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What is the Relative Influence of NJ School Report Card Variables on NJ Ask 5 Scores?

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**WHAT IS THE RELATIVE INFLUENCE OF NJ SCHOOL REPORT CARD
VARIABLES ON NJ ASK 5 SCORES?**

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**Submitted in partial fulfillment of the
requirements for the degree of
Doctor of Education**

Seton Hall University

2012

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

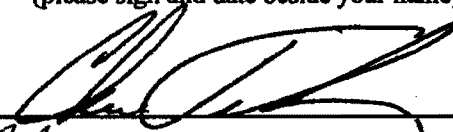
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ABSTRACT

WHAT IS THE RELATIVE INFLUENCE OF NJ SCHOOL REPORT CARD
VARIABLES ON NJ ASK 5 SCORES?

In this study, the researcher examined the strength and direction of relationships between NJ School Report Card Variables (NJ SRC) and 2008-2009 NJ ASK 5 Math and Language Arts Literacy (LAL) student test scores. Variables found to have an influence on standardized test scores in the extant literature were evaluated and reported. Analyses were conducted using a two-tiered approach. A simultaneous multiple regression of NJ SRC variables was employed first for both Math and LAL scores. Multiple regression models for School, Student, and Staff variable sets were then analyzed for Math and LAL achievement. The sample was taken from the NJ School Report Card to be a proportional random sample of the state's district composition. The results of the study revealed that Socioeconomic Status, Student/Faculty Ratio, Faculty and Administrator Credentials, Grade 5 Class-size, Grade 5 Attendance Rate, Student Mobility, Length of School Day, Faculty Mobility, and Instructional Minutes were found to influence NJ ASK 5 scores. Recommendations for policy, practice, and future research are explored.

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To Dr. Achilles, thank you for keeping this paper on track and scholarly. Your expertise in education literature is unparalleled. Thank you for your time and the privilege of working with you.

DEDICATION

This work is dedicated to my family--my husband, Michael, my mom, Palma, and of course, my children, Alessia and Nicholas, whose favorite question during this process was, "Do you have to do your homework now?"

I can now tell them I have finished my homework.

I would also like to dedicate this paper to the memory of Marie Mazzeo, true intellectual and true friend.

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Chapter 1

INTRODUCTION

Background

Ubiquitous in American education, standardized testing has evolved dramatically from its beginnings as a screening tool for hopeful Chinese government workers during the reign of the Han Dynasty. Knowledge of Confucian teaching was the focus of this early standardized testing (Fletcher, 2009). The Western world, following the principles of the Socratic Method, used essays and discourse as a means of assessment. This intellectual tradition came to a virtual halt with the onset of the Industrial Revolution when an expeditious method of assessing large numbers of disparate students was preferred by governmental agencies.

Alfred Binet and Theodore Simon, in 1905, began work on a test of intelligence with the intent of identifying the many different mental capacities of children. The test was used for educational placement based on mental, not solely chronological age. The research became the basis of the Stanford Binet IQ test, used to this day. The instrument was welcomed in America as a means to meet the needs of a rapidly diversifying population. It also fit in with the American economic, social, and political ideology of meritocracy (Seigler, 1992). In 1916, Louis Terman of Stanford University standardized the test using a large American sample, renaming the test the Stanford Binet Revision (White, 2000). The test was administered to over 170,000 soldiers in the U.S. Army during World War I (Michels, 2004).

By World War I, the United States Army was routinely administering the various aptitude assessments called Army Mental Tests. These quizzes were standardized, yet

painstakingly hand-scored. However, in 1936, the invention of the IBM 805 gave the world its first automatic bubble test scanner. With its advent, standardized testing became less expensive and more efficient.

Founded in 1900, The College Entrance Examination began creating assessments for screening potential applicants for college. Most tests consisted of a series of essay questions. World War I generated a need for the U.S. Army to have an expeditious and efficient method of testing its personnel for general aptitude. The Army Alpha and Beta tests were developed and administered starting in the year 1917. In 1926, the SAT (Scholastic Aptitude Test) was generated to screen college applicants more quickly with its multiple choice format. In 1941, due to the war efforts, the College Board decided the SAT should be given in this format exclusively to expedite the entire screening process.

The role of the U.S. government in education was minimal during the early history of the country. The founding fathers did not want a strong centralized, unitary government. Purposively, the role of federal government was limited by the U.S. Constitution. Ergo, education was mainly relegated to state and local control (Brimley & Garfield, 2008). Not until 1867 was the Office of Education, later renamed the U.S. Department of Education (USDOE), established to collect information on schools and teaching in an effort to aid states in creating effective school entities (U.S. Department of Education, 2008). Some early legislation gave the department an increasing role in policy. Specifically, the Second Morrill Act in 1890 gave the department administrative responsibility to support land-grant colleges and universities. Additionally, the 1917 Smith-Hughes Act granted the department administrative delegation of federal funds to vocational education (U.S. Department of Education, 2008). However, the Department

of Education retained a minimal Influence on education. Some societal changes and accompanying legislation allowed the USDOE to gain increasing power.

Table 1

Major Developments in the U.S. Department of Education

Year	Title	Summary
1867	Office of Education	US Office of Education established to collect data and aid states effectively set up schools
1869	Change of Status	Office of Education absorbed into the Department of the Interior
1870	Bureau of Education	Office of Education renamed the Bureau of Education
1890	Second Morrill Act	Office of Education begins to support land-grant colleges and universities
1917	Smith-Hughes Act	Federal aid for vocational training
1929	Office of Education	The Bureau reverts to its former name
1939	USDOE transferred	USDOE absorbed by the Federal Security Agency
1941	The Lanham Act	Authorized monies to school districts affected by military operations
1944	GI Bill	Postsecondary education assistance given to 8 million WW II veterans
1953	USDOE part of HEW	FSA becomes the Department of Health, Education, and Welfare (HEW)
1958	National Defense Education Act (NDEA)	Propelled by Sputnik, the USDOE gives monies to create better science, mathematics, and foreign language instruction in elementary and secondary schools. Also gives college loans and grants
1964	Title VI of the Civil Rights Act	Decrees that federally assisted programs be free from discrimination
1965	Elementary and Secondary Education Act; Public Law 89-10	General purpose was to improve educational opportunities for poor children
1965	Higher Education Act	Financial aid for needy college students, assistance for postsecondary institutions
1972	Title IX of the Education Amendments	No person can, on the basis of sex, be excluded from participation in any education program given federal financial assistance

1973	Section 504 of the Rehabilitation Act	Protects qualified individuals from discrimination based on their disability
1979	USDOE gets cabinet level status	The USDOE name becomes official and the department receives a presidentially-appointed secretary with Senate approval
2001	No Child Left Behind (NCLB)	A reauthorization of ESEA. NCLB is built on four principles: accountability for results, more choices for parents, greater local control and flexibility, and an emphasis on doing what works based on scientific research

In 1957, when the Soviets launched Sputnik, a new fervor for improving American education was launched as well. Standardized testing became more commonplace. In 1975, New Jersey passed the Public School Education Act (PSEA) with the goal of having all state students, regardless of socioeconomic or geographic status, meet minimum proficiencies to function in society. This act led to the testing of third, sixth, and ninth grade students with the *Minimum Basic Skills* (MBS) testing program that included sections on reading and mathematics.

In 1983, with the publication of *A Nation at Risk*, testing gained momentum, most likely due to the incendiary wording of the document such as, "...the educational foundations of our country are presently being eroded by a rising tide of mediocrity that threatens our very future as a nation and a people" (*A Nation at Risk*, 1983, p. 1). Politicians became involved at the federal and state levels (Matthews, 2006). Although inconsistent throughout the country, standardized test usage was on the rise. Defining goals and objectives for American students to meet became a national pastime. In 1991, the U.S. Secretary of Labor appointed the Secretary's Commission of Achieving Necessary Skills (SCANS) in an effort to identify skills students would need to be ready

for the workplace. “Fundamental skills” and “workplace competencies” each graduating high school student should possess were identified (Secretary’s Commission of Achieving Necessary Skills [SCANS], 1991). The terms have remained in the national testing and standards movement to this day.

The New Jersey Board of Education adopted the Core Curriculum Content Standards (CCCS) in 1996. The CCCS listed the skills and competencies a student should have upon completion of a New Jersey education. New Jersey was soon administering a triad of statewide tests: the Elementary School Proficiency Assessment (ESPA) in Grade 4, the Grade Eight Proficiency Assessment (GEPA), and the High School Proficiency Test (HSPT) in Grade 11.

With the advent of the No Child Left Behind Act (NCLB) in 2002, New Jersey testing underwent further changes. President George W. Bush described the need for this act by stating that the neediest children were being left behind; hence, the act’s name (No Child Left Behind Act (2005)). This act was the reauthorization of the Elementary and Secondary Education Act of 1965 (PL 89-10). According to Washington, the research upon which this act was based includes the fact that school funding had nearly doubled in the past 30 years (even accounting for inflation) and achievement hadn’t followed suit. The act specifically speaks of reading scores and the lack of improvement, regardless of dollars spent. The achievement gap between White and minority students was not getting smaller. NCLB concluded this was due largely to faulty, unproven teaching methods. NCLB’s supposition led them to add this quote to their introductory presentation, “Insanity: the belief that one can get different results by doing the same thing” (NCLB,

2005). Therefore, the emphasis of the act is reform, with the four reform principles (NCLB, 2005):

Accountability: Guarantecing Results

Flexibility: Local Control for Local Challenges

Research-Based Reforms: Proven Methods with Proven Results

Parental Options: Choices for Parents, Hope for Kids

Since accountability and adherence to NCLB are tantamount to standardized testing, the federal government, in an unprecedented move, required yearly testing of all public school students in certain grades. Testing became the paramount indicator of school performance (Rogers, 2006). Every child in Grades 3 through 8 would be tested in reading and math. NCLB commands the states to use this data to make improvements where necessary. Each state was given the directive to decide on its own proficiency standards, measurement instrument, and quantification system (USDOE, 2008). The state control aspect of NCLB has fostered controversy, as proficiency looks markedly different for each state (Carey, 2006). In one well-publicized example, Mississippi proudly stated that 89% of its fourth grade students met or surpassed proficiency levels. However, the more rigorous, national testing conducted by NAEP (National Assessment of Education Progress) indicated that only 18% of the same students met proficiency or higher (Dillon, 2005).

Another controversial aspect of NCLB is funding. The demands set by the mandate are high, and some argue that the funding is inadequate or nonexistent (Talbert, 2010). However, even with NCLB, arguably the most federally driven education legislation to date, federal education appropriations are miniscule at \$68.6 billion, less

than 2.3% of the federal government's \$3 trillion 2008 budget; 91% of school budgets come from state and local taxation (Talbert, 2010). As such, the National Education Association (NEA) and the school district of Pontiac, Michigan sought to label NCLB an “unfunded mandate” in the U.S. Court of Appeals for the Sixth Circuit in *School District of the City of Pontiac [MI] v. Duncan* (U.S. Court of Appeals for the Sixth Circuit, 2011). The trial court rejected the NEA’s argument, stating that states must comply with the statutes and there is no guarantee that Congress will reimburse states for money they might spend to comply with the act. A request to The U.S. Supreme Court to review the decision was turned down (Talbert, 2010).

One stated goal, as set by the NCLB legislation, was 100% proficiency for all students in both reading and math by the year 2014. “Proficiency” was the key component, a term used initially by the NAEP in the 1990s to distinguish a high level of academic achievement, not minimal literacy standards (Ravitch, 2010). Additionally, testing was to be conducted yearly for any institution receiving federal funding in Grades 3-8 in both reading and math. Scores needed to be disaggregated by race, low income, disability status, and limited English proficiency (USDOE, 2008).

New Jersey commenced using the NJ ASK 3 in 2003; the Grade 4 ESPA became the NJ ASK 4. Grades 5-7 NJ ASK testing was added in 2006 (NJDOE, 2009). To establish complete NCLB compliance, New Jersey is currently testing language arts and mathematics laterally in Grades 3-8 and 11. The state’s proficiency levels, true to the term, denote more than minimal literacy. Education stakeholders are vested in achieving progressively higher results to meet the 2014 goal.

High-stakes test ubiquity warrants researchers seeking to define impressionable variables. Taken by all Grade 5 New Jersey students in public education settings, the NJ ASK 5 serves 591 operating school districts and their 1725 individual elementary schools (NJDOE, 2009). The schools are monitored by NJ ASK results for Annual Yearly Progress (AYP). If schools or districts do not make AYP, the districts suffer increasingly punitive measures with the final step being school closure or district takeover. The NJDOE (2010) summarizes the actions taken against a school on its *NCLB/Title 1 School Continuum Chart*.

Table 2

NCLB / Title I School Continuum Chart

Year	Status	Interventions for Title I Schools
Year 1	Early Warning – Did not make AYP for one year	None
Year 2	First year of school in need of improvement status. Did not make AYP for two consecutive years in the same content area.	Parent notification, public school choice (or supplemental educational services), school improvement plan, technical assistance from district.
Year 3	Second year of school in need of improvement status. Did not make AYP for three consecutive years in the same content area.	Parent notification, public school choice, supplemental educational services, school improvement plan, technical assistance from district.
Year 4	Third year of school in need of improvement status – corrective action . Did not make AYP for four consecutive years in the same content area.	Parent notification, public school choice, supplemental educational services, school improvement plan, technical assistance from district and state, corrective action, participation in CAPA.
Year 5	Fourth year of school in need of improvement status – school restructuring plan . Did not make AYP for five consecutive years in the same content area.	Parent notification, public school choice, supplemental educational services, school improvement plan, technical assistance from district and state, development of restructuring plan (governance).
Year 6 and above	Fifth year of school in need of improvement status – implementation of restructuring plan . Did not make AYP for six consecutive years in the same content area.	Parent notification, public school choice, supplemental educational services, school improvement plan, technical assistance from district and state, implementation of restructuring plan.

The NJ ASK testing program has further implications, extending outside of the education realm. Real estate values are often assessed with the school system's ratings as a factor. Popular newspapers and magazines often report test scores for the public to rate their community schools (Michel, 2004). Test scores have increasingly become the unit of measurement of quality by policymakers for schools. As Ravitch states, "The public thinks the tests have scientific validity, like that of a barometer or thermometer, and that they are objective, not tainted by fallible human judgment" (Ravitch, 2010, p. 152). With

all of the emphasis on high-stakes testing that reaches into the very morale of a community, research is warranted to aid education professionals to make advantageous, data-driven decisions regarding them.

The increased dependence on standardized test scores is topical for all education stakeholders: administrators, faculty members, students, parents, and state and federal departments of education. Rational Choice Theory is a paradigm associated with standardized testing theory. Although RCT's origins lie within the field of economics, it has become part of the social sciences in an effort to understand human behavior. RCT is sometimes referred to as choice theory and /or rational choice theory. It is a framework for the formal modeling of social and economic behavior (Bourdieu, 2005).

RCT theory postulates that a person makes all decisions after a 'rational' process of weighing costs against benefits (Hedström & Stern, 2008). Applied to standardized testing, educators would make the choice to have students pass the test as the costs of doing poorly would be exponential (professionally, personally, and financially).

Skinnerian in nature, RCT emphasizes rewards and punishments or lack of rewards.

The notion of AYP is based on these beliefs. NJ ASK and AYP proponents tend to believe that educators are motivated by the thought of potential partial proficient scores and will accordingly, teach what will be tested more effectively. Proponents also tend to believe that students who know there will be serious consequences for failure on standardized testing will put more effort into their academic careers.

However, detractors from the standardized testing paradigm cited the elimination of behavioral freedoms that followed RCT (in this case teacher behaviors) as a deterrent, not motivation. Reactance theory corroborates this ideology, as it explains an emotional

reaction in direct contradiction to the behavioral rules or regulations. Reactance can even cause an attitude that is contrary to the original intention. In the case of standardized testing, reactance theory adherents believe the loss of teacher behavioral freedoms cause educators to rebel against the tests.

Some critics criticize the fact that RCT operates on unrealistic assumptions in order to generate testable predictions. One assumption is that an individual has complete and accurate information of exact consequences from the choice. Another assumption is that the individual has the ability and time to weigh every choice against every other choice (Bourdieu, 2005).

Additionally, standardized testing, under NCLB, is used to dole out varying levels of punishment for schools in which the educators do not attain increasing proficiency in the allotted time frames. The goal of NCLB is 100% proficiency by 2014 for all students. This level of student achievement is unrealistic, unless proficiency is equated with "minimal literacy" (Ravitch, 2009). This fact frustrates educators and students alike as they work to meet an ever-increasing proficiency score, and a predetermined fail rate.

However, rational choice theorists have become the norm in education today. Increased accountability and increased testing are the topical issues of the day. Stiggins (2002) concerned by this remarked that America is "a nation obsessed with the belief that the path to school improvement is paved with better, more frequent, and more intense standardized testing" (p.759). In essence, there is a need for all stakeholders to be aware of methods of maximizing scores.

Statement of the Problem

Education researchers and policymakers seek to define variables that influence student achievement on high-stakes tests. Federal and state legislation such as the No Child Left Behind Act (P.L. 107-110), Goals 2000: Educate America Act (P.L. 103-227), and the New Jersey Department of Education's Administrative Code (Title 18A) all encompass district assessment components. NCLB specifically mandates schools employ "scientifically based research" in the quest for higher achievement.

The escalating achievement requirements have educators and policymakers searching for variables that will yield maximum achievement results for monies spent. For New Jersey, the NJ ASK (New Jersey Assessment of Skills and Knowledge), a standards-based assessment administered to all state students in Grades 3-8, is the instrument by which achievement is quantified. The NJDOE advocates using the NJ ASK 5 data in a summative, diagnostic, and prescriptive manner. The Technical Report (2007) for Grades 5, 6, and 7 NJ ASK states that the scores were intended to be used as "an indication of student progress toward achieving the knowledge and skills identified in the NJ CCS," as a guide for "annual school improvement planning," and for "student, teacher, and parent information concerning the academic levels of performance of individual students" (p. 31). Accordingly, in a proportional random stratified sample of 74 New Jersey school districts, Tienkin (2008) found that 98% of surveyed school leaders used NJ ASK results in their decision-making processes including student placement and curricula efficacy. Using a single test score to make high-stakes decisions is not supported in the empirical literature. The National Research Council's Committee on Appropriate Test Use warned against this practice, "... an educational decision that will

have a major influence on a test taker should not be made solely or automatically on the basis of a single test score” (National Research Council, 1999, p. 239).

Empirical literature exists on the variables affecting achievement on both the NJ ASK 4 and the NJ HSPA (11th grade assessment). The NJ ASK 5, administered from 2006 to the present, has been largely neglected in the literature due to the state’s elementary emphasis on NJ ASK 4, administered from 2003 to the present. The state deems the NJ ASK 5 an “off-grade” or “interim” assessment (Davey, L.E., 2006). However, NJ ASK 5 testing occurs at a pivotal time in a student’s academic career, customarily directly prior to the transition from elementary to middle school. Grade 5 NJ ASK scores are regularly used to track students into levels of academic placement in the middle school. The effect on the student’s academic confidence is compounded by the personal self-esteem decline that occurs during the middle school transition (Wigfield, Eccles, Mac Iver & Midgeley, 1991). Student-teacher relationships change as middle school is often compartmentalized, with educators seeing students for short periods of time (Feldhauser, Midgeley, & Eccles, 1998). The decreased self-esteem, coupled with less personal interaction from compartmentalized educators who see students for short periods of time (Feldhauser, Midgeley, & Eccles, 1998), make the utilization of NJ ASK 5 scores particularly precarious.

The fiscal cost to the district for students who do not meet proficiency on the NJ ASK 5 can be substantial. Often basic skills and special services are required for remediation. Continued failure to meet AYP may bring sanctions to the school and possible closure.

Therefore, determining which factors, if any, most influence scores on the NJ ASK 5 would aid both administrators and policymakers in allocating funds according to data driven research.

Purpose for the Study

The purpose for this non-experimental, quantitative, explanatory study is for the researcher to determine which factors on the NJ School Report Card account for the greatest amount of variance on the NJ ASK 5. Multiple regression analyses of data will be employed to determine the NJ School Report Card variables that can be targeted by administrators to ultimately increase student achievement on the NJ ASK 5. This study is evaluative and explanatory of the variables influencing NJ ASK 5.

Significance of the Study

Results from this study will contribute to the body of research examining the relationship between the NJ School Report Card and NJ ASK performance. Research conducted through multiple regression analyses of data will provide statistics for decision making in education policy and practice.

Study results might offer education administrators more information to enhance the following capacities:

- The ability to make informed, research-based decisions concerning fund allocation
- The aptitude to increase achievement by the influencing variables that most affect test scores
- The capacity to structure existing school practices to maximize the influence on achievement

- The ability to modify mutable variables in order to maximize achievement

Administrative resources are scarce; therefore, knowledge of which factors most affect NJ ASK 5 scores is warranted. Fund allocation should be dependent on a firm research base. The current legislative and economic climate merits an increasing need to target those variables that can be influenced and have the greatest effect on achievement results. This will benefit all stakeholders in public school education as well as community members.

Research Questions

The researcher's goal is to illuminate the variables on the NJ School Report Card that most affect NJ ASK 5 scores. Therefore, the guiding research question that seeks to be answered is the following: What NJ School Report Card factors account for a statistically significant amount of variance on NJ ASK 5 test scores?

The researcher seeks to answer the following subsidiary questions as measured by the state mandated mean NJ ASK 5 score of 200:

1. Which documented variables are the strongest predictors of performance on NJ ASK 5 Language Arts Literacy?
2. Which documented variables are the strongest predictors of performance on NJ ASK 5 Math?
3. Which administratively-mutable variables, reported on the NJ School Report Card are the strongest predictors of performance on NJ ASK 5 Language Arts Literacy?
4. Which administratively-mutable variables, reported on the NJ School Report Card are the strongest predictors of performance on NJ ASK 5 Math?

5. Which mutable school variables, as listed on the NJ School Report Card, have an influence on NJ ASK 5 LAL and Math scores as determined by statistical analyses? School variables identified are class size, length of school day, and instructional time.
6. Which mutable student variables, as listed on the NJ School Report Card, have an influence on NJ ASK 5 LAL and Math scores as determined by statistical analyses? Student variables identified are rates of mobility, attendance, and enrollment.
7. Which mutable teacher variables, as listed on the NJ School Report Card, have an influence on NJ ASK 5 LAL and Math scores as determined by statistical analyses? Teacher variables identified are National Board Certification, master's degree, doctoral degree, and attendance rate.

Limitations of the Study

Limitations are an inherent factor in education research. In this study, boundaries included the validity and reliability issues of the NJ ASK 5, variations in teacher training not accounted for by degree, and confidentiality issues related to studying individual students, not in the district aggregate. There are internal consistency issues documented with the NJ ASK 5 (Tienken, 2008; NJDOE, 2009). Internal consistency is lacking across content clusters as a whole and within content clusters to a lesser extent. To lessen the effect of this, all variable models will be assessed for correlations to the language arts literacy (LAL) and Math NJ ASK 5 sections separately.

Although non-experimental research is a valuable and necessary tool in the education field, the design itself exhibits limitations. The researcher can make statements

about the observed relationship between two variables; however, the determination of causality is not afforded. In addition, in non-experimental research, it is difficult to establish proper time order and to rule out alternative explanations for the relationships found.

New Jersey boasts 591 operational school districts with 1725 elementary schools. The individual schools can be broken down by DFG as shown in the table below.

Table 3

NJ District Factor Groupings

District Factor Group	Elementary Schools
A	290
B	199
CD	177
DE	229
FG	249
GH	221
I	296
J	64

Due to the sheer volume, all could not be included in the study. To minimize the influence of this, the researcher used a randomized, stratified sample based on the composite DFG of the state (n=314).

Delimitations of the Study

The researcher will use only the NJ ASK 5 results. The NJ ASK 5 consists of two components: language arts literacy (reading and writing) and mathematics. No data are available for other content areas, inclusive of science and social studies. Therefore, the

study could not explore the relationship between NJ Report Card factors and their relative influence on performance in content areas other than math and language arts.

Data are cross-sectional. Ergo, only the influence of the tested year's variables can be accounted for, neglecting the possible contribution of the variables to test scores from previous years.

In 2008, the NJDOE redesigned the NJ ASK 5, a fact that makes comparisons to prior years less reliable. The NJDOE (2009) states, "It is important to note that the redesigned NJ ASK 5-8 for LAL and Mathematics differ significantly in terms of item type, passage length, and testing time. Therefore, direct comparisons of student performance across these tests are inappropriate" (p. 2).

The NJ School Report Card data on district financial information are not included as district financial particulars are not mutable, and therefore not the focus of this study. Student learning is multifaceted and the variables contributing to achievement are vast. The available data do not take into account all the possible factors that influence test scores such as instructional materials, teacher delivery, curriculum setup, etc. The NJ School Report Card (NJDOE, 2009) offers only thirty-five variables, under the following categories: school environment, students, student performance indicators, staff, and district finances.

Independent Variables: The NJ School Report Card

In this study, the researcher examines variables set forth on the NJ School Report Card affecting outcomes on the NJ ASK 5, with attention to those factors that are malleable. The NJ School Report Card does not include variables that have been proven significant indicators of achievement. Student intelligence quotient (IQ) and parental

education level not aggregated into DFG, are conspicuously absent. However, since the goal for this researcher is to identify variables that may be manipulated in an effort to increase achievement, the aforementioned, relatively static variables would not be germane.

The NJ School Report Card has been controversial since its inception in 1988. James A. Moran, former executive director of the New Jersey Association of School Administrators, stated, "It has a few isolated items. . . .We don't believe it will do good for the students of New Jersey or the school districts" (Hanley, 1989, p. 2). Dissenters feel that the NJ School Report Card lends itself to flawed comparisons between districts. Since its first publication in 1989, the NJ School Report Card has expanded its scope. With the advent of NCLB, the NJ School Report Card found increased influence. In 1995, the NJSRA was put into law *N.J.S.A. 18A: 7E 1-5*, mandating a yearly report for the public.

The NJ School Report card is inclusive of 26 variables pertaining to primary education, categorized under the following headings: staff information, student information, school environment, student performance indicators, and district financial data.

Table 4

NJ School Report Card Variables by Categorization

Staff Information	Student Information	School Environment	Student Performance Indicators	District Financial Data
Student/ Administrator Ratio	Enrollment by Grade	Average Class-size	Assessments	Administrative and Faculty Personnel
Student/ Faculty Ratio	Students with Disabilities	Length of School Day	Student Expulsions	Median Salary and Years of Experience of Administrative and Faculty Personnel
Faculty Attendance Rate	Language Diversity	Instructional Time	Student Suspensions	Teacher Salaries and Benefits
Faculty Mobility Rate	Limited English Proficient	Student/ Computer Ratio		Administrative Salaries and Benefits
Highly Qualified Teacher Information	Student Mobility	Internet Connectivity		Revenues
Faculty and Administrator Credentials	Student Attendance			Budgets and Per- pupil Expenditures
National Board Certification				

From the NJ School Report Card, the researcher examined the following variables:

Staff Information

The following staff variables will be analyzed for influence on the NJ ASK 5: Student/Administrator Ratio, Student/Faculty Ratio, Faculty Attendance Rate, Faculty Mobility Rate, and Faculty and Administrator Credentials. National Board Certification will not be analyzed, as statewide there are only 200 New Jersey educators who possess

said certification spread from kindergarten through high school (National Board for Professional Teaching Standards, 2009).

Student Information

Student variables as listed on the NJ School Report Card that will be examined are Language Diversity, Limited English Proficiency, Student Attendance Rate, and Student Mobility. Students with Disabilities will not be analyzed, as the modifications and accommodations are voluminous; this sector's scores are not standardized for validity.

Student eligibility for free lunch and student eligibility for reduced lunch are two variables that will be added to the regression. Free-lunch and reduced-lunch eligibility is tied directly to U.S. poverty guidelines. The data appear on the NJ DOE web site as part of the school information section. Although not on the NJSRC, the use of these variables in quantitative education research is well-documented. It is "...typically used in data analyses to control statistically the effect of SES on education outcomes, to increase statistical power, and to enhance causality" (Harwell & Le Beau, 2009). Purposely, free-lunch and reduced-lunch were disaggregated in this study to show the differences between the two groups. In this study, the District Factor Group (DFG) has been proportionately random-sampled to give a clear view of NJSRC factors affecting NJ ASK 5 outcomes. The addition of the free-lunch and reduced-lunch variables will illuminate the specific role of monetary resources on NJ ASK 5 testing. This important relationship has been documented since the early 1960's (e.g., Bryant, Glazer, Hansen, & Kursch, 1974; Coleman et al., 1966; Sirin, 2005; White, 1982).

School Environment

School environment variables that will be explored are length of school day, instructional time, student/computer ratio, and internet connectivity.

Student Performance Indicators

Student performance indicators of student expulsions and student suspensions will not be analyzed. The relevant data pertains to Grade 5; only a very small rate of expulsions and suspensions occur in the elementary grades. The data are limited.

District Financial Data

The District Factor Group (DFG) will serve as a proxy for district financial data, a variable proven to have a significant influence on achievement. DFG is an NJDOE composite statistical index that models the socioeconomic status of a district (NJDOE, 2008). DFG classification uses 8 demographic variables:

- Percentage of adult residents who failed to complete high school
- Percentage of adult residents who attended college
- Occupational status of adult household members:
 - 1 = Laborers
 - 2 = Service workers (except private and protective)
 - 3 = Farm workers
 - 4 = Operatives and kindred workers
 - 5 = Protective service workers
 - 6 = Sales workers
 - 7 = Clerical and kindred workers
 - 8 = Craftsmen, foremen, and kindred workers

9 = Quasi-professionals

10 = Managers, officials, and proprietors

11 = Old and new professionals

- Population Density: Persons per square mile
- Income: Median family income
- Unemployment: Percentage of those in the work force who received some unemployment compensation
- Poverty: Percentage of residents below the poverty level

Additionally, due to the fact that SES is a well-documented predictor variable on achievement, the variables free-lunch and reduced-lunch eligibility were used. Free- and reduced-lunch eligibility is a commonly used factor in education research (Kurki, Boyle, & Aladjem, 2006). This proxy for SES is readily available for all states so that the research conducted can be analyzed in tandem with the extant literature from any state.

Dependent Variable: The NJ ASK 5

The dependent variable in this study is student achievement on the NJ ASK 5. Scores for aggregate Language Arts Literacy (LAL) and aggregate Mathematics were used (Total GE Scale Score LAL and Total GE Scale Score Mathematics). The highest score attainable is 300 for each section. For purposes of this discussion, the NJDOE, based on these scores, places students into three categories: Partially Proficient (<200), Proficient (200-260), and Advanced Proficient (260-300) for both Mathematics and Language Arts. Proficient and above will be the measurement value of the dependent variable.

Definitions of Terms and Abbreviations

Unless otherwise noted, all definitions are taken from the New Jersey Department of Education School Report Card Guide (2009).

AA -- academic achievement

Average Class Size -- Average class size for elementary schools (Pre-K-8) is based on the enrollment per grade divided by the total number of classrooms for that grade. For elementary grades, the state average is the statewide total enrollment for each grade divided by the statewide total number of classrooms in that grade.

AYP --Adequate Yearly Progress. An NCLB requirement that all students meet state-determined proficiency levels by 2014. For New Jersey, the goal has been set at 100%. That means every student must score at Proficient or Advanced Proficient levels on state assessments by 2014 (USDOE, 2008).

CSR -- Acronym for Class Size Reduction

DFG -- District Factor Group. An NJDOE composite statistical index that models the socioeconomic status of a district. It encompasses seven indices: percentage of population with no high school diploma, percentage with some college, occupation, population density, income, unemployment, and poverty (NJDOE, 2008).

Enrollment by Grade Enrollment is the October 15 count as reported on the department's annual Fall Survey collected from each school. The enrollment is reported by grade level for regular and charter schools. For Special Services school districts and Special Education schools, the enrollment is reported by class description.

Faculty Attendance Rate -- The average daily attendance for the faculty of the

school. It is calculated by dividing the total number of days present by the total number of days contracted for all faculty members.

Faculty Mobility Rate -- The rate at which faculty members come and go during the school year. It is calculated by using the number of faculty who entered or left employment in the school after October 15 divided by the total number of faculty reported as of that same date.

Faculty and Administrator Credentials -- Percentages of faculty and administrative members in the school who hold a bachelor's, master's, or doctoral degree. For vocational and special services schools, there is also information about licenses or certification in addition to or in place of degrees.

GE -- General Education

GEPA -- Grade Eight Proficiency Assessment. A test given to all eighth grade students in the state of New Jersey from 1999 to 2008, now the NJ ASK 8.

Instructional Time -- The amount of time per day that a typical student is engaged in instructional activities under the supervision of a certified teacher.

Internet Connectivity -- The number of instructional, multimedia-capable computers (any computer that has a manufacture date after July 1, 2005) available for instruction at various locations and how many of those computers have a connection to the Internet.

LAL -- Language Arts Literacy.

Length of School Day -- The amount of time a school is in session for a typical student

on a normal school day.

Limited English Proficient (LEP) Students -- The percentage of LEP students in the school. It is calculated by dividing the total number of students who are in Limited English Proficient programs by the total enrollment.

NAEP -- The National Association of Education Progress. The largest nationally representative and continuing assessment of what America's students know and can do in various subject areas. Assessments are conducted periodically in mathematics, reading, science, writing, the arts, civics, economics, geography, and U.S. history (NAEP, 2011).

NJ ASK -- New Jersey Assessment of Skills and Knowledge, a state mandated testing instrument from Grades 3-7. The instrument was designed to measure the NJCCS.

NJ CCCS New Jersey Core Curriculum Content Standards, first adopted in 1996, revised in 2004, and most recently revised in 2009:

- Standard 1: Visual and Performing Arts
- Standard 2: Comprehensive Health and Physical Education Standards
- Standard 5: Science
- Standard 6: Social Studies
- Standard 7: World Languages
- Standard 8: Technology
- Standard 9: 21st-Century Life and Careers (NJDOE, 2008)

NJDOE -- Acronym for the New Jersey Department of Education

NJ SRC -- Acronym for the NJ School Report Card

RCT -- Acronym for Rational Choice Theory

Student Attendance Rate -- The grade-level percentages of students on average who are present at school each day. They are calculated by dividing the sum of days present in each grade level by the sum of possible days present for all students in each grade. The school and state totals are calculated by the sum of days present in all applicable grade levels divided by the total possible days present for all students.

Student/Computer Ratio -- The average number of students served by each instructional, multimedia-capable computer (any computer that has a manufacture date after July 1, 2005) that is available for the purposes of supervised instruction. The ratio is calculated by dividing the total enrollment by the total number of multimedia-capable computers that are used for instruction.

Student/Administrator Ratio -- The number of students per administrator in the school. It is calculated by dividing the total school enrollment in October by the number of administrators reported in full-time equivalents (FTEs). Where a single administrator has responsibility for more than one school, the FTE may represent the administrator as less than one.

Student/Faculty Ratio -- The number of students per faculty member. It is calculated by dividing the reported October school enrollment by the combined full-time equivalents (FTEs) of classroom teachers and education support services personnel assigned to the school as of October of the school year.

Student Mobility Rate -- The percentage of students who both entered and left during the school year. The calculation is derived from the sum of students entering and leaving after the October enrollment count divided by the total enrollment.

Organization for the Study

In Chapter 1, the researcher has set forth an overview of the problem related to NJ ASK 5 scores and their relationships to variables on the NJ School Report Card.

Although the state education officials tout its use as a placement tool, the research on the NJ ASK 5 is limited. In addition, districts are assessed on the NJ ASK 5 scores. For these reasons, this assessment tool warrants further investigation. With this study, the researcher seeks to identify variables on the NJ School Report Card that have a significant predictive value on NJ ASK 5. This was determined by statistical analyses.

Chapter 2 consists of a review of literature pertaining to standardized testing with attention to NJ ASK assessments. Validity, reliability, and usage are explored. NJ ASK 5 as a pivotal year for student placement is illuminated.

Chapter 3, in tandem with Chapter 1, explicates design methods and procedures for this study. Data were collected from the NJ ASK 5 test results and the NJ School Report Card.

In Chapter 4, the researcher present the data and the statistical findings obtained.

Chapter 5 provides a statistical summary and data implications for the administrative and education practices and policies. Conclusions are drawn based on the research question: What variables on the NJ School Report Card have a significant influence on the NJ ASK 5? Also offered are suggestions for future research.

Literacy, 55.8% of all students scored at the Proficient level and 4.1% scored at the Advanced Proficient level. The mean LAL scale score was 204. In Mathematics, 48.6% of all students scored at the Proficient level and 27.8% scored at the Advanced Proficient level. The mean scale score in Mathematics was 225.5.

The NJ ASK 5 that is the focus of this research was administered between May 11-14, 2009. Of the 103,339 students enrolled in New Jersey public schools, 102,076 students received valid scale scores in Language Arts Literacy, and 102,382 in Mathematics. The mean scale score in LAL was 209. For LAL, 57.1% of all students scored at the Proficient level and 8.7% at the Advanced Proficient level. In Mathematics, the mean scale score was 227.9. In Math, 45.3% of all students scored at the Proficient level and 32.1% at the Advanced Proficient level (NJDOE, 2009).

The 2010 Grade 5 NJ ASK assessment results showed slight improvement in the Language Arts component with 57.1% of all students scoring at the Proficient level and 8.7% scoring at the Advanced Proficient level. The mean scale score in Language Arts Literacy was 209, a 5 point increase. For the Mathematics component, 45.3% of all students scored at the Proficient level and 32.1% scored at the Advanced Proficient level. The mean scale score in Mathematics was 227.9, a minor improvement (2.4 points) over 2008.

Although slight improvements have been noted, the achievement gap between economically disadvantaged students and non-economically disadvantaged students remains sizeable. However, the gap was nearly erased by the use of small class-size (15-17 students) as compared to the average 22-24 students in the Tennessee Star Research (Achilles, 1999). In 2008, only 36.1% of economically disadvantaged students scored at

or above Proficient in LAL while 70.1% of non-economically disadvantaged students scored at or above Proficient. Mathematics scores followed with 59.4% of economically disadvantaged students scoring at or above Proficient. For non-economically disadvantaged students, 83.8% scored at or above Proficient. The achievement gap did not diminish the next year. In 2009 43.3% of economically disadvantaged students scored at or above Proficient in LAL while 76.4% of non-economically disadvantaged students scored at or above Proficient. For 2009 Mathematics, 61.6% of economically disadvantaged students scored at or above Proficient while 84.7% of their non-economically disadvantaged counterparts achieved Proficiency or Advanced Proficiency.

The New Jersey School Report Card

The NJ School Report Card, although a separate entity, has been used in school comparisons both in conjunction with NJ ASK and on its own. According to the New Jersey Department of Education (2009), the function of the NJ School Report Card is “to increase school- and district-level accountability for educational progress by communicating useful information to members of the public to be used in measuring how well their schools are doing.” The Report Card had its germination in 1989 to much criticism (Hanley, 1989). A more intricate Report Card, mandated in 1995 by the New Jersey State Legislature, has its foundation in the seminal Coleman Report of 1966. The Coleman study was born out of the 1964 Civil Rights Act and aimed at explicating the disparity between Black and White educational outcomes. Then the second largest social science research project in history, it encompassed 600,000 children in 4,000 U.S. schools. The final product of this research was The Equality of Educational Opportunity Report (known widely as the Coleman Report). The findings shocked many, as the

disparity in funding between schools was not as large as anticipated. Secondly, researchers found that funding was not closely associated with achievement; more predictive was family SES status. Additionally, school peers mattered; attending school with middle-class peers was an advantage, attending school with lower-class peers, a disadvantage. The report states, "Schools bring little influence to bear upon a child's achievement that is independent of his background and general social context" (Coleman et al., p. 325).

The NJ School Report Card attempts to encompass the findings of the Coleman Report with its "District Factor Group" ratings and measures of minority, ESL, and divergent student groups. Additionally, the NJ School Report Card adds further variables, some of which have been shown to have an effect on student outcomes, such as student attendance and student mobility.

Most likely due to the multivariate nature of the NJ School Report Card, there has been little research on individual variables effect on NJ ASK scores. The exception is the DFG variable. Michel (2004) found that DFG was a significant and by far the strongest predictive factor on NJ ASK 4 scores. In a study conducted by Tienkin (2008a), a perfect Spearman Rho correlation was found between district test scores and district SES. No research has been found regarding the effect of NJ School Report Card variables on NJ ASK 5, a void this researcher hopes to fill.

Regardless of the known research regarding SES and educational outcomes, the NJ School Report Card gives education professionals other variables to examine, an important consideration considering that under NCLB adequate yearly progress is achieved only if *all* students meet state standards, inclusive of subgroups. Therefore, it is

apparent that education professionals need to seek methods of improving *all* scores. One mode of increasing scores includes targeting areas that have been statistically proven to have an influence on NJ ASK 5. Therefore, the goal for this research is to summarize, statistically review, and interpret the influence of the NJ School Report Card variables on NJ ASK 5 achievement outcomes.

Organizational report cards have become increasingly common for institutions that provide client services (Gormley & Weiner, 1999). Schools, hospitals, government departments, daycare centers, and HMO's have all been held accountable via some form of report card. As Gormley & Weiner (1999) explained, report cards have become "...popular policy instruments because of the growing importance of consumer choice and because of the growing impatience of public policymakers with the low quality and high cost of social service delivery" (p. 4). School report cards are intended to inform education stakeholders of school performance and characteristics.

Even though the use of school report cards has become more prominent, research supporting their efficacy as an evaluation tool has been scarce. School performance is complex, the minimal inputs on school report cards are not. In the 1992 Tennessee Report Card on Schools, researchers sought to find the value of the instrument (Bobbett, French, Achilles, McNamara, & Trusty, 1992). The Tennessee Report Card provided eight categories of information for study:

1. County per capita income
2. Average professional salary
3. Expenditures per pupil
4. Average daily membership

5. Percentage of students in attendance
6. Percentage of oversized classes
7. Percentage of free lunch and reduced lunch eligibility
8. Percentage of professionals on Tennessee's Career Ladder I & II

Researchers found that the Tennessee Report Card variables accounted for only 25% of student outcomes, not the 75% majority of student outcomes. Furthermore, "Good inputs to the educational process (money, small classes, good community, etc.) do not guarantee high student achievement" (Bobbet, French, Achilles, McNamara & Trusty, 1992; p. 25). Tennessee changed its testing in 1991 and added more facets to its school report card. Bobbett, Achilles, & French (1993) analyzed the new data. The results of the second study remained similar to the first, save for the significant influence on student outcomes of student attendance and per pupil expenditure.

Using a school report card from a Southern state, Mathews (2001) found that daily attendance, per pupil expenditure (as in the aforementioned studies), ability/achievement comparison index, and average percentage of teachers with higher degrees were predictors of higher school academic status. Intriguingly, SES was found an important moderating variable between the report card predictors and achievement; the variables had a substantially greater effect in low SES schools (Mathews, 2001).

Miller-Whitehead (2000) examined Alabama's 2000 State Education Report Card. Analyses were conducted for 61 city and 67 county school systems. The variables included the following:

- number of students
- percentage of students on free and reduced-price lunch

- average daily attendance
- per-pupil expenditure
- drop-out percentages
- school-system revenue sources
- percentage of school employees with advanced degrees

Miller-Whitehead (2000) found that SES was highly correlated with achievement.

Indicators shown to positively affect achievement were higher faculty education, increased funding, and high attendance. A negative correlation was discovered between the percentage of teachers with bachelor's degrees and achievement (Miller-Whitehead, 2001). Bobbett, French, Achilles & Bobbett (1995) analyzed The Texas State Report Card indicators' influence(s) on student outcomes as assessed by the Texas Assessment of Academic Skills and the College Admissions Tests. SES was found to be the greatest predictor of achievement. Attendance and teacher turnover rates were found to be significantly correlated with achievement. However, the authors cautioned that more comprehensive information is needed to explain variance in educational achievement.

Focus for the Review

Although there is much research using NJ ASK scores and NJ School Report Card variables, few researchers use the data in tandem. The exception is the effect of DFG on NJ ASK scores, the strongest predictive factor on state testing achievement (NJDOE, 2006a). Compounding this is the plethora of existing research supporting SES as the strongest predictive factor on educational outcomes (Coleman et al., 1966). Research has been conducted pointing to the extreme sensitivity of New Jersey's standardized testing system to DFG. Tienkin's (2008a) analysis of state GEPA data found a perfect

Spearman's Rho correlation coefficient of 1.0 ($p \leq .001$) between GEPA results and DFG. Only one other piece of research was found regarding the effect of other factors on the NJ School Report Card for their relative influence on NJ ASK scores. Michel (2004) analyzed factors on the NJ ASK 4 with a focus on teacher credentials. No study has analyzed NJ School Report variables on NJ ASK 5, although fifth grade is often a pivotal year for students. Transitioning into middle school, NJ ASK 5 results situate the student in tracking systems that may persevere throughout his or her academic career.

To that end, any factor that can be manipulated to some degree that is listed on the NJ School Report Card will be analyzed for its contribution to variance in NJ ASK 5 test scores. These will include the categories of Student/Administrator Ratio, Student/Faculty Ratio, Faculty Attendance Rate, Faculty Mobility Rate, and Faculty and Administrator Credentials. The student variables that will be examined include Language Diversity, Limited English Proficiency, Student Attendance Rate, and Student Mobility. School environment variables that will be explored are Length of School Day, Instructional Time, Student/Computer Ratio, and Internet Connectivity. It is the goal of this study to aid education professionals in allocating limited resources to targeted variables that have been shown to affect NJ ASK 5 scores.

Review Method

Following the framework for scholarly literature reviews set forth by Boote & Biele (2005), online academic databases were used for accessing the literature reviewed for this chapter. ERIC, EBSCOhost, ProQuest, JSTOR, Academic Search Premier, and Google Scholar were all employed. Each variable was entered verbatim into the various databases with the keywords "achievement" and "elementary education" unless otherwise

noted under the individual variable. Due to the phrasing of the NJ School Report Card variables, using alternate phrasing was necessary in some instances due to the lack of research found. For example, the research on the Faculty/Staff Credentials variable was non-existent, therefore “Teacher Credentials” was substituted. Each instance of this type of occurrence is noted under the actual variable heading. Since each individual variable is discretely analyzed in this study, the literature review reflects that structure.

Criteria for Inclusion

A requisite for literature included in this chapter was that it must have been published in a peer-reviewed source. All studies had to be published in English but could have been carried out in other countries. Types of studies reviewed were experimental, quasi-experimental, meta-analysis, and non-experimental. Methods and design issues arose, as true experimental research was lacking for most of the variables explored. Quasi-experimental data and meta-analysis were more common. However, this placed a larger dependence on correlational studies.

The inclusion of non-experimental research was deliberate in this chapter due to the nature of education research. Johnson (2001) stated, “Nonexperimental quantitative research is an important area of research for educators because there are so many important but nonmanipulable independent variables needing further study in the field of education” (p. 3).

To enhance the quality of the study further, it was necessary to assess the validity of the studies to be examined. Internal validity deals with the causal inference of the independent variable on the dependent variable (Hinkle, Wiersma, & Jurs, 2002). If other variables could have accounted for the variation on achievement, the study was not used.

External validity speaks to the ability of the results to be generalized across settings, population, and time (Hinkle, Wiersma, & Jurs, 2002). Generalizing studies in education has proven precarious, as SES factors have a strong predictive value on student achievement. However, the studies that dealt with a particular population are noted and discussed under each variable.

The data analyzed were limited to time periods relevant to this research. Any study that met the aforementioned criteria between 1996 and the present was included. In 1996, New Jersey set forth the Core Curriculum Content Standards upon which the NJ ASK 5 is based. Additionally, 1996 saw an increase in standardized testing and studies relating to this phenomenon. Notable exceptions to the time frame include historical data for background and information purposes and seminal landmark studies. Adhering to the literature review framework set forth developed by Boote and Beile (2005), this scholarly work will provide much needed research on variables affecting outcomes on NJ ASK 5.

Limitations of the Review

The limitations of this study take into account the disparity between the NJ School Report Card variable definitions and the research related to said variable. The variables on the NJ School Report Card are often unique to the state and do not always correspond with key terms in the literature. In order to illuminate and account for these discrepancies, The researcher addressed such issues in detail under the affected variable. Some of these issues include aggregated variables, such as Faculty and Administrative Credentials. Almost all the literature regarding credential influence on student achievement focuses on teachers, since administrators do not have daily contact with the students. The variable "Length of the School Day" includes all time spent in school, not

just pedagogical time. The variable “Instructional Time” is also an aggregate measure that does not take into account student engagement time, a variable that has been shown to have an influence on student achievement. The NJ School Report Card’s “Enrollment by Grade Level” variable does not give accurate representations of district, school, and learning community sizes, variables demonstrated to have an influence on student achievement. Due to the lack of research on variables affecting NJ ASK 5, the literature extends into other standardized tests. No comparison of the varied standardized tests listed in the following studies to the NJ ASK 5 can be made.

Practical Significance of Existing Literature for K-12 Administrators

Each school year, administrators are faced with using decreasing budgets to maintain increasing gains on testing. Anywhere from \$19 to \$54 is spent per student each school year on these assessments (APQC, 2005; Donnell-Kay Foundation, 2007). This does not include the variety of test-preparation programs that have flooded the market in recent years. As stated above, the researcher found no literature specifically designed to address the needs of K-12 administrators regarding the NJ School Report Card and the NJ ASK 5. However, based on studies using other testing instruments, some generalizations can be garnered:

- **Faculty Mobility Rate**

High mobility rates are associated with underperforming schools and inexperienced staff. Its influence on standardized testing is negative. However, it is unclear if the actual mobility is the reason for lesser scores or if teacher inexperience is the culprit. This is an area that would benefit from further research. Generally, districts are best served when the faculty is not overly mobile.

- **Faculty Attendance Rate**

Teacher absenteeism has large fiscal consequences. It has also been shown to affect student performance, especially in math. Research is needed in this area that uses value-added measures and disaggregated data to see the subtle, individual effects. However, given the myriad of costs, teacher absenteeism should be minimized.

- **Faculty and Administrator Credentials**

The research regarding faculty and administrator credentials typically focuses on teachers. Having an advanced degree is not associated with higher test scores; however, having a subject-related degree has a positive influence on student outcomes. More recent research is needed on quality of degree, as no study made the distinction between higher and lower achieving teacher preparation programs.

- **Student/Faculty Ratio**

Student/faculty ratio is often represented in the literature as pupil/teacher ratio (PTR). Pupil/teacher ratio is not associated with increased achievement. PTR is a division problem often erroneously used interchangeably with class-size, an addition problem shown to have a positive influence on achievement.

- **Student Attendance Rate**

Student attendance rate is positively associated with higher achievement. Student absenteeism is also associated with higher dropout rates. Student attendance should be encouraged and examined closely, as it is an indicator for at-risk students. The research on this topic is well documented.

- Student Mobility

Student mobility is associated with lower achievement. Mobile students often have lower SES status. Coupled with discontinuity of instruction and low SES, mobile students are at an educational disadvantage. Programs that aid such students and their parents may lessen this effect. Further research is warranted on the reasons behind increased mobility. It may give means by which to help those families in need.

- Enrollment by Grade Level

This NJ variable serves as a proxy for school/district size. There is much research showing that smaller learning communities are a means to improve student outcomes. However, other research points to the economies of scale that allow larger schools to offer more, and thus the students perform better. For administrators, this variable is dependent upon grade level, district size, and school size.

- Average Class-Size

Research on class-size has shown that smaller classes increase educational outcomes, especially at the K-3 level. When possible, class-sizes should be kept small, especially in the early grades where the effects are the greatest. The class-size research is some of the largest scale, empirical research in education.

However, experimental repetition might bolster its influence.

- Length of School Day

Research on school-day length yields mixed results, with zero to moderate effects on student outcomes. The added time should be slated for academic engaged time

(see below), as non-instructional time does not increase student outcomes.

Research on school days is almost always done in a private school setting, making it hard to generalize to public education. A school-day-lengthening experiment in public education is warranted.

- **Instructional Time**

Increased instructional time positively affects student outcomes when it is engaged time. Students need to be actively engaged for noticeable changes in student outcomes. Research on what engaged time looks like needs to be addressed.

- **Free- and Reduced-Lunch**

The extant literature on this topic is abundant. Socioeconomic Status (SES) affects a child's achievement more than any other factor. Many education studies have used free- and reduced-lunch as a proxy for SES, and have supported the fact that free- and reduced-lunch eligibility negatively affects achievement.

Methodological Issues with Existing Literature

Due to the plethora of variables included on the NJ School Report Card, each body of research needs to be individually analyzed. Therefore, under every heading below, methodological issues are addressed for that particular variable. Generally, with the exception of the class-size research, it was difficult to find true experimental research for any of the variables. To overcome this, the researcher chose to include non-experimental and quasi-experimental research, a common practice in education literature. Johnson (2001, p. 3) explained that although true experimental studies are best for determining cause and effect relationships, "the fact remains that educational researchers

are often faced with a situation in which neither a randomized experiment nor a quasi-experiment (with a manipulated independent variable) is feasible.”

Additionally, most studies employed aggregated regression, a method that may overlook subtle but important individual changes. For some variables, studies used input/output functions when a value-added measure approach would have been more meaningful and may have produced different results. There were instances where researchers did not control for necessary extraneous variables, thus leading to a confounding variable possibility.

Terminology and different definitions for the variables became an issue when conducting the review. For example, student-faculty ratio in New Jersey is calculated using all staff excluding those at the administrative level. This variable in the extant research typically includes all staff including administration. Therefore, for each variable, the specific issues inherent in its body of research were explored individually.

Standardized-testing Literature

Standardized testing had its origins in China when potential state employees were asked to give answers to Confucian teachings during the Han Dynasty (Fletcher, 2009). The Socratic Method similarly assessed learning using essays and discourse. The Industrial Revolution, with its need for factory workers, was the springboard for the standardized testing movement. Taylor (1911) founded the idea of “scientific management,” in which factory workers were incentivized and matched by ability to perform a specific job, maximizing efficiency. This notion carried over to the U.S. military at the beginning of World War I. Consulting with the American Psychological Association, a series of standardized tests, known as the Army Alpha tests, were

implemented to match recruits with appropriate positions within the military (Popham, 2001).

The work of Alfred Binet and Theodore Simon aimed to assess the capacities of children. Its current form, the Stanford Binet IQ test, is used to this day.

The omnipresent SAT (Scholastic Aptitude Test) was generated to screen college applicants more quickly with its multiple-choice format in 1926. Today, more than two million college applicants take the test each year (College Board, 2011).

Under Lyndon Johnson's presidency, new social reforms were made that would have an influence on public education and would inadvertently increase reliance on standardized testing. His "War on Poverty" included data concerning the vast differences between Whites and non-Whites in the areas of education, employment, healthcare, and housing (Amaker, 1988). Thus, the Elementary and Secondary Education Act (ESEA) of 1965 was signed into law; PL 89-10 (ESEA, 1965). Title 1 funds were given to schools and districts that had large constituencies of poverty-level students. The Act was continually reauthorized, and by the 1990s, funds reached over \$6 billion yearly (Solley, 2007). Those funds came with provisions concerning student achievement, and an evaluation tool was necessary. Therefore, the Army Alpha tests were modified for student use (Solley, 2007).

A Nation at Risk, published in 1983, sealed the fate of public education and its reliance on high-stakes testing. The report was found to be flawed by Stedman (1994), who used the data from the report and found that although overall scores had declined, the scores of subgroups had actually increased. Regardless, the report's impact remained tremendous. New Jersey got into the world of high-stakes testing relatively early. In

1975, New Jersey passed the Public School Education Act (PSEA), requiring all New Jersey students meet minimum proficiencies to function in society as tested by the *Minimum Basic Skills* (MBS) testing.

The New Jersey Board of Education adopted the Core Curriculum Content Standards (CCCS) in 1996. The CCCS listed the skills and competencies a student should have upon completion of a New Jersey education. New Jersey was soon administering a triad of statewide tests: the Elementary School Proficiency Assessment (ESPA) in Grade 4, the Grade Eight Proficiency Assessment (GEPA), and the High School Proficiency Test (HSPT) in Grade 11. It is the CCCS that the current tests, NJ ASK, use as their criterion-referenced bases.

The No Child Left Behind Act in 2002, a reauthorization of the ESEA; PL 89-10, made accountability and standardized testing virtually synonymous. The federal government, in an unprecedented move, required yearly testing of all public school students in certain grades (Rogers, 2006).

Under President Obama, in 2009, the American Recovery and Reinvestment Act (ARRA) was signed into law. Commonly referred to as the recovery or stimulus act, it includes a mandate to “expand educational opportunities” (ARRA, 2009). The plan’s reform elements include standards and assessments as one of its key ideals. Standardized testing has become the ideal in American education today.

High-stakes Testing

The term *high-stakes testing* is controversial (Marchant, 2004; Raymond & Hanushek, 2003; Solley, 2007). High-stakes tests are usually national or state-wide standardized assessments with rewards and/or punishments contingent upon outcomes

(Marchant, 2004). However, it may be important to have a clearer notion of this subject when garnering research for the literature review. For this purpose, the high-stakes testing definition set forth by Tienkin (2008a) was used. For a test to be labeled high-stakes, three conditions must be present:

1. A significant consequence related to individual student's performance
2. Test results must be the basis for the evaluation of quality and success of school districts
3. Test results must be the basis for the evaluation of quality and success of individual teachers

With the federal government's, state's, district's and newspapers' reliance on NJ ASK scores, the NJ ASK series of tests fit under the label of high-stakes testing. The NJ ASK 5, occurring at the pivotal transition to middle school, is no exception. It is often used to place students into ability-leveled programs. This practice is not supported by the literature (Marchant, 2004). However, Tienkin (2008a) found that 55% of New Jersey administrators made decisions regarding student placement predominantly on state test results.

Whether high-stakes testing actually increases student achievement is a question that some researchers have sought to answer. Amrein and Berliner (2002) used the National Assessment of Education Progress (NAEP) results to analyze the 28 states with the highest-stakes contingent upon testing. Some of the states had monetary awards attached to high performance and/or sanctions or state takeover for those underperforming. Based on the individual state's testing mechanism, scores had increased significantly. The researchers felt that such gains lacked authenticity.

However, using the NAEP data, the researchers found that the increased use of standardized testing did not have a significant effect on achievement (Amrein & Berliner, 2002). However, this non-experimental study lacked a control group. Rosenshine (2003) seized upon the study's weakness, generated a comparison group of states, and reanalyzed the data. It was concluded that states with consequences attached to their testing outperformed the comparison group on the NAEP tests.

Amrein-Beardsley and Berliner (2003) reexamined their study in response to Rosenshine's work. Adding the comparison group, Rosenshine's conclusions were validated. However, Amrein-Beardsley and Berliner (2003) maintained that part of the increase was because some administrators were preventing certain students from taking the NAEP tests.

Using the same classification system as Amrein and Berliner (2002), Carnoy and Loeb (2002) attempted to add the strength level of accountability for each state to the mix on a scale of 0 = least pressure to 5 = greatest pressure. The researchers found that for eighth grade African American and Hispanic students, a gain of 5 percentage points was garnered for every two-step increase in level of accountability.

Nichols, Glass, and Berliner (2006) analyzed the relationship between high-stakes testing pressure and achievement across 25 states using a state portfolio system that displayed the accountability pressure for each state. From this, the states were put on a pressure continuum and regression and correlation analyses were conducted with achievement. The researchers found no relationship between pressure and performance on NAEP fourth and eighth grade math tests. In addition, no relationship was found between pressure and NAEP reading scores for any grade level or ethnic subgroup. A

weak causal relationship was found between pressure and fourth grade math achievement and the math achievement of some ethnic subgroups.

Adding to the controversial research on high-stakes testing and achievement, Hanushek and Raymond (2005) used the NAEP data to determine that “the introduction of consequential accountability systems has a clearly beneficial influence on overall performance.” However, the same accountability systems were found to widen the Black/White achievement gap. Clearly, the influence of high-stakes testing is in need of further research. However, it should be noted that the inherent flaw in the NAEP data is the exclusion of students, typically classified ones. A clear picture may be garnered only from data that are inclusive of all students.

Based on the extant literature, it seems that high-stakes testing and its consequences will not, by itself, lead to the successful bridging of existing achievement gaps (Lee & Wong, 2004).

Socioeconomic Status

Beginning with Coleman et al. (1966) SES was identified as the greatest predictor of student achievement. *The Equality of Educational Opportunity Report* remains a landmark in education research. In 1966, the USDOE commissioned the report to shed light on the fact that minority and poverty-level students were greatly underperforming due to lack of resources. The researchers’ findings, however, demonstrated that SES was the best indicator of achievement, not schools or teacher quality. A seminal work, this study is one of the most cited in education research.

The Coleman Report has held up to rigorous evaluation. In a reanalysis of the Coleman data entitled *Inequality: A Reassessment of the Effects of Family and Schooling*

in America, the research was corroborated (Jencks et al., 1972). The Jencks' reanalysis found that schools have little effect on the gaps between rich and poor and more- and less-able students. Student achievement was most influenced by SES, and there was little evidence that education reform could improve student achievement. Averch, Carroll, Donaldson, Kiesling, and Pincus (1974) discovered that SES was the greatest predictor of student achievement. Smith (1972) reviewed the Coleman report with a focus on regression coefficients and came to similar conclusions as Coleman. Hanushek and Kain (1972) also concluded that resources have little effect on student achievement when SES was controlled for. Jencks et al. (1972) found that SES was such a strong predictor of student achievement that unless SES issues were addressed explicitly, education institutions will always be inequitable.

White (1982) conducted the first meta-analysis of the influence of SES on student achievement. He found SES to be an aggregate concept comprised of many factors in addition to income, akin to New Jersey's DFG index. When taken in the aggregate, SES accounted for approximately 75% of the variation in student outcomes. In a replica meta-analysis conducted with research dating from 1990-2000, Sirin (2005) found only a slight decrease in said variation.

Coleman (1988) pointed out that SES affects not only academic achievement but a host of variables that influence students. For example, geographical segregation due to economics found students in lower SES categories tend to attend districts with lower per pupil expenditures (Sirin, 2005). Additionally, the notion of "social capital," the relationships between schools, community, and individuals that support students, decreases in tandem with SES. It has been noted that this economic (and resulting

academic) stratification can be detected across generations; “the children of economically disadvantaged parents lack access to resources and opportunities in ways that undermine their long-term social mobility (Crosnoe & Cooper, 2009; p. 3).

Life experiences, particularly early childhood ones, are different for varying levels of SES. Hart and Risley (2003) conducted a clinical language intervention program for an impoverished Kansas City preschool. The goal was to build language skills and compare the growth with a control group of university professors’ children. The researchers found that *all* children experienced a vocabulary boost; however, by kindergarten the effects of the vocabulary acceleration on the lower SES students had diminished. The researchers then ambitiously took on the task of pinpointing when the discrepancy of vocabulary trajectories started. They observed 42 families monthly to determine what went on in homes from the time children were 7-9 months old to 3 years old. They “observed the 42 children grow more like their parents in stature and activity levels, in vocabulary resources, and in language and interaction styles,” and “86 percent to 98 percent of the words recorded in each child’s vocabulary consisted of words also recorded in their parents’ vocabularies” (Hart & Risley, 2003, p. 3). The higher SES families had higher vocabularies and higher word growth; the converse was true for the lower SES children. The researchers estimated that, weekly, the average child in professional families had 215,000 words of language experience, the average child in a working-class family had 125,000, and the average child in a welfare family had 62,000 words. Moreover, the rate of vocabulary growth at age 3 was strongly associated with third grade scores on the Peabody Picture Vocabulary Test, Revised (PPVT-R) and the Test of Language

Development 2: Intermediate (TOLD).

SES is blatantly a factor in education achievement and is reflected in the research. Typically, the measure of poverty used in education research is the percentage of children eligible for free- and/or reduced-lunch (Kurki, Boyle & Aladjem, 2006). This proxy for SES is readily available for all states. It is included in this research to match the extant data. New Jersey uses a composite statistical index that models the socioeconomic status of a district as a proxy for SES. It encompasses seven indices: percentage of population with no high school diploma, percentage with some college, occupation, population density, income, unemployment, and poverty (NJDOE, 2008).

The NJ ASK 5 has been shown to be particularly vulnerable to SES (Tienken, 2008a). The research is clear: SES matters.

NJ School Report Card Variables

Staff Information

Coleman et al. (1966, p. 325) negated the relative influence of teachers and schools on student achievement, stating they “bring little influence to bear upon a child’s achievement that is independent of his background and general social context.” However, SES is not a factor that can be controlled by administrators. Ergo, looking at information regarding school staff that may influence achievement is warranted.

Faculty Mobility Rate

The faculty mobility rate represents how often faculty come and go during the school year. It is calculated by dividing the number of faculty who entered or left employment after October 15 by the sum of faculty on the same day. The implications of faculty mobility on the flow of the school year, teacher-student relations, and curriculum

delivery have been documented. The Alliance for Excellent Education (2008) found that teachers whose students have higher test score gains have lower rates of turnover.

In the literature, faculty mobility and teacher persistence are sometimes used interchangeably. However, teacher persistence typically denotes teachers leaving the profession, not merely switching assignments. Therefore, although related terms, the two have slightly different implications and uses in the literature. The teacher persistence variable is most often used in studies showing a relationship between teacher attrition and school environment (Goldhaber, Gross, & Player, 2011).

For two decades, the National Center for Education Statistics (NCES) has been recording teacher mobility information. Typically, attrition occurs most often after the first three years of teaching (Kaiser, 2011). For the time encompassed in this study, of the beginning teachers who began teaching in public schools in 2007 or 2008, about 10% were not teaching at all in 2008-09. In 2009-10, 12% were not teaching. A further 10% percent were teaching in a different school in 2009-10 than the previous school year.

Mobility rates are significantly higher in poorer schools (Alliance for Excellent Education, 2008; Allensworth, Ponisciak, & Mazzeo, 2009; Planty, Hussar, William, & Snyder, 2008). For the year 2003-2004, the United States public schools saw a teacher turnover rate of 21% for high poverty districts (75% or more eligible for free lunch) vs. 14% for low poverty schools where 15% or less of the student population was eligible for free lunch (Planty, Hussar, William, & Snyder, 2008). A statistical analysis of new teachers in Georgia found that educators were much more likely to exit schools with large proportions of minority students (Scafidi, Sjoquist, & Stinebrickner, 2007).

A plethora of possible reasons for faculty mobility have been set forth:

unsatisfactory working conditions, student behavioral issues, poor leadership, and lower compensation rates (Allensworth, Ponisciak, & Mazzeo, 2009). However, the principal issue plaguing districts with high mobility rates is the inexperience of teaching staff. Across demographics, researchers found that teachers with three years or less experience had the highest turnover rates (Alliance for Excellent Education, 2008). Research indicates that schools with high turnover are more likely to have inexperienced, less effective teachers. Faculty turnover studies in New York City (Boyd, et al., 2007), North Carolina (Goldhaber et al., 2006) and Texas (Hanushek & Rivkin, 2004) have shown that more effective teachers tend to stay in their schools the longest. However, the fact that inexperienced teachers leave the classroom more frequently should highlight that replacement teachers tend to be less experienced, causing cyclical turnover of less-practiced educators.

In a large-scale empirical study of the Chicago Public Schools, Allensworth, Ponisciak, & Mazzeo (2009) analyzed the turnover rates of 35,000 teachers in 538 elementary schools and 118 high schools. They found that in a typical Chicago Public School, approximately half of the teaching staff turns within five years. This instability undermines district long-term initiatives and influences staff collaboration.

Faculty mobility rate's influence on the standardized testing is less documented (NYCBE, 1992). When amalgamated with teacher absence, mobility demonstrates an influence on student achievement. One Harvard study found that for every 10 days of teacher absence (inclusive of mobile teachers who left prior to the end of the school year), student math achievement was reduced 3.3% of a standard deviation (Miller, Murnane, & Willett, 2007). Keeler & McCall (1972) analyzed data from San Diego

Public Schools and found teacher movement to be negatively correlated with reading ability. The New York City Board of Education (1992) quantitatively looked at teacher mobility for correlation to student performance (above the set student reference point for passing) on the state's Regents Testing. It was determined that teacher mobility was weakly but significantly related to student outcomes. On the elementary level, Grade 3 reading demonstrated the greatest negative influence of high teacher mobility ($r = -.27$).

Faculty Attendance Rate

The faculty attendance rate is the average daily attendance for faculty. It is computed for all faculty members by dividing the total number of days present by the total number of contracted days. U.S. public school teachers, on average, are absent 5% to 6% of the days of a school year (Ballou, 1996; Podgursky, 2003). The rate of teacher absenteeism has been found to be higher in the following school models: elementary, low-performing, economically disadvantaged, minority, high student populations (257,000+), and schools where teachers are required to call the principal directly to report an absence (Pitkoff, 1993).

In the literature, the term *faculty* is more closely associated with college educators, not elementary teachers. Therefore, the variable *teacher attendance* was used to obtain results that were focused on the elementary school years.

Generally associated with absenteeism is less effective and discontinuous instruction. In a landmark piece, Olsen (1971) demonstrated that substitute teachers are significantly less effective than are regular teachers. In thirty-seven states, districts do not require a bachelor's degree for an individual to become a substitute teacher. In New Jersey, 60 college credits or greater are required for substitute certification.

Researchers who explore teacher attendance rates as a predictor of student achievement have yielded mixed results. The New York City Board of Education (2000), after controlling for demographics, performed an analysis of the elementary reading and math Regents scores. Researchers found that teacher attendance had no significant influence on student outcomes. According to econometric analysis of data from 700 New York state school districts, Ehrenberg, Ehrenberg, Rees, & Ehrenberg (1991) found that teacher absenteeism was not associated with lower test scores. These two studies used data aggregated at the district level and may have been unable to detect small but significant effects.

Woods & Montagno (1997) described the large financial costs incurred to the districts because of faculty absences, in addition to finding a negative correlation between teacher absenteeism and student achievement. The researchers looked at Grade 3 students in Indiana and Wyoming. Researchers found that in classes where teachers had the greatest number of absences, individual standardized test scores of students were lowered, student rank in class was lowered, and overall school scores were down following frequent absences.

In contradiction, researchers used a value-added model to determine the effect of teacher absence on student achievement in North Carolina (Clotfelter, Ladd, & Vigdor, 2009). The researchers' findings imply that a teacher with ten additional sick days in a year is associated with a reduced math test score of about 2.3% of a standard deviation and a reduced reading score of about 1% of a standard deviation. However, the simple least-squares model employed may have inflated the correlation. In an urban Northern California school district, Miller, Murnane, & Willett (2007) controlled for teacher and

school variables. They found that students' math achievement was reduced 3.3% of a standard deviation for every 10 days of their teacher's absence. No significant influence was found for reading scores.

Faculty and Administrator Credentials

The credentials of school faculty members are identified on the NJ School Report Card as percentages based on degree levels (bachelor's, master's, or doctoral) of the staff. The relationship between teacher inputs and student outputs first came into prominence with the influential Coleman Report (Coleman et al., 1966), which found a weak correlation between the two measures. Improving teacher quality has been a forefront initiative at the district, state, and federal levels since the 1996 publication of the Hunt Report that proclaimed, "A caring, competent, and qualified teacher for every child is the most important ingredient in education reform."

However, the NJ report card aggregate credential variable presents a quandary: most of the literature regarding credential influence on student achievement focuses on teachers. NJ's aggregate variable includes all staff, which could result in a skewing of the results in favor of those districts with higher administrative numbers. Administration certification usually requires higher education attainment and extended coursework). The research on teacher credentials on student achievement is voluminous; the credentials of other faculty's influence, sparse.

Yet, the NJDOE and USDOE both advocate, in policy, the notion that teacher credentials have an influence on student achievement. First, prospective educators must become certified in their state, which typically requires college preparation and Praxis testing. The majority of new teachers (85%) entering the field of education today are

graduates from traditional collegiate teacher preparation programs holding standard certificates (Boyd, Goldhaber, Lankford, & Wyckoff, 2007; USDOE, 2009). Secondly, the USDOE (2002) and NJDOE require that all core academic teachers (i.e., English, reading or language arts, mathematics, science, foreign languages, government, economics, history, and geography) be *highly qualified*. The USDOE classifies "Highly Qualified Teachers" (HQT) as those that "have state certification (which may be alternative state certification), hold a bachelor's degree, and have demonstrated subject area competency" (p. 19). The highly qualified requirement was "to help ensure that all children have the opportunity to obtain a high-quality education and reach proficiency on challenging state academic standards and assessments" (p. 13).

The NJ School Report Card solely makes distinction in credentials based on degree held (Bachelor's, Master's, Doctorate), an out-of-classroom factor. Hanushek (1986) performed a meta-analysis of education productivity studies that measured teacher credentials by degree. It was stated that there is "no strong evidence that teacher education . . . [has] an expected positive effect on student achievement" (p.1142). In a later study using data from the UTD Texas Schools Project, Rivkin, Hanushek, and Kain (2005) attempted to find school and teacher effects that influenced achievement. Three cohorts of 200,000+ students were analyzed from Grades 3 or 4 to Grade 7. The Texas Assessment of Academic Skills (TAAS) reading and mathematics sections were used. Rivkin et al. (2005) found that there was no evidence that a master's degree improved teacher effectiveness or student achievement.

In the Hanushek and Rivken analyses, as well as the NJ school report card variable, there is no mention of degree relevance to subject(s) taught. This data has

proven to be significant by Harold Wenglisky (2000) for its respective contribution to student achievement. Wenglisky conducted a study using eighth grade data from the NAEP (National Assessment of Education Progress). He found that only those educators who majored or minored in their subject area had a positive influence (roughly 40% of a grade level) on student achievement. Using NAEP data from 1998, Johnson (2000) found that in reading and math, Grade 8 students whose teachers held an advanced degree in education, underperformed peers whose teachers held an advanced degree in English or a bachelor's/advanced degree in math or science. Similarly, Goldhaber and Brewer (1996) analyzed data from the National Educational Longitudinal Study of 1988, which allowed the researchers to link students to specific teachers. The analysis suggested that only subject-matter-specific training resulted in increased student performance. In a meta-analysis of 16 studies highlighting math and science teacher training, Blank and de Alas (2011) found a positive relationship to math student achievement. The results displayed consistent positive effect on gains in student achievement in mathematics from teacher professional development in mathematics education.

Michel (2008) sampled 888 New Jersey public schools and conducted an analysis to determine which variables were the greatest predictors of NJ ASK 4 scores. After controlling for SES, Michel found that the greatest predictor variable on NJ ASK 4 Language Arts Literacy and Mathematics was teachers holding a master's degree or higher.

In the future, the NJ School Report Card variable of "Faculty and Staff Credentials" may increase its predictive value by using a value-added measure. Sanders & Rivers (1996) used the Tennessee Value-added Assessment System (TVAAS) database to track

student math achievement longitudinally for three years (Grades 3-5) in two of the state's largest districts. The researchers placed teachers on an effectiveness spectrum (quintiles 1 = lowest, 5 = highest). The results were dramatic: those students afforded Level 5 teachers for all three years had a mean score on math achievement tests 50 points higher than their peers. The research also suggests that the residual effects of prior ineffective teachers are measurable in later student achievement scores. No differences in response were discovered across student ethnicities.

Nye, Konstantopoulos, and Hedges (2004) conducted a study involving 79 Tennessee elementary schools. Students were randomly assigned to classes controlled for SES, achievement, class-size, ethnicity, gender, and aides in classroom. Using an efficacy survey, teachers were rated on a percentile scale (25th percentile = not so effective, 50th percentile = average, 75th percentile = effective, 90th percentile = very effective). The findings suggested that having a 75th percentile teacher over a 25th percentile teacher would raise achievement by over one-third of standard deviation (14 points in reading, 18 points in math).

Student-Faculty Ratio

The NJ School Report Card variable "Student-Faculty Ratio" is calculated by dividing the reported October school enrollment by the combined full-time equivalents (FTEs) of classroom teachers and education support services personnel assigned to the school as of October of the school year (NJSRC, 2009). This variable is unique to New Jersey in the literature. The variable takes into account only education support personnel and teachers, not entire staff including administration, as is typical in the research. The New Jersey variable is, ergo, not accurately reflected in current education literature. To

further compound the dearth of research, student-faculty ratios typically become prevalent in post secondary research.

With its emphasis on support personal and teachers, pupil-teacher ratio (PTR) is the closest documented variable to New Jersey's student-faculty ratio in the extant literature. PTR is the number of students in a school or district compared to the number of teaching professionals (McRobbie, Finn, & Harman, 1998). Counselors, specialists, etc., can be counted in this number. PTR is often erroneously confused with class-size, confounding the research (Achilles, Sharp, & Nye, 1998). The National Center for Education Statistics cite the average PTR for a United States public elementary school in 2008 was 15.3. By comparison, the average class-size in 2007–08 was 20.0 pupils for public elementary schools (Chen, 2010). Using PTR data as a proxy for class-size may be improperly dismissing the positive influence of decreased class-size on student achievement.

This practice becomes particularly critical when considering the school experiences of minority students, students of low socioeconomic status (SES), and limited-English-proficiency (LEP) students who have demonstrated highly positive achievement gains from being in small classes in early grades (Word et al., 1990) when compared to the gains of other students. Indeed, when looked at simultaneously, class-size is often shown to have a statistically significant influence on student achievement, whereas PTR does not (Achilles, Sharp, & Nye, 1998; Boozer & Rouse, 1995).

Many class-size reduction initiatives have taken place, including the Star Experiment in Tennessee and Wisconsin's SAGE (Student Achievement Guarantee in Education). However, both of these initiatives show positive results for decreasing class-

size, not pupil teacher ratio. Therefore, these programs are highlighted in the section for the “average class-size” variable.

Student Information Variables

Student Attendance Rate

Student attendance is a factor that is associated with higher achievement. The NJ School Report Card measures this rate without making a distinction between types of absence (excused or unexcused).

Chronic absenteeism is particularly detrimental to learning outcomes and occurs when a student misses more than 11% of the school year (Chang & Romero, 2008). After a national data analysis, the researchers found that chronic absence in kindergarten is associated with lower academic performance in first grade for all students, especially Latino children. Betts, Zau, and Rice (2003) found the number of days a student missed school to have a strong negative influence on achievement gains in math and reading.

Analyzing publicly available student data in Ohio, Roby (2003) found moderate positive relationships between student attendance and student achievement on the Ohio State Proficiency Exam administered in fourth, sixth, ninth, and twelfth grades. In the fourth and sixth grade subgroups, school attendance accounted for 32% and 29%, respectively, of the variance in student achievement. Also using data from Ohio, Sheldon (2007), affirmed that reading and mathematics test results were high and negatively correlated to student absences.

In Louisiana, Crone (1993) analyzed school attendance for its relationship to The Louisiana Educational Assessment Program (LEAP) given to Grades 3, 5, and 7 and Graduation Exit Exams (GEE). Crone (1993) found that attendance was a strong

predictor of student performance across grade levels on LEAP ($r^2=.66$). Attendance was further found to be the strongest predictor variable for the GEE ($r^2=.70$).

In Broward County Public Schools in Florida, Clement (2006) examined student absenteeism longitudinally from 1998-99 through 2003-2004 for its influence on the Florida Comprehensive Assessment Tests (FCAT). In this study, excused absences and unexcused absences were demarcated. No important relationship between excused absences and performance on the FCAT was detected. However, unexcused absences were found to have a negative influence on FCAT scores.

Noting a lack of empirical research on the relationship between individual attendance and achievement, Gottfried (2010) used a quasiexperimental design to assess attendance and achievement effects as measured by GPA and standardized reading and math test scores. This population was approximately 86,000 students from 200 urban Philadelphia elementary and middle schools. The researcher found that students with higher attendance levels had higher GPAs and test scores even in the early school years.

In a 2011 California study, 640 students' attendance records were looked at and compared to local school readiness measures and Grade 3 reading proficiency (Applied Survey Research, 2011). Students who missed 10% of their kindergarten and first grade years, scored, on average, 60 points below their peers in reading and 100 points on math on the California Standards Tests.

Today, researchers postulate that the positive influence of school attendance on academic achievement may be stronger than historically thought (Johnston, 2000, Lamdin, 1996). Over time, chronically absent students tend to increase the pattern of absenteeism throughout their academic career and are more likely to drop out of high

school (Ensminger & Slusarcick, 1992; Rumberger, 1995). Dekalb (1999) presciently wrote, "Absenteeism is detrimental to students' achievement, promotion, graduation, self-esteem, and employment potential."

Student Mobility

Due to the decreased consistency in instruction, student mobility rate is a variable that warrants accounting. Calculated by the total of new student entries and withdrawals during the year divided by the total first day official enrollment, mobility rates are often higher in less affluent districts. Inability to pay rent, seasonal work, and divorce are among the main causes for student mobility. Accordingly, poorer school districts and those with high minority populations tend to have higher transience (Rumberger, 2003). The results of this instability have been shown to affect student outcomes. The United States General Accounting Office (GAO) ascertains "within each income group, children who change schools frequently are more likely to be low achievers--below grade level--in reading than children who have never changed schools." Shuler (1990) analyzed the effect of student mobility on California Achievement Test scores in a Rochester public school. Comparing the transient students to the regular population, he found that math and reading scores of the transient population were significantly lower (with the one exception of Grade 5 reading). The New York City Board of Education (1992) quantitatively looked at student mobility for correlation to student outcomes on Regent's Testing. It was determined that student mobility was significantly related to all student outcomes with the exception of the earth science Regents exam. Examination of group means showed that schools with low mobility rates had an average of 83% to 94% students pass the Regents, while schools with high mobility rates had an average of 54%

to 78% passing rate. New York Public Schools, with the highest mobility rates, had the lowest test scores.

In North Carolina, four cohorts of third graders were followed longitudinally from 1997 to 2005 (Xu, Hannaway, & D'Souza, 2009). Researchers found that minority and disadvantaged students had the highest mobility rates. Mobility presented a negative influence on math achievement, reducing the expected score gains by approximately 1½%, a standard deviation. The same study found insignificant or marginally positive gains for reading scores, postulating that math is a more “school dependent” subject (Xu, Hannaway, & D'Souza, 2009).

Kerbow (1996) noted that frequent moving had a cumulative effect on student achievement, placing the student up to a year behind peers. (Kerbow, 1996). Hartman (2002) explains, “For students, the long-term effects of high mobility include lower achievement levels and slower academic pacing, culminating in a reduced likelihood of high school completion” (p. 112).

Enrollment by Grade Level

William J. Fowler, Jr., (1992) stated, “There is a natural predilection in American education toward enormity, and it does not serve schools well.” Research has illustrated that generally the states with the largest schools and school districts have the lowest school achievement and highest dropout rates (Jewell 1989; Walberg 1992). For this study, enrollment by grade level will serve as a means by which to ascertain if there is a significant difference between larger and smaller districts. This variable does not take into account how the enrollment is distributed, however, and therefore serves as a general guide to district size. Research on enrollment by grade level is non-existent; school size

and district size are related, but not exact, terms. Williams (1992) reviewed earlier research and found that smaller schools can be highly effective in providing quality education. Howley (1994) noted that smaller school size in impoverished communities increased high school graduation rates. Raywid (1999) defined a district size that was considered small: 350 students for elementary schools, 900 for high schools. These numbers are not by grade level; however, in a K-5 school, the average number of students would have to be less than 50 to be considered small enough to have significant influence on achievement.

Howley & Bickel (1999) conducted a four state study in which school size was analyzed for its effect on achievement across SES boundaries. In all four states (Montana, Ohio, Georgia, and Texas), smaller schools cut the variance in achievement associated with SES by 20% to 70%. In a study of Chicago's Public Schools, Walsey, Fine, Gladden, Holland, King, Mosak, & Powell (2000) found that small schools increase student performance, graduation rates, grades, and course completion.

The NJ School Report Card variable, however, is a confounding one, as enrollment by grade level may or may not have an effect on actual school/district size.

District Information Variables

Average Class-size

The NJDOE determines average class-size for Pre-K-8 by dividing the enrollment per grade by the total number of classrooms for that grade. According to the class-size literature, it is imperative to make the distinction between class-size and pupil-teacher ratio. The former is the number of students for whom a classroom teacher is accountable. The latter can be defined as the number of students per adults in a school (which can

include administrators, counselors, etc.). Pupil-teacher ratio has been used to minimize actual class-size in some research (Underwood & Lumsden, 1994). The NJ School Report Card uses the physical classroom space divided by the total number of students at the grade level to give a more accurate description of the number of students per classroom teacher. However, this number may be misleading if small instructional classes are counted. In the future, the NJDOE variable should adhere to the research standard of number of students for which each classroom teacher is accountable.

Glass and Smith published the pioneering and highly regarded *Meta-Analysis of Class-size Research* (Glass & Smith, 1979). This piece contended that in order to have a discernible difference in achievement, optimal class-size should be no more than 15 to 1. The Tennessee Project STAR research is the longest, best-controlled class-size reduction (CSR) research to date. Tennessee's Project Star commenced in 1985 and ended in 1990. Clearly evident in the experimental design is keen attention to variable control. The random sampling of 79 schools from across the state varied from inner city, suburban, rural, and urban. Grades involved were kindergarten through third grade with the optimal class-size being 13-17 students. Comparison schools were identified in addition to a within-school comparison. The only differential would be class-size; i.e., no special curriculum or materials were provided. Individual students and staff were followed throughout the four-year period. The principal analysis was constructed by post-test-only design. Analyses-of-variance procedures were employed. The longitudinal analysis used the same basic design in a repeated-measures form with the students who were in the smaller classes for three consecutive years (Achilles et al., 1990).

The results of this project showed a strong, statistically significant gain in

achievement for students in smaller classes across the board. The compelling class-size effect was evident across demographic lines. Anovas performed for race, gender, and a host of other variables corroborated the positive correlation between small class-size and achievement (Achilles et al., 1990).

Project Star provided the unique opportunity for researchers to follow students longitudinally. Interestingly, the greatest improvements were seen in kindergarten and first grade. Students who remained in small classes retained the statistically significant advances in achievement. A correlation between small class-size and reduced grade retention was also discovered (Achilles, Nye, Zaharias, Fulton, & Cain, 1996).

In 1996, California's implementation of CSR was far grander in scope. The policy was statewide and handed down to the school districts. All K-3 classes were mandated to reduce average class-size from 28 students to a maximum of 20. Therefore, it is difficult to glean information concerning the actual effect size of reduced classes, as no control groups were established and experimental design was generally lacking. Researchers have attempted to study subpopulations as a result. Generally, of the subset of students who had decreased class-size for at least 3 consecutive years, a significant improvement in math scores was noted. This was in comparison to those students whose CSR experience was interrupted. No statistically significant gains in reading were noted (Wexler, Izu, Carlos, Fuller, Hayward, & Kirst, 1998).

The California CSR program was plagued by many problems unique to its demographics (Wexler et al., 1998). Specifically, increased enrollment in California schools led to shortages of space that in turn led to reduced space for playgrounds, computer labs, and other

ancillary education space. Whereas the overwhelming majority of Tennessee students spoke English, only one third of the California students claimed English as their primary language. Emergency certifications were being honored as a result of the widespread educator shortage prompted by the CSR initiative (Stecher & Bohrnstedt, 2000). It is

important to note that California enacted many reforms in conjunction with its CSR initiative, making it difficult for researchers to determine the causation of results. Also, the program was widely recognized as being ill-funded, undermining the program's adequacy (Underwood & Lumsden, 1994). However, 3 years into the program, there were 91,000 K-3 classes that afforded 1.7 million students small but statistically significant achievement gains (Wexler et al., 1998).

The 1996-1997 school year saw a trial CSR program in Wisconsin, named Project SAGE (Student Achievement Guarantee in Education). Specifically targeting K-3 poverty-level students, this five-year pilot, capped class-size to a maximum of 15. Results showed significant gains in reading, language arts, and mathematics roughly analogous to the Star Project. Students in SAGE schools outperformed students in comparison schools in reading, language arts, and mathematics. Provocatively, SAGE students commenced the school year *behind* their peers in the comparison schools (Wisconsin Education Association Council, 2000).

Interestingly, although class-size reduction is topical fodder for education debate, aggregate class-size has decreased steadily from 1955 to 1995, falling by 35% in the United States.

Length of School Day

The length of the school day is defined as the amount of time a school is in session for a typical student on a normal school day. A study conducted by Roth, Brooks-Gunn, Linver, and Hofferth (2003), showed that, on average, the typical school day is 6 hours and 35 minutes long. A school day of 6 to 7 hours prompted the National Commission on Excellence in Education (1983) in its seminal report *A Nation at Risk*, to advocate "more effective use of the existing school day, a longer school day, or a longer school year" (p. 12). The decision to lengthen the school day is a topical issue. Proponents feel a longer school day will yield proportionally higher achievement scores. However, the correlation between time, instructional time, and achievement is not easily correlated. Switching classes, lunch, assemblies, recess, announcements, and other non-instructional activities are aggregated into school day length, negating the academic value of the time (Silva, 2007).

The National Center on Time & Learning produced a report on "expanded time" (ET) schools (Farbman, 2009). Of the 655 ET schools analyzed, 74% were charter schools. A correlational analysis found a statistically significant ($p < .01$) moderate association between the school day length and student achievement for grades 7 and 10 in both math ($r = .29$ and $r = .41$) and language arts ($r = .31$ and $r = .43$). Barro and Lee (2001) analyzed international achievement results on TIMSS (The International Math and Science Survey) and PISA (Programme for International Student Assessment) by the differences in the length of the school year. They noted that more time in school improves math and science test scores, but lowers reading scores. Marcotte and Hansen (2010) analyzed data from different states and years, estimating that an additional 10 days

of instruction results in an increase in student performance on state math assessments of 0.2 standard deviations.

Wheeler (1987) examined the school day and time allocated for each subject for 1,030 California schools. The times were compared to achievement on report cards and the 1982 California Achievement Tests. Researchers found that increased time for math and science and a longer school day correlated with higher test scores across subjects.

WestEd researchers reviewed time and learning research. They found little or no relationship between increased school day length and achievement (Aronson, Zimmerman & Carlos, 1998). Eren and Millimet (2007) examined the small variation that exists across states in the United States. The researchers found weak evidence that longer school hours improve achievement. Rangel (2007) simplified the research findings, “Allocating more time is only part of the solution; using it well is equally crucial.

Instructional Time

This is the amount of time per day that a typical student is engaged in instructional activities under the supervision of a certified teacher. Teachers surveyed by Roth et al. (2003) reported that the average 6.45-hour school day is usually broken up into 14 discrete activities: 64.4% academic, 14.6% maintenance, 11.9% enrichment, and 6.8% recess-related. The average academic instructional time is 254 minutes or 4.24 hours. The logic inherent in instructional time research is that increased instructional time will result in proportionally higher achievement. Pedagogist John Carroll (1963) set forth an equation as part of his “Model of School Learning” to illustrate his view: the degree of learning is equal to time spent learning divided by the time needed to learn. However, all

“time spent learning” or “instructional time” may not be equal. The New Jersey variable does not take into account academic learning time or engaged time (Silva, 2007). In the future, the variable may benefit from alignment with the extant literature on engagement.

A meta-analysis of school effects conducted by Scheerens and Bosker (1997) showed that the effect of instructional time increased student achievement by 15 percentile points. In 1998, WestEd researchers studying time and achievement found that achievement is increased only when additional time is “engaged time” where students are attuned to the tasks of learning (Aronson, Zimmerman, & Carlos, 1998).

However, in the body of research, this logic has not always held true. In a landmark study, Karweit & Slavin (1981) tracked students in 18 math classes in four elementary schools. Using the Comprehensive Test of Basic Skills (CTBC) pre- and post-test scores, they found increased instructional time had no effect on post-test scores. Brown and Saks (1986) found that increasing engaged time shows the greatest results on students of lower ability. Higher ability students benefit slightly from the same increase.

When compared internationally, the United States tends to have lower instructional times than other developed nations (Lavy, 2010). Baker, Fabrega, Galindo, & Mishook (2004) explored the international instructional times of 28 to 38 countries for correlations to TIMMS (The International Math and Science Survey), PISA (Programme for International Student Assessment) & CIVED (The International Study for Civic Education) achievement. They found a weak correlation between both yearly instructional hours total and yearly instructional hours achievement. In math, the average variation in achievement explained by instructional time was +/- 0.14 (2.2% of the variance). In science, a slightly stronger correlation of .23 was noted, explaining 5.0% of

score variance. Baker et al. (2004) postulates instructional time to be comprised of several discrete variables including pedagogy, curriculum, and student culture (2004).

However, using the PISA 2006 results of 15-year-olds from over fifty countries, Lavy (2010) consistently found that instructional time has a positive and significant effect on PISA scores in math, science, and reading.

Conclusions

The NJ School Report Card's variables will most likely affect performance on the NJ ASK 5 congruent with the research. For faculty characteristics, less mobile, more present educators with higher credentials should demonstrate a positive influence on NJ ASK 5 scores. In accordance with the extant literature, those educators will be more than likely teaching in more affluent districts, compounding the effect on NJ ASK 5 results with the positive role of SES (DFG). This almost cyclical relationship is at the core of many education equality proponents' platforms. Minority students are often the recipients of the less qualified teachers. Longtime education critic Jonathon Kozol went so far as to call this inequity "educational apartheid" (Kozol, 2005). As one critic expressed it, "There are cheap children and there are expensive children" (Warner, 1989). Although many will point to the fact that increased monetary aid given to poorer districts has not greatly affected test scores, Kozol states that short-term comparisons are not useful. Students in high poverty areas have experienced many long term, complicated issues:

- Years of mediocre schooling for the students
- Years of mediocre schooling for their parents
- Lack of preschools

- Racial isolation
- General long-term shortchanging of the community

The education of lower SES students often compounds the already negative influence on NJ ASK 5 scores. This is an area that warrants much more research and critical debate. New York City, a unified school district that controls seven boroughs, has pronounced inequities in its education system. Former Mayor David Dinkins accurately stated, “New York is a tale of two cities, and it should come as no surprise that each city has its own school system” (Kozol, 2005, p. 141). New York Public Schools are in need of research and rigorous scientific study to affect change.

Students who regularly attend class and are less mobile should, on average, outperform their peers on the NJ ASK 5. These students, typically, are located in areas of higher SES status. It is expected that NJ ASK 5 results will increase with DFG as the primary factor. However, it will be intriguing should the research reveal attendance and mobility to have a significant positive influence on NJ ASK 5 scores independent of DFG. Although hinted at by the Chang & Romero study (2008), it may be that those chronically absent students are mostly on the lower end of the SES spectrum, negating the affect of absence and/or mobility.

For the elementary grades, lower enrollment by grade level numbers and smaller class-sizes should positively affect NJ ASK 5 scores. The rigorous experimental work of Project Star points to class-size as having the most influence on K-3. However, in New Jersey, class-sizes vary greatly (again, typically smaller in higher DFG districts). This may make the variable’s influence more noticeable on the NJ ASK 5.

The length of school day variable may or may not influence NJ ASK 5 scores. In

New Jersey, the variation in length is small. However, increased academic utilization of time (variable: instructional time) will most likely have a positive influence on NJ ASK 5 results.

State testing has proven to be pointedly sensitive to SES (Tienken, 2008). The NJ ASK 5 is expected to mirror those sensitivities to SES. Education pioneer Ted Sizer, author of *The Horace Trilogy*, stated, "There is little correlation between the [test scores] we make so much of and future behavior. What happens to a youngster 10 years out of school? Unless we find out how schooling connects with peoples' lives down the road, we shouldn't take these indices seriously at all" (Ruenzel, 1996).

Production Function Framework

The ideology base held by the NJDOE is production function theory, an economic theory that focuses on input-output measurement. Education professionals seek to meet the production function requirements of Adequate Yearly Progress for NCLB. Hopkins (as cited in Hoenack & Collins, 1990) explained production function theory in terms of higher education structures; it is "intended to represent the process by means of which an institution--here, a college or university--transforms inputs (typically labor and capital) into outputs" (p. 11).

This study used this theoretical model to best mirror the New Jersey education system. The institution is the school; inputs are student, school, and teacher variables as listed on the NJ School Report Card, the output is previously addressed, and the output becomes the students' NJ ASK 5 scores.

Table 5

Input: Output Chart for Variables on NJ ASK 5

Input	Output: NJ ASK 5 LAL and Mathematics
Faculty Mobility Rate	High mobility rates are associated with underperforming schools and inexperienced staff. Their influence on standardized testing is expected to be negative.
Faculty Attendance Rate	Absent teachers are associated with less effective instruction. Faculty attendance rate should be positively associated with achievement.
Faculty and Administrator Credentials	The extant research focuses on the educator. The NJ variable will be skewed as administrators often have more advanced degrees. Therefore, it is expected this variable will positively affect student achievement.
Student-faculty Ratio	The literature is clouded by the terminology. Whereas class-size reduction is positively associated with achievement, student-faculty ratio is not well documented. NJ ASK 5 scores will hopefully mimic class-size research on this ambiguous variable and increase achievement.
Student Attendance Rate	Positively associated with achievement. It is expected that higher attendance rates for students will correspond with higher achievement. However, attendance rates may not be varied enough in the sample to detect achievement gains.

Student Mobility	Negatively associated with lower achievement. However, the mobility rates in sample may be too small to detect achievement differences.
Enrollment by Grade Level	The NJ variable serves as a proxy for school/district size. The literature is mixed on this topic and given the uniqueness of this variable, it will probably have little to no influence on achievement.
Average Class-size Length of School Day	<p>Research on class-size has shown that smaller classes increase education outcomes, especially at the K-3 level. It is expected that smaller class-size will positively influence achievement.</p> <p>Research on school-day length yields mixed results, with zero to moderate effects on student outcomes. Since NJ school days do not vary that greatly, with an average of 6.5 hours, it is not expected to show achievement gains.</p>
Instructional Time	Increased instructional time positively affects student outcomes when it is engaged time. The NJ variable does not account for engagement, but it is expected that slight gains may be seen in achievement with increased instructional time.
Free- and Reduced-Lunch Eligibility	The research is clear that achievement increases with higher SES levels. This factor is expected to account for the most variation in NJ ASK 5 scores.

Chapter 3

DESIGN AND METHODS

The objective of this empirical study is to examine the relative influence of NJ School Report Card variables on aggregate NJ ASK 5 scores in Language Arts and Mathematics. Using quantitative data, the results will aid relevant education stakeholders as they make reforms and initiatives that are research-based and will generate positive, increased achievement results on NJ ASK 5. There is a void in the literature concerning the NJ ASK 5 and variables that increase achievement. This study will add to the extremely limited extant literature on the subject.

Research Design

The researcher will use a non-experimental research design, a design cited as an important one for education researchers due to the inability to conduct large-scale randomized, experimental studies (Johnson, 2007). Kerlinger (1986) pointedly stated that non-experimental research is more important than experimental research because “most social scientific and education research problems do not lend themselves to experimentation, although many of them do lend themselves to controlled inquiry of the non-experimental kind” (p. 359).

The study is one of correlation and is explanatory in nature. The researcher will analyze one point in time, the spring 2009 NJ ASK 5 test. A proportional, stratified random sample was generated and analyzed for NJ School Report Card variable influence on NJ ASK 5 scores. This study will utilize a two-tier research approach. First, a multiple simultaneous regression will be performed using all variables. This will enable a reference point for research and will be exploratory in nature. The second tier of research

will involve three regression models for staff, student, and school variables.

Data Collection

Data will be taken from publically available resources offered by the New Jersey Department of Education. Results for the 2008-2009 NJ ASK 5 are given on the NJDOE web site under the heading of “Test Results.” Additionally, data sets from all years of the NJ School Report Card are publically available under the heading, “New Jersey School Report Card.” The variables, eligibility for free lunch and reduced lunch, were obtained from the NJDOE web site under the heading “Public Schools Fact Sheet.” All the data were entered and matched by school into an excel spreadsheet. This data sheet accounted for all of the public schools listed in NJ, their NJ ASK 5 2009 Results, NJ School Report Card variables, and the free lunch and reduced lunch eligibility variables.

Data Sampling Method

To best represent the state, the sample proposed must simulate the state makeup as a whole. The state of New Jersey has 591 operating school districts serving 1.37 million students (NJDOE, 2010). Districts in the state vary widely by socioeconomic status. New Jersey utilizes the District Factor Grouping method as a proxy for SES, a composite statistical index that models the socioeconomic status of a district. It encompasses seven indices: percentage of population with no high school diploma, percentage with some college, occupation, population density, income, unemployment, and poverty (NJDOE, 2008). A statistical technique, principal components analysis, is employed, allowing each district to receive a letter on the DFG scale; A, B, CD, DE, FG, GH, I, J (NJDOE, 2008). Districts then are grouped so that each DFG letter would include those having factor scores within an interval of 1/10 of the distance between high

and low scores. The scale goes from lowest SES status (A) to highest (J). The DFG system was first introduced in 1975 and was based on the SES research, to avoid making unfair comparisons between districts (NJDOE, 2008). However, it should be noted that NCLB does not take SES into account, requiring 100% proficiency by the year 2014 for all students.

The NJDOE lists the breakdown of its 591 districts by DFG:

Table 6

NJ School District Numbers by DFG

District Factor Group	Number of Districts
A	39
B	67
CD	67
DE	83
FG	89
GH	76
I	103
J	25

The NJDOE NJ ASK 5 results list 1725 separate public elementary schools controlled by the state's 591 operating public districts. The elementary schools are distributed by DFG as follows.

Table 7

NJ Elementary School Numbers by DFG

District Factor Group	Number of Elementary Schools
A	290
B	199
CD	177
DE	229
FG	249
GH	221
I	296
J	64

To best distinguish the NJ School Report Card variables that affect NJ ASK scores, a proportional stratified random sample of schools will be identified. In order to make inferences about a whole population, the necessary number of schools in the sample must be determined. The purpose for the study, population size, precision level, confidence level, and the degree of variability in what is being measured need to be taken into account (Miaoulis & Michener, 1976; Murphy & Myors, 2004). For this study, a 95% confidence level was chosen, as it is the norm for social sciences. The confidence level will allow the researcher to state results with 95% confidence that the results are accurate. A confidence interval of the social science norm of 5% was set, indicating that scores could reflect ± 5 margin of error (Witte & Witte, 2007). Given those parameters, the sample size formula will be determined via computer statistical calculator (Creative Research Solutions, 2010), using the formula below where $Z = Z$ value (1.96 for 95% confidence level), $p =$ population, and $c =$ confidence interval, expressed as decimal (.05 = ± 5).

Table 8

Sample Size Formula

$$SS = \frac{Z^2 * (p) * (1-p)}{c^2}$$

The formula indicates that for 1725 elementary schools at a 95% confidence level and 5% confidence interval, a sample size of 314 is necessary. To ensure that the 314 sample size best represents the DFG makeup of the state, a proportional random sample will be generated. The calculation of number of schools to include for each DFG will adhere to the formula: # in DFG / 1725 * 314= # for sample

Therefore, employing an embedded formulas table in Microsoft Excel, the proportional stratified sample will be randomly chosen as follows:

Table 9

Proportional Stratified Random Sample Table (Formulas Embedded)

District Factor Group	Number of Elementary Schools	# in DFG / 1725 * 314	Rounded
A	290	52.79	53
B	199	36.22	36
CD	177	32.22	32
DE	229	41.68	42
FG	249	45.33	45
GH	221	40.23	40
I	296	53.88	54
J	64	11.65	12

To ensure that the sample is random, the 2009 NJ School Report Card will be downloaded from the New Jersey Department of Education web site in Microsoft Excel format (available for public use: <http://education.state.nj.us/rc/rc09/database.htm>). The file is listed in alphabetical order by district and spread across several tabs. In order to extract the relevant data, the qualifiers followed are below:

1. 08-09 data only was extracted
2. Elementary schools only
3. High schools excluded
4. Charter schools excluded
5. Vocational/magnet schools excluded
6. Schools without all necessary data excluded

Upon mining the data using the above criteria, the schools will be arranged in ascending order by DFG (A-J) using Microsoft Excel. Within each DFG, schools will be arranged by individual school name, a factor not associated with the district. The researcher will then take the first schools listed in the proportional random sampling number necessary for each DFG. For example, in the DFG of J, 12 schools must be represented for a proportional random sample. The first 12 J Factor schools alphabetized by school name start at the Alexander Hamilton School in Glen Rock Borough in Bergen County and end with Cranbury Elementary School in Cranbury Township in Middlesex County. This method of random sampling will lead to a rich and diverse database of schools in each DFG.

The researcher will glean all NJ School Report Card relevant data from the

chosen 314 districts in Microsoft Excel program:

- District Code
- School Code
- County Name
- District Name
- School Name
- School Type (E, Elementary)
- DFG
- Year (2008-2009)
- Level
- School Day (Hours and Minutes converted to School Day Minutes)
- Instructional Time (Hours and Minutes converted to School Day Minutes)
- Student Mobility
- Faculty Attendance
- Student-Faculty Ratio
- Student Attendance
- Faculty, Bachelor's Degree or Higher
- Faculty, Master's Degree or Higher
- Faculty, PhD Degree or Higher
- Faculty Mobility
- Grade 5 Attendance
- Grade 5 Average Class-size
- Grade 5 Enrollment

- Free Lunch
- Reduced Lunch

Added to the NJ School Report Card Data will be the test results for the NJ ASK 5 08-09 (available for public download:

<http://www.state.nj.us/education/schools/achievement/2009/njask58/g5/>). Schools will be matched for both data sources (NJ School Report Card and NJ ASK Grade 5 Results).

Percentage of students for each school scoring Proficient or above will be amalgamated.

To the categories above, the following NJ ASK 5 results will be added:

- Total Proficient, Math
- Total Advanced Proficient, Math
- Total Proficient or higher, Math
- Total Proficient, Language Arts
- Total Advanced Proficient, Language Arts
- Total Proficient or higher, Language Arts

The data garnered, cleaned, and formatted as outlined above are in quality form to import into IBM's PASW statistical software.

Production Function Theory

The NJDOE, through use of these tests and the recommendations for using scores to place students, advocates rational choice theory, believing that schools will react by raising test scores. Another ideology base held by the NJDOE is production function theory, an economic theory that focuses on input-output measurement. The education production function concept was first used as an approach to education research as early as the late 1960s (Klein, 2007). The theory does have its limitations, especially in

education where the variables are voluminous and unable to be dissected from one another. One of the names mostly strongly associated with production function theory is Hanushek who noted that “with information about only one output, estimation of the reduced form might be quite misleading. The estimated effects of the various inputs will reflect both the production technology (the effect of each input on the single output) and the choice between outputs, not simply the production technology” (Hanushek, 1979, pp. 361-2).

Hopkins (as cited in Hoenack & Collins, 1990) explained production function theory in terms of higher education structures; it is "intended to represent the process by means of which an institution--here, a college or university--transforms inputs (typically labor and capital) into outputs" (p. 11). This study used this theoretical model as it closely resembles the mandates set forth by NCLB and by the NJDOE. The institution is the school; inputs are student, school, and teacher variables as listed on the NJ School Report Card, the output is previously addressed, and the output becomes the students' NJ ASK 5 scores.

Data Analysis

Tier One: Simultaneous Regression

Simultaneous multiple regression will be the first tier of this study. This process involves the simultaneous input of several predictor variables to learn more about their individual relationship to the dependent or criterion variable. It is often used in prediction and forecasting (Witte & Witte, 2007). Researchers may use multiple linear regression when it is not evident which variables would provide the best prediction equation model (Leech, Morgan, & Barrett, 2008). Multiple linear regression “fits”

straight lines to scattered data points of paired values X_i , Y_i , etc., where the values of Y (the vertical line) are observations of a variable. MLR is based on least squares: the model is fit such that the sum-of-squares of differences of observed and predicted values is minimized (Witte & Witte, 2007). The linear regression model requires that the relationship is linear; in fact, it assumes linearity. This can be observed in a scatterplot diagram. Additionally, the linear regression model uses the standard error of estimate that assumes, except for chance, that the scatterplot dots will be equally dispersed about all segments of the regression line (Witte & Witte, 2007). This assumption is termed *homoscedasticity*. As a result of these two assumptions, the scatterplot diagrams will be examined for adherence. Provided the data are linear, performing an MLR will allow the researcher to answer the following question: Which NJSRC variable most influences NJ ASK 5 scores?

NJ School Report Card Variables

Student-Faculty Ratio

Faculty Attendance Rate

Faculty Mobility Rate

Faculty and Administrator Credentials

Enrollment by Grade

Student Mobility

Student Attendance

Average Class-size

Length of School Day in Minutes

Instructional Time

Eligibility for Free/ Reduced Lunch

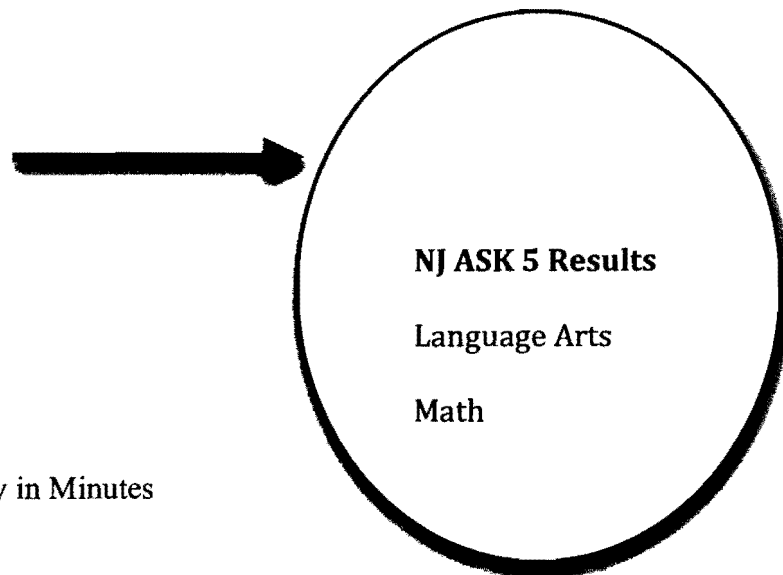


Figure 2. Simultaneous Regression Framework

Tier Two: Regression Models

The NJ School Report variables are organized under the larger headings of Staff Information, Student Information, and School Information, characterizing the variables in broader context. As such, the second tier to this research will be analysis of the data using these headers in multiple linear regression models. The multiple linear regression analyses permit researchers to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable (Ravid, 2000; Witte & Witte, 2007). Studies using a multiple regression model are typically predictive, forecasting, or attempting to define the strength of relationships (Ravid, 2000). A multiple regression allows the simultaneous testing and modeling of multiple independent variables, and therefore is well suited to the data format listed on the NJ School Report Card. The multiple regression models will mimic the categorizations given by the state, allowing the researcher to answer the following question: Which model (staff, student or school) most influences NJ ASK 5 scores?

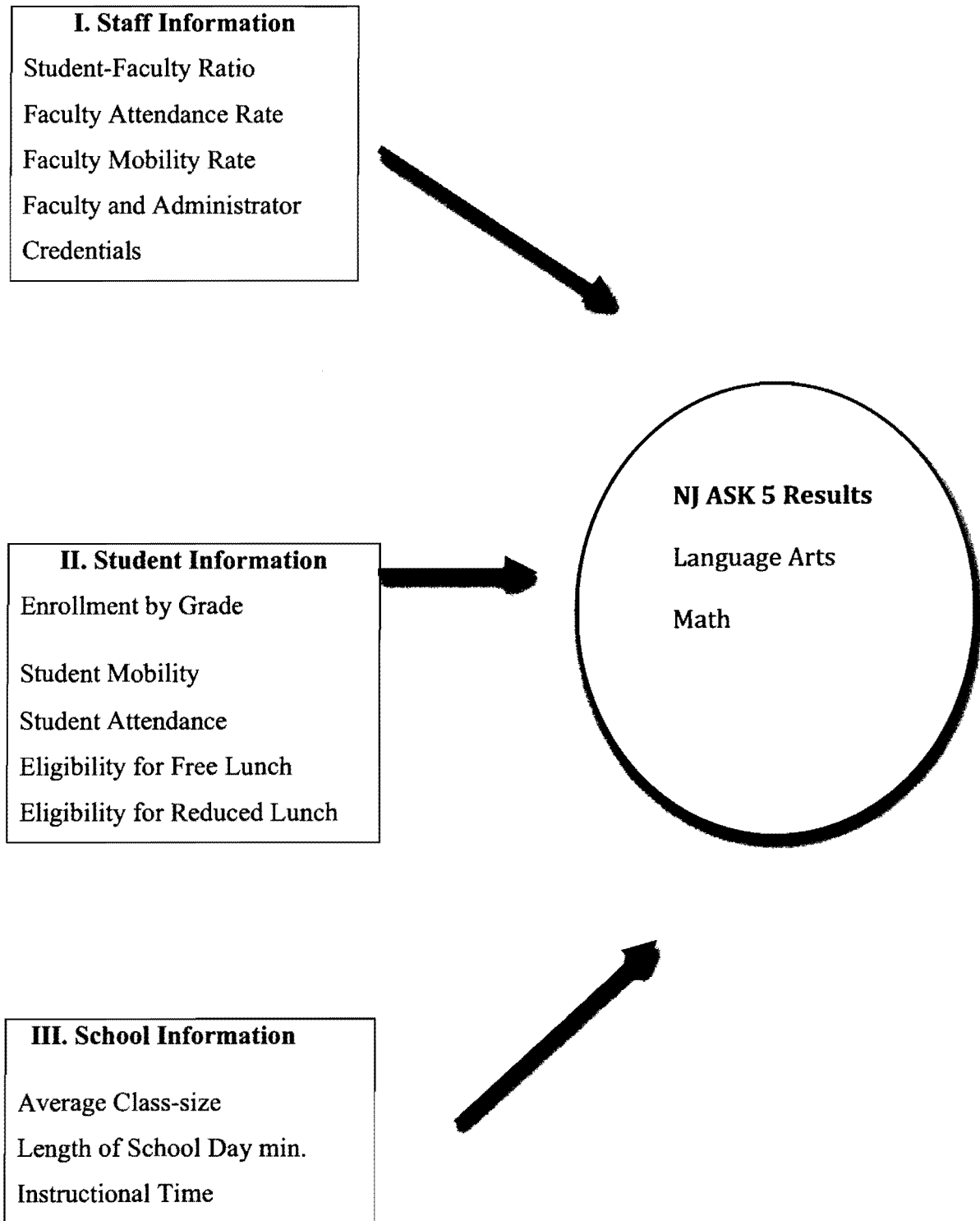


Figure 3. Multiple Regression Framework

The regression models generated by this research will illuminate the variation in the dependent variable (NJ ASK 5 scores in both LAL and Math) caused the NJ School Report Card variables. The models will first be evaluated for significance, with the alpha set at .05, the significance threshold for the social sciences ($p \leq .05$). LAL and Math will be treated separately as results do not correlate strongly between the subjects, based on the test's internal validity findings (NJDOE, 2008).

If the model meets the significance threshold, the Pearson correlation coefficient (r) will be analyzed. Pearson's r represents the linear relationship between pairs of variables for quantitative data (Witte & Witte, 2007). It will be interpreted in the following manner (Hinkle, Wiersman, & Jurs, 2003):

$\pm .9$ to 1	very highly correlated (positively or negatively)
$\pm .7$ to .9	highly correlated (positively or negatively)
$\pm .5$ to .7	moderately correlated (positively or negatively)
$\pm .3$ to .5	weakly correlated (positively or negatively)
$\pm .0$ to .3	little, if any, correlation (positively or negatively)

The proportion of variance in one variable that can be explained by or is associated with the variance in another distribution is the Pearson value squared (r^2). More simply, the r^2 represents explained variance. In this case, the R^2 will explain the percent of variation in NJ ASK 5 scores caused by the predictor variables on the NJ School Report Card.

The Beta Coefficient will be performed on the NJ School Report Card variables to

standardize them to have variances of 1. The Beta is available, as the variables listed on the NJ SRC are noted in different measurement units. The Beta Coefficients generated by the models will be used to determine the effect size of the NJ SRC variables on NJ ASK 5 scores.

The analyses performed will give New Jersey education stakeholders information on variables that have the greatest influence on NJ ASK 5 scores. The R^2 change for each model will help determine whether the variables significantly affect NJ ASK 5 results. The Beta analysis will allow the relative contribution of each independent variable to be examined for influence on NJ ASK 5.

Collinearity Issues

The New Jersey School Report Card includes variables that may hold strong correlations to one another. Multicollinearity occurs when two or more variables contribute too much to the model. These issues may inflate variances and cause problems estimating correlation coefficients. The researcher may then generate inaccurate conclusions about relationships. The researcher employed collinearity diagnostics in PAWS to examine the Variance Inflation Factor (VIF), Tolerance, and Condition Number for each model. The multicollinearity statistics will be interpreted as follows:

- VIF > 5 indicates multicollinearity
- Tolerance Value > .3 indicates multicollinearity
- Condition Number >30 indicates high multicollinearity

In the case of multicollinearity, variables will either be combined or removed, depending on the nature of the information.

Research Questions

The study is guided by the overarching researching question: *Which documented variables are the strongest predictors of performance on NJ ASK 5?* The researcher will seek to answer the following subsidiary questions:

1. Which mutable variables, as listed on the NJ School Report Card, have a statistically significant influence on NJ ASK 5 math scores?
2. Which mutable variables, as listed on the NJ School Report Card, have a statistically significant influence on NJ ASK 5 LAL scores?
3. Which staff variables, as listed on the NJ School Report Card, have a statistically significant influence on NJ ASK 5 Math and LAL scores? Staff variables identified are student/faculty ratio, faculty attendance rate, faculty mobility rate, and faculty and administrator credentials.
4. Which student variables, as listed on the NJ School Report Card, have a statistically significant influence on NJ ASK 5 Math and LAL scores? Student variables identified are enrollment by grade, rates of mobility, and attendance.
5. Which school variables, as listed on the NJ School Report Card, have a statistically significant influence on NJ ASK 5 scores? School variables identified are average class-size, length of school day, and instructional time.

Null Hypotheses

Null Hypothesis 1: There are no statistically significant NJ School Report Card variables that predict student Language Arts achievement as measured by the NJ ASK5 for the 2008-2009 school year for any category: Student, School, or Staff.

Null Hypothesis 2: There are no statistically significant NJ School Report Card Variables that predict student Mathematics achievement as measured by the NJ ASK5 for the 2008-2009 school year for any category: Student, School, or Staff.

Independent Variables

The two-tier research method of a simultaneous regression model followed by three multiple regression analyses under the NJSCR headings: student, school, and teacher will illuminate the relationships inherent between the variables and NJ ASK 5 performance.

Due to the known influence of socioeconomic status on standardized testing and academic achievement, this study will conduct a foundational analysis of the SES effects inherent in the sample. District Factor Grouping is a proxy for SES; however, the study will also account for free- and reduced-lunch percentage eligibility for each school, a factor that is a clear economic delineation based on U.S. poverty guidelines. The criteria for obtaining free lunch in the state of New Jersey for the 2008-2009 school year were as follows (Brody & Sheingold, 2009).

Table 10

NJ 2008-2009 Guidelines for Free- and Reduced-Lunch

Earnings Per Year for a Family of 4	Percentage of the Federal Poverty Level	Lunch Price per Student
-------------------------------------	---	-------------------------

Free Lunch	\$28,665	130	Free
Reduced Lunch	\$40,793	185	≤ \$.40

For the 2008-2009 school year, the number of New Jersey students receiving free-and reduced-price lunches grew by 11% to 341,000 students (Alloway, 2009). The exact cause of the spike in free- and reduced-lunch enrollment in the 2008-2009 school year is unclear; however, it is likely that three factors played a role: (1) the country was experiencing a recession during the years studied, (2) in 2009, the U.S. Food and Nutrition Service pushed states to automatically entitle students to free lunch if their families received food assistance aid such as food stamps, and (3) the new ability to fill forms online gave greater anonymity to families (Brody & Sheingold, 2009). In any case, on average, free- and reduced-lunch programs saw a swell in numbers in New Jersey. Since eligibility for these programs is not a mutable variable, it will be accounted for separately and initially. Additionally, the data for enrollment is not listed on the NJ School Report Card but can be found on the NJ DOE web site.

After accounting for free- and reduced-lunch, two overarching analyses will be conducted, listing all described variables on the NJ School Report Card and their relative influences on NJ ASK 5 Math and Language Arts Literacy. This simple regression will be run to allow the researcher to pinpoint the most effective individual variables influencing NJ ASK 5 scores. NJ ASK 5 Math and Language Arts will be run separately due to the less than optimal internal consistency between the two sections. Issues of multicollinearity will be identified. Multicollinearity occurs when two variables are related and contribute too much to the model. In the case of multicollinearity, variables

will either be combined or removed, depending on the nature of the information.

The variables will then be grouped under the heading: student, staff, or school and analyzed. The multiple regression model setup of the NJ School Report Card will follow the table below.

Table 11

NJ School Report Card Multiple Regression Model

Model	I. Staff Information	II. Student Information	III. School Information
Variables	Student-Faculty Ratio	Enrollment by Grade	Average Class-size
	Faculty Attendance Rate	Student Mobility	Length of School Day min.
	Faculty Mobility Rate	Student Attendance	Instructional Time
	Faculty and Administrator Credentials		

The three multiple hierarchical linear regression models will aim to find the relationship between NJ ASK 5 scores and possible predictor variables under the headings of staff, student, and school. Multiple hierarchical regression analysis will allow the researcher to pose the question: “What is the greatest mutable predictor listed on the NJ School Report Card of NJ ASK 5 scores?” Additionally, the use of multiple regression will allow the researcher to identify variables that have separate effects that cannot be isolated, thus giving administrators more possible options for improving NJ ASK 5 scores.

Multiple linear regression is a useful tool for the social sciences. However, as with any statistical analysis, limitations are present. As the name implies, multiple regression assumes the relationship between variables is linear, yet minor deviations from

this assumption do not generally affect its effectiveness (Witte & Witte, 2007). Another assumption inherent in multiple linear regression analysis is that results are normally distributed. This does not pose a major threat to this research, as distribution of NJ ASK 5 scores tends to follow a normal distribution pattern. Linear regression is limited to predicting numeric output; ergo, all variables listed on the NJ SRC will be given numeric variable status in SPSS. The major limitation to multiple regression analysis is the fact that it can only be employed to identify relationships, not causal associations (Witte & Witte, 2007).

The Dependent Variable: Instrumentation

Instrumentation for the research was comprised of scores from the state mandated test, NJ ASK 5. The assessment is commercially prepared to measure students' performance in relation to the state's Core Curriculum Content Standards. The NJ ASK 5 is a criterion-referenced assessment instrument. It is designed to show the progress students are making in mastering the skills and knowledge set forth in New Jersey's CCCS for Language Arts Literacy and Mathematics. Additionally, the test is used as data for NCLB AYP benchmarks, although considered an interim assessment. It is used to monitor progress towards the NCLB 2014 goal of proficiency for all students. Additionally NJ ASK assessments in general are often used as a diagnostic tool for students in need of remedial help (Tienken, 2008). The NJ DOE seeks to prepare students for the global marketplace (NJDOE, 2010).

The NJ ASK assessments were created under the ideology of Classical Test Theory (CTT). According to CTT, a total test score consists of multiple items, assuming "that the raw score (X) obtained by any one individual is made up of a true component (T) and

a random error (E) component: $X=T+E$ " (Kline, 2005, p. 91). Since a student cannot sit for infinite NJ ASK tests, CTT assumes that the single test session will generally be in the range of the impossibility of infinite test sessions.

The Language Arts Literacy component of the NJ ASK 5 is reported in two content clusters (NJDOE, 2008):

Reading (3.1)

Working with or Interpreting Text

Analyzing and Critiquing Text

Writing (3.2)

Speculative prompt

Expository prompt

The Mathematics component of the NJ ASK 5 is reported in four content clusters (NJDOE, 2008):

Number and Numerical Operations

Number Sense

Numerical Operations

Estimation

Geometry and Measurement

Geometric Properties

Transforming Shapes

Coordinate Geometry

Units of Measurement

Measuring Geometric Objects

Patterns and Algebra

Patterns

Functions and Relationships

Modeling

Procedures

Data Analysis, Probability, and Discrete Mathematics

Data Analysis (Statistics)

Probability

Discrete Mathematics--Systematic Listing and Counting

Discrete Mathematics--Vertex-Edge Graphs and Algorithms

The highest attainable score is 300. The NJ ASK 5 allows students to score within three categories: Partially Proficient (<200), representing a partial understanding of the content, Proficient (200-260), representing a solid understanding, and Advanced Proficient (260-300), representing a comprehensive understanding for both Mathematics and Language Arts.

Validity and Reliability

The NJ ASK is a criterion-referenced test, measuring the student's progress in mastering the NJ Core Curriculum Content Standards. According to the NJ ASK Technical Report (2008), the assessment is designed with the NJCCS as its framework. In addition to the NJ DOE, three companies, Measurement Incorporated (MI), Riverside, and Pearson generated and field-tested questions to appear on the NJ ASK tests (NJDOE,

2008). The state relied on New Jersey educators knowledgeable in each subject area for further approval. The NJDOE is mandated under federal law to be sure that student achievement tests used for accountability purposes provide reliable results (NJDOE, 2009). The test is designed to measure the NJCCS. The construct validity of the test can be analyzed by the use of correlation coefficients (Pearson's). The NJ ASK Technical Report (2009) explains the NJDOE's procedure for measuring the construct validity of the test:

Because the NJ ASK testing program assesses student performance in several content areas using a variety of testing methods, it is important to study the pattern of relationships among the content areas and testing methods. Therefore, this section addresses evidence based on responses and internal structure. One method for studying patterns of relationships to provide evidence supporting the inferences made from test scores is the multi-trait matrix. Tables 7.3.1 through 7.3.4 summarize Pearson correlation coefficients among test content domains and clusters by grade level. The correlations between clusters within a content area were generally found to be higher than the correlations between clusters across the content areas" (p. 144).

The NJ ASK 5 internal consistency displays issues with its reliability coefficients, represented as r ($-1 \leq r \leq +1$). Cronbach's alpha was the reliability technique used for the NJ ASK 5. The correlation is denoted as high to low in relation to -1 or +1, with the sign an indicator of a positive or negative relationship. Reliability coefficients are considered strongest nearest 1 (Hinkle, Wiersman, & Jurs, 2003). As the table below

illustrates, internal consistency is lacking on the across-content clusters as a whole, and within content clusters to a lesser extent. This is problematic when the NJ ASK 5 is used as a diagnostic and prescriptive tool. Tienken (2008b, citing Frisbie, 1988; Rudner & Schafer, 2001) set forth that a “reliability estimate of at least .85 out of a possible 1.00 should be used when an education leader makes high-stakes decisions about students, although an argument can be made for a minimum of .90 - .95” (p. 36). The NJ ASK 5 does not always provide such a high standard of reliability. Ergo, its use as a prescriptive tool should fall under much scrutiny. The within-discipline (LAL) reliability coefficients of the writing and reading scores are of particular concern. The construct of the test seems less reliable than it should be for the placement of students. This lack of reliability may inaccurately pigeon-hole students into often long-lasting, erroneous education placements.

Table 12

*NJ ASK 5 Correlation Coefficients among Content Domains and Clusters***Table 7.3.1: Grade 5 Correlation Coefficients among Content Domains and Clusters**

	LAL	Writing	WT1	WT2	Reading	LAL1	LAL 2	Math	Math 1	Math 2	Math 3	Math 4	Math 5
LAL	1.00												
Writing	0.75	1.00											
*WT1	0.69	0.97	1.00										
(WT2)	0.67	0.80	0.62	1.00									
Reading	0.99	0.62	0.56	0.59	1.00								
LAL1	0.95	0.59	0.54	0.56	0.96	1.00							
LAL2	0.92	0.59	0.54	0.56	0.93	0.80	1.00						
Math	0.76	0.55	0.50	0.51	0.75	0.72	0.70	1.00					
Math 1	0.64	0.48	0.44	0.45	0.63	0.61	0.59	0.88	1.00				
Math 2	0.66	0.46	0.42	0.43	0.66	0.64	0.60	0.89	0.69	1.00			
Math 3	0.66	0.48	0.44	0.45	0.66	0.63	0.62	0.86	0.68	0.68	1.00		
Math 4	0.70	0.51	0.47	0.47	0.69	0.66	0.64	0.89	0.71	0.72	0.70	1.00	
Math 5	0.72	0.53	0.48	0.49	0.71	0.69	0.66	0.96	0.85	0.85	0.82	0.84	1.00

*WT1 = Persuasive Writing Prompt, WT2 = Speculative Writing Prompt, LAL1 = Working with Text, LAL2 = Analyzing Text, Math 1 = Number & Numerical Operations, Math 2 = Geometry & Measurement, Math 3 = Patterns & Algebra, Math 4 = Data Analysis, Probability, & Discrete Mathematics, Math 5 = Problem Solving

Source: NJDOE NJ ASK 5 Technical Report 2008

Additionally, the heavy reliance on standardized test scores as a means by which to measure schools raises concerns over the broader education of students. Robert Glasser (1986) of the National Academy of Education, discussing the NAEP testing, presciently stated, “While these competencies are prerequisite for living in our modern world and fundamental to continuing and general education, they represent only a portion of the goals of elementary and secondary schooling” (p. 30). This is an inherent flaw in any standardized test, including the NJ ASK 5. Some educationally important characteristics, skills, and competencies are not measured.

Chapter 4

ANALYSIS OF THE DATA

The New Jersey Department of Education commenced publishing the NJ School Report Card as a result of a legal mandate in 1995 (NJDOE, 2010). Public domain access to the NJ School Report Card is given in Microsoft Excel format on the NJDOE web site. For the layperson, newspapers often print simplified versions of the NJ School Report Card, most notably the *Star Ledger*. These anticipated publications often cause confusion to readers and school officials alike as results are listed without variable information, enabling inaccurate and sometimes harmful comparisons. The goal for the results section of this study is to present the data in an objective manner using a stratified, proportional random sample of New Jersey Public schools to examine factors that influence NJ ASK 5 scores.

The sample for this study was 314 New Jersey public schools on the NJ School Report Card. The minimum number of fifth-grade students tested in a school was 10; the maximum, 576. The mean number of students sitting for the NJ ASK 5 was 80.52 with a standard deviation of 67.557 (See Table 1).

Table 13

Number of Students Tested

	N	Minimum	Maximum	Mean	Std. Deviation
NJ ASK 5 Students	314	10	576	80.52	67.557
Valid N (listwise)	314				

The scores for the NJ ASK 5 are scaled to fit into the 100-300 range of possible points available. Of the sample, the range of Math scale scores was 177 to 263, a mean of 226.74 with a standard deviation of 18.365. For Language Arts, the range of scale scores was 173 to 232, a mean of 208.48 with a standard deviation of 13.093.

Table 14

Student Performance NJ ASK 5: Math and Language Arts

	N	Minimum	Maximum	Mean	Std. Deviation
Total Scale Math	314	177	263	226.74	18.385
Total Scale LAL	314	173	232	208.48	13.093
Valid N (listwise)	314				

Because the goal for this research is to provide education professionals with the knowledge of factors that affect NJ ASK 5 performance, percentages of those students scoring Proficient or higher on both the Math and Language Arts components of the test are warranted. Table 3 details the percentages of students scoring Proficient, Advanced Proficient and Proficient or higher.

Table 15

Percentages of Students' Proficiency Levels of Sample

	N	Minimum	Maximum	Mean	Std. Deviation
Language Arts					
Proficient (%)	314	10	86	57.48	15.308
Advanced Proficient (%)	314	0	31	8.20	7.252
Proficient or higher (%)	314	10.3	100.0	65.680	19.6318
Math					
Proficient (%)	314	19	73	45.89	10.161
Advanced Proficient (%)	314	0	71	30.77	17.593
Proficient or Higher (%)	314	20.0	100.0	76.659	17.0135
Valid N (listwise)	314				

The performance of Grade 5 students in Language Arts ranged from schools having 10% of their students meet minimum proficiencies to 86% with a mean of 57.48 (std. dev. =15.308), from 0% to 31% with a mean of 8.20% (std. dev. =7.252), meeting the Advanced Proficient threshold. For the total sample, schools ranged from 10.3% to 100% scoring Proficient or higher in Language Arts, with a mean of 65.680% (std. dev.= 19.6318).

The performance of Grade 5 students in Math ranged from schools having 19% of their students meet minimum proficiencies to 73% with a mean of 45.89 (std. dev. =10.161), and from 0% to 71% with a mean of 30.77% (std. dev. =17.593), meeting the Advanced Proficient threshold. For the total sample, schools ranged from 20% to 100% scoring Proficient or higher in Math, with a mean of 76.659% (std. dev.= 17.0135).

More students from the sample performed at the Proficient or higher level in Mathematics (76.659%) than those performing at equal levels in Language Arts (65.8680%). Additionally, for those students scoring at the highest levels, denoted by Advanced Proficient status, Math boasted a 30.77% AP, while Language Arts had only 8.20% students receive Advanced Proficient status.

Independent Variables

The variables tested from the NJ School Report Card were those known in the research to have some influence on testing and/or achievement as outlined in Chapter 2. For PASW editor purposes, variable names were shortened.

Table 16

Abbreviated Variable Names

Variable	Short Form / Abbreviation
School Day in Minutes	schday min
Instructional Minutes	insmin
Student Mobility	stmob
Student-faculty Ratio	sfratio
Faculty Attendance Rate	fattend

Student Attendance Rate	saratio
Student Administrator Ratio	sadminratio
Teachers Holding Bachelor's Degrees	babs
Teachers Holding Master's Degrees	mams
Teachers Holding Doctoral Degrees	phded
Faculty Mobility	mobility
Grade 5 Attendance Rate	g5attend
Grade 5 Class-size	g5classsize
Grade 5 Enrollment	g5enr
Eligibility for Free Lunch %	free %
Eligibility for Reduced Lunch %	reduce %

Organized into the three headings of School Information, Student Information, and Staff Information, a descriptive statistics profile of the variables including Minimum, Maximum, Mean, and Standard Deviation is offered below:

Table 17

Profile of Variables

	Min	Max	M	SD
School Information				
Length of School Day	360	450	388.22	13.901
Instructional Minutes	307	395	342.10	15.490
Grade 5 Average Class-size	6	34	20.51	3.856
Student Information				
Enrollment by Grade	10	576	80.52	67.557
Student Mobility	0	40	9.65	7.764
Student Attendance	87	100	95.79	1.248

Staff Information

Student-faculty Ratio

4	17	10.61	2.124
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Faculty Attendance Rate

2	100	95.40	9.106
---	-----	-------	-------

Faculty Mobility Rate

0	38	4.31	6.294
---	----	------	-------

Faculty and Administrator
Credentials

Master's Degree	8	78	40.18	15.345
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PhD	0	20	1.12	2.544
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SES Information

Percentage Reduced-lunch	0	24	6.94	4.826
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Eligibility

Percentage Free-lunch	0	89	25.31	26.132
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Eligibility

Using the total sample means, a composite picture of the data can be generated.

The average school day in the sample was approximately 388 minutes, with 342 minutes

of instructional time. The average Grade 5 class-size was approximately 21. The approximate average grade level enrollment was 81. Average student mobility was 9.65%, while average student attendance was 95.79%. The average student/faculty ratio was 10.51: 1. Faculty attendance was 95% with 4.31 % of faculty mobility. Approximately 41% of faculty held a master's degree or higher.

Free- and reduced-lunch programs in New Jersey, on average, were on the rise for the 2008-2009 school year. Although not listed on the NJ School Report Card, eligibility for these programs denotes students whose families fall below the poverty level. To qualify for free lunch, a family of four can make \$28,665 or less; for reduced lunch, \$40,793. Although not a variable that can be manipulated, it is imperative to account for this economic factor and its relation to NJ ASK 5 achievement. For the sample, the average percentage of students who qualified for the reduced-price lunch program was 6.94. The average percentage of students receiving free lunch was 25.31.

Multiple Regression: All Data

The NJ School Report Card offers a plethora of information on students, schools, and faculty. A regression analysis consisting of all NJ School Report Card Data offers a broad overview of possible correlations to Proficient or higher performance on the NJ ASK 5. This preliminary data will allow researchers to identify those variables that demonstrate the greatest influence on NJ ASK 5 scores. Any instances of multicollinearity will be noted and addressed. Multicollinearity occurs in statistical analyses when two or more independent variables in a multiple regression are highly correlated (Witte & Witte, 2007). This may interfere with the correlation coefficients and needs to be controlled.

The regression models will measure the influence of the listed variables on NJ ASK 5 scores in Math and LAL separately, due to the known reliability issues within the NJ ASK 5 as discussed in Chapter 3. This data will be the starting point for further analysis that will allow education stakeholders to make research-based decisions on NJ ASK preparation measures.

The variables entered are reduced-lunch eligibility (reduce %), school day in minutes (schday min), instructional minutes, (insmin), student mobility (stmob), student faculty ratio (sfratio), faculty attendance rate (fattend), student attendance rate (saratio), student administrator ratio (sadminratio), teachers holding bachelor's degrees, (babs), teachers holding master's degrees (mams), teachers holding doctoral degrees (phded), faculty mobility (mobility), attendance rate (g5attend), grade 5 class-size (g5classsize), grade 5 enrollment (g5enr) and percentage free school lunch (Free %). The first multiple linear regression model is analyzed for its contribution to NJ ASK 5 math scores.

All Variables on NJ ASK 5 Math

Table 18

Model Summary of All Variables on NJ ASK 5 Math

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.752 ^a	.565	.544	11.5437

^a Predictors: (Constant), reduce %, sfratio, mobility, fattend, schday min, g5enreg, phdedd, mams, g5attend, saratio, g5classsize, stmob, insmin, free %

Table 19

ANOVA: All Variables on NJ ASK 5 Math

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	49245.220	14	3517.516	26.396	.000 ^a
Residual	37845.062	284	133.257		
Total	87090.282	298			

^a Predictors: (Constant), reduce %, sfratio, mobility, fattend, schday min, g5enreg, phdedd, mams, g5attend, saratio, g5classsize, stmob, insmin, free % ^b Dependent Variable: PplusMath.

Table 20

Coefficients: All Variables on NJ ASK 5 Math

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-86.317	63.122		-1.367	.173
	schday min	.016	.063	.013	.250	.802
	stmob	.082	.128	.038	.642	.521
	fattend	-.160	.129	-.050	-1.239	.216
	saratio	7.199E-5	.007	.000	.011	.992
	mams	.060	.049	.054	1.243	.215

g5classsize	.156	.206	.037	.757	.449
g5enreg	.003	.012	.009	.215	.830
reduce %	-17.973	19.363	-.053	-.928	.354

^a Dependent Variable: PplusMath

Table 21

Collinearity Statistics of All Variables on NJ ASK 5 Math: Condition Index

Collinearity Diagnostics^a

Mo del	Dimen sion	Eigenv alue	Condit ion Index	Variance Proportions												Sch day Min
				(Const ant)	g5enr reg	ins min	fatte nd	mobi lity	Ba_ bs	g5att end	sfra tio	phde dd	stm ob	sara tio	g5class size	
1	1	10.547	1.000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
	2	.923	3.380	.00	.02	.00	.00	.00	.00	.00	.00	.56	.02	.00	.00	.00
	3	.665	3.983	.00	.02	.00	.00	.87	.00	.00	.00	.01	.01	.00	.00	.00
	4	.408	5.086	.00	.27	.00	.00	.11	.00	.00	.00	.18	.30	.00	.00	.00
	5	.263	6.338	.00	.55	.00	.00	.00	.00	.00	.00	.01	.46	.00	.00	.00
	6	.093	10.671	.00	.09	.00	.00	.00	.09	.00	.00	.03	.06	.72	.00	.00
	7	.048	14.896	.00	.00	.00	.00	.00	.77	.00	.02	.04	.06	.22	.04	.00
	8	.032	18.240	.00	.02	.00	.00	.01	.06	.00	.36	.03	.01	.04	.16	.00
	9	.018	23.982	.00	.01	.00	.00	.00	.02	.00	.55	.01	.00	.00	.76	.00
	10	.003	61.256	.00	.00	.06	.74	.00	.00	.00	.04	.00	.01	.00	.00	.03
	11	.001	100.80	.03	.01	.39	.20	.00	.00	.04	.02	.00	.00	.01	.03	.01
	12	.001	143.28	.01	.01	.55	.05	.00	.03	.01	.01	.05	.00	.01	.01	.94
	13	6.555E-5	401.13	.97	.00	.00	.00	.00	.02	.94	.01	.08	.07	.00	.00	.01

^a Dependent Variable: PplusMath

Table 22

Collinearity Statistics of All Variables on NJ ASK 5 Math: Tolerance & VIF

Model	Collinearity Statistics	
	Tolerance	VIF
1 (Constant)		
g5enreg	.804	1.244
insmin	.557	1.795
fattend	.948	1.055
mobility	.972	1.029
babs	.853	1.172
g5attend	.792	1.262
sfratio	.675	1.482
phdedd	.720	1.389
stmob	.758	1.320
saratio	.721	1.388
g5classsize	.678	1.475
schday min	.584	1.712

The model was found to be statistically significant ($F=26.396$; $df= 14, 284$; $p\leq .000$). The R^2 is .565, indicating that 56.5% of the variance in Math scores can be accounted for by the model. One variable was excluded from the model for multicollinearity: teachers holding a bachelor's degree (babs). Considering that New Jersey requires all teachers in the state to hold a minimum of a bachelor's degree, it seems a redundant variable and overlapped by the higher delineation of teachers holding master's degrees and doctoral degrees (who also hold the prerequisite bachelor's degree). Therefore, the variable was

not analyzed in this regression model as the ill conditioning would cause a loss in statistical power and entangled interpretation.

The standardized coefficients reveal that the variables within the model not found to be statistically significant predictors of NJ ASK 5 performance in Math: school day minutes, instructional minutes, student mobility, faculty attendance rate, student attendance rate, teachers holding master's degrees, faculty mobility, Grade 5 class-size, grade 5 enrollment, and students receiving reduced lunch.

Factors in this analysis found to significantly affect NJ ASK 5 Math scores from greatest to least amount of variance are as follows:

- Students receiving free lunch
- Student-faculty ratio
- Grade 5 attendance,
- Teachers holding doctoral degrees
- Faculty mobility

The variable most predictive of performance on NJ ASK 5 Math scores was eligibility for free lunch. Free lunch (free %) was found to have a significant moderate and negative influence on Math scores ($B = -.684$; $t = -9.000$; $p \leq .000$), suggesting that students eligible for free lunch significantly underperformed their peers on NJ ASK 5 Math.

Student-faculty ratio (sfratio) was found to have a statistically significant but very weak influence on NJ ASK 5 Math scores ($B = .131$; $t = -2.718$; $p \leq .007$), suggesting that schools with lower student-faculty ratios outperformed their peers slightly on NJ ASK 5 math. Grade 5 attendance (g5attend) was found to be a significant but weak predictor of

NJ ASK 5 scores ($B=-.098$; $t=2.148$; $p\leq .033$). This implies that students with higher attendance rates scored slightly better on NJ ASK 5 math.

The variable, teachers holding doctoral degrees (phded) degrees, was found to have a significant, albeit very weak positive effect on Math scores ($B=.096$; $t=1.977$; $p\leq .049$). Faculty mobility (mobility) was found to have a significant but weak negative influence on NJ ASK 5 math performance ($B=-.081$; $t= -2.203$; $p\leq .044$).

Investigation of the collinearity statistics suggests that the analysis does not have collinearity issues.

All Variables on NJ ASK 5 LAL

The NJ School Report Card variables will be analyzed for their influence on NJ ASK 5 Language Arts Literacy in the same manner as the Math section. This striation will enable a more precise picture of predictor variables that affect LAL scores. Once again, the variable, teachers holding bachelor's degrees (babs) was excluded due to multicollinearity issues.

Table 23

Model Summary of All Variables on NJ ASK 5 LAL

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.875 ^a	.766	.755	9.7393

^a Predictors: (Constant), reduce %, sfratio, mobility, fattend, schday min, g5enrreg, phdedd, mams, g5attend, saratio, g5classsize, stmob, insmin, free %

Table 24

ANOVA: All Variables on NJ ASK 5 LAL

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	88408.998	14	6314.928	66.575	.000 ^a
	Residual	26938.478	284	94.854		
	Total	115347.476	298			

^a Predictors: (Constant), reduce %, sfratio, mobility, fattend, schday min, g5enrreg, phdedd, mams, g5attend, saratio, g5classsize, stmob, insmin, free % ^b Dependnet Variable: PplusLang.

Table 25

Coefficients: All Variables on NJ ASK 5 LAL

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-44.671	53.255		-.839	.402
	schday min	-.029	.053	-.020	-.542	.588
	stmob	-.107	.108	-.042	-.991	.323
	fattend	-.097	.109	-.026	-.890	.374
	saratio	-.001	.006	-.005	-.162	.872
	phdedd	.370	.272	.049	1.360	.175
	mobility	-.147	.091	-.048	-1.611	.108
	g5classsize	.029	.174	.006	.166	.868
	g5enreg	-.003	.010	-.009	-.288	.774
	reduce %	-25.707	16.337	-.065	-1.574	.117

^a Dependent Variable: PplusLang.

Table 26

Collinearity Statistics of All Variables on NJ ASK 5 LAL: Condition Index

Table 27

Collinearity Diagnostics^a

Model	Dimension	Eigen value	Condition Index	Variance Proportions												
				(Constant)	g5enrreg	insmin	fattend	mobility	babs	g5attend	sfratio	phdedd	stmob	saratio	g5classsize	Sch day Min
1	1	10.547	1.000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
	2	.923	3.380	.00	.02	.00	.00	.00	.00	.00	.00	.56	.02	.00	.00	.00
	3	.665	3.983	.00	.02	.00	.00	.87	.00	.00	.00	.01	.01	.00	.00	.00
	4	.408	5.086	.00	.27	.00	.00	.11	.00	.00	.00	.18	.30	.00	.00	.00
	5	.263	6.338	.00	.55	.00	.00	.00	.00	.00	.00	.01	.46	.00	.00	.00
	6	.093	10.671	.00	.09	.00	.00	.00	.09	.00	.00	.03	.06	.72	.00	.00
	7	.048	14.896	.00	.00	.00	.00	.00	.77	.00	.02	.04	.06	.22	.04	.00
	8	.032	18.240	.00	.02	.00	.00	.01	.06	.00	.36	.03	.01	.04	.16	.00
	9	.018	23.982	.00	.01	.00	.00	.00	.02	.00	.55	.01	.00	.00	.76	.00
	10	.003	61.256	.00	.00	.06	.74	.00	.00	.00	.04	.00	.01	.00	.00	.03
	11	.001	100.808	.03	.01	.39	.20	.00	.00	.04	.02	.00	.00	.01	.03	.01
	12	.001	143.281	.01	.01	.55	.05	.00	.03	.01	.01	.05	.00	.01	.01	.94
	13	.000	401.131	.97	.00	.00	.00	.00	.02	.94	.01	.08	.07	.00	.00	.01

^a Dependent Variable: PplusLang

Collinearity Statistics of All Variables on NJ ASK 5 LAL: Tolerance & VIF

Model	Collinearity Statistics	
	Tolerance	VIF
1 (Constant)		

g5enreg	.804	1.244
insmin	.557	1.795
fattend	.948	1.055
mobility	.972	1.029
babs	.853	1.172
g5attend	.792	1.262
sfratio	.675	1.482
phdedd	.720	1.389
stmob	.758	1.320
saratio	.721	1.388
g5classsize	.678	1.475
schday min	.584	1.712

The model was found to be a significant predictor of NJ ASK LAL scores ($F=66.575$; $df=14, 284$; $p \leq .000$). The R^2 is .766, indicating that 76.6% of the variation in NJ ASK LAL scores could be accounted for by the model. No multicollinearity issues were detected.

Inspection of the standardized coefficients discloses that the following variables within the model were not found to be statistically significant predictors of NJ ASK 5 performance in Language Arts Literacy: school day minutes, student mobility, faculty attendance rate, student-administrator ratio, teachers holding doctoral degrees, faculty mobility, Grade 5 class-size, Grade 5 enrollment, and percentage of students receiving reduced lunch.

The variables accounting for the greatest amount of variance on NJ ASK 5 LAL scores from greatest to least influence are as follows:

- Eligibility for free lunch
- Student-faculty ratio

- Instructional minutes
- Teachers holding master's degrees
- Grade 5 attendance rate

The greatest predictive variable was the same for LAL scores as it was for math scores. Eligibility for free lunch demonstrated a significant, strong negative influence on NJ ASK 5 LAL achievement ($B=-.759$; $t=-13.618$; $p\leq .000$).

Student-faculty ratio was found to have a significant but weak positive influence on LAL scores ($B=.078$; $t=2.210$; $p\leq .028$). The number of instructional minutes per day was found to be a significant but weak positive predictor of LAL NJ ASK 5 performance ($B=.077$; $t=1.995$; $p\leq .047$). Teachers holding master's degrees (either MA's or MS's) were found to have a significant but weak positive influence on LAL scores ($B=.077$; $t=2.419$; $p\leq .016$). Grade 5 attendance rate was found to be a significant but weak predictor of LAL scores ($B=.068$; $t=2.040$; $p\leq .042$), indicating that students with higher attendance rates slightly outperformed their peers.

Multiple Regression Models

The multiple regression models for each class of variables (student, school, faculty) allowed the researcher to identify the variables that demonstrate an influence on NJ ASK 5 scores. The F statistic designated whether the model was significant. For this research the alpha was set as $p\leq .05$. The R^2 statistic allowed the researcher to determine the explained variance in the dependent variable (NJ ASK 5 scores) influenced by the various independent student, school, and faculty variables. The Beta statistic aids in determining the relative contribution of each independent variable in the model to the outcome on NJ ASK 5 scores. Given the validity issues with the NJ ASK 5, LAL scores

and Math scores were used in separate models as independent variables to ensure higher statistical accuracy and to acknowledge the internal consistency issues presented by the NJ ASK 5 instrument.

The School Variables Model

The first model is inclusive of school variables as listed on the NJ School Report Card: length of school day, instructional minutes, and grade 5 average class-size. The regression model seeks to answer the question: Do the NJ School Report Card school variables length of school day, instructional minutes, and grade 5 average class-size have an influence on NJ ASK 5 Language Arts scores?

Table 28

Model Summary: School Variables Influence on NJ ASK 5 LAL Scores

Model Summary					
Model	R	R Square	Adjusted R	Std. Error of	Change Statistics

					R Square Change	F Change	df1	df2	Sig. F Change
1	.263 ^a	.069	.060	19.0297	.069	7.707	3	310	.000

^a Predictors: (Constant), g5classsize, schday min, insmin

Table 29

^a Dependent Variable: PplusLang

Coefficients: School Variables Influence on NJ ASK 5 LAL Scores

Model		Coefficients ^a						
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	24.927	32.690		.763	.446	-39.394	89.249
	Instructional Minutes	-.168	.088	-.132	-1.901	.058	-.341	.006

Table 30

Collinearity Statistics of School Variables on NJ ASK 5 LAL: Condition Index

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Schday Min	insmin	g5classsize
1	1	3.971	1.000	.00	.00	.00	.00
	2	.027	12.029	.00	.00	.00	.90
	3	.001	65.448	.54	.01	.71	.09
	4	.001	86.184	.46	.99	.28	.01

^a Dependent Variable: PplusLang

Table 31

Collinearity Statistics of School Variables on NJ ASK 5 LAL: Tolerance & VIF

Model	Collinearity Statistics	
	Tolerance	VIF
1	(Constant)	
	schday min	.633
	insmin	.620
	g5classsize	.962

In this linear regression pertaining to school variables as listed on the NJ School Report Card and their relative contribution to NJ ASK LAL scores, the model was found to be significant ($F=7.707$; $df= 3, 310$; $p\leq .000$). The R^2 is .069 indicating that 6.9% of the variance in NJ ASK Language Arts scores can be attributed to the variables in the model. No multicollinearity issues were found.

The standardized coefficients reveal that the number of instructional minutes per day is not a significant predictor of NJ ASK 5 LAL scores.

The number of total minutes in a school day has a small but significant influence on NJ ASK 5 LAL results ($B=.136$; $t=1.972$; $p=.049$). The direction of length of school day on NJ ASK 5 LAL scores suggests that scores are increasingly likely to be at Proficient or higher with increases in school minutes. Average Grade 5 class-size also has a small but significant influence on NJ ASK 5 LAL scores ($B=.227$; $t=4.062$; $p=.000$). The direction of the relationship suggests that smaller class-sizes increase LAL scores.

The second model contains the same independent variables as the first, classified as school variables on the NJ School Report Card: length of school day, instructional minutes, and grade 5 average class-size. The regression model seeks to answer the question: Do the NJ School Report Card school variables length of school day, instructional minutes, and Grade 5 average class-size have an influence on NJ ASK 5 Math score?

Table 32

Model Summary: School Variables Influence on Math NJ ASK 5 Scores

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.274 ^a	.075	.066	16.4422	.075	8.376	3	310	.000

^a Predictors: (Constant), insmin, g5classize, schday min

Table 33

Coefficients: School Variables Influence on Math NJ ASK 5 Scores

Coefficients^a

Unstandardized Coefficients		Standardized Coefficients	t	Sig.
B	Std. Error	Beta		
14.566	28.245		.516	.606
-.090	.076	-.082	-1.178	.240

^a Dependent Variable: PplusMath

Table 34

Collinearity Statistics of School Variables on NJ ASK 5 Math: Condition Index

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Schday Min	insmin	g5classsize
1	1	3.971	1.000	.00	.00	.00	.00
	2	.027	12.029	.00	.00	.00	.90
	3	.001	65.448	.54	.01	.71	.09
	4	.001	86.184	.46	.99	.28	.01

^a Dependent Variable: PplusMath

Table 35

Collinearity Statistics of School Variables on NJ ASK 5 Math: Tolerance & VIF

Model	Collinearity Statistics		
	Tolerance	VIF	
1	(Constant)		
	schday min	.633	1.579
	insmin	.620	1.614
	g5classsize	.962	1.039

The model was found to be significant ($F=8.376$; $df= 3, 310$; $p \leq .000$). The R^2 is .075, indicating that 7.5% of the variance in NJ ASK 5 Math scores can be attributed to the model, including school variables as listed on the NJ School Report Card. No multicollinearity issues were noted.

The standardized coefficients reveal that the number of instructional minutes per day is not a significant predictor of NJ ASK 5 Math scores.

The number of total minutes in a school day has a small but significant influence on NJ ASK 5 Math results ($B=.148$; $t=2.151$; $p=.032$). The direction of the relationship between length of school day on NJ ASK 5 Math scores suggests that scores are increasingly likely to be at Proficient or higher with increases in school minutes. Average Grade 5 class-size also has a small but significant influence on NJ ASK 5 Math scores ($B=.250$; $t=4.495$; $p=.000$). The direction of the relationship suggests that smaller class-sizes increase scores.

The Student Variables Model

Student Variables listed on the NJ School Report Card include Enrollment by Grade, Student Mobility, and Student Attendance. The first student variable model seeks to answer the question: Do the NJ School Report Card student variables Grade 5 enrollment, student mobility, and student attendance have an influence on NJ ASK 5 Language Arts scores?

Table 36

Model Summary: Student Variables Influence on LAL NJ ASK 5 Scores

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.658 ^a	.432	.427	14.8341	.432	77.172	3	304	.000

^a Predictors: (Constant), saratio, stmob, g5enreg

Table 37

Coefficients: Student Variables Influence on LAL NJ ASK 5 Scores

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	78.519	2.883		27.236	.000
	g5enreg	-.010	.013	-.036	-.767	.444
	stmob					
	saratio	.013	.008	.076	1.631	.104

^a Dependent Variable: PplusLang

Table 38

Collinearity Statistics of Student Variables on NJ ASK 5 LAL: Condition Index

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	g5enreg	stmob	saratio
1	1	3.251	1.000	.01	.02	.02	.01
	2	.500	2.550	.00	.28	.43	.01
	3	.197	4.066	.06	.70	.34	.16
	4	.053	7.866	.93	.00	.21	.82

Table 39

Collinearity Statistics of Student Variables on NJ ASK 5 LAL: Tolerance & VIF

Model		Tolerance	VIF
1	(Constant)		
	g5enreg	.860	1.163
	stmob	.936	1.068
	saratio	.859	1.165

The model was found to be significant ($F=77.172$; $df= 3, 304$; $p\leq .000$). The R^2 is .432 indicating that 43% of the variance in NJ ASK 5 LAL scores can be attributed to the model, including student variables as listed on the NJ School Report Card. No multicollinearity issues were detected.

The standardized coefficients reveal that the variables Grade 5 enrollment registration and student attendance rate were not significant predictors of NJ ASK 5 LAL scores. Student mobility was found to have a negative significant moderate influence on NJ ASK 5 LAL results ($B=-.645$; $t=-14.442$; $p=.000$). The direction of the relationship suggests that increased student mobility is associated with lower scores on NJ ASK LAL. Paradoxically, the student mobility variable was not found to be significant in the

simultaneous regression model, perhaps due to the impact of a suppressor variable in the full model. Specifically, Grade 5 attendance rate and student mobility were moderately correlated at .354; $p=.001$ (see Correlation Matrix in Appendix). These findings are in accordance with Michel's (2004) research on NJ ASK 4. Student mobility was found to be the second greatest predictor variable, after SES.

The second student variable model seeks to answer the question: Do the NJ School Report Card student variables Grade 5 enrollment, student mobility, and student attendance have an influence on NJ ASK 5 Math scores?

Table 40

Model Summary: Student Variables Influence on Math NJ ASK 5 Scores

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.528 ^a	.279	.272	14.5327	.279	39.217	3	304	.000

^a Predictors: (Constant), saratio, stmob, g5enrreg

Table 41

Coefficients: Student Variables Influence on Math NJ ASK 5 Scores

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	84.280	2.824		29.841	.000
	g5enrreg	-.001	.013	-.002	-.040	.968
	saratio	.011	.008	.073	1.392	.165

^a Dependent Variable: PplusMath

Table 42

Collinearity Statistics of Student Variables on NJ ASK 5 Math: Condition Index

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	g5enrreg	stmob	saratio
1	1	3.251	1.000	.01	.02	.02	.01
	2	.500	2.550	.00	.28	.43	.01
	3	.197	4.066	.06	.70	.34	.16
	4	.053	7.866	.93	.00	.21	.82

^a Dependent Variable: PplusMath

Table 43

Collinearity Statistics of Student Variables on NJ ASK 5 Math: Tolerance & VIF

Model	Collinearity Statistics	
	Tolerance	VIF
1 (Constant)		
g5enrreg	.860	1.163
stmob	.936	1.068
saratio	.859	1.165

The model was found to be significant ($F=39.217$; $df= 3, 304$; $p\leq .000$). The R^2 is .279 indicating that 27.9% of the variance in NJ ASK 5 Math scores can be attributed to the model, including student variables as listed on the NJ School Report Card. No multicollinearity issues were detected.

The standardized coefficients reveal that the variables Grade 5 enrollment registration and student attendance rate were not significant predictors of NJ ASK 5 Math scores. Student mobility was found to have a negative significant, moderate influence on NJ ASK 5 Math results ($B=-.509$; $t=-10.103$; $p=.000$). The direction of the relationship suggests that increased student mobility is associated with lower scores on NJ ASK 5 Math. These findings are similar to Michel's (2004) research on NJ ASK 4, where student mobility was found to be the second greatest predictor variable after SES.

The Staff Variables Model

Faculty-staff variables listed on the NJ School Report Card include the following:

- Student-faculty ratio

- Faculty attendance rate
- Faculty mobility rate
- Faculty and administrator credentials (master's degree or higher)

The first staff variable model seeks to answer the question: Do the NJ School Report Card staff variables have an influence on NJ ASK 5 Language Arts scores?

Table 44

Model Summary: Staff Variables Influence on LAL NJ ASK 5 Scores

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.485 ^a	.235	.222	17.3800	.235	18.387	5	299	.000

^a Predictors: (Constant), phdedd, mobility, fattend, mams, sfratio

Table 45

Coefficients: Staff Variables Influence on LAL NJ ASK 5 Scores

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	32.785	18.472		1.775	.077
	fattend	.075	.190	.020	.392	.695
	mobility	-.076	.158	-.024	-.482	.630

^a Dependent Variable: PplusLang

Table 46

Collinearity Statistics of Staff Variables on NJ ASK 5 LAL: Condition Index

Collinearity Diagnostics^a

Mode	Dimensio n	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	sfratio	fattend	mobility	mams	phdedd
1	1	4.428	1.000	.00	.00	.00	.01	.01	.01
	2	.838	2.298	.00	.00	.00	.05	.00	.88
	3	.612	2.690	.00	.00	.00	.90	.01	.05
	4	.097	6.748	.00	.05	.00	.01	.94	.01
	5	.023	13.786	.02	.94	.03	.02	.04	.05
	6	.002	54.260	.97	.00	.97	.00	.00	.00

^a Dependent Variable: PplusLang

Table 47

Collinearity Statistics of Staff Variables on NJ ASK 5 LAL: Tolerance & VIF

Model	Tolerance	VIF
1 (Constant)		
sfratio	.948	1.054
fattend	.978	1.023
mobility	.990	1.010
mams	.981	1.019
phdedd	.956	1.046

The model was found to be significant ($F=18.387$; $df= 5, 299$; $p\leq .000$). The R^2 is .235, indicating that 23.5% of the variance in NJ ASK 5 LAL scores can be attributed to the model, including staff variables as listed on the NJ School Report Card. No multicollinearity issues were found.

The standardized coefficients reveal that the variables faculty attendance rate and faculty mobility were not significant predictors of NJ ASK 5 LAL scores. Student-faculty ratio was found to have a significant but weak influence on NJ ASK 5 LAL results ($B=-.120$; $t=-2.318$; $p\leq .021$). The variable “teachers holding a masters degree” was also found to be a significant but weak predictor of NJ ASK 5 LAL scores ($B= .317$; $t=-6.205$; $p\leq .000$). Intriguingly, the variable “teachers holding a Phd” was found to have a significant but weak negative influence on NJ ASK 5 LAL scores ($B= -.290$; $t=-5.603$; $p\leq .000$). This unexpected result may well be more the consequence of the extremely small numbers of PhD educated teachers in the classroom, with a mean of only 1.12% of PhD educated teachers.

The second staff variable model seeks to answer the question: Do the NJ School Report Card staff variables have an Influence on NJ ASK 5 Math scores?

Table 48

Model Summary: Staff Variables Influence on Math NJ ASK 5 Scores

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.416 ^a	.173	.159	15.6551	.173	12.523	5	299	.000

^a Predictors: (Constant), phdedd, mobility, fattend, mams, sfratio

Table 49

Coefficients: Staff Variables Influence on Math NJ ASK 5 Scores

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	58.046	16.638		3.489	.001
	fattend	-.051	.172	-.016	-.296	.767
	mobility	-.146	.142	-.054	-1.024	.307

^a Dependent Variable: PplusMath

Table 50

Collinearity Statistics of Staff Variables on NJ ASK 5 Math: Condition Index

Collinearity Diagnostics ^a									
Mode	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	sfratio	fattend	mobility	mams	phdedd
1	1	4.428	1.000	.00	.00	.00	.01	.01	.01
	2	.838	2.298	.00	.00	.00	.05	.00	.88
	3	.612	2.690	.00	.00	.00	.90	.01	.05
	4	.097	6.748	.00	.05	.00	.01	.94	.01
	5	.023	13.786	.02	.94	.03	.02	.04	.05
	6	.002	54.260	.97	.00	.97	.00	.00	.00

^a Dependent Variable: PplusMath

Table 51

Collinearity Statistics of Staff Variables on NJ ASK 5 Math: Tolerance & VIF

Model		Tolerance	VIF
1	(Constant)		
	sfratio	.948	1.054
	fattend	.978	1.023
	mobility	.990	1.010
	mams	.981	1.019
	phdedd	.956	1.046

The model was found to be significant ($F=12.523$; $df= 5, 299$; $p \leq .000$). The R^2 is

.173, indicating that 17.3% of the variance in NJ ASK 5 Math scores can be attributed to the model, including staff variables as listed on the NJ School Report Card. No multicollinearity issues were found.

The standardized coefficients reveal that the variables faculty attendance rate and faculty mobility were not significant predictors of NJ ASK 5 Math scores. Student/faculty ratio was found to have a significant but weak influence on NJ ASK 5 Math results ($B = -.163$; $t = -3.028$; $p \leq .003$). The variable “teachers holding a master’s degree” was also found to be a significant but weak predictor of NJ ASK 5 Math scores ($B = .260$; $t = 4.896$; $p \leq .000$). Similar to the findings on LAL performance, the variable “teachers holding a PhD” was found to have a significant but weak negative influence on NJ ASK 5 LAL scores ($B = -.219$; $t = -4.079$; $p \leq .000$). This result, although unexpected, may be due to the small number of educators holding PhD’s.

Overall Conclusions

In accord with the research on the effects of socioeconomic status on school achievement, eligibility for free lunch accounted for the greatest amount of variance in achievement on both NJ ASK 5 Math and LAL scores. This variable is not one that is administratively-mutable, but it illustrates the issue of inequity in standardized testing. Results tend to be positively correlated to SES status. The search for variables that can be manipulated in an effort to increase NJ ASK 5 math and LAL scores show some weak but positive relationships between student-faculty ratio. Minimizing student faculty ratio is an area that warrants exploration. Taking these results in combination with the extant research, it is likely that specifically targeting teacher-student ratio will yield the maximum influence. Teachers holding advanced degrees proved to have a positive

Influence on scores. Therefore, it would be beneficial to look at advanced licensing options for educators to maximize the relationship. Grade 5 attendance rate is a factor affecting both Math and LAL scores. This relationship can be manipulated by school and state attendance policies/requirements. Faculty mobility rate was found to influence Math but not LAL scores. Given the extant research on the subject, administrators should seek to minimize faculty mobility. Instructional minutes were found to affect LAL but not Math scores. This is also in accordance with the extant research, and LAL instructional time warrants maximization.

When exploring the relative influence of school variables on LAL and Math scores, the variables school day length and Grade 5 class-size prove to be predictive. The latter, given these results and the extant research, is an area for administrators to minimize ratios. When exploring the relative influence of student variables on LAL and Math scores, the variable with the highest relative influence was student mobility, demonstrating a negative influence on performance, a finding bolstered by the extant research.

When exploring the relative influence of school variables on LAL and Math scores, the variables student/ faculty ratio and teachers holding master's degrees proved to be predictive of student outcomes. These relationships proved to be significant in all models.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Standardized testing is omnipresent in American education today. More pointedly, it has been argued that the “passage of No Child Left Behind made testing and accountability our national education strategy” (Ravitch, 2010, p. 30). The NJ ASK 5 is a high-stakes test for the New Jersey education system, reflecting the current climate. Students are placed in tracked classes based on scores, and districts and schools are ranked based on average achievement. Furthermore, funding and AYP progress is contingent upon results. Therefore, the goal for this research is to illuminate variables that administrators can work with to achieve maximum results.

The purpose for this study was to illuminate factors on the NJ School Report Card that influence NJ ASK 5 performance. The strength and direction of the relationships between variables and achievement was explored. By focusing on variables that can be manipulated, the researcher aimed to provide administrators with the tools to make research-based decisions regarding factors that will influence NJ ASK 5 scores. Additionally, all education stakeholders would benefit from the results of this study combined with the extant research.

Socioeconomic Status

Conclusions

This study illustrates that the results of NJ ASK 5 are most influenced by socioeconomic status, as measured by the variables indicating eligibility for free- or reduced-lunch. These variables denoted students whose families fall below the poverty level, a major indicator of SES. The extant research is supportive of this finding.

Beginning with Coleman (1966) SES was identified as the greatest predictor of student achievement. White (1982) conducted the first meta-analysis of the influence of SES on student achievement. He found SES to be an aggregate concept comprised of many factors in addition to income, akin to New Jersey's DFG index. When taken in the aggregate, SES accounted for approximately 75% of the variation in student outcomes. In a replica meta-analysis conducted with research dating from 1990-2000, Sirin (2005) found only a slight decrease in said variation. Socioeconomic status remains, at minimum, a moderate to strong predictor of achievement.

For administrators, SES is not a mutable factor. However, attempts to overcome this hurdle are not unprecedented. In 1896, the Supreme Court decision *Plessy v. Ferguson* upheld the constitutionality of racial segregation but mandated that schools be "separate but equal," indicating that school resources played a role in education. The New Jersey Supreme Court decision of *Hedgepeth-Williams v. Board of Education, Trenton, NJ* (1944) desegregated Trenton Public Schools, stating that, "It is unlawful for boards of education to exclude children from any public school on the grounds that they are of the Negro race" (Cane, 2009). The United States Supreme Court's landmark decision *Brown v. Board of Education, Topeka* (1954) desegregated schools stating, "Separate educational facilities are inherently unequal." In New Jersey, the 1990 *Abbott v. Burke* decision found school funding procedures to be unconstitutional. Thirty of the state's poorest districts (with the lowest district factor group ratings) received funding commensurate with the highest funded schools. NLCB addresses school resources by giving parental intra-district choice should the home school fail to meet AYP for two consecutive years (USDOE, 2006).

However, the findings from this study corroborate the extant research on the strong relationship between SES and achievement. This fact should be the ultimate basis of any education reform. Policymakers who would like to believe that external mandates such as better qualified teachers, merit pay, charter schools, performance pay, smaller schools, vouchers, etc., must revisit the extant research. The difference in test scores between SES groups is due to SES itself. Lower SES status is tantamount to lower scores. Mandates targeted at poverty itself will likely have more of an influence on achievement than any other variable(s). Perhaps the most recent example of this concept is the well-meaning work of the Bill and Melinda Gates Foundation. In 2001, the Foundation gave \$1 million to Manual High School in Denver, a low-income, low achieving school (Greene & Symonds, 2006). It was hypothesized that creating three small, separate schools from the large high school would promote better personal relationships and higher expectations for all students; the Foundation believed that these were important variables for achievement. Although attendance rates rose slightly and relationships strengthened, there was no carryover into achievement. Only 20% of 2001 freshman graduated four years later. No student reached Advanced Proficient levels on state testing. In 2006, the Denver Board of Education shut down the school.

Free market ideology also has been a popular mantra of today's policymakers. Education is compared to business models, and competition should be fierce. Charter schools and vouchers will mimic big business, and only the proverbial strong will survive. However, the Broad Foundation, along with other business investors, attempted to prove this theory with the Oakland, California School District. In 2003, Randy Ward was given the superintendency and \$26 million from business investors to make

accountability and choice work. By 2008, the district had 32 charter schools where 17% of its school-age population was enrolled. Test scores did go up (albeit in tandem with statewide gains); however, they remained below the state average. The Oakland charter schools laid claim to higher performing students and sent those not performing up to expectations to the regular schools (Ravitch, 2010).

Given the results of this study and the voluminous extant research, one can't help but wonder if the money spent on these education reforms would be better spent on poverty issues. Programs with a proven track record, such as Head Start, founded in 1965 as part of the War on Poverty directly attack the issues of SES. It has been shown that students who participate in Head Start display higher cognitive growth and improved school readiness when compared to a control group (U.S. Department of Health and Human Services, 2010).

The economic aspect of schools is a political, social, and cultural phenomenon, often provoking visceral responses from all parties. In an effort to gain widespread equity in education, Jonathan Kozol's provocative book, *The Shame of the Nation: The Restoration of Apartheid Schooling in America* (2005) states that American education is woefully inequitable. Kozol points to the widespread practice of economic segregation entrenched in the policy of education "districting." The very presence of district boundaries mandates that the societal *haves* and *have nots* are exposed to inequitable school experiences, some vastly and irreconcilably so. For example, for the 1997-1998 school year, a student in the Bronx could expect an \$8,000 per year education. If that student simply moved to a typical White NY suburb, he or she would reap the benefit of a \$12,000 per year education. If the student moved to a wealthy suburb, he or she would

suddenly be worth \$18,000 per year. Dissidents often state that money is not the answer to education inequity. This topic is not one typically decided upon by New Jersey administrators; it is rather a state or federal issue. However, for those administrators working in districts with large SES disparities, heterogeneous SES grouping may warrant further research, including a district feasibility study. Redistricting and/or regrouping will most likely be met with much opposition, including legal battles for administrators. Both district communities and communities within districts (such as the New York City example) tend to mirror personal preferences to live among others with similar cultural, economic, linguistic, ethnic, generational and political traits. In New Jersey, where school districts remain smaller than most of the country, districts are often naturally segregated by SES. For most New Jersey administrators, this may be a moot point, yet some areas are experimenting with housing as a means of changing the SES of schools. Rusk (2001) explicated the link, "School enrollment patterns are closely tied to residential patterns. *In short, housing policy is school policy.*" The school district of Montgomery County, MD, boasts impressive achievements:

- 2/3 of its high school students take AP courses
- SAT scores exceed national average
- 9 out of 10 students graduate high school

While it is true that Montgomery County is affluent, an increasing number of students are low income (1/3 qualify for free- and/or reduced-lunch), and the majority of students are minority. The county's impressive record and its ability to serve minority students are most likely due to its inclusionary housing policy. Real estate developers are mandated to set aside a portion of the homes they build or rent for low-income residents

below market value. Furthermore, the Housing Opportunities Commission may purchase one-third of these homes to operate as federally subsidized public housing. This enables families who live below the poverty line to send their children to school in the district. In an intriguing study of 850 students below poverty level attending the more affluent schools, Schwartz found that the students far outperformed their peers in less advantaged schools. Additional low-income families in the more affluent schools tended to have more residential stability, increasing academic outcomes.

Recommendations for Policy and Practice

SES continues to be the most influential factor in achievement. Money sent to schools, such as to the Abbott districts in New Jersey, has not closed achievement gaps. As of this time, the most promising programs for increasing achievement for lower SES students are Head Start and inclusionary housing.

Head Start is well-documented for its positive outcomes. Yet, its funding is constantly being threatened or given conditionally. In 2011, a 22.4% reduction was proposed in funding for Head Start and Early Head Start. The Senate rejected the bill, but if Congress passes it, 218,000 poor children will be dropped from the program and 55,000 Head Start workers will lose their jobs. This is not prescient public policy given the exponential benefits of the program. The Obama administration would like to put conditions upon Head Start funding; specifically, the schools that receive it can't be failing (McCartney, 2011). This would take the program away from those who need it most desperately.

Additionally, affluent students have better access to pre-Kindergarten programs that have been clearly demonstrated to have a positive influence on a child's future

schooling. If programs are available at all to low-income students, they are typically poorly funded, overcrowded and incomparable to pricier private programs. Kozol (2005) uses New York City as an example, where parents hire consultants to give their children the competitive edge to attain admittance to the best preschools, also known as the "Baby Ivies."

Studies regarding inclusionary housing are warranted. Inclusionary housing may turn out to be a best practice crossover social-education policy. It is important to note that inclusionary housing is intergenerational in its effects. The benefits of living in a more affluent community include less exposure to crime and other poverty-related issues for the adult and child. Additionally, the child is exposed to a better school experience. This is a particularly important area for policymakers to highlight. Long-term, child-centered approaches are preferable because short-term, adult-centered approaches (public assistance, tax relief) have not been proven to help intergenerational poverty issues (Heckman, 2006; Smith, 1995). Clearly this is a first step for families who have lived in poverty for generations, as "the developmental significance of economic disadvantage is rooted in family dynamics" (Crosnoe & Cooper, 2009). However, the exposure of at least two generations to positive environments is worthy of further study on both the education and social front. This is a topic that needs to be addressed both inside and outside the education arena. Social programs, such as those set forth by Johnson's War on Poverty, directly and indirectly affect schools. Under Johnson's presidency, data concerning the vast differences between Whites and non-Whites in the areas of education, employment, health care, and housing were uncovered (Amaker, 1988). Using the research on SES and family dynamics in tandem, great strides could be made on the

culture of poverty and, thereby, education. The costs saved would be exponential on both fronts with reduced grade retention, reduced remedial costs, and reduced high school attrition rates. Dropping out of school is correlated with many social issues, reduced juvenile delinquency rates, lower teenage pregnancy rates, and decreased intergenerational economic dependency (Furstenberg, 1976).

Warren Buffett, the economic tycoon, gave a quick and easy solution to end the cycle of poverty and low quality education, "Make private schools illegal and assign every child to a public school by random lottery" (Rhee, 2010). The integration of students and resources might possibly grow a high quality public education system unparalleled anywhere in the world.

Student-Faculty Ratio

Conclusions

Student-faculty ratio proved to have a significant but weak relationship to NJ ASK 5 scores in both Math and Language Arts Literacy. The NJ School Report Card variable "Student-faculty Ratio" is calculated by dividing the reported October school enrollment by the combined full-time equivalents (FTEs) of classroom teachers and education support services personnel assigned to the school as of October of the school year (NJSRC, 2009). This variable is unique in the literature to New Jersey.

Based on the results and the extant research, it may be that this ratio and class-size are more related than the NJ class-size variable, although it does not follow the research definition of number of students accountable to one teacher. Research on class-size has shown that smaller classes increase education outcomes, especially at the K-3 level. Superficially, this variable looks like pupil-teacher ratio, which may result in improperly

negating the positive influence of decreased class-size on student achievement. This variable may be more powerful than it displays itself to be when class-size is defined correctly. This notion becomes particularly critical when considering the school experiences of minority students, students of low socioeconomic status (SES), and limited-English-proficiency (LEP) students who have demonstrated highly positive achievement gains from being in small classes in early grades (Word et al., 1990) when compared to gains of other students.

Recommendations for Policy and Practice

The unique nature of the variable makes it difficult to identify the exact cause of the variation. However, using the existing literature on the subject combined with these results, the recommendation is for the student-faculty ratio to be kept smaller, especially in the early grades where the effects are the greatest. Specifically, lessening the amount of students for which one teacher is responsible should yield even greater results. Tennessee's Project Star showed a strong, statistically significant gain in achievement for students in smaller classes across the board. The compelling class-size effect was evident across demographic lines. Anovas performed for race, gender, and a host of other variables corroborated the positive correlation between small class-size and achievement (Achilles et al., 1990). Using Glass and Smith (1979) as a guide, in order to have a discernible difference in achievement, optimal class-size should be no more than 15 to 1.

The ultimate aspiration of CSR is increased student achievement. Ideologically, the smaller student-teacher ratio provides educators increased opportunity to individualize instruction, minimize behavioral problems, and focus on strategic planning (Underwood & Lumsden, 1994). Much political opposition

may be met when administrators attempt to lower class-size due to increased costs. Dissenters of CSR contend that in order to produce benefits, class-size needs to be reduced drastically, a process that is not cost effective (Hanushek, 1999). However, a correlation between small class-size and reduced grade retention is found (Achilles, Nye, Zaharias, Fulton, & Cain, 1996), lowering remedial costs. Additionally, the cost of class-size reduction is further negated by reduced dropout rates and higher adult earnings. Considering the fount of research regarding class-size, ineffective interventions may be cut in order to reduce the number of students in each class. Repurposing teachers who do not have regular class assignments (pull-out, remedial, special education, Title I) may be another viable method to make CSR less costly (Odden & Archibald, 2000). Class-size reduction is a prescient and research-proven education reform.

Faculty and Administrator Credentials

Conclusions

Faculty/staff holding advanced degrees proved to have a positive influence on NJ ASK 5 scores. Notably, most of the literature regarding credential influence on student achievement focuses on teachers specifically. Michel (2008) sampled 888 New Jersey public schools and conducted an analysis to determine which variables were the greatest predictors of NJ ASK 4 scores. After controlling for SES, Michel found that the greatest predictor variable on NJ ASK 4 Language Arts Literacy and Mathematics was teachers holding a master's degree or higher.

Furthermore, the influence may be greater when teachers hold advanced degrees in subject(s) taught. Wenglisky (2000) found that only those educators who majored or

minored in their subject area had a positive influence (roughly 40% of a grade level) on student achievement on NAEP. Using NAEP data from 1998, Johnson (2000) found that in reading and math, Grade 8 students whose teachers held an advanced degree in education, underperformed peers whose teachers held an advanced degree in English or a bachelor's/advanced degree in math or science. Similarly, Goldhaber and Brewer (1997) analyzed data from the National Educational Longitudinal Study of 1988, which allowed the researchers to link students to specific teachers. The analysis suggested that only subject-matter-specific training resulted in increased student performance. In a meta-analysis of 16 studies highlighting math and science teacher training, Blank and de las Alas (2011) found a positive relationship to math student achievement. The results displayed a consistent positive effect on gains in student achievement in mathematics from teacher professional development in mathematics education.

Additionally, there is research to suggest that teacher quality may have a positive influence on a student's education. This variable is not directly measured on the NJ School Report Card by degree earned, an out-of-classroom factor. However, an advanced degree does require more time in learning pedagogy and reflection. After conducting a meta-analysis regarding the effects of school factors on student achievement, Marzano (2007, p. 1) stated that "the single factor that surfaced as the single most influential component of an effective school is the individual teachers within that school."

Recommendations for Policy and Practice

Given the results of this study and the extant research findings, teachers holding advanced degrees proved to have a weak but positive influence on scores. Ball and

Darling-Hammond (1997) explained that the key to increasing achievement is investing in teachers. Therefore, it would be beneficial to look at advanced licensing options for educators to maximize the relationship. Teachers with advanced degrees, particularly in their subject area, should be given preference in hiring. Goldhaber and Brewer (1997), explained, "Teachers who are certified in mathematics and have BA and MA degrees in mathematics are associated with higher student mathematics test scores. Likewise, teachers with BA degrees in science are associated with higher student science test scores. Because mathematics and science degrees were not found to influence student outcomes in English and history, we believe that these results suggest that it is the subject-specific training rather than teacher ability that leads to these findings" (p. 520). Furthermore, since measuring the selectivity of teachers' colleges has been shown to have a positively influence on student achievement (Ehrenberg and Brewer 1994), teachers with more selective college experiences should be first considered. It has been suggested that New Jersey adopt a similar program to New York, mandating teachers receive a master's degree within the first 5 years of teaching (Michel, 2004). Based on this study, that recommendation seems, at the least, worth looking into further. However, since subject-area specialization has been shown to have the most positive influence, it should be reflected in any mandate regarding teacher degrees.

It should be noted that far-reaching programs such as mandatory advanced degree requirements can incur possible unintended consequences such as decreasing selectivity/quality of collegiate master's programs, thus rendering the program ineffective. Additionally, the costs, in increased salaries due to higher degrees may pose a problem as well. With over 60% of all school budgets going to instructional costs that "consist

overwhelmingly of teacher salaries and benefits,” it may be a cost-prohibitive measure (Goldhaber & Brewer, 1997).

Teaching professionals from selective colleges with degrees in their subject area should be the preferential candidates. Teachers who are currently employed should be encouraged to pursue advanced degrees in their respective content areas. Educators should be encouraged and perhaps rewarded for attending more rigorous, selective training programs.

Grade 5 Class-size

Conclusions

Grade 5 class-size also has a small but significant influence on NJ ASK 5 LAL and Math scores. Once again, however, the variable in the NJ School Report Card is out of line with the literature, making accurate conclusions and comparisons to extant literature trying. The NJ School Report Card uses the physical classroom space divided by the total number of students at the grade level to give a more accurate description of the number of students per classroom teacher. This number may be misleading if small instructional classes are counted. In the future, the NJDOE variable should adhere to the research standard of number of students for which each classroom teacher is accountable.

It is the contention of this paper that should New Jersey adopt the standard variable for class-size, a far greater effect would be demonstrated on overall achievement, even for math scores. The extant research is clear: class-size matters, especially in the early grades and for disadvantaged students. The Tennessee Project STAR class-size research is the longest, best-controlled CSR research to date. Project Star involved over 11,000 students in its experimental design, a marked difference from simple CSR

implementation. Project Star demonstrated a statistically significant positive correlation between lower class-size (15) to student achievement. CSR was verified to have an especially significant positive effect on achievement for disadvantaged students (Achilles et al., 1990). Hence, states such as Wyoming and Nevada have made at-risk students the priority of their CSR initiatives. The research shows CSR to be optimally effective when there is early intervention (Kindergarten or first grade) and CSR duration of at least three years (Mitchell & Mitchell, 2001).

Grade 5 class-size reduction should be preceded by class-size reduction in the early grades. Class-size reduction may be initially costly; in order to finance this initiative, a shift in education resources from ineffective programs to CSR should occur. Teachers not responsible for classrooms may be repurposed to effect this change. The statistically significant gains of CSR cannot be underestimated and should be thought of in terms of future savings. Particularly responsive to decreased class-size are grades K-3 at-risk students. Accordingly, CSR program would save future monies in remediation, retention, and related costs associated with attrition. The effects of reduced class-size have been proven to be long lasting if small class-sizes are maintained for 3 years. Longitudinal findings from Tennessee's Project Star show students attending small classes in grades K-3 outperformed comparison students on standardized measures in Grades 4, 6 and 8. The same students continued to outperform classmates in high school, taking more AP classes and persisting in high school to a greater degree than their counterparts (Achilles et al., 1996).

In 1986, Robinson and Wittebols examined over 100 class-size research studies, employing a related cluster analysis approach. The conclusion was analogous to the

findings of the Star Project. Most significant gains were seen in the primary grades (K-3). The review added an important dimension to the CSR equation, teacher instructional methods. Robinson and Wittebols (1986) argued that teachers need to do more small group instruction, have high expectations of students, and be motivated. However, Achilles (1999), principal researcher with Project Star, indicated that teachers may not need to change their methods to gain a significant class-size effect.

Recommendations for Policy and Practice

Administrators should note that the class-size research was honored on the political front in 2000 when CSR was a federally supported school-improvement strategy (Whitehurst & Chingos, 2011). A federal class-size-reduction program gave states funding to recruit, hire, and train new teachers to achieve lower class-sizes. However, under the No Child Left Behind Act, the CSR program was fused into a general teacher-quality block-grant program. This was a curious move considering that the platform of NCLB is research-driven decision making. Based on this study and the extant research, any monies received from the aforementioned grant should be funneled into CSR.

Good and McCaslin (2005) of The University of Arizona conducted interviews with principals involved in the state's CSR programs to gauge attitudes about its effectiveness. Generally, the principals rated class-size reduction as being valuable but were unhappy with the lack of time for implementation, approval of funds, and managerial components. The principals tended to focus on the administrative side to CSR. Moreover, only two questions on the Good and McCaslin (2005) survey were focused on students, one involving test scores and one regarding "fluctuations in classroom performance." Administrators involved in CSR initiatives should be allowed

to use some of the monies for extra aid in its implementation.

Administrators should also note the issues that have come up when implementing CSR programs to avoid unintended consequences. For example, as was the case in California, a shortage of qualified teachers may negate any positive effects of CSR (Stecher & Bohrnstedt, 2000). Another frequent confounding variable includes the lack of space to accommodate more classrooms. The table below illustrates, by state, the allocation, grades, average class-size, and variables affecting CSR programs.

Table 52

Class-size Reduction Initiatives by State

State	Star Year	Allocation	Grades	Class-size	Issues
Alaska	1997	1.6 million	K-4	20	Teacher Shortage
California	1997	53 billion	K-3	20	Teacher Shortage, Lack of space
Florida	1996	100 million	K-3	20	Still operating
Illinois	1981	5 million	K-3	18-20	Teachers have improved attitude CSR adopted statewide
Indiana	1981	36 million	K-3	15-18	Still operating
Iowa	1999	10-30 million	K-3	17	Teacher shortage, Lack of space

Louisiana	1986	32 million	K-3	20	Teacher shortage, Lack of space
Maryland	1999	12 million	1-2	20	Still operating
Minnesota	1993	135 million	K-6	17	Still operating
Nevada	1989	83 million	at risk K-3	17	Lack of space
New York	1999	225 million	K-3	20	Lack of space
Oklahoma	1990	Funds vary	K-6	20	Still operating
Ohio	1999	131 million	K-1	20	Teacher shortage, Lack of space
South Carolina	1995	34 million	1-3	15	Lack of space
Tennessee	1985	NA	K-3	15-18	Study showed significant Class- size effect
Texas	1984	NA	K-4	20	Still operating
Utah	1990	67 million	K-6	21-25	Lack of space
Virginia	1996	Funds vary	K-8	varies	Still operating
Washington	1986	99 million	K-4	varies	Lack of space
Wisconsin	1996	56 million	K-3	15	Still operating
Wyoming	-	NA	K-3	20	Still operating

Blatantly, space is an issue when considering a CSR initiative. Additionally, the shortage of qualified teachers that plagued some states displays the necessity of introducing a CSR program in stages, making sure supply keeps up with demand. In Nevada, an enrollment boom occurred as CSR was underway. In Clark County, Nevada's student population grew by 75% from 1984 to 1994, exacerbating space and teacher shortage problems (McRobbie, Finn & Harmon, 1998). These confounding variables show the administrative need to perform a more in-depth analysis of CSR than simplistic dollar cost averaging to view tertiary problems. However, CSR is a proven method of increasing achievement. Prescient and specific planning that addresses the issues should be laid out prior to commencement to reap the maximum benefit from CSR.

CSR will benefit educators and students as well in many ways. Logically, the decreased paperwork would be beneficial to both the educator and the student, as time could be used more meaningfully. Moreover, smaller classes translate into less behavior management, individualized instruction, flexible grouping, student-teacher interaction, more planning time, and more physical space (Good & McCaslin, 2005). An approach combining smaller class-size and increased professional selectivity is clearly the best practice, albeit initially costly. Intriguingly, in all of the studies, educators almost always had positive feelings towards CSR. Those sentiments affected the morale and attitude of the professionals. Students also benefit socially with increased peer interaction. Moreover, achievement will be positively affected.

Grade 5 Attendance Rate

Conclusions

Grade 5 attendance rate is a factor affecting both NJ ASK 5 Math and LAL scores. The NJ School Report Card variable is similar to the attendance rate variable in the extant literature. However, the demarcation of excused and unexcused absences in the extant literature has made greater progress in understanding the effects of absenteeism. The New Jersey variable is calculated by dividing the sum of days present in each grade level by the sum of possible days present for all students in each grade. It does not make the distinction between types of absences.

The findings of this study corroborate the research on student attendance. Studies conducted by Caldas (1993), Chang & Romero (2008), and Gottfreid (2010) all demonstrated that student attendance has a statistically significant relationship with student standardized test achievement. Higher student absenteeism results in lower scores. The positive influence of school attendance on academic achievement may be even stronger than research indicates (Johnston, 2000; Lamdin, 1996). Over time, chronically absent students tend to increase the pattern of absenteeism throughout their academic career, and are more likely to drop out of high school (Ensminger & Slusarcick, 1992; Rumberger, 1995).

Recommendations for Policy and Practice

Student attendance can be manipulated by school and state attendance policies/requirements. Administrators on district and state levels must take a proactive approach toward student absenteeism. The NJ School Code is useful on unexcused absence issues. Sections 6A:16-7.8 have specific protocols regarding unexcused absences.

Figure 4

NJ School Code: Attendance

6A:16-7.8 Attendance

- (a) Each district board of education shall develop, adopt and implement policies and procedures regarding the attendance of students, pursuant to N.J.S.A. 18A:38-25 through 31 and N.J.A.C. 6A:32-8 and 13.1, at the public schools of the district or day schools in which students are provided with equivalent instruction, according to the requirements of N.J.S.A. 18A:38-25, that shall include, at a minimum:
1. The expectations and consequences regarding the timely arrival of students to school and classes;
 2. The expectations and consequences regarding attendance at school and classes;
 3. A definition of unexcused absence, for the purpose of this section, that, at a minimum, shall be based on the definition of a school day, pursuant to N.J.A.C. 6A:32-8.3, and the following considerations:
 - i. Family illness or death;
 - ii. Educational opportunities;
 - iii. Written parental permission;
 - iv. Excused religious observances, pursuant to N.J.S.A. 18A:36-14 through 16;
 - v. Where appropriate, Individualized Education Programs pursuant to 20 U.S.C. § § 1400 et seq., the Individuals with Disabilities Education Improvement Act, accommodation plans under 29 U.S.C. § § 794 and 705(20), and individualized health care plans, pursuant to N.J.A.C. 6A:16-2.3(b)2ix; and
 4. School staff responses for unexcused absences:
 - i. For up to four cumulative unexcused absences, the school district shall:
 - (1) Make a reasonable attempt to notify the student's parents of each unexcused absence prior to the start of the following school day;
 - (2) Conduct an investigation to determine the cause of each unexcused absence, including contact with the student's parents;
 - (3) Develop an action plan in consultation with the student's parents designed to address patterns of unexcused absences, if any, and to have the child return to school and maintain regular attendance;
 - (4) Proceed in accordance with the provisions of N.J.S.A. 9:6-1 et seq. and N.J.A.C 6A:16-11, if a potential missing or abused child situation is detected; and
 - (5) Cooperate with law enforcement and other authorities and agencies, as appropriate;
 - ii. For between five and nine cumulative unexcused absences, the school district shall:

- (1) Make a reasonable attempt to notify the student's parents of each unexcused absence prior to the start of the following school day;
 - (2) Conduct a follow-up investigation, including contact with the student's parents, to determine the cause of each unexcused absence;
 - (3) Evaluate the appropriateness of the action plan developed pursuant to (a)4i(3) above;
 - (4) Revise the action plan, as needed, to identify patterns of unexcused absences and establish outcomes based upon the student's needs and specify the interventions for achieving the outcomes, supporting the student's return to school and regular attendance that may include any or all of the following:
 - (A) Refer or consult with the building's Intervention and Referral Services team, pursuant to N.J.A.C. 6A:16-8;
 - (B) Conduct testing, assessments or evaluations of the student's academic, behavioral and health needs;
 - (C) Consider an alternate educational placement;
 - (D) Make a referral to a community-based social and health provider agency or other community resource;
 - (E) Refer to the court program designated by the New Jersey Administrative Office of the Courts; and
 - (F) Proceed in accordance with the provisions of N.J.S.A. 9:6-1 et seq. and N.J.A.C. 6A:16-11, if a potential missing or abused child situation is detected; and
 - (5) Cooperate with law enforcement and other authorities and agencies, as appropriate.
- iii. For cumulative unexcused absences of 10 or more, the student, between the ages of six and 16, is truant, pursuant to N.J.S.A. 18A:38-27, and the school district shall:
- (1) Make a mandatory referral to the court program required by the New Jersey Administrative Office of the Courts;
 - (2) Make a reasonable attempt to notify the student's parents of the mandatory referral
 - (3) Continue to consult with the parent and the involved agencies to support the student's return to school and regular attendance;
 - (4) Cooperate with law enforcement and other authorities and agencies, as appropriate; and
 - (5) Proceed in accordance with N.J.S.A. 18A:38-28 through 31, Article 3B, Compelling Attendance at School, and other applicable State and Federal statutes, as required.
-

Administrators must adhere to the code for unexcused absences. However, excused absences are not addressed. Both may be lessened with administrative input. Some schools have adopted reward policies for perfect/near perfect attendance and/or improvement in attendance rate. Parent-School partnerships have been shown to positively affect attendance. Epstein and Sheldon (2002; p. 317) state that “supportive activities give a human quality to corrective action. For example, when parents have clear information about school attendance policies and the importance of attendance for student report card grades and classroom learning, more parents may convey messages to their children about the importance of school and good attendance. When families feel that the school cares enough to provide them with the telephone number of a responsive contact person (whether they ever call that person or not), fewer parents may keep students home from school for family reasons. “

Studies show students are significantly more likely to be absent from class if they perceive there are no academic consequences. (Duckwork & DeJung, 1989). Therefore, absences must have consequences, which may be as simple as missing free time to complete make-up work. Attendance rules must be clear, written, observed, and adhered to consistently to help combat absenteeism and its affect on achievement.

Student Mobility

Conclusions

Student mobility was found to have a negative influence on NJ ASK 5 scores in both Math and Language Arts in the school variables model. This finding is in accordance with the extant literature. The variable was not found to be significant in the

simultaneous regression model, perhaps due to the impact of a suppressor variable in the full model. Specifically, Grade 5 attendance rate and student mobility were moderately correlated at .354; $p=.001$ (see Correlation Matrix in Appendix). Mobility occurs when students change schools for reasons other than grade promotion. Typically, student mobility is highly associated with lower SES status (Rumberger, 2003). However, heightened student mobility has a negative influence in any SES grouping (Shuler, 1990). The influences of high mobility may include the following:

- Lower achievement
- Discontinuity/disconnect of curriculum between schools, affecting performance
- Behavioral problems
- Difficulty developing peer relationships
- Greater risk for dropping out of school
- Lower achievement for non-mobile students who attend highly mobile schools

The effects of student mobility may be even greater than the research suggests as highly mobile students often fall through the cracks (Barak, 2004). With its documented influence on achievement and host of other negative issues, student mobility is an issue that warrants administrative action.

Recommendations for Policy and Practice

Administrators must take a proactive approach to student mobility. Populations targeted should include homeless students, children of illegal residents, low-income students, and children of migratory workers. These populations are most affected and arguably least informed on their rights as parents of school children. The administrator needs to have strong home communication when possible and resources regarding the

negative affect of mobility in the language(s) of the parents. Human resources and access to aid and services should be made available.

Tracking a student from school to school is imperative. A statewide longitudinal student identification program would benefit these students and allow districts to track students more readily. This would enhance a school's ability to best place a mobile student to meet academic needs (Dougherty, 2002). For the individual administrator, being sure a student's records arrive in a timely manner can save months of inaccurate placement.

For mobile students who are homeless, the McKinney-Vento Act needs to be adhered to. This law entitles homeless children to a free and appropriate education. The Act also mandates that schools appoint a liaison to work with homeless students and their families and serve as a resource for educators (Duffield, 2001). This model may be worth looking into for all mobile students.

Other interventions may include buddy systems, partnering new students with current students to guide them, and professional development for teachers working with the highly mobile and their special needs. An informed educator may be able to get through to a parent and explain options in a less threatening way than a school administrator. Student mobility should also respond to poverty interventions such as affordable housing.

Length of School Day

Conclusions

The length of school day is defined as the amount of time a school is in session for a typical student on a normal school day. The typical American school day is 6 hours and

35 minutes (Roth et al., 2003). This NJSRC factor was found to have a weak but statistically significant influence on NJ ASK 5 scores in both Math and Language Arts. The extant literature on this variable has produced mixed results, most notably favoring instructional time as being more predictive of achievement. However, using the results and the extant research, an increase in the school day may yield statistically significant results. In this study, school day length ranged from 360-450 minutes, with a mean of 388.22 and a standard deviation of 13.901. Some research points to the law of diminishing returns when school day length is involved (Silva, 2007) so the standard deviation is of particular importance in these findings.

Recommendations for Policy and Practice

Using the standard deviation as a guide, administrators may add 14 minute increments to their respective school days. Each year, the addition of minutes should be reanalyzed and tested statistically for influence on achievement. Based on prior research, a length-of-school-day increase may be far more effective in low SES districts (Silva, 2007). The maximum school day length, using this study as a guide, should not exceed 450 minutes, as currently there is no data supporting the notion that greater time will produce increasingly greater results. This variable may have little influence for an individual district at a high cost, negating its feasibility. However, if other unproven reforms are replaced with increased time, the monetary costs may become more reasonable. Additionally, since engaged time has been shown to most greatly influence student achievement, the added minutes should be specifically dedicated to activities that foster engagement.

Faculty Mobility

Conclusions

Faculty mobility is the turnover rate of school staff members. In this study, faculty mobility was found to have weak but significant influence on NJ ASK 5 Math scores, but not on LAL scores. Higher mobility was associated with lower Math scores. The New Jersey variable includes teachers who left a position for a different placement and teachers who left the profession altogether. The extant research is considerably more robust on teachers leaving the profession, which has been shown to affect all achievement negatively (Planty, Hussar, William, & Snyder, 2008). If the New Jersey variable demarcated the difference between transfer, retirement, and attrition, the results would probably better align with the literature and show statistically significant negative achievement scores across all disciplines for the latter. In addition to achievement, faculty mobility affects flow of the school year, continuity of education experience, teacher-student relations and curriculum delivery (Alliance for Excellent Education, 2008).

Recommendations for Policy and Practice

Administrators should be proactive in recruiting the best education professionals to avoid the pattern of early attrition. Certified teachers should be given preferential hiring over emergency certification candidates. In California, researchers found that 40% of emergency-permit teachers left teaching within one year, and two-thirds never received full certification (Darling-Hammond, 2002). Starting salaries should be competitive to attract the brightest and best-equipped candidates. Typically, attrition occurs most often after the first three years of teaching (Kaiser, 2011). Therefore,

strengthening mentor programs with well-established and experienced educators would be beneficial to lessen the attrition rate of inexperienced teachers. Other support programs, including new teacher orientation classes, advisory aid, and curriculum support should be made readily available to novice teachers. Some districts have reduced attrition rates of beginning teachers by more than two-thirds simply by offering expert mentors release time to coach beginning teachers (NCTAF, 1996).

Addressing attrition due to factors other than new teacher attrition is also necessary to recruit and retain faculty. Unsatisfactory working conditions, student behavior issues, and lower compensation rates have all been noted as reasons for faculty mobility (Allensworth, Ponisciak, & Mazzeo, 2009). Working conditions must be sanitary and supplies provided. Increasing compensation rates for teachers so they are competitive with other districts is imperative. Student behavior issues must have consequences that allow for educator input. Leadership must also value and actively engage educators in decision-making processes. Darling-Hammond (2003, p. 6) explained, “To reduce high teacher turnover rates that impose heavy costs on schools, we must improve working conditions, insist on effective teacher preparation, and provide support for new teachers.”

Instructional Minutes

Conclusions

Instructional time was found to influence NJ ASK 5 LAL scores slightly, but not Math scores. The New Jersey variable is the amount of time per day that a typical student is engaged in instructional activities under the supervision of a certified teacher. The extant research is increasingly focused on engaged time, not simply instructional minutes (Silva, 2007). In the future, the variable may benefit from alignment with the extant

literature on engagement, which has been documented to increase achievement learning (Aronson, Zimmerman, & Carlos, 1998). For researchers that have attempted to rank the importance of school level effects, such as Scheerens & Bosker (1997) and Marzano (2000), time is in first and second place, respectively, for influence on student achievement.

Recommendations for Policy and Practice

Given the results and the extant literature, maximizing instructional minutes to increase engaged time for students would be the most prudent recommendation. However, an administrator may work this research into practice in stages. The instructional time range in this study was from 307 to 395 minutes, with a mean of 342.10 and a standard deviation of 15.490. Using the standard deviation as a guide, the administrator may add 15 minutes to the instructional time until a maximum of 395 is reached. Additionally, simply labeling the additional time instructional minutes could be the first tier of the program. Results in achievement should be monitored and statistically analyzed with each step. Once the time is increased, training in engaged time could be added to further take advantage of the extant research. It has been noted that in any given lesson, students may spend less than 50% of the time engaged or actively responding. (Mastropieri & Scruggs, 2000). After the training, teachers would then be expected to ensure that students are engaged during the allocated time, ensuring that the maximum possible benefit of this variable is received.

Recommendations for Future Research

This research adds to the extant literature on factors that influence NJ ASK 5 scores. However, one exploratory study cannot provide complete answers as to which

variables most influence NJ ASK 5 achievement. Finding the best methods of educating New Jersey students is a multifaceted and complex task. The variables on the NJ School Report Card as described in this study are useful as a starting point and guide for further research. The results of this study are in line with the extant research on factors influencing student achievement. To make the literature more complete, some possible areas to explore include the following research topics:

1. Do NJ School Report Card Variables statistically correlate with similar variables in the extant research?
2. The repetition of this study with all of the NJ ASK tests (3, 4, 6, 7, 8) would enable researchers to compare/contrast whether the variables are context specific.
3. The repetition of this study with other standardized criterion-referenced achievement results would give greater insight into the variables and their influence on standardized testing in the aggregate.
4. Conduct a similar study using the report cards of other states and their respective standardized measures.
5. Perform a meta-analysis on the extant research between state report cards and standardized achievement and find the effect size of each variable.
6. Given the large influence of SES on NJ ASK 5 scores, it would be beneficial to compare the same group of students' results on another standardized measure. Possible correlations should be sought. This would illuminate the differences of testing instruments to variances in SES. Is the NJ ASK more or less biased toward higher SES groups than other standardized measures?
7. Perform a study regarding the achievement differences between excused and

unexcused absences.

The task of educating New Jersey students in a “thorough and efficient” manner has been relegated to the NJ ASK series of tests. The information garnered from this study should aid administrators, policymakers and other education stakeholders in focusing on factors that make a difference. To quote Meier (1987), “We are all carriers of our own stories. We have never trusted our own voices. School by school changes, however slow, could make a powerful difference.”

APPENDIX

Correlation Matrix for Simultaneous Regression

Correlations		Schday Min	insmin	stmob	sfratio	fattend	saratio	babs	mams	Phd edd	mobility	g5 attend	g5class size	g5enr reg	Pplus Math	Pplus Lang
Schday Min	Pearson Correlatio n Sig. (2- tailed) N	1	.606**	.032	-.141	.028	.016	-.060	.076	-.097	.002	.027	-.128	-.053	.066	.027
insmin	Pearson Correlatio n Sig. (2- tailed) N	.606**	1	.081	-.271**	.068	-.136*	.059	-.079	.124	.024	-.066	-.193**	-.011	-.041	-.094
stmob	Pearson Correlatio n Sig. (2- tailed) N	.032	.081	1	-.195**	-.054	-.209**	.270**	-.307**	.218*	.112	-.354**	-.181**	-.209**	.520**	.652**
sfratio	Pearson Correlatio n Sig. (2- tailed) N	-.141	-.271**	-.195**	1	.106	.351**	-.020	.052	-.190**	-.063	.046	.477**	.246**	.220**	.195**
fattend	Pearson Correlatio n Sig. (2- tailed) N	.028	.068	-.054	.106	1	-.001	-.014	.033	-.114*	.067	.032	.028	.036	-.001	-.002
saratio	Pearson Correlatio n Sig. (2- tailed) N	.016	-.136*	-.209**	.351**	-.001	1	-.126*	.175**	-.299**	-.009	.130	.332**	.347**	.187**	.206**
babs	Pearson Correlatio n Sig. (2- tailed) N	-.060	.059	.270**	-.020	-.014	-.126*	1	-.986**	-.093	.060	-.165**	-.065	-.059	-.258**	-.307**
mams	Pearson Correlatio n Sig. (2- tailed) N	.076	-.079	-.307**	.052	.033	.175**	-.986**	1	-.073	-.054	.217**	.108	.081	.302**	.362**
phdedd	Pearson Correlatio n	-.097	.124	.218*	-.190**	-.114*	-.299**	-.093	-.073	1	-.036	-.314**	-.260**	-.132*	-.260**	-.325**

	Sig. (2-tailed)	.087	.029	.000	.001	.043	.000	.101	.199		.526	.000	.000	.019	.000	.000
	N	314	314	310	305	314	312	314	314	314	314	314	314	314	314	314
mobility	Pearson Correlation	.002	.024	.112	-.063	.067	-.009	.060	-.054	-.036	1	.020	-.017	-.050	-.076	-.047
	Sig. (2-tailed)	.973	.678	.048	.272	.239	.868	.289	.338	.526		.719	.770	.377	.179	.405
	N	314	314	310	305	314	312	314	314	314	314	314	314	314	314	314
g5attend	Pearson Correlation	.027	-.066	.354**	.046	.032	.130*	.165**	.217**	.314**	.020	1	.119	.087	.407**	.465**
	Sig. (2-tailed)	.629	.247	.000	.427	.577	.022	.003	.000	.000	.719		.035	.124	.000	.000
	N	314	314	310	305	314	312	314	314	314	314	314	314	314	314	314
g5classsize	Pearson Correlation	-.128	-.193*	.181**	.477**	.028	.332**	-.065	.108	.260**	-.017	.119	1	.317**	.247**	.235**
	Sig. (2-tailed)	.024	.001	.001	.000	.624	.000	.252	.056	.000	.770	.035		.000	.000	.000
	N	314	314	310	305	314	312	314	314	314	314	314	314	314	314	314
g5enrreg	Pearson Correlation	-.053	-.011	.209**	.246**	.036	.347**	-.059	.081	.132*	-.050	.087	.317**	1	.125	.124
	Sig. (2-tailed)	.349	.852	.000	.000	.530	.000	.300	.155	.019	.377	.124	.000		.027	.027
	N	314	314	310	305	314	312	314	314	314	314	314	314	314	314	314
PplusMath	Pearson Correlation	.066	-.041	.520**	.220**	-.001	.187**	.258**	.302**	.260**	-.076	.407**	.247**	.125	1	.867**
	Sig. (2-tailed)	.242	.472	.000	.000	.983	.001	.000	.000	.000	.179	.000	.000	.027		.000
	N	314	314	310	305	314	312	314	314	314	314	314	314	314	314	314
PplusLang	Pearson Correlation	.027	-.094	.652**	.195**	-.002	.206**	.307**	.362**	.325**	-.047	.465**	.235**	.124	.867**	1
	Sig. (2-tailed)	.638	.096	.000	.001	.975	.000	.000	.000	.000	.405	.000	.000	.027	.000	
	N	314	314	310	305	314	312	314	314	314	314	314	314	314	314	314

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

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

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