | B |
| DADE | ACADEMY OF ARTS & MINDS | 9-12 | SHS | Regular | 390 | B |
| DADE | AMERICAN SHS SCHOOL | 9-12 | SHS | Regular | 2495 | C |
| DADE | ARCHIMEDEAN UPPER CONSERVATORY CHARTER SCHOOL | 9-12 | SHS | Regular | 67 | A |
| DADE | BARBARA GOLEMAN SHS | 9-12 | SHS | Regular | 3216 | C |
| DADE | BOOKER T. WASHINGTON SHS | 9-12 | SHS | Regular | 1438 | F |
| DADE | CITY OF HIALEAH EDUCATION ACADEMY | 9-12 | SHS | Regular | 112 | C |
| DADE | CORAL GABLES SHS SCHOOL | 9-12 | SHS | Regular | 3658 | C |
| DADE | CORAL REEF SHS SCHOOL | 9-12 | SHS | Regular | 3054 | A |
| DADE | DESIGN & ARCHITECTURAL SHS | 9-12 | SHS | Regular | 483 | A |
| DADE | DOCTORS CHARTER SCHOOL OF MIAMI SHORES | 6-12 | SHS | Regular | 560 | A |
| DADE | DORAL ACADEMY CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 952 | A |
| DADE | DORAL PERFORMING ARTS & ENTERTAINMENT ACADEMY | 9-12 | SHS | Regular | 68 | A |
| DADE | DR MICHAEL M. KROP SHS | 9-12 | SHS | Regular | 3951 | B |
| DADE | FELIX VARELA SHS SCHOOL | 9-12 | SHS | Regular | 3586 | C |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| DADE | G. HOLMES BRADDOCK SHS | 9-12 | SHS | Regular | 3942 | C |
| DADE | HIALEAH GARDENS SHS SCHOOL | 9-12 | SHS | Regular | 1120 | B |
| DADE | HIALEAH SHS SCHOOL | 9-12 | SHS | Regular | 3709 | D |
| DADE | HIALEAH-MIAMI LAKES SHS | 9-12 | SHS | Regular | 2535 | D |
| DADE | HOMESTEAD SHS SCHOOL | 9-12 | SHS | Regular | 2476 | D |
| DADE | INTERNATIONAL STUDIES CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 276 | A |
| DADE | JOHN A. FERGUSON SHS | 9-12 | SHS | Regular | 4385 | A |
| DADE | LAWRENCE ACADEMY SHS CHARTER SCHOOL | 9-12 | SHS | Regular | 52 | C |
| DADE | MARITIME & SCIENCE TECHNOLOGY ACADEMY | 9-12 | SHS | Regular | 555 | A |
| DADE | MATER ACADEMY CHARTER HIGH | 9-12 | SHS | Regular | 1524 | A |
| DADE | MATER ACADEMY EAST CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 195 | C |
| DADE | MATER ACADEMY LAKES HIGH SCHOOL | 9-12 | SHS | Regular | 300 | B |
| DADE | MATER PERFORMING ARTS & ENTERTAINMENT ACADEMY | 9-12 | SHS | Regular | 159 | A |
| DADE | MIAMI BEACH SHS SCHOOL | 9-12 | SHS | Regular | 2224 | B |
| DADE | MIAMI CAROL CITY SHS | 9-12 | SHS | Regular | 2367 | D |
| DADE | MIAMI CENTRAL SHS SCHOOL | 9-12 | SHS | Regular | 2046 | D |
| DADE | MIAMI CORAL PARK SHS | 9-12 | SHS | Regular | 3658 | C |
| DADE | MIAMI EDISON SHS SCHOOL | 9-12 | SHS | Regular | 1206 | F |
| DADE | MIAMI JACKSON SHS SCHOOL | 9-12 | SHS | Regular | 1697 | F |
| DADE | MIAMI KILLIAN SHS SCHOOL | 9-12 | SHS | Regular | 3540 | C |
| DADE | MIAMI LAKES EDUCATIONAL CENTER | 9-12 | SHS | Regular | 1631 | A |
| DADE | MIAMI NORLAND SHS SCHOOL | 9-12 | SHS | Regular | 1949 | D |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| DADE | MIAMI NORTHWESTERN SHS | 9-12 | SHS | Regular | 2387 | F |
| DADE | MIAMI PALMETTO SHS SCHOOL | 8-12 | SHS | Regular | 3341 | A |
| DADE | MIAMI SHS SCHOOL | 9-12 | SHS | Regular | 3150 | C |
| DADE | MIAMI SOUTHRIDGE SHS | 9-12 | SHS | Regular | 3513 | F |
| DADE | MIAMI SPRINGS SHS SCHOOL | 9-12 | SHS | Regular | 2395 | B |
| DADE | MIAMI SUNSET SHS SCHOOL | 9-12 | SHS | Regular | 3018 | B |
| DADE | NEW WORLD SCHOOL OF THE ARTS | 9-12 | SHS | Regular | 488 | B |
| DADE | NORTH MIAMI BEACH SHS | 9-12 | SHS | Regular | 2931 | D |
| DADE | NORTH MIAMI SHS SCHOOL | 9-12 | SHS | Regular | 2939 | D |
| DADE | RIVIERA MIDDLE SCHOOL | 6-12 | SHS | Regular | 816 | C |
| DADE | ROBERT MORGAN EDUCATIONAL CENTER | 9-12 | SHS | Regular | 2426 | B |
| DADE | RONALD W. REAGAN/DORAL SHS SCHOOL | 9-12 | SHS | Regular | 2137 | A |
| DADE | SOMERSET ACADEMY CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 122 | B |
| DADE | SOUTH DADE SHS SCHOOL | 9-12 | SHS | Regular | 3287 | D |
| DADE | SOUTH MIAMI SHS SCHOOL | 9-12 | SHS | Regular | 2778 | B |
| DADE | SOUTHWEST MIAMI SHS | 9-12 | SHS | Regular | 3053 | B |
| DADE | THOMAS JEFFERSON MIDDLE SCHOOL | 6-12 | SHS | Regular | 829 | C |
| DADE | WESTLAND HIALEAH SHS SCHOOL | 9-12 | SHS | Regular | 1443 | C |
| DADE | WILLIAM H. TURNER TECHNICAL ARTS HIGH SCHOOL | 9-12 | SHS | Regular | 1767 | C |
| DADE | YOUNG MENS PREPARATORY ACADEMY | 9-12 | SHS | Regular | 70 | A |
| DADE | YOUNG WOMENS PREPARATORY ACADEMY | 6-12 | SHS | Regular | 295 | A |
| DESOTO | DESOTO COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 1227 | D |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| DIXIE | DIXIE COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 626 | C |
| DUVAL | A. PHILIP RANDOLPH ACADEMIES | P-K, 6-12 | COMB | Regular | 1046 | F |
| DUVAL | ANDREW JACKSON HIGH SCHOOL | 9-12 | SHS | Regular | 1520 | F |
| DUVAL | BALDWIN MIDDLE-SHS SCHOOL | 6-12 | SHS | Regular | 1299 | C |
| DUVAL | DARNELL COOKMAN MIDDLE/HIGH SCHOOL | 6-12 | SHS | Regular | 1146 | A |
| DUVAL | DOUGLAS ANDERSON SCHOOL OF THE ARTS | 9-12 | SHS | Regular | 1164 | B |
| DUVAL | DUNCAN U. FLETCHER HIGH SCHOOL | 9-12 | SHS | Regular | 2577 | B |
| DUVAL | EDWARD H. WHITE HIGH SCHOOL | 9-12 | SHS | Regular | 2304 | D |
| DUVAL | ENGLEWOOD HIGH SCHOOL | 9-12 | SHS | Regular | 2045 | D |
| DUVAL | FIRST COAST HIGH SCHOOL | 9-12 | SHS | Regular | 2509 | F |
| DUVAL | FRANK H. PETERSON ACADEMIES | 9-12 | SHS | Regular | 1243 | C |
| DUVAL | JEAN RIBAULT HIGH SCHOOL | 9-12 | SHS | Regular | 1317 | F |
| DUVAL | MANDARIN HIGH SCHOOL | 9-12 | SHS | Regular | 3175 | A |
| DUVAL | NATHAN B. FORREST HIGH SCHOOL | 9-12 | SHS | Regular | 1940 | D |
| DUVAL | PAXON SCHOOL/ADVANCED STUDIES | 9-12 | SHS | Regular | 1566 | A |
| DUVAL | ROBERT E. LEE HIGH SCHOOL | 9-12 | SHS | Regular | 2069 | C |
| DUVAL | SAMUEL W. WOLFSON HIGH SCHOOL | 9-12 | SHS | Regular | 2043 | D |
| DUVAL | SANDALWOOD HIGH SCHOOL | 9-12 | SHS | Regular | 3307 | C |
| DUVAL | STANTON COLLEGE PREPARATORY | 9-12 | SHS | Regular | 1549 | A |
| DUVAL | TERRY PARKER HIGH SCHOOL | 9-12 | SHS | Regular | 2114 | D |
| DUVAL | WILLIAM M. RAINES HIGH SCHOOL | 9-12 | SHS | Regular | 1302 | F |
| ESCAMBIA | ESCAMBIA HIGH SCHOOL | 9-12 | SHS | Regular | 2423 | C |
| ESCAMBIA | J. M. TATE SHS SCHOOL | 9-12 | SHS | Regular | 2252 | B |
| ESCAMBIA | NORTHVIEW HIGH SCHOOL | 6-12 | SHS | Regular | 630 | D |
| ESCAMBIA | PENSACOLA HIGH SCHOOL | 9-12 | SHS | Regular | 1936 | B |
| ESCAMBIA | PINE FOREST HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2364 | C |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| ESCAMBIA | WASHINGTON SHS SCHOOL | 9-12 | SHS | Regular | 2064 | C |
| ESCAMBIA | WEST FLORIDA HIGH SCHOOL/TECHNICAL | 9-12 | SHS | Regular | 1394 | A |
| FAMU LAB SCH | FLORIDA A&M UNIVERSITY DEVELOPMENTAL RESEARCH SCHOOL | K-12 | COMB | Regular | 490 | D |
| FAU LAB SCH | A.D. HENDERSON UNIVERSITY SCHOOL/FAU HIGH | K-12 | COMB | Regular | 636 | A |
| FLAGLER | FLAGLER-PALM COAST HIGH SCHOOL | 9-12 | SHS | Regular | 2589 | D |
| FLAGLER | MATANZAS HIGH SCHOOL | 9-12 | SHS | Regular | 1639 | B |
| FRANKLIN | FRANKLIN COUNTY SCHOOLS K-12 | P-K-12 | COMB | Regular | 989 | C |
| FSU LAB SCH | FLORIDA STATE UNIVERSITY SCHOOL | K-12 | COMB | Regular | 1641 | A |
| GADSDEN | EAST GADSDEN HIGH SCHOOL | 9-12 | SHS | Regular | 1142 | F |
| GADSDEN | WEST GADSDEN HIGH SCHOOL | 6-12 | SHS | Regular | 675 | F |
| GILCHRIST | BELL HIGH SCHOOL | 6-12 | SHS | Regular | 875 | A |
| GILCHRIST | TRENTON HIGH SCHOOL | 5-12 | SHS | Regular | 891 | A |
| GLADES | MOORE HAVEN JUNIOR/SHS SCHOOL | 7-12 | SHS | Regular | 406 | C |
| GULF | PORT ST. JOE HIGH SCHOOL | 9-12 | SHS | Regular | 410 | C |
| GULF | WEWAHITCHKA HIGH SCHOOL | 9-12 | SHS | Regular | 314 | C |
| HAMILTON | HAMILTON COUNTY HIGH SCHOOL | 7-12 | SHS | Regular | 794 | F |
| HARDEE | HARDEE SHS SCHOOL | P-K, 9-12 | COMB | Regular | 1373 | D |
| HENDRY | CLEWISTON HIGH SCHOOL | 9-12 | SHS | Regular | 1046 | F |
| HENDRY | LABELLE HIGH SCHOOL | 9-12 | SHS | Regular | 1109 | D |
| HERNANDO | CENTRAL HIGH SCHOOL | 9-12 | SHS | Regular | 2154 | D |
| HERNANDO | FRANK W. SPRINGSTEAD HIGH SCHOOL | 9-12 | SHS | Regular | 2260 | B |
| HERNANDO | HERNANDO HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1604 | D |
| HERNANDO | NATURE COAST TECHNICAL HIGH | P-K, 9-12 | COMB | Regular | 1551 | C |
| HIGHLANDS | AVON PARK HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1222 | D |
| HIGHLANDS | LAKE PLACID HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 859 | D |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| HIGHLANDS | SEBRING HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1783 | D |
| HILLSBOROUGH | ALONSO HIGH SCHOOL | 9-12 | SHS | Regular | 3069 | B |
| HILLSBOROUGH | ARMWOOD HIGH SCHOOL | 9-12 | SHS | Regular | 2198 | D |
| HILLSBOROUGH | BLAKE HIGH SCHOOL-MAGNET | 9-12 | SHS | Regular | 1654 | D |
| HILLSBOROUGH | BLOOMINGDALE HIGH SCHOOL | 9-12 | SHS | Regular | 2526 | B |
| HILLSBOROUGH | BRANDON HIGH SCHOOL | 9-12 | SHS | Regular | 2624 | C |
| HILLSBOROUGH | BROOKS DEBARTOLO COLLEGIATE HIGH SCHOOL | 9-12 | SHS | Regular | 286 | D |
| HILLSBOROUGH | CHAMBERLAIN HIGH SCHOOL | 9-12 | SHS | Regular | 2404 | D |
| HILLSBOROUGH | DURANT HIGH SCHOOL | 9-12 | SHS | Regular | 2699 | B |
| HILLSBOROUGH | EAST BAY HIGH SCHOOL | 9-12 | SHS | Regular | 2228 | D |
| HILLSBOROUGH | FREEDOM HIGH SCHOOL | 9-12 | SHS | Regular | 2414 | C |
| HILLSBOROUGH | GAITHER HIGH SCHOOL | 9-12 | SHS | Regular | 2503 | B |
| HILLSBOROUGH | HILLSBOROUGH HIGH SCHOOL | 9-12 | SHS | Regular | 2239 | C |
| HILLSBOROUGH | JEFFERSON HIGH SCHOOL | 9-12 | SHS | Regular | 1886 | C |
| HILLSBOROUGH | KING HIGH SCHOOL | 9-12 | SHS | Regular | 2087 | D |
| HILLSBOROUGH | LENNARD HIGH SCHOOL | 9-12 | SHS | Regular | 1398 | C |
| HILLSBOROUGH | LETO HIGH SCHOOL | 9-12 | SHS | Regular | 2007 | D |
| HILLSBOROUGH | LITERACY LEADERSHIP CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 72 | D |
| HILLSBOROUGH | MIDDLETON HIGH SCHOOL | 9-12 | SHS | Regular | 1548 | D |
| HILLSBOROUGH | NEWSOME HIGH SCHOOL | 9-12 | SHS | Regular | 2292 | A |
| HILLSBOROUGH | PLANT CITY HIGH SCHOOL | 9-12 | SHS | Regular | 3129 | C |
| HILLSBOROUGH | PLANT HIGH SCHOOL | 9-12 | SHS | Regular | 2378 | B |
| HILLSBOROUGH | RIVERVIEW HIGH SCHOOL | 9-12 | SHS | Regular | 2348 | B |
| HILLSBOROUGH | ROBINSON HIGH SCHOOL | 9-12 | SHS | Regular | 1418 | B |
| HILLSBOROUGH | SICKLES HIGH SCHOOL | 9-12 | SHS | Regular | 2761 | A |
| HILLSBOROUGH | SPOTO HIGH SCHOOL | 9-12 | SHS | Regular | 1690 | D |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| HILLSBOROUGH | TAMPA BAY TECH HIGH SCHOOL | 9-12 | SHS | Regular | 2185 | B |
| HILLSBOROUGH | WHARTON HIGH SCHOOL | 9-12 | SHS | Regular | 2675 | C |
| HOLMES | BETHLEHEM HIGH SCHOOL | P-K-12 | COMB | Regular | 571 | B |
| HOLMES | HOLMES COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 523 | D |
| HOLMES | PONCE DE LEON HIGH SCHOOL | 6-12 | SHS | Regular | 458 | B |
| HOLMES | POPLAR SPRINGS HIGH SCHOOL | P-K-12 | COMB | Regular | 366 | B |
| INDIAN RIVER | INDIAN RIVER CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 700 | A |
| INDIAN RIVER | SEBASTIAN RIVER HIGH SCHOOL | 9-12 | SHS | Regular | 2160 | A |
| INDIAN RIVER | VERO BEACH HIGH SCHOOL | 9-12 | SHS | Regular | 3003 | B |
| JACKSON | COTTONDALE HIGH SCHOOL | 6-12 | SHS | Regular | 507 | C |
| JACKSON | GRACEVILLE HIGH SCHOOL | 6-12 | SHS | Regular | 412 | A |
| JACKSON | MALONE HIGH SCHOOL | P-K-12 | COMB | Regular | 613 | C |
| JACKSON | MARIANNA HIGH SCHOOL | 9-12 | SHS | Regular | 892 | D |
| JACKSON | SNEADS HIGH SCHOOL | 6-12 | SHS | Regular | 446 | C |
| JEFFERSON | JEFFERSON COUNTY MIDDLE/HIGH SCHOOL | 6-12 | SHS | Regular | 532 | F |
| LAFAYETTE | LAFAYETTE HIGH SCHOOL | 6-12 | SHS | Regular | 577 | B |
| LAKE | EAST RIDGE HIGH SCHOOL | 9-12 | SHS | Regular | 3146 | C |
| LAKE | EUSTIS HIGH SCHOOL | 9-12 | SHS | Regular | 1461 | D |
| LAKE | LEESBURG HIGH SCHOOL | 9-12 | SHS | Regular | 1841 | D |
| LAKE | MT. DORA HIGH SCHOOL | 9-12 | SHS | Regular | 1074 | C |
| LAKE | SOUTH LAKE HIGH SCHOOL | 9-12 | SHS | Regular | 2222 | D |
| LAKE | TAVARES HIGH SCHOOL | 9-12 | SHS | Regular | 1414 | B |
| LAKE | UMATILLA HIGH SCHOOL | 9-12 | SHS | Regular | 990 | D |
| LEE | CAPE CORAL HIGH SCHOOL | 9-12 | SHS | Regular | 2138 | C |
| LEE | CITY OF CAPE CORAL CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 85 | A |
| LEE | CYPRESS LAKE HIGH SCHOOL | 9-12 | SHS | Regular | 1432 | B |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| LEE | DUNBAR HIGH SCHOOL | 9-12 | SHS | Regular | 1314 | D |
| LEE | EAST LEE COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 2054 | D |
| LEE | ESTERO HIGH SCHOOL | 9-12 | SHS | Regular | 1573 | C |
| LEE | FORT MYERS HIGH SCHOOL | 9-12 | SHS | Regular | 1729 | A |
| LEE | GATEWAY CHARTER HIGH SCHOOL | 9-12 | SHS | Regular | 958 | B |
| LEE | IDA S. BAKER HIGH SCHOOL | 9-12 | SHS | Regular | 1973 | A |
| LEE | ISLAND COAST HIGH SCHOOL | 9-12 | SHS | Regular | 1540 | D |
| LEE | LEHIGH SHS SCHOOL | 9-12 | SHS | Regular | 1663 | C |
| LEE | MARINER HIGH SCHOOL | 9-12 | SHS | Regular | 1830 | C |
| LEE | NORTH FORT MYERS HIGH SCHOOL | 9-12 | SHS | Regular | 1827 | A |
| LEE | RIVERDALE HIGH SCHOOL | 6-12 | SHS | Regular | 1818 | C |
| LEE | SOUTH FORT MYERS HIGH SCHOOL | 9-12 | SHS | Regular | 1628 | C |
| LEE | TANGLEWOOD/RIVERSIDE ELEMENTARY SCHOOL | P-K-12 | COMB | Regular | 800 | A |
| LEON | AMOS P. GODBY HIGH SCHOOL | 9-12 | SHS | Regular | 1528 | F |
| LEON | JAMES RICKARDS HIGH SCHOOL | 9-12 | SHS | Regular | 1486 | D |
| LEON | LAWTON CHILES HIGH SCHOOL | 9-12 | SHS | Regular | 2060 | B |
| LEON | LEON HIGH SCHOOL | 9-12 | SHS | Regular | 2032 | C |
| LEON | LINCOLN HIGH SCHOOL | 9-12 | SHS | Regular | 2167 | B |
| LEVY | BRONSON MIDDLE/HIGH SCHOOL | 6-12 | SHS | Regular | 807 | B |
| LEVY | CEDAR KEY HIGH SCHOOL | P-K-12 | COMB | Regular | 297 | A |
| LEVY | CHIEFLAND HIGH SCHOOL | 9-12 | SHS | Regular | 568 | C |
| LEVY | WILLISTON HIGH SCHOOL | 9-12 | SHS | Regular | 765 | F |
| LIBERTY | LIBERTY COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 358 | D |
| MADISON | MADISON COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 722 | F |
| MANATEE | BAYSHORE HIGH SCHOOL | 9-12 | SHS | Regular | 1772 | D |
| MANATEE | BRADEN RIVER HIGH SCHOOL | 9-12 | SHS | Regular | 1869 | B |
| MANATEE | LAKEWOOD RANCH HIGH SCHOOL | 9-12 | SHS | Regular | 2010 | A |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| MANATEE | MANATEE HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2327 | B |
| MANATEE | MANATEE SCHOOL FOR THE ARTS | 6-12 | SHS | Regular | 1196 | A |
| MANATEE | PALMETTO HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1942 | D |
| MANATEE | SOUTHEAST HIGH SCHOOL | 9-12 | SHS | Regular | 1537 | C |
| MARION | BELLEVIEW HIGH SCHOOL | 9-12 | SHS | Regular | 1682 | C |
| MARION | DUNNELLON HIGH SCHOOL | 9-12 | SHS | Regular | 1675 | C |
| MARION | FOREST HIGH SCHOOL | 9-12 | SHS | Regular | 2619 | C |
| MARION | LAKE WEIR HIGH SCHOOL | 9-12 | SHS | Regular | 2024 | C |
| MARION | NORTH MARION HIGH SCHOOL | 9-12 | SHS | Regular | 1677 | D |
| MARION | VANGUARD HIGH SCHOOL | 9-12 | SHS | Regular | 1824 | C |
| MARION | WEST PORT HIGH SCHOOL | 9-12 | SHS | Regular | 2104 | B |
| MARTIN | CLARK ADVANCED LEARNING CENTER | 10-12 | SHS | Regular | 224 | A |
| MARTIN | JENSEN BEACH HIGH SCHOOL | 9-12 | SHS | Regular | 1656 | A |
| MARTIN | MARTIN COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 2138 | A |
| MARTIN | SOUTH FORK HIGH SCHOOL | 9-12 | SHS | Regular | 2088 | B |
| MONROE | CORAL SHORES HIGH SCHOOL | 9-12 | SHS | Regular | 818 | B |
| MONROE | KEY WEST HIGH SCHOOL | 9-12 | SHS | Regular | 1527 | C |
| MONROE | MARATHON HIGH SCHOOL | 6-12 | SHS | Regular | 708 | B |
| NASSAU | FERNANDINA BEACH HIGH SCHOOL | 9-12 | SHS | Regular | 947 | C |
| NASSAU | HILLIARD MIDDLE-SHS | 6-12 | SHS | Regular | 921 | B |
| NASSAU | WEST NASSAU COUNTY HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1100 | D |
| NASSAU | YULEE HIGH SCHOOL | 9-12 | SHS | Regular | 979 | A |
| OKALOOSA | BAKER SCHOOL | P-K-12 | COMB | Regular | 1474 | A |
| OKALOOSA | CHOCTAWHATCHEE SHS SCHOOL | 9-12 | SHS | Regular | 1940 | C |
| OKALOOSA | COLLEGIATE HIGH SCHOOL AT NORTHWEST FLORIDA STATE COLLEGE | 10-12 | SHS | Regular | 272 | A |
| OKALOOSA | CRESTVIEW HIGH SCHOOL | 9-12 | SHS | Regular | 2215 | A |
| OKALOOSA | FORT WALTON BEACH HIGH SCHOOL | 9-12 | SHS | Regular | 2093 | A |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| OKALOOSA | LAUREL HILL SCHOOL | P-K-12 | COMB | Regular | 502 | A |
| OKALOOSA | NICEVILLE SHS SCHOOL | 9-12 | SHS | Regular | 2235 | B |
| OKEECHOBEE | OKEECHOBEE HIGH SCHOOL | 9-12 | SHS | Regular | 1465 | C |
| ORANGE | APOPKA HIGH | 9-12 | SHS | Regular | 2811 | C |
| ORANGE | COLONIAL HIGH | 9-12 | SHS | Regular | 3957 | C |
| ORANGE | CYPRESS CREEK HIGH | 9-12 | SHS | Regular | 3562 | B |
| ORANGE | DR. PHILLIPS HIGH | 9-12 | SHS | Regular | 3634 | B |
| ORANGE | EDGEWATER HIGH | 9-12 | SHS | Regular | 2096 | D |
| ORANGE | EVANS HIGH | 9-12 | SHS | Regular | 2271 | D |
| ORANGE | FREEDOM HIGH | 9-12 | SHS | Regular | 2647 | B |
| ORANGE | JONES HIGH | 9-12 | SHS | Regular | 1094 | D |
| ORANGE | LEGACY HIGH CHARTER | 9-12 | SHS | Regular | 85 | A |
| ORANGE | NORTHSTAR HIGH CHARTER | 9-12 | SHS | Regular | 219 | D |
| ORANGE | OAK RIDGE HIGH | 9-12 | SHS | Regular | 2289 | D |
| ORANGE | OCOEE HIGH | 9-12 | SHS | Regular | 2786 | D |
| ORANGE | OLYMPIA HIGH | 9-12 | SHS | Regular | 2968 | B |
| ORANGE | ORLANDO SCIENCE MIDDLE HIGH CHARTER | 6-12 | SHS | Regular | 132 | B |
| ORANGE | TIMBER CREEK HIGH | 9-12 | SHS | Regular | 4267 | C |
| ORANGE | UNIVERSITY HIGH | 9-12 | SHS | Regular | 3426 | B |
| ORANGE | WEKIVA HIGH | 9-12 | SHS | Regular | 2474 | C |
| ORANGE | WEST ORANGE HIGH | 9-12 | SHS | Regular | 2851 | B |
| ORANGE | WINTER PARK HIGH | 9-12 | SHS | Regular | 3109 | A |
| OSCEOLA | CELEBRATION HIGH SCHOOL | 9-12 | SHS | Regular | 1923 | D |
| OSCEOLA | GATEWAY HIGH SCHOOL | 9-12 | SHS | Regular | 2765 | D |
| OSCEOLA | HARMONY HIGH SCHOOL | 9-12 | SHS | Regular | 2029 | B |
| OSCEOLA | LIBERTY HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2386 | D |
| OSCEOLA | NEW DIMENSIONS HIGH SCHOOL | 9-12 | SHS | Regular | 375 | B |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| OSCEOLA | OSCEOLA COUNTY SCHOOL OF ARTS | 6-12 | SHS | Regular | 751 | A |
| OSCEOLA | OSCEOLA HIGH SCHOOL | 9-12 | SHS | Regular | 2516 | C |
| OSCEOLA | POINCIANA HIGH SCHOOL | 9-12 | SHS | Regular | 1673 | F |
| OSCEOLA | PROFESSIONAL & TECHNICAL HIGH | 9-12 | SHS | Regular | 708 | A |
| OSCEOLA | ST. CLOUD HIGH SCHOOL | 9-12 | SHS | Regular | 1988 | C |
| PALM BEACH | ALEXANDER W DREYFOOS JUNIOR SCHOOL OF THE ARTS | 9-12 | SHS | Regular | 1328 | A |
| PALM BEACH | ATLANTIC HIGH SCHOOL | 9-12 | SHS | Regular | 2763 | B |
| PALM BEACH | BOCA RATON COMMUNITY HIGH SCHOOL | 9-12 | SHS | Regular | 2734 | A |
| PALM BEACH | BOYNTON BEACH COMMUNITY HIGH | 9-12 | SHS | Regular | 1636 | C |
| PALM BEACH | FOREST HILL COMMUNITY HIGH SCHOOL | 9-12 | SHS | Regular | 2151 | C |
| PALM BEACH | GLADES CENTRAL HIGH SCHOOL | 9-12 | SHS | Regular | 1265 | D |
| PALM BEACH | G-STAR SCHOOL OF THE ARTS | 9-12 | SHS | Regular | 826 | C |
| PALM BEACH | INLET GROVE COMMUNITY HIGH SCHOOL | 9-12 | SHS | Regular | 788 | D |
| PALM BEACH | JOHN I. LEONARD HIGH SCHOOL | 9-12 | SHS | Regular | 2433 | C |
| PALM BEACH | JUPITER HIGH SCHOOL | 9-12 | SHS | Regular | 3064 | A |
| PALM BEACH | LAKE WORTH HIGH SCHOOL | 9-12 | SHS | Regular | 2403 | D |
| PALM BEACH | OLYMPIC HEIGHTS COMMUNITY HIGH | 9-12 | SHS | Regular | 1862 | B |
| PALM BEACH | PAHOKEE MIDDLE-SHS | 7-12 | SHS | Regular | 1002 | C |
| PALM BEACH | PALM BEACH CENTRAL HIGH SCHOOL | 9-12 | SHS | Regular | 3094 | B |
| PALM BEACH | PALM BEACH GARDENS HIGH SCHOOL | 9-12 | SHS | Regular | 2726 | B |
| PALM BEACH | PALM BEACH LAKES HIGH SCHOOL | 9-12 | SHS | Regular | 2435 | D |
| PALM BEACH | PARK VISTA COMMUNITY HIGH SCHOOL | 9-12 | SHS | Regular | 3265 | A |
| PALM BEACH | RIVIERA BEACH MARITIME ACADEMY | 9-12 | SHS | Regular | 121 | D |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| PALM BEACH | ROYAL PALM BEACH HIGH SCHOOL | 9-12 | SHS | Regular | 2485 | D |
| PALM BEACH | SANTALUCES COMMUNITY HIGH | 9-12 | SHS | Regular | 2649 | D |
| PALM BEACH | SEMINOLE RIDGE COMMUNITY HIGH SCHOOL | 9-12 | SHS | Regular | 2587 | B |
| PALM BEACH | SOUTH TECH ACADEMY | 9-12 | SHS | Regular | 1412 | D |
| PALM BEACH | SPANISH RIVER COMMUNITY HIGH SCHOOL | 9-12 | SHS | Regular | 2273 | A |
| PALM BEACH | SUNCOAST COMMUNITY HIGH SCHOOL | 9-12 | SHS | Regular | 1339 | A |
| PALM BEACH | WELLINGTON HIGH SCHOOL | 9-12 | SHS | Regular | 2308 | A |
| PALM BEACH | WEST BOCA RATON HIGH SCHOOL | 9-12 | SHS | Regular | 2254 | A |
| PALM BEACH | WILLIAM T. DWYER HIGH SCHOOL | 9-12 | SHS | Regular | 2096 | B |
| PASCO | GULF HIGH SCHOOL | 9-12 | SHS | Regular | 2139 | D |
| PASCO | HUDSON HIGH SCHOOL | 9-12 | SHS | Regular | 1936 | D |
| PASCO | JAMES W. MITCHELL HIGH SCHOOL | 9-12 | SHS | Regular | 2786 | C |
| PASCO | LAND O LAKES HIGH SCHOOL | 6-12 | SHS | Regular | 1704 | B |
| PASCO | PASCO HIGH SCHOOL | 9-12 | SHS | Regular | 1429 | C |
| PASCO | RIDGEWOOD HIGH SCHOOL | 9-12 | SHS | Regular | 2188 | D |
| PASCO | RIVER RIDGE HIGH SCHOOL | 6-12 | SHS | Regular | 2183 | C |
| PASCO | SUNLAKE HIGH SCHOOL | 9-12 | SHS | Regular | 1657 | B |
| PASCO | WESLEY CHAPEL HIGH SCHOOL | 9-12 | SHS | Regular | 1506 | D |
| PASCO | WIREGRASS RANCH HIGH SCHOOL | 9-12 | SHS | Regular | 1995 | B |
| PASCO | ZEPHYRHILLS HIGH SCHOOL | 9-12 | SHS | Regular | 1798 | C |
| PINELLAS | BOCA CIEGA HIGH SCHOOL | 9-12 | SHS | Regular | 2025 | D |
| PINELLAS | CLEARWATER HIGH SCHOOL | 9-12 | SHS | Regular | 2405 | C |
| PINELLAS | COUNTRYSIDE HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2588 | D |
| PINELLAS | DIXIE M. HOLLINS HIGH SCHOOL | 9-12 | SHS | Regular | 2078 | D |
| PINELLAS | DUNEDIN HIGH SCHOOL | 9-12 | SHS | Regular | 2136 | D |
| PINELLAS | EAST LAKE HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2485 | B |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| PINELLAS | GIBBS HIGH SCHOOL | 9-12 | SHS | Regular | 2262 | F |
| PINELLAS | LAKEWOOD HIGH SCHOOL | 9-12 | SHS | Regular | 1682 | D |
| PINELLAS | LARGO HIGH SCHOOL | 9-12 | SHS | Regular | 2273 | D |
| PINELLAS | NORTHEAST HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2396 | D |
| PINELLAS | OSCEOLA HIGH SCHOOL | 9-12 | SHS | Regular | 1703 | C |
| PINELLAS | PALM HARBOR UNIVERSITY HIGH | 9-12 | SHS | Regular | 2439 | B |
| PINELLAS | PINELLAS PARK HIGH SCHOOL | 9-12 | SHS | Regular | 2561 | D |
| PINELLAS | SEMINOLE HIGH SCHOOL | 9-12 | SHS | Regular | 2341 | C |
| PINELLAS | ST. PETERSBURG COLLEGIATE HIGH SCHOOL | 9-12 | SHS | Regular | 188 | A |
| PINELLAS | ST. PETERSBURG HIGH SCHOOL | 9-12 | SHS | Regular | 2397 | C |
| PINELLAS | TARPON SPRINGS HIGH SCHOOL | 9-12 | SHS | Regular | 2029 | D |
| POLK | AUBURNDALE SHS SCHOOL | 9-12 | SHS | Regular | 1670 | C |
| POLK | BARTOW SHS SCHOOL | 9-12 | SHS | Regular | 2094 | B |
| POLK | FORT MEADE MIDDLE/SHS SCHOOL | 6-12 | SHS | Regular | 759 | C |
| POLK | FROSTPROOF MIDDLE/SHS | 6-12 | SHS | Regular | 1317 | B |
| POLK | GEORGE W. JENKINS SHS | 9-12 | SHS | Regular | 2391 | C |
| POLK | HAINES CITY SHS SCHOOL | 9-12 | SHS | Regular | 2223 | D |
| POLK | KATHLEEN SHS SCHOOL | 9-12 | SHS | Regular | 2114 | D |
| POLK | LAKE GIBSON SHS SCHOOL | 9-12 | SHS | Regular | 2174 | C |
| POLK | LAKE REGION HIGH SCHOOL | 9-12 | SHS | Regular | 2146 | C |
| POLK | LAKE WALES SHS SCHOOL | 9-12 | SHS | Regular | 1469 | D |
| POLK | LAKELAND SHS SCHOOL | 9-12 | SHS | Regular | 2321 | B |
| POLK | MCKEEL ACADEMY OF TECHNOLOGY | 6-12 | SHS | Regular | 1135 | A |
| POLK | MULBERRY SHS SCHOOL | 9-12 | SHS | Regular | 1094 | C |
| POLK | RIDGE COMMUNITY HIGH SCHOOL | 9-12 | SHS | Regular | 2081 | D |
| POLK | TENOROC HIGH SCHOOL | 9-12 | SHS | Regular | 1546 | D |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| POLK | WINTER HAVEN SHS SCHOOL | 9-12 | SHS | Regular | 1966 | D |
| PUTNAM | CRESCENT CITY JUNIOR/SHS SCHOOL | 7-12 | SHS | Regular | 929 | C |
| PUTNAM | INTERLACHEN HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1051 | D |
| PUTNAM | PALATKA HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1642 | D |
| SANTA ROSA | CENTRAL HIGH SCHOOL | 7-12 | SHS | Regular | 301 | B |
| SANTA ROSA | GULF BREEZE HIGH SCHOOL | 9-12 | SHS | Regular | 1626 | A |
| SANTA ROSA | JAY HIGH SCHOOL | 7-12 | SHS | Regular | 514 | A |
| SANTA ROSA | MILTON HIGH SCHOOL | 9-12 | SHS | Regular | 1992 | D |
| SANTA ROSA | NAVARRE HIGH SCHOOL | 9-12 | SHS | Regular | 1975 | A |
| SANTA ROSA | PACE HIGH SCHOOL | 9-12 | SHS | Regular | 2032 | B |
| SARASOTA | BOOKER HIGH SCHOOL | 9-12 | SHS | Regular | 1494 | D |
| SARASOTA | NORTH PORT HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2869 | C |
| SARASOTA | RIVERVIEW HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2791 | B |
| SARASOTA | SARASOTA HIGH SCHOOL | 9-12 | SHS | Regular | 2646 | C |
| SARASOTA | SARASOTA MILITARY ACADEMY | 9-12 | SHS | Regular | 673 | C |
| SARASOTA | VENICE SHS SCHOOL | 9-12 | SHS | Regular | 2181 | C |
| SEMINOLE | CROOMS ACADEMY OF INFORMATION TECHNOLOGY | 9-12 | SHS | Regular | 628 | A |
| SEMINOLE | HAGERTY HIGH SCHOOL | 9-12 | SHS | Regular | 2372 | B |
| SEMINOLE | LAKE BRANTLEY HIGH SCHOOL | 9-12 | SHS | Regular | 3163 | B |
| SEMINOLE | LAKE HOWELL HIGH SCHOOL | 9-12 | SHS | Regular | 2571 | B |
| SEMINOLE | LAKE MARY HIGH SCHOOL | 9-12 | SHS | Regular | 2636 | B |
| SEMINOLE | LYMAN HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 2714 | B |
| SEMINOLE | OVIEDO HIGH SCHOOL | 9-12 | SHS | Regular | 2197 | B |
| SEMINOLE | SEMINOLE HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 3553 | C |
| SEMINOLE | WINTER SPRINGS HIGH SCHOOL | 9-12 | SHS | Regular | 2463 | C |
| ST. JOHNS | ALLEN D NEASE SHS SCHOOL | 9-12 | SHS | Regular | 1663 | B |
| ST. JOHNS | BARTRAM TRAIL HIGH SCHOOL | 9-12 | SHS | Regular | 1844 | A |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| ST. JOHNS | PEDRO MENENDEZ HIGH SCHOOL | 9-12 | SHS | Regular | 1665 | D |
| ST. JOHNS | PONTE VEDRA HIGH SCHOOL | 9-12 | SHS | Regular | 965 | B |
| ST. JOHNS | ST. AUGUSTINE HIGH SCHOOL | 9-12 | SHS | Regular | 1690 | A |
| ST. JOHNS | ST. JOHNS TECHNICAL HIGH SCHOOL | 7-12 | SHS | Regular | 388 | F |
| ST. JOHNS | THE WEBSTER SCHOOL | P-K-12 | COMB | Regular | 621 | A |
| ST. LUCIE | FORT PIERCE CENTRAL HIGH SCHOOL | 9-12 | SHS | Regular | 1903 | D |
| ST. LUCIE | FORT PIERCE WESTWOOD HIGH SCHOOL | 9-12 | SHS | Regular | 1699 | D |
| ST. LUCIE | LINCOLN PARK ACADEMY | 6-12 | SHS | Regular | 1904 | A |
| ST. LUCIE | PORT ST. LUCIE HIGH SCHOOL | 9-12 | SHS | Regular | 2517 | D |
| ST. LUCIE | ST. LUCIE WEST CENTENNIAL HIGH | P-K, 9-12 | COMB | Regular | 2937 | C |
| ST. LUCIE | THE CHARTER SCHOOL OF FORT PIERCE | 6-12 | SHS | Regular | 108 | F |
| ST. LUCIE | TREASURE COAST HIGH SCHOOL | 9-12 | SHS | Regular | 2797 | C |
| SUMTER | SOUTH SUMTER HIGH SCHOOL | 9-12 | SHS | Regular | 1193 | C |
| SUMTER | VILLAGES CHARTER SCHOOL | P-K-12 | COMB | Regular | 2109 | A |
| SUMTER | WILDWOOD HIGH SCHOOL | 9-12 | SHS | Regular | 545 | C |
| SUWANNEE | BRANFORD HIGH SCHOOL | 6-12 | SHS | Regular | 703 | A |
| SUWANNEE | SUWANNEE HIGH SCHOOL | 9-12 | SHS | Regular | 1406 | C |
| TAYLOR | TAYLOR COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 744 | D |
| UF LAB SCH | P.K. YONGE DEVELOPMENTAL RESEARCH SCHOOL | K-12 | COMB | Regular | 1198 | A |
| UNION | UNION COUNTY HIGH SCHOOL | 9-12 | SHS | Regular | 669 | B |
| VOLUSIA | ATLANTIC HIGH SCHOOL | 9-12 | SHS | Regular | 1425 | D |
| VOLUSIA | DELAND HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 3644 | C |
| VOLUSIA | DELTONA HIGH SCHOOL | 9-12 | SHS | Regular | 3245 | C |
| VOLUSIA | MAINLAND HIGH SCHOOL | 9-12 | SHS | Regular | 2132 | D |
| VOLUSIA | NEW SMYRNA BEACH HIGH SCHOOL | 9-12 | SHS | Regular | 2160 | B |
| VOLUSIA | PINE RIDGE HIGH SCHOOL | 9-12 | SHS | Regular | 2585 | D |

| District | School Name | Grade Config. | School Type | Population Served | Mem. | School Grade |
|---|---|---|---|---|---|---|
| VOLUSIA | SEABREEZE HIGH SCHOOL | 9-12 | SHS | Regular | 2059 | B |
| VOLUSIA | SPRUCE CREEK HIGH SCHOOL | 9-12 | SHS | Regular | 2967 | B |
| VOLUSIA | T. DEWITT TAYLOR MIDDLE-HIGH SCHOOL | 6-12 | SHS | Regular | 1090 | C |
| WAKULLA | WAKULLA HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 1394 | C |
| WALTON | FREEPORT SHS SCHOOL | 9-12 | SHS | Regular | 403 | B |
| WALTON | PAXTON SCHOOL | P-K-12 | COMB | Regular | 688 | A |
| WALTON | SOUTH WALTON HIGH SCHOOL | 9-12 | SHS | Regular | 627 | B |
| WALTON | WALTON SHS SCHOOL | P-K, 9-12 | COMB | Regular | 755 | B |
| WASHINGTON | CHIPLEY HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 674 | C |
| WASHINGTON | VERNON HIGH SCHOOL | P-K, 9-12 | COMB | Regular | 463 | D |

*Note*. Grade Config. = Grade Configuration; Mem. = Membership

# APPENDIX B
# INSTITUTIONAL REVIEW BOARD APPROVAL

University of Central Florida

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

From : **UCF Institutional Review Board #1**
**FWA00000351, IRB00001138**

To : **John Carr**

Date : **February 28, 2011**

Dear Researcher:

On February 28, 2011, the IRB determined that the following proposed activity is not human research as defined by DHHS regulations at 45 CFR 46 or FDA regulations at 21 CFR 50/56:

Project Title: **FLORIDA SCHOOL INDICATOR REPORT DATA AS PREDICTORS OF HIGH SCHOOL ADEQUATE YEARLY PROGRESS (AYP)**

Investigator:

Per your email of 2/25/2011, you will be using the Florida Department of Education Public Crunched Data known as the Florida School Indicator Report. This data is publically accessible and does not contain specific student data.

This determination applies only to the activities described in the February 25, 2011 email correspondence to the IRB and does not apply should any changes be made. If changes are to be made and there are questions about whether these activities are research involving human subjects, please contact the IRB office to discuss the proposed changes.

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

Janice M Turchin

IRB Coordinator

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