ABSTRACT

Title of dissertation: DIFFERENCES IN ACADEMIC ACHIEVEMENT BETWEEN TRADITIONAL NEIGHBORHOOD AND MAGNET PUBLIC HIGH SCHOOLS IN A MID- ATLANTIC STATE

Rebecca Benson, Doctor of Education, May 2019

Chair of dissertation: Warren Hayman, EdD, Department of Advanced Studies, Leadership & Policy

The purpose of this quantitative research study was to examine the differences in academic achievement between traditional neighborhood and magnet public high schools in a mid-Atlantic state. Using Robert Marzano’s factors that influence academic achievement as the theoretical framework, the independent variable is the type of high school, and the dependent variable is student performance on the HSA Biology, Algebra I, English 10 and Government tests, as well as, the PARCC English 10 and Algebra I tests.

The sample of schools consisted of approximately 31 traditional neighborhood high schools and 40 magnet high schools throughout a mid-Atlantic state. Data were obtained from
http://reportcard.msde.maryland.gov/, to retrieve information about the location, number of students, High School Assessment (HSA) and Partnership for Assessment of Readiness for College and Careers (PARCC) scores on Biology, Algebra I, Government, and English 10 tests, as well as, percentages of the demographics of the school population; to include special populations, free and reduced meals (FARMS), migrant, minority, limited English proficient (LEP), special education, and the attendance rate of each school.
DIFFERENCES IN ACADEMIC ACHIEVEMENT BETWEEN TRADITIONAL NEIGHBORHOOD AND MAGNET PUBLIC HIGH SCHOOLS IN A MID-ATLANTIC STATE

by

Rebecca Benson

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DIFFERENCES IN ACADEMIC ACHIEVEMENT BETWEEN TRADITIONAL NEIGHBORHOOD AND MAGNET PUBLIC HIGH SCHOOLS IN A MID-ATLANTIC STATE

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has been approved

November 2018

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DEDICATION

To my husband, Josh, you have given me unconditional love and support to see this long journey through to completion. You have taken care of the boys so that I could work to complete this task, and for that, I say thank you.

To my mom, you have supported and encouraged me to continue when I wanted to give up. Thank you for believing in me.

Benjamin and Julian, you are the best sons a mother could ask for. I finished this so that you could have an example of not giving up, no matter how difficult the circumstances may be. It may have taken 8 and a half years, but I did it!
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CHAPTER I

INTRODUCTION

With a four-year high school graduation rate of about 90%, a suburban school district in a mid-Atlantic state has opened three magnet high schools since 2004. These magnet schools are touted as premier educational institutions, in addition to another magnet school which opened in 1978. If the school district already boasts a high school graduation rate of about 90%, have these magnet schools done any better in increasing the academic achievement for their students? The researcher took the idea these magnet schools are premier educational institutions that should produce higher academic achievements than that of traditional schools and broadened the study to include all of the school districts in this same mid-Atlantic state so that there would be more data to examine, including standardized test scores.

Background of the Study

Magnet schools were established in the 1960s as a way to reduce segregation and as a way to address the educational inequities among minority students. This was at the height of the civil rights era when courts were involved in the desegregation of schools. Since then, magnet schools have been established to promote desegregation in urban areas that would appeal to a diverse group of parents and students, while
offering a high-quality school Ainsworth, 2013, p. 446). The number of magnet schools has increased throughout the country. Today they play an important role in the persistent debates about race, segregation, student assignment, as well as student achievement.

Magnet schools are defined by the United States Department of Education (2004) as public schools “that offer a special curriculum capable of attracting substantial numbers of students of different racial backgrounds” (Definition section, para. 1). Today there are approximately 4,000 magnet and theme-based schools in the U.S. These schools have emerged as school districts try to find ways to attract new students, provide choice to families, and turn around low-performing schools (Magnet Schools of America, 2013).

Many magnet schools still help increase diversity within the public school system. But over the last 20 years, some magnet schools have taken on a more competitive role in education in that they can only admit 10-20% of the students that apply to their school. The current role of magnet schools, therefore, is to promote academic opportunity and excellence beyond that which is offered at their regular public school counterparts (Chen, 2015, Current role of magnet schools section, para. 1).
The academic achievement of students who attend magnet high schools was compared to the performance of students who attend traditional neighborhood schools in the same county. The researcher used data from all of the school districts in a mid-Atlantic state that have magnet high schools. "According to the U.S. Department of Education, more than half of large urban school districts have magnet school programs as compared to only 10% of suburban districts" (Chen, 2015, para. 3). Since magnet schools are primarily placed near urban centers to draw students from diverse backgrounds and all walks of life, the placement of magnet schools in suburban areas is sparse. The researcher found that more than 10% of the suburban school districts in this mid-Atlantic state had magnet schools, making it a good place to conduct the study.

There is a void in the literature that describes, explains, and reviews the academic achievements of students who attend magnet schools in suburban areas. Adcock and Phillips (2000) and Yu, Li, and Tompkins (2005) completed studies that have been done in suburban areas with predominantly African American students. This study focused on an entire mid-Atlantic state with large suburban areas that have a more heterogeneous population.
There is also conflict in research results in the literature when it comes to the impact magnet schools have on student academic achievement. Studies which show a positive impact on academic achievement from magnet schools include: Betts, Koedel, Rice, and Zau (2006), Bifulco, Cobb and Bell (2009), Dohrmann, Nishida, Gartner, Lipsky, and Grimm (2007), Fuller, Burr, Huerta, Puryear, and Wexler (1999), Gamoran (1996), Goldring (2004), Hadderman and Smith (2002), and Poppell and Hague (2001). Studies finding comparable levels of academic achievement between magnet and non-magnet students include Archbald and Kaplan (2004), Ballou, Goldring, and Liu (2006), Esposito (2010), Penta (2001), Rhea and Regan (2007), and Yu et al. (2005). Finally, a study finding higher achievement among non-magnet students is Adcock and Phillips (2000). Finding out where the students in this mid-Atlantic state fall, as well as, adding more research to the current body of work was the intention of this study.

**Theoretical Framework**

The framework that was used to guide this study was Robert Marzano’s factors that influence student academic achievement. Robert Marzano (2003) points out that school-level factors, student-level factors, and teacher-level factors are the three general categories that influence student academic achievement. “School-level factors are those that are
primarily a function of school policy and schoolwide decisions and initiatives” (Marzano, 2003, p. 3). Marzano (2003) states that “changes in these factors are usually a result of formal or informal policy decisions” (p. 15). “Teacher-level factors are those that are primarily under the control of individual teachers” (Marzano, 2003, p. 71). These factors affect individual students in the classroom and can be described as the impact that teachers have on student achievement, according to Marzano (2003). Finally, student-level factors account for the lion’s share of the variance in student achievement, according to Marzano (2003, p. 125). This is due to the overwhelming importance of student background characteristics that determine student achievement.

Robert Marzano has identified eleven factors included in the three categories (school-level, teacher-level, and student-level) as the primary determinants of student achievement. The school-level factors are: “a guaranteed and viable curriculum, challenging goals and effective feedback, parent and community involvement, a safe and orderly environment, and staff collegiality and professionalism” (Marzano, 2003, p.15). The teacher-level factors include; instructional strategies, classroom management, and classroom curriculum design (Marzano, 2003, p.76). The student-level factors include; the home atmosphere, learned intelligence and background knowledge, and student motivation
(Marzano, 2003, p.124). For this study, the student-level factors of percentage minority, percentage special education students, and percentage of students who receive free and reduced meals, were used as covariates in ANCOVA, to remove their effects when finding the differences in student academic achievement scores based on school type. Scores on state testing completed by students from magnet and traditional neighborhood high schools were used to determine differences.

Marzano (2003) stated, "that if we follow 35 years of research, we can enter an era of unprecedented effectiveness for the public practice of education—one in which the vast majority of schools can be highly effective in promoting student learning" (p.1). The researcher believed that Marzano’s framework fit the study because based on research by Marlow, (2000) and Wilms, (2003), schools are structured differently, and one would expect differences in the student characteristics at magnet and traditional high schools. The differences in the student characteristics would then drive the differences in student achievement. These same student-level factors helped to answer all of the research questions because they helped to explain the differences in academic achievement of students at different types of schools.
Statement of the Problem

The purpose of this quantitative research study was to examine the differences in student academic achievement between magnet and traditional neighborhood high schools in a mid-Atlantic state. Using Marzano’s (2003) factors that influence student academic achievement as the theoretical framework, the independent variable is the type of high school, and the dependent variable is student performance on High School Assessment (HSA) Biology, Algebra I, English 10, and Government tests, as well as, the Partnership for Assessment of Readiness for College and Careers (PARCC) tests for English 10 and Algebra I. The type of high school will be defined as either traditional neighborhood or magnet. Student achievement will generally be defined as the scores the students at the school received on the HSA and PARCC tests. This study examined the HSA scores for the school year of 2015-2016 and the PARCC scores for the 2016-2017 school year since the HSA and PARCC tests had already been administered and scored.

Research Questions

Given the statement of the problem, the purpose of the study, and the theoretical framework, the following research questions were posed:

RQ1: Is there a significant difference in HSA Biology test scores between traditional neighborhood and magnet high schools?
RQ2: Is there a significant difference in HSA Government test scores between traditional neighborhood and magnet high schools?

RQ3: Is there a significant difference in HSA English 10 test scores between traditional neighborhood and magnet high schools?

RQ4: Is there a significant difference in HSA Algebra I test scores between traditional neighborhood and magnet high schools?

RQ5: Is there a significant difference in PARCC English 10 test scores between traditional neighborhood and magnet high schools?

RQ6: Is there a significant difference in PARCC Algebra I test scores between traditional neighborhood and magnet high schools?

**Hypotheses**

The following hypotheses were generated for this study:

**H\(_0\)1:** There is no difference in HSA Biology test scores between traditional neighborhood and magnet high schools.

**H\(_0\)2:** There is no difference in HSA Government test scores between traditional neighborhood and magnet high schools.

**H\(_0\)3:** There is no difference in HSA English 10 test scores between traditional neighborhood and magnet high schools.

**H\(_0\)4:** There is no difference in HSA Algebra I test scores between traditional neighborhood and magnet high schools.
**H05:** There is no difference in PARCC English 10 test scores between traditional neighborhood and magnet high schools.

**H06:** There is no difference in PARCC Algebra I test scores between traditional neighborhood and magnet high schools.

**Significance of the Study**

Since there are mixed reports about the academic achievements of students that attend magnet schools (Betts et al., 2006; Bifulco, Cobb, & Bell, 2009; Dohrmann et al., 2007; Fuller et al., 1999; Gamoran, 1996; Goldring, 2004; Hadderman & Smith, 2002; Poppell & Hague, 2001; Archbald & Kaplan, 2004; Ballou, Goldring, & Liu, 2006; Esposito, 2010; Penta, 2001; Rhea & Regan, 2007; Yu et al., 2005), this study will contribute to the body of knowledge needed to address the extent to which magnet schools might increase student achievement. Previous studies done only addressed the academic achievement of students in urban areas; this study focused on the academic achievements of students in magnet and traditional neighborhood schools in more suburban areas. If the results from this study show that magnet high schools in this Mid-Atlantic state have significantly higher student achievement than traditional neighborhood high schools, this information could be used by the Maryland State Department of Education to support creating
additional magnet high schools. If this information becomes public, perhaps more parents will consider trying to enroll their children in magnet schools.

**Limitations of the Study**

Limitations are the matters and occurrences, or conditions that the researcher cannot control that may place restrictions on the methodology and conclusions (Simon & Goes, 2013, Limitations section, para. 1). The limitations of this study were the small number of magnet high schools in the state. The researcher assumed that the information obtained from was complete and accurate for all of the students.

**Delimitations of the Study**

Delimitations are characteristics that limit the scope and define the boundaries of the study. They result from specific choices made by the researcher (Simon & Goes, 2013, Delimitations section, para. 1). The delimitations for this study include only using public high schools, examining only two years’ worth of data, and only using high school data from one mid-Atlantic state. The results of the study were only from public high schools in one state and only two school years worth of data were collected, thus not representing the entire country.
Definition of Terms

The following key terms were defined to provide clarity and consistency:

Academic achievement/student achievement: a students' success in education which is usually measured by test scores and grades.

High School Assessment (HSA): “tests that measure school and individual student progress toward Maryland’s High School Core Learning Goals in English, Algebra/Data Analysis, Government, and Biology. Passing the HSA is a graduation requirement. Students take each test whenever they complete the course” (Maryland State Department of Education, n.d.a.) What is the High School Assessment Program? section, para. 1).

Magnet high school: “public schools that offer a special curriculum capable of attracting substantial numbers of students of different racial backgrounds” (United States Department of Education, 2004, Definition section, para. 1).

Partnership for Assessment of Readiness for College and Career (PARCC): “computer-based assessments, covering English language arts/literacy and mathematics in grades 3-8 and at the high school level, are aligned with the new Maryland College and Career-Ready Standards, which were built on the Common Core State
Standards” (Maryland State Department of Education, n.d.c, The PARCC Assessment Represents a Total Reset section, para. 1).

Traditional Neighborhood school: “public school students are assigned to attend because they live in the school’s attendance area or attendance zone” (School Choice for Kids, 2016, N section, para. 2).

Summary

Some school districts have implemented magnet school programs aimed at increasing academic achievement, due to the reforms that are taking place in education both locally and nationally. Chapter 1 presented the background for this study, defined the purpose of the study, presented a brief overview of the theoretical framework used, specified the problem, research questions along with hypotheses were posed, and the significance of the study was determined. The first chapter concluded by stating some of the specific limitations and delimitations contained within the study. A review of the literature will be presented in Chapter 2. Chapter 3 will present the methodology of the study, including the research design, the participants, the instrumentation used, and the procedure in which the data was collected and analyzed. The findings and results of the study will be presented in Chapter 4. The researcher will discuss conclusions and recommendations that can be made using the findings of the study. A discussion about the literature
that supports the researcher's findings, as well as the implications for further research will also be discussed in Chapter 5.
CHAPTER II

LITERATURE REVIEW

Magnet schools were born from the desegregation of schools movement. This was done to achieve a better racial and ethnic balance in the student population, as well as, to provide educational equity among students. Specialized curriculums became an extension of these efforts. This literature review will focus on the six major themes which emerged repeatedly throughout the literature reviewed. The major themes that presented themselves in the literature were magnet schools, arguments for magnet schools, arguments against magnet schools, neighborhood schools, academic achievement, and the home environment. These topics are important in understanding the magnet school movement.

Magnet Schools

Magnet schools are defined as “public schools that offer a special curriculum capable of attracting substantial numbers of students of different racial backgrounds” (United States Department of Education, 2004). According to Chen (2013), over the last 40 years magnet schools have been opening around the country as a way to desegregate the public school system and offer the students a choice regarding what or how they will learn. In more recent years, magnet schools have
competed with neighborhood schools to attract the best students, which has, in turn, created schools that have higher percentages of students with strong academic performance and other skills and smaller percentages of lower performing students.

Magnet schools are different from neighborhood schools, in that, they are distinguishable by their funding, “their names, themes, special advertising, recruitment programs, and registration procedures” (Archbald, 2004, p. 284). Magnet schools offer different themes and courses to attract a variety of students from all over the district that are interested in that particular theme. While neighborhood schools only accept students who live in the attendance area. Some examples of the specialized themes that magnet schools offer are: Fine and Performing Arts, Gifted and Talented, Design and Architecture, International Studies, International Baccalaureate, Science, Technology, Engineering, and Mathematics (STEM), World Languages, and Montessori. Neighborhood schools do not offer these types of themes in their curricula. Most of the funding for magnet schools comes from the school district and the state. Additional money is secured from the United States Department of Education from the Magnet School Assistance Program grant or the federal government. In 2013, $89.8 million was given to magnet schools in “27 school districts in 12 states” (U.S. Department of Education, 2013) to
“desegregate schools, expand school choice and increase parental options” (U.S. Department of Education, 2013). This special funding is also used “to create and develop programs as well as funding for marketing and recruitment of students” (Poppell & Hague, 2001, p. 2). This additional funding allows magnet schools to spend more on books and resources, and supplies, which helps to maintain the schools’ high standards and reputation. Neighborhood schools get their funding from state and local sources with no additional help from the federal government.

**Arguments for Magnet Schools**

Proponents of magnet schools have several arguments for their existence. Additional funding, increased achievement, higher admittance to colleges, and the curricular/theme focused schools are among the arguments for magnet schools. Proponents of magnet schools say that these schools offer “programs with a distinct curricular focus, promising to build coherent and warm school communities comprised of teachers and students who share particular interests” (Fuller, Burr, Huerta, Puryear, Wexler, 1999, p. 8). Some of the distinct curricular focuses are Science, Technology, Engineering, and Mathematics (STEM), Fine and Performing Arts, International Baccalaureate, International Studies, MicroSociety, Career and Technical Education (CTE), World Languages, and many others (About Magnet Schools of America, 2013).
The allocation of resources among magnet programs comes from the financial capital that the school district receives. The local public school system includes magnet schools in the district. They operate under the same school board and administration as the other public schools in its district. Therefore, magnet schools get their funding from the same places as the public schools, the district, state, and federal governments. Since magnet schools offer a specialized curriculum, they need additional resources. “In 2013, the U.S. Department of Education earmarked nearly $90 million in special grants to magnet schools throughout the country to increase access to their programs by local families” (Chen, 2015, What is a Magnet School? section, para. 4). Magnet schools receive additional funding to be spent on their educational programs, their students, teachers, and supplies. This additional funding is used to attract a wide range of students to make magnet schools more diverse. (Chen, 2015).

“Magnet programs typically spend more per pupil than neighborhood schools and often attract more highly qualified teachers” (Fuller et al., 1999, p. 8). As mentioned above, magnet schools receive additional funding from the federal government which allows them to spend more per pupil. “The glamour of high school performing arts magnets and specialized vocational magnets such as the health professions served to keep white students from defecting to private,
parochial or suburban school districts” (Poppell & Hague, 2001, p. 2). The reputation that a magnet school has can attract some of the best students to its school. So, the higher per-student spending is important in maintaining the reputation of the school, as well as, maintaining the resources for books, supplies, recruiting, and advertising for the school.

Positive outcomes have been found in some magnet schools including: (a) student and teacher motivation is high, (b) student achievement tends to be higher, (c) behavioral problems are in decreased numbers, (d) job satisfaction among magnet school teachers is higher and (e) school integration is reasonable (Poppell & Hague, 2001, p. 3). Having a distinct specialized curricular focus attracts teachers and students who are eager to learn more about that focus. The specialized curricula ensures that everyone who is at the school wants to be there and wants to learn or do the best that they can. Higher student achievement should be expected if all of the students are there to learn from some of the best teachers around. According to Orfield (2013) research has found that there are additional academic and social benefits of attending a magnet school. These benefits can include stronger peer support for academic achievement, more encouragement and support for college attainment and placement, higher classroom attendance for magnet students, and minority students and white
students have closer friendships at magnet schools (Orfield, 2013, p. 6). There has also been “increased data showing a correlation between attendance at magnet schools and higher graduation rates as well as admission to college” (Orfield, 2013, p. 6). The literature shows that the higher attendance rates at magnet schools lead to higher rates of college-bound seniors. These are just some of the arguments for magnet schools and why we should continue opening, funding, and continuing to send children to them.

**Arguments Against Magnet Schools**

Opponents of magnet schools argue that “the number of magnet programs causes problems with: public awareness, public understanding, management of magnet programs, marketing of magnet programs, and allocation of resources among magnet programs. Barriers to the success of magnet programs include transportation, distance, funding” (Poppell & Hague, 2001, p. 12). Magnet school opponents believe that there is an oversaturation of magnet schools in districts that make it hard for them all to be successful. The confusion arises when parents and students cannot make informed decisions about schools because there are too many options being presented to them.

Public awareness, marketing of magnet programs, and public understanding of magnet programs comes from the collection and
disseminating of information to parents and students. “Markets work best when consumers have high-quality information” (McShane, 2015a, p. 1). This high-quality information can be hard to come by as the number of school choice options continues to expand. However, parents and students should be equipped with all of the important information about all schooling options so that an informed decision can be made. The Center on Reinventing Public Education surveyed 4,000 public school parents in eight cities with large numbers of school choice programs, including magnet schools, and found that getting information about different schools, understanding eligibility requirements, different application deadlines, confusing paperwork, and arranging transportation to and from school were some of the challenges that parents faced when looking into school choice programs and magnet schools. These challenges were heightened for families where the parents had little education or for families with children with special needs (Prothero, 2015, p. 16).

According to Michael McShane (2015a), from the American Enterprise Institute, identifying the important aspects of education to parents and making that information easily accessible is what should be done by policymakers (p. 2). McShane (2015a) also says that in addition to school test scores, parents “value the opinions of other parents,” and
that “finding ways to include the thoughts of parents, by allowing for star ratings, comment sections, or easy sharing via social media can help ensure information is put to use” (p. i). Since parents value the opinions of other parents, the GreatSchools organization has become the frontrunner for school reporting (McShane, 2015a). GreatSchools provides information about different schools using ratings and parental evaluations to help guide other parents in making choices about schools. GreatSchools provides useful information and data for parents. In some states, it rates the schools from 1-10 based on the performance of the students at that school on state testing. Other states include data on additional measures of college readiness and student growth. A 1-5 star rating is also given to schools based on parent and student reviews submitted to the GreatSchools site (McShane, 2015a, p. 3).

Excellent Schools Detroit has taken steps to remove the information barrier for families “by grading the schools in the city using a common set of metrics. Parents, teachers, and outside education experts help evaluate school performance and culture, and the results are published in an annual score card” (Prothero, 2015). Other school districts, in Denver and New Orleans, are turning to a common enrollment system. The enrollment and school matching process became centralized in these districts. Streamlined timelines, common enrollment policies, and
formalized school-applicant matching decisions are practices that some school districts are moving towards to make it easier for some parents to make decisions about what school to send their children to (Gross, DeArmond, Denice, 2015, p. 5). Many parents find it very helpful to have all of the information about the schools that they are choosing between all in one place.

"Many school choice programs are designed specifically to help low-income families, a demographic group that is often disenfranchised from the political process" (McShane, 2015a, p. i). These low-income families would fare much better with school choice if the process were made easier. In many low-income communities, parents do not always have the extra time that is needed to gather and analyze the necessary information on several different schools. When a family only has a single parent, and they work several different jobs, the task of information gathering and sharing can be especially challenging. As a result, these families can feel like they are being left out of the educational loop (McShane, 2015b, para. 5). "In short, some students may enjoy the benefits of well-informed and well-considered family decisions and others may suffer the consequences of poorly informed and poorly considered family decisions about schooling" (Lauen, 2009, p. 195).
The management of magnet programs can become tricky since many school districts offer school choice to families. Most of these districts do not fully assume responsibility for the entire regulation process. Since students can come from different districts, different neighborhoods, and different parts of the state, it can be challenging to find a central governing body that sets out the rules and regulations for all of the schools. In many districts, responsibility for school choice programs that include magnet schools is split across multiple agencies. Each agency is responsible for setting their expectations for providers and sometimes the agencies are not located in the same city as the school, making it hard to address and resolve issues (DeArmond, Jochim, & Lake, 2014, p. 4).

Detroit is a city of choice, meaning that students can choose between charter schools, magnet schools, district schools, and schools in nearby districts to attend (DeArmond et al., 2014, p. 5). Parents in Detroit are finding it difficult to find the responsible party for fixing any educational problems that they face. In interviews with city leaders, who are also unsure of what agency handles which problems, they say “No one has responsibility for ensuring quality citywide...No one in Detroit is responsible for ensuring that all neighborhoods and students have quality options or that parents have the information and resources they need to choose a school” (DeArmond et al., 2014, p. 7). Being unsure of who
handles what and how to get problems resolved is a major problem that unfortunately falls into the hands of parents to try to solve.

Even though there have been several studies that have shown that magnet school students have increased achievement than their counterparts in regular schools, “there have been a number of studies that show no significant differences in student achievement between magnet schools and traditional public schools” (Orfield, 2013, p. 7). Opponents of magnet schools will use these studies to justify saying, what is the purpose of magnet schools if the academic achievement is not any better than that of traditional neighborhood schools.

**Neighborhood Schools**

“With neighborhood schooling, students must attend school in their neighborhood of residence” (Epple & Romano, 2003, p. 233). A neighborhood school is where “public school students are assigned to attend because they live in the school’s attendance area or attendance zone” (School Choice for Kids, 2016).

Neighborhood schools are part of the public school system. In the public education system, all schools are run by government bureaucracies and staffed by public employees; each community had just one school “system”; every school. . . was essentially identical to every other; and the
bureaucracy assigned you to a school district and then to a particular school building. All funding came from taxpayers via complex formulae and regulations devised by at least three levels of government (Finn & Gau, 1998, p. 79).

This model of the public school system is seeing a shift due to the open enrollment and school choice programs. Puerto Rico, the Northern Mariana Islands, and at least 24 other states have some form of school choice and open enrollment programs that families can participate in. The degree to which state operates these programs varies. Some states allow students to attend any public school in that same state, another state allows students who earn low test scores for two years to opt out of the assigned school, while another state, California, allows students to attend schools based on their proximity to their parents’ jobs or child-care facility (Finn & Gau, 1998, p. 86). Neighborhood schools are changing based on the other educational programs that have been set in place. They are not just for students that live close by anymore.

**Academic Achievement**

Student achievement can be undermined if schools are racially isolated with high concentrations of poverty. According to several studies, attracting and retaining qualified teachers can be difficult for schools with concentrations of minority and low-income students
(Clotfelter, Ladd, & Vigdor, 2005; Freeman, Scafidi, & Sjoquist, 2005; Lankford, Loeb, & Wyckoff, 2002). Schools with high proportions of minorities usually offer few opportunities to take advanced placement courses and other academically challenging coursework thereby hindering the academic achievements of these students. Bifulco, Cobb, and Bell (2009) believe that by providing more opportunities to take advanced courses, having higher teacher expectations and more qualified teachers, and providing environments that are beneficial to learning can help poor and minority students improve academic achievement. It has also been argued that by organizing curriculum around a theme, magnet schools can encourage higher student engagement and a stronger sense of community, helping to improve student achievement (Bifulco, Cobb, & Bell, 2009, p. 325).

Many magnet schools are creating “trailblazing programs that inspire students and teachers to do their best work. Technology and partnerships provide cutting-edge resources for students, engaging them in state-of-the-art research programs and professional-grade projects” (U.S. Department of Education, 2008, p. 3). As stated earlier, these schools focus on preparing their students for college and successful professional careers. To do this, the graduation requirements at most magnet schools far exceed the traditional schools in their districts and the state graduation
requirements. “Their rigorous graduation requirements include portfolios, senior projects, and advanced course curriculum” (U.S. Department of Education, 2008, p. 16). Advanced Placement courses are offered at many magnet schools that offer “dual enrollment programs with local universities, setting the expectation that college is attainable for all of their students” (U.S. Department of Education, 2008, p. 6). Students who attend magnet schools usually know that when they graduate they will have the tools necessary to succeed in college.

“There is an ongoing challenge to prepare secondary students to demonstrate academic achievement at high levels” (U.S. Department of Education, 2008, p. 2). A strategy that some magnet schools have chosen to use to address low student achievement “has been to increase the level of rigor in courses that students are taking in secondary school programs. Increasingly, Advanced Placement (AP) and International Baccalaureate (IB) diploma programs have been added to high school curricula to enrich the academic content of teaching” (U.S. Department of Education, 2008, p. 20).

Arguments have been made which suggest that students who attend magnet school programs that focus on science, technology, and mathematics have the potential to be better prepared for future university studies and professional careers. “The high levels of
achievement by minority students at these magnet schools further suggests their success in preparing all students for rigorous college programs" (U.S. Department of Education, 2008, p. 20).

There are mixed reports about the academic achievements of students that attend magnet or open enrollment schools. Cullen, Jacob, and Levitt (2006) found that high school students that attended a Chicago magnet school did not benefit more academically than students who went to a nonmagnet high school. They also found that the magnet high school students “were less likely to be arrested and were less likely to report disciplinary incidents” (Cullen, Jacob, & Levitt, 2006, p. 1198). While another study done in Chicago, using a larger sample size found that “students who attend a nonneighborhood high school through Chicago’s extensive open enrollment program were more likely than those who remained in their assigned school to graduate” (Lauen, 2009, p. 182).

In Arkansas, the Hot Springs School District, where all of the elementary, middle, and high schools are magnet schools, have seen test scores increased across the district since the magnet program was put into place. “Minority students have also made greater gains than nonminority students over a two-year period in four of five subjects tested” (Jackson, 2007, p. 35). The magnet program in the Hot Springs School District has shown growth regarding academic achievement.
Beecher and Sweeny (2008) list the factors that affect overall student achievement as “the rigor of the curriculum; the experience, quality, and commitment of the teachers; the learning environment, including safety and expectations of students; and class size” (p. 504). They also developed recommendations for school improvement that will increase student achievement for all students. They list “standards-based instruction, curriculum alignment and coherence, data-based decision making, improving teacher skills through evaluation and professional development, family and community involvement, and other research-based initiatives” (Beecher and Sweeny, 2008, p. 504), as the recommendations that will aid in increasing student achievement. This list is very similar to Robert Marzano’s “Factors that Affect Student Learning” (Marzano, 2003). His list includes factors that he believes are the key to increased student achievement. The factors are; a guaranteed and viable curriculum, challenging goals and effective feedback, parent and community involvement, safe and orderly environment, collegiality and professionalism, instructional strategies, classroom management, classroom curriculum design, home environment, learned intelligence and background knowledge, and student motivation (Marzano, 2003). Marzano’s factors will be discussed further as they are going to be used to guide the study as the theoretical framework.
Home Environment

The home environment can consist of several indicators; the income of the adults in the home, parental education, parental occupation, and the home atmosphere. These indicators have a strong relationship with student achievement. According to Marzano (2003), the home environment has a profound impact on the academic achievement of students and parents/guardians have the power to alter the environment of their household (Marzano, 2003, p. 132).

"With the expansion of school choice programs in the past three decades, the family’s role in making school choice has become more important" (Lauen, 2009, p.195). The shift to magnet schools has placed the greater responsibility of ensuring educational opportunity on the parents and the students and less on the local school boards. Many of the parents of the students who live in low-income neighborhoods do not have a postsecondary education, and some do not have high school diplomas. So, the students have a fear of the unknown because their peers and family members attended the neighborhood schools, so going to a magnet program will mean having to travel that path alone with unfamiliar faces, bus routes, and curricula. Some parents take a good look at the schools before they make a final decision as to where their child will learn. Studies have found stronger evidence of differential
participation by parental-education level than by race (Henig, 1999; Levin, 1999). More educated parents tended to make different choices about where to send their students to school, like sending their students to magnet schools. “Studies looking at the types of choices that families make tend to indicate that parents seek schools where the composition of the student body more closely resembles the student’s own background” (Koedel, Betts, Rice, & Zau, 2009, p.113).

“Some students may enjoy the benefits of well-informed and well-considered family decisions and others may suffer the consequences of poorly informed and poorly considered family decisions about schooling” (Lauen, 2009, p.195). Students’ education depends largely on the education of their parents. Many magnet schools understand and embrace the challenges that come along with poorly informed or uneducated parents. These schools offer outreach programs to parents and families to get them acquainted and accustomed to the school community. They engage the students' family as partners in the education process, in which the teachers and families work together for maximum student success. To help parents participate in their students’ education, many magnet high schools devote resources to getting parents to informal meetings and workshops. For example, at Francisco Bravo Medical Magnet High School (Bravo) in Los Angeles, California, a
six-week Saturday Bridge Achievement Academy is offered to parents of incoming freshman who had fallen behind or had failing grades in middle school. Other Bridge workshops include how to read your child’s report card, how to use the daily progress report, as well as, other skills such as building a positive learning environment and time management.

As part of Bravo’s outreach, parents were introduced and encouraged to make use of such school resources as the Counseling and Career Center. The goal is to empower parents to support their children’s education so that they will feel comfortable enough to communicate concerns and requests to their child’s teachers. In communities where many of the students will be the first in their family to attend college, or parents do not speak English, this type of communication between school and home can be vital to students’ success. (U.S. Department of Education, 2008, p.13)

Many magnet schools have not shied away from the challenges that exist when bringing in students who have not been fortunate to the same luxuries as others. They take the time to cultivate both the parents and the students for optimum success. For this transition to run smoothly, the magnet school needs to have highly trained, motivated staff.
Theoretical Framework

Robert Marzano’s “Factors that Affect Student Achievement” will be used as the framework that will guide this study. The eleven basic tenets of this framework are described in detail below, but for this study, only the student-level factors; home atmosphere, learned intelligence and background knowledge, and student motivation, will be used.

Marzano (2003) organized the results of his research into three general categories that “influence student academic achievement: (1) school-level factors, (2) teacher-level factors, and (3) student-level factors” (p.10). The factors in each of the categories mentioned above come from 35 years of research that has been analyzed by Marzano. Eleven total factors have been identified as the primary determinants of student achievement.

“School-level factors are those that are primarily a function of school policy and schoolwide decisions and initiatives” (Marzano, 2003, p. 3). Marzano (2003) states that “changes in these factors are usually a result of formal or informal policy decisions” (p. 15). These factors include a guaranteed and viable curriculum, challenging goals and effective feedback, parent and community involvement, a safe and orderly environment, and staff collegiality and professionalism. Each of these
factors will be defined below, and action steps will be identified that would aid in implementing each factor.

Factor 1, a guaranteed and viable curriculum, refers to a students' opportunity to learn (OTL) in the time allotted. “States and districts give clear guidance to teachers regarding the content to be addressed in specific courses and at specific grade levels. It also means that individual teachers do not have the option to disregard or replace assigned content" (Marzano, 2003, p. 24). Marzano (2003) also states that “opportunity to learn has the strongest relationship with student achievement of all the school level factors” (p. 22).

OTL was first introduced more than 40 years ago by the International Association for the Evaluation of Educational Advancement. It quickly became a part of the First, and then later, the Second International Mathematics Study (SIMS) because it has shown to have a very strong relationship with student achievement. According to SIMS, there are three types of curricula, the intended curriculum, the implemented curriculum, and the attained curriculum (Marzano, 2003).

The intended curriculum is content specified by the state, district, or school to be addressed in a particular course or at a particular grade level. The implemented curriculum is content actually delivered by the teacher, and the attained curriculum is content
actually learned by students. The discrepancy between the intended curriculum and the implemented curriculum makes OTL a prominent factor in student achievement. (Marzano, 2003, p. 23)

This intended curriculum is only viable if the benefit of time is afforded to the teachers and students. “The content that teachers are expected to address must be adequately covered in the instructional time teachers have available” (Marzano, 2003, p. 24).

Marzano (2003) lists five action steps to implement a guaranteed and viable curriculum. They are:

1. “Identify and communicate the content considered essential for all students versus that considered supplemental or necessary only for those seeking postsecondary education” (Marzano, 2003, p. 25).
2. “Ensure that the essential content can be addressed in the amount of time available for instruction” (Marzano, 2003, p. 29).
3. “Sequence and organize the essential content in such a way that students have ample opportunity to learn it” (Marzano, 2003, p. 30).
4. “Ensure that teachers address the essential content” (Marzano, 2003, p. 30).
5. “Protect the instructional time that is available” (Marzano, 2003, p. 31).

A guaranteed and viable curriculum by definition is a combination of opportunity to learn and time. To be successful in implementing a guaranteed and viable curriculum, Marzano’s action steps should be followed.

Factor 2, challenging goals and effective feedback, refers to “setting academic goals for all students that do not underestimate their potential and that provide feedback as to progress” (Marzano, 2003, p. 18). This is a combination of setting challenging goals for students and effective monitoring of those goals to see if they have been met.

Research completed by Lipsey and Wilson (1993) found that in 204 different studies, that had already been completed, classes that had clear learning goals set were 0.55 standard deviations higher than classes where no clear learning goals were set. This translates to a 21-point difference in student achievement.

Once challenging goals have been set, timely and content specific feedback must be provided. Marzano (2003) states that monitoring should be done at least every nine weeks using a new report card. The top of the report card would look like the traditional report card, and the bottom “section contains information about student performance on
specific topics and skills" (Marzano, 2003, p. 40). This would give the
students formative data on their learning, as well as, their goals.

Marzano (2003) lists three action steps to implement challenging
goals and effective feedback. They are

1. “Implement an assessment system that provides timely feedback
   on specific knowledge and skills for specific students” (Marzano,
   2003, p. 39).

2. “Establish specific, challenging achievement goals for the school
   as a whole” (Marzano, 2003, p. 40).

3. “Establish specific goals for individual students” (Marzano, 2003,
   p. 46).

“Schoolwide achievement goals, as well as individual student goals, can
be set and monitored” (Marzano, 2003, p. 46), using the new innovative
report card that includes formative classroom assessments.

Factor 3, parent and community involvement, refers to “the extent
to which parents (in particular) and the community at large (in general)
are both supportive of and involved in a school” (Marzano, 2003, p. 47).
The three key features that define effective parental and community
involvement are communication, participation, and governance.

“Effective parental and community involvement comes with good
communication from schools to parents and community and vice versa,...
participation in the day to day running of the school, . . . and governance requires the establishment of specific structures that allow parents and community some voice in key school decisions” (Marzano, 2003, p. 48).

Marzano (2003) lists three action steps to promote the effective involvement of parents and community members. They are

1. “Establish vehicles for communication between schools and parents and the community” (Marzano, 2003, p. 49).

2. “Establish multiple ways for parents and community to be involved in the day-to-day running of the school” (Marzano, 2003, p. 50).

3. “Establish governance vehicles that allow for the involvement of parents and community members” (Marzano, 2003, p. 50).

Effective lines of communication with parents and the community can come through phone calls, home visits, information on the Internet, and parent-teacher conferences. Parents and community members should be given the opportunity to volunteer at schools. This gives them a sense of ownership because they are involved in the day-to-day running of the school. Having school-based teams that include administrators, teachers, parents, students, professional support staff, and paraprofessional support staff to establish policies, plan school activities, and implementing and
evaluating schoolwide initiatives, aids in promoting effective parent and community involvement in schools (Marzano, 2003).

Factor 4, a safe and orderly environment, is essential for academic success. “If teachers and students do not feel safe they will not have the necessary psychological energy for teaching and learning. . . Without a minimum level of safety and order, a school has little chance of positively affecting student achievement” (Marzano, 2003, p. 53). A safe and orderly environment is a major component of effective schooling. Marzano (2003) states that this can be achieved by doing the following things:

1. “Establish rules and procedures for behavioral problems that might be caused by the school’s physical characteristics or the school’s routines” (Marzano, 2003, p. 55).


3. “Establish and enforce appropriate consequences for violations of rules and procedures” (Marzano, 2003, p. 56).

4. “Establish a program that teaches self-discipline and responsibility to students” (Marzano, 2003, p. 57).
5. “Establish a system that allows for the early detection of students who have high potential for violence and extreme behaviors” (Marzano, 2003, p. 57).

Factor 5, staff collegiality and professionalism, refers to “the manner in which staff members in the school interact and the extent to which they approach their work as professionals” (Marzano, 2003, p. 60). “Collegiality and professionalism involve interactions between teachers that are collaborative and congenial” (Marzano, 2003, p. 67). Cooperation between teachers and leadership that engages staff in meaningful staff development activities that allow for involvement in policies and decisions for the school would account for staff collegiality and professionalism, according to Marzano (2003). The action steps that Marzano suggests to foster staff collegiality and professionalism are:

1. “Establish norms of conduct and behavior that engender collegiality and professionalism” (Marzano, 2003, p. 65).

2. “Establish governance structures that allow for teacher involvement in decisions and policies for the school” (Marzano, 2003, p. 65).

“Teacher-level factors are those that are primarily under the control of individual teachers” (Marzano, 2003, p. 71). These factors include instructional strategies, classroom management, and classroom curriculum design. These factors affect individual students in the classroom—the independent impact that a teacher can have on student achievement, according to Marzano (2003).

Factor 6, instructional strategies, refer to more effective teachers who use more effective instructional strategies. These teachers also tend to have more instructional strategies at their disposal. There are over 40 research-based instructional practices that can aid in academic achievement. Some are the use of experiments, teacher expectations, direct instruction, questioning, memorization, homework, classroom assignments, feedback, ability grouping, and evaluation. Marzano (2003) states that teachers should be presented with a list of research-based instructional strategies and then be provided with an instructional framework for units that use these research-based strategies (Marzano, 2003, p. 85). Not only do teachers need to know what the best practices are, but they also need to know how to use them correctly for the best results.

Factor 7, classroom management, is defined by Marzano as the “confluence of teacher actions in four distinct areas: (1) establishing and
enforcing rules and procedures, (2) carrying out disciplinary actions, (3) maintaining effective teacher and student relationships, and (4) maintaining an appropriate mental set for management” (Marzano, 2003, p. 89). Marzano (2003) recommends doing the following seven things to promote effective classroom management:

1. “Have teachers articulate and enforce a comprehensive set of classroom rules and procedures” (Marzano, 2003, p. 95).
2. “Have teachers use specific strategies that reinforce appropriate behavior and recognize and provide consequences for inappropriate behavior” (Marzano, 2003, p. 97).
5. “Provide teachers with an awareness of the needs of different types of students and ways of alleviating those needs” (Marzano, 2003, p. 101).
6. “Have teachers employ specific strategies to maintain or heighten their awareness regarding the actions of students in their classes (“withitness”)” (Marzano, 2003, p. 102).
7. “Have teachers employ specific strategies that help them maintain a healthy emotional objectivity with their students” (Marzano, 2003, p. 102).

Factor 8, classroom curriculum design, refers to the ability of the teacher to identify the specific content that needs to be taught. Once this is identified, they should put like skills, ideas, and tasks together to engage the students and provide multiple exposures of the content (Marzano, 2003, p. 120).

Marzano (2003) identifies five action steps to translate the above principles into effective classroom curriculum design. They include:

1. “Have teachers identify the important declarative and procedural knowledge in the topics that are to be the focus of instruction” (Marzano, 2003, p. 116).

2. “Have teachers present new content multiple times using a variety of input models” (Marzano, 2003, p. 116).

3. “Have teachers make a distinction between those skills and processes students are to master versus those they are not” (Marzano, 2003, p. 117).

4. “Have teachers present content in groups or categories that demonstrate the critical features of the content” (Marzano, 2003, p. 118).
5. “Have teachers engage students in complex tasks that require addressing content in unique ways” (Marzano, 2003, p. 119).

All of the teacher-level factors; instructional strategies, classroom management, and classroom curriculum design, are all comprised of decisions made by the individual teacher. Of course, those decisions can be influenced by choices and decisions that the school makes on the school level factors (choices that include a guaranteed and viable curriculum, challenging goals, and feedback) (Marzano, 2003).

Student-level factors that affect student learning or achievement, according to Marzano are home atmosphere, learned intelligence and background knowledge, and student motivation. These factors were used to guide this study, and they are defined below.

Factor 9, the home atmosphere is “composed of three basic elements: (1) communications about school, (2) supervision, and (3) parental expectations and parenting styles” (Marzano, 2003, p. 128). “Communication about school refers to parents’ interest in and communication about the schoolwork of their children” (Marzano, 2003, p. 128). “Supervision generally refers to the extent to which parents monitor and control their children’s behavior to optimize academic achievement” (Marzano, 2003, p. 128). High parental expectations that
are communicated to their children are associated with increased academic achievement, according to Marzano (2003).

Since schools and school districts “cannot (and should not) go into homes and recommend specific techniques for communicating about school, for supervising students, or for parental expectations and parenting style” (Marzano, 2003, p. 130), Marzano suggests having schools follow this action step:

1. “Provide training and support to parents to enhance their communication with their children about school, their supervision of their children, and their ability to communicate expectations to their children within the context of an effective parenting style” (Marzano, 2003, p. 131).

This usually is done as training programs which are free of charge to the parents and provided by the school. Providing these training sessions sends a strong message to parents “that the home environment has a profound impact on the academic achievement of their children and that they have the power to alter the environment of their household” (Marzano, 2003, p. 132).

Factor 10, learned intelligence and background knowledge, can be defined as the information retained after it was learned and things done previously that help aid in the learning of new material. “The more
intelligence we have, the easier it is to learn, and school is certainly about learning,” says Marzano (2003). Crystallized intelligence, or background knowledge, has a strong relationship with academic achievement. Dochy, Segers, and Buehl (1999) conducted a study to investigate the relationship between background knowledge and academic achievement. They found that 91.5% of the 183 studies that they looked at demonstrated positive effects of background knowledge on learning.

Marzano presents three action steps that he says will promote the acquisition of learned intelligence and background knowledge. They are:

1. “Involving students in programs that directly increase the number and quality of life experiences” (Marzano, 2003, p. 141).
2. “Involve students in a program of wide reading that emphasizes vocabulary development” (Marzano, 2003, p. 141).
3. “Provide direct instruction in vocabulary terms and phrases that are important to specific subject matter content” (Marzano, 2003, p. 142).

Factor 11, student motivation refers to students who “are motivated to learn the content in a given subject, their achievement in that subject will most likely be good. If students are not motivated to learn the content, their achievement will likely be limited” (Marzano, 2003, p. 144).

According to Marzano (2003), student motivation includes the students’
“drive for success or failure avoidance, the student’s attributions, the student’s need for a sense of self-worth, the student’s emotional dynamics, and the workings of the student’s self-system” (p. 152).

Marzano (2003) identifies four action steps that a school or teacher can take to increase individual student motivation. They include:

1. “Provide students with feedback on their knowledge gain” (Marzano, 2003, p. 149).

2. “Provide students with tasks and activities that are inherently engaging” (Marzano, 2003, p. 149).

3. “Provide opportunities for students to construct and work on long-term projects of their own design” (Marzano, 2003, p. 150).

4. “Teach students about the dynamics of motivation and how those dynamics affect them” (Marzano, 2003, p. 151).

Marzano presents eleven factors that he believes are the primary determinants of student achievement. These factors are placed with the school, teacher, or student, and if all factors are met, then student achievement will be great, according to Marzano. The research questions that the researcher attempted to answer by conducting this study and how Robert Marzano’s framework supports these questions are described below.
RQ1: Is there a significant difference in HSA Biology test scores between traditional neighborhood and magnet high schools?

RQ2: Is there a significant difference in HSA Government test scores between traditional neighborhood and magnet high schools?

RQ3: Is there a significant difference in HSA English 10 test scores between traditional neighborhood and magnet high schools?

RQ4: Is there a significant difference in HSA Algebra I test scores between traditional neighborhood and magnet high schools?

RQ5: Is there a significant difference in PARCC English 10 test scores between traditional neighborhood and magnet high schools?

RQ6: Is there a significant difference in PARCC Algebra I test scores between traditional neighborhood and magnet high schools?

Summary

The purpose of this review was to help the reader understand the background about the creation of the magnet schools in the United States and to examine the topics that are central to magnet schools, like student achievement, the arguments for and against them, and neighborhood schools. The “Factors that Affect Student Achievement” was used as the theoretical framework to guide the study. More studies and research are required to get a better understanding of the effects of a magnet school curriculum on student achievement.
CHAPTER III

METHODOLOGY

The purpose of this quantitative research study was to examine the differences in academic achievement between traditional neighborhood and magnet high schools in a mid-Atlantic state. Using Robert Marzano’s factors that influence student academic achievement as the theoretical framework, the independent variable was the type of high school, and the dependent variable was student performance on the HSA Biology, English 10, Algebra I and government tests, as well as, the PARCC English 10 and Algebra I tests. HSA or High School Assessments are “tests that measure school and individual student progress toward Maryland’s High School Core Learning Goals in English, Algebra/Data Analysis, Government and Biology. Passing the HSA is a graduation requirement. Students take each test whenever they complete the course” (Maryland State Department of Education, n.d).

PARCC or Partnership for Assessment of Readiness for College and Career are “computer-based assessments, covering English language arts/literacy and mathematics in grades 3-8 and at the high school level, are aligned with the new Maryland College and Career-Ready Standards, which were built on the Common Core State Standards” (Maryland State Department of Education, n.d).
The type of high school will be defined as either magnet or traditional neighborhood. This study used the test scores of the selected high schools for the school years 2015-2016 and 2016-2017.

The following research questions were formulated given the purpose of the study and the theoretical framework:

RQ1: Is there a significant difference in HSA Biology test scores between traditional neighborhood and magnet high schools?

RQ2: Is there a significant difference in HSA Government test scores between traditional neighborhood and magnet high schools?

RQ3: Is there a significant difference in HSA English 10 test scores between traditional neighborhood and magnet high schools?

RQ4: Is there a significant difference in HSA Algebra I test scores between traditional neighborhood and magnet high schools?

RQ5: Is there a significant difference in PARCC English 10 test scores between traditional neighborhood and magnet high schools?

RQ6: Is there a significant difference in PARCC Algebra I test scores between traditional neighborhood and magnet high schools?

Based on the statement of the problem, the purpose of the study, the theoretical framework, and the research questions, the following hypotheses were generated for this study:
H₀₁: There is no difference in HSA Biology test scores between traditional neighborhood and magnet high schools.

H₀₂: There is no difference in HSA Government test scores between traditional neighborhood and magnet high schools.

H₀₃: There is no difference in HSA English 10 test scores between traditional neighborhood and magnet high schools.

H₀₄: There is no difference in HSA Algebra I test scores between traditional neighborhood and magnet high schools.

H₀₅: There is no difference in PARCC English 10 test scores between traditional neighborhood and magnet high schools.

H₀₆: There is no difference in PARCC Algebra test scores between traditional neighborhood and magnet high schools.

Research Design

The researcher used a quantitative research design to conduct the study. Quantitative research is a way of testing objective theories by looking at the relationship between the variables. Quantitative research can either be an experimental design or nonexperimental design. Since this study lacked random participant selection and random assignment to treatment, it is considered a nonexperimental design. Random
assignment to groups was not possible since the type of school (magnet or traditional) could be manipulated.

The data were compiled in an electronic spreadsheet. The spreadsheet contained rows for each of the high schools and columns for each of the variables. The demographic variables included an assigned school district number, type of school (magnet or traditional high school), percentage of minority students, the percentage of special education students, and percentage of students receiving free and reduced meals. This was followed by columns to record each school’s high school assessment scores in Biology, English 10, Algebra I, and Government for 2015, as well as PARCC English 10 and Algebra I for 2017. These were the most recently available standardized test scores.

**Site Selection**

All of the magnet high schools (as reported by each school district) in the particular mid-Atlantic state were selected and included in the dataset. While the state has more than 20 school districts, not all of the districts have designated magnet high schools. Several districts organized magnet high schools within larger neighborhood schools, so it was not possible to select these magnet schools because their standardized test scores could not be disaggregated from the larger host high school.
The original intent of the researcher was to select a corresponding traditional neighborhood high school based on its proximity to one of the magnet schools already selected for the study. The desire was to match the two schools within the same school district based on their demographic information. This proved to be impossible. For example, matching based on size because the magnet high schools tended to be smaller than the neighborhood schools. Also, there was a large range of percentages based on race, free and reduced meals (FARMS), the percentage of students with 504 plans, percentage special education students, the percentage of limited English proficiency students, and percentage of migrant students. Because of these limitations, the matching of schools as a site selection process was abandoned, and the data analysis approach was changed to ANCOVA. ANCOVA allows for the researcher to use statistical procedures (covariate) to control for differences in the selected sites. The covariates for this study were (a) percentage of special education students, (b) percentage of minority students, and (c) percentage of students receiving free and reduced meals (FARMS).

This process resulted in the selection of 40 magnet high schools and 31 neighborhood high schools from throughout the mid-Atlantic state. The neighborhood schools were selected from the same school districts as the
magnet high schools. The selected schools came from six school districts in the state (see Table 1). Table 1 lists the number of schools that were either traditional neighborhood or magnet and the number of high schools from each of the school districts.

Table 1

Profile of the Participating Sites

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of School</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional Neighborhood</td>
<td>31</td>
<td>43.7</td>
</tr>
<tr>
<td>Magnet</td>
<td>40</td>
<td>56.3</td>
</tr>
<tr>
<td><strong>School District Number</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>25</td>
<td>35.2</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2.8</td>
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<td>3</td>
<td>6</td>
<td>8.5</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>33.8</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>16.9</td>
</tr>
</tbody>
</table>

**Instruments**

The Maryland High School Assessments (HSA) and the Partnership for Assessment of Readiness for College and Careers (PARCC) are the
instruments that were examined to determine if there were any differences in academic achievement in high school students at magnet and traditional high schools. Both instruments will be described in detail below.

“The Maryland High School Assessments (HSA) are tests that measure school and individual student progress toward Maryland’s High School Core Learning Goals in English, Algebra/Data Analysis, Government and Biology” (Maryland State Department of Education, n.d.a). Maryland educators were “involved in selecting materials for the tests, writing test items, and reviewing test items for content accuracy, difficulty, and fairness” (Educational Testing Service, 2006). Test items are based on the content covered in Maryland’s Core Learning Goals.

The HSA tests are taken as students complete each course, as this is a graduation requirement. Each test consists of multiple choice questions, as well as, constructed response questions or questions that require written responses. The constructed response questions can be either brief constructed response or extended constructed response, both requiring written responses rather than selecting an answer. Responses for all questions are recorded in a separate Answer Book (Maryland State Department of Education, n.d.a).
To help ensure that the test is valid and equitable for all students, teachers are supplied with content area-specific Test Examiner’s Manuals that provide guidelines and specific directions for administering the test. “Each content area test will be administered on a single day throughout Maryland and takes approximately three to three and a half hours to complete, including short breaks” (Educational Testing Service, 2006). Once testing is complete, a scoring contractor picks up materials from each school site and takes them back to the company for scoring. Within nine weeks after testing, the scoring company sends students’ scores to the local school system. The local school system then sends the scores to parents. Scores for schools, school systems, and the state are published annually in mid-August on the Web at http://www.mdreportcard.org.

Students’ scores are reported as scale scores. Maryland uses a scale to provide a more precise measurement of a student’s achievement and to assure that tests given at different times are comparable. Students’ scores can range from 240 to 650 on the scale. Local school systems place students’ HSA performance on the students’ official records (Maryland State Department of Education, (n.d.b)).
The Partnership for Assessment of Readiness for College and Careers (PARCC) have replaced the Maryland HSA tests. These new assessments measure the skills and content in the new Maryland College and Career-Ready Standards. The assessments are aligned to the new standards making it easier to examine students’ “deeper learning, critical thinking, problem-solving, and communication skills” (Maryland State Department of Education, n.d.c). Over several years, a wide range of researchers, educators, psychometricians, and others from the PARCC states, developed the tests (Partnership for Assessment of Readiness for College and Careers, n.d.b).

Previous assessments for English Language Arts (HSA) were mainly assessed through multiple choice questions. Sixty percent of the PARCC ELA assessments involve writing where students are asked to analyze text and generate a response using that information (Maryland State Department of Education, n.d.d). The PARCC Mathematics assessments include three types of tasks; 1. Tasks that elicit “evidence to show how well students can solve problems that target the content standards, while making connections to the practice standards” (Maryland State Department of Education, n.d.e), 2. Tasks that elicit “evidence of students’ abilities to express their mathematical reasoning by constructing valid arguments” (Maryland State Department of Education, n.d.e), and 3.
Tasks that provide “students the opportunity to demonstrate how well they can use mathematics to model real-world situations” (Maryland State Department of Education, n.d.e).

All PARCC assessments are single, end of year assessments that are taken within the states prescribed testing window. They are computer-based tests which use “interactive questions to determine whether students have mastered the fundamentals, as well as higher-order skills such as critical thinking, problem-solving, and analyzing sources to write arguments and informational essays” (Partnership for Assessment of Readiness for College and Careers, n.d.b). These skills are not easily assessed on traditional multiple-choice tests like the HSA.

The computer-based PARCC assessments require the Test Administrator to read from a script that is provided, for the unit they are administering. They should follow the directions and read the scripts in the Test Administrator Manual verbatim, to ensure testing validity and equitability. Since the PARCC assessments are computer-based, results are yielded quicker than traditional paper and pencil tests. Score reports are sent to the school districts, then to each school, and then sent home to parents. These score reports “show a student’s overall numerical score and the related performance level achieved, based on that score” (Maryland State Department of Education, n.d.e). Teachers use the
information contained in the score reports to help inform and modify classroom instruction.

**Procedures**

Institutional Review Board (IRB) approval at Morgan State University was obtained. The researcher then identified all of the magnet schools in the mid-Atlantic state. This process was completed using the selected state’s department of education website that listed all of the public schools operating in the state. Information about the location, number of students, High School Assessment (HSA) test scores, and Partnership for Assessment of Readiness for College and Career (PARCC) tests scores in biology, algebra I, government, and English 10, as well as percentage of minority students, percentage of special education students, percentage of students with 504 plans, percent migrant, percent English as a second language, and percentage of students receiving free and reduced meals, were also available from this site. The researcher then entered the data into an electronic spreadsheet and analyzed the data using SPSS.

**Data Analysis**

*Descriptive.* Descriptive statistics are used to “summarize the characteristics of a data set” (Tanner, 2012, p 8). They “are calculated so that one can know the essential characteristics of data sets without having to refer to each individual measure” (Tanner, 2012, p 20).
Frequencies and percentages were used to indicate the number and type of high schools and the number of selected high schools for each of the school districts.

**Inferential.** “Inferential statistics reveal the larger group through the smaller group’s characteristics” (Tanner, 2012, p. 8) by using statistical procedures to test hypotheses. The purpose of using inferential statistics for this study is to determine if the standardized test scores differ between the traditional neighborhood high schools and the magnet high schools.

Because it was not possible to select matched pairs of high schools, with similar demographics and from the same school district, ANCOVA (analysis of covariance) was used to analyze the data. The procedure is an extension of ANOVA by adding covariates (variables that may impact the dependent variable) which could not be controlled by random selection, random assignment, or matching. Instead, the covariates are used to statistically control for the variables that could not be controlled by the researcher. Procedural, the covariates are entered in the ANOVA model before the independent variable. This results in the controlling of the variance for the covariates before the researcher examines possible differences in the dependent variable, standardized test scores, between the magnet and traditional public high schools. Each of the hypotheses was tested at the .05 level of significance. These procedures are
summarized in Table 2. For example, research question 1 compared the differences in HSA biology test scores between the traditional high schools and magnet high schools after controlling for the percentage of minority students, the percentage of students receiving free and reduced meals, and percentage of students who are in special education as covariates.

Table 2

**Summary of Data Analysis Procedures**

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Hypothesis</th>
<th>Independent Variable</th>
<th>Dependent Variable</th>
<th>Statistical Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Type of High School</td>
<td>HSA</td>
<td>ANCOVA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Government</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Type of High School</td>
<td>HSA Biology</td>
<td>ANCOVA</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Type of High School</td>
<td>HSA English 10</td>
<td>ANCOVA</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Type of High School</td>
<td>HSA Algebra I</td>
<td>ANCOVA</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Type of High School</td>
<td>PARCC English 10</td>
<td>ANCOVA</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Type of School</td>
<td>PARCC Algebra I</td>
<td>ANCOVA</td>
</tr>
</tbody>
</table>
Summary

This chapter described the methods and procedures that were used to determine the differences in academic achievement between students who attend magnet high schools and students who attend traditional neighborhood high schools. The research design, sites, and instruments were presented. Procedures and analysis of the information were discussed. The data will be presented in Chapter 4, as it will address the research questions.
CHAPTER IV
FINDINGS

The purpose of this quantitative research study is to examine the differences in student academic achievement between magnet, and traditional/neighborhood school students in a mid-Atlantic state. Using Marzano’s (2003) factors that influence student academic achievement as the theoretical framework.

Comparison of HSA Biology Scores

The following null hypothesis is associated with research question 1

H₀₁: There is no difference in HSA Biology test scores between neighborhood school and magnet schools.

A non-significant difference was found in HSA Biology test scores, \( F(1, 52) = 0.340, p = 0.562 \), between magnet high schools (\( M = 81.681, SD = 12.3244 \)) and traditional high schools (\( M = 83.527, SD = 11.7629 \)). Thus, the null hypothesis was not rejected, and it was concluded that there is not a significant difference in HSA Biology test scores between traditional and magnet high schools (see Table 3). Students who attended traditional high schools performed similarly to students at magnet high schools (see Figure 1).
Table 3

**ANCOVA Results for the Comparison of Biology (HSA) Scores between Traditional High Schools and Magnet High Schools**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>5062.220(^a)</td>
<td>4</td>
<td>1265.555</td>
<td>21.922</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>60487.877</td>
<td>1</td>
<td>60487.877</td>
<td>1047.793</td>
<td>.000</td>
</tr>
<tr>
<td>Percent Minority Enrollment</td>
<td>686.411</td>
<td>1</td>
<td>686.411</td>
<td>11.890</td>
<td>.001</td>
</tr>
<tr>
<td>Percent Free and Reduced Meals</td>
<td>391.459</td>
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<td>391.459</td>
<td>6.781</td>
<td>.012</td>
</tr>
<tr>
<td>Percent Special Education</td>
<td>314.796</td>
<td>1</td>
<td>314.796</td>
<td>5.453</td>
<td>.023</td>
</tr>
<tr>
<td>Type of School</td>
<td>19.647</td>
<td>1</td>
<td>19.647</td>
<td>.340</td>
<td>.562</td>
</tr>
<tr>
<td>Error</td>
<td>3001.900</td>
<td>52</td>
<td>57.729</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>396234.900</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>8064.120</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) R Squared = .628 (Adjusted R Squared = .599)
Comparison of Mean HSA Biology Test Scores between Students Enrolled at Traditional High Schools and Students Enrolled at Magnet High Schools.

**Comparison of HSA Government Scores**

The following null hypothesis is associated with research question 2

$H_0^2$: There is no difference in HSA Government test scores between neighborhood school and magnet schools.

A non-significant difference was found in HSA Government test scores, $F(1, 47) = 2.201$, $p = 0.145$, between magnet high schools ($M = 63.242$, $SD = 16.0848$) and traditional high schools ($M = 69.938$, $SD = 14.1519$). Thus, we fail to reject the null hypothesis, and it was concluded that there is not a significant difference in HSA Government test scores between traditional and magnet high schools (see Table 4). Students who attended traditional high schools performed similarly to students at magnet high schools (see Figure 2).
Table 4

ANCOVA Results for the Comparison of Government (HSA) Scores between Traditional High Schools and Magnet High Schools

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>6996.447a</td>
<td>4</td>
<td>1749.112</td>
<td>16.242</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>34805.987</td>
<td>1</td>
<td>34805.987</td>
<td>323.207</td>
<td>.000</td>
</tr>
<tr>
<td>Percent Minority Enrollment</td>
<td>138.370</td>
<td>1</td>
<td>138.370</td>
<td>1.285</td>
<td>.263</td>
</tr>
<tr>
<td>Percent Free and Reduced Meals</td>
<td>1292.932</td>
<td>1</td>
<td>1292.932</td>
<td>12.006</td>
<td>.001</td>
</tr>
<tr>
<td>Percent Special Education</td>
<td>1639.804</td>
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<td>1639.804</td>
<td>15.227</td>
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</tr>
<tr>
<td>Type of School</td>
<td>237.069</td>
<td>1</td>
<td>237.069</td>
<td>2.201</td>
<td>.145</td>
</tr>
<tr>
<td>Error</td>
<td>5061.398</td>
<td>47</td>
<td>107.689</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>242640.370</td>
<td>52</td>
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<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>12057.845</td>
<td>51</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

a. R Squared = .580 (Adjusted R Squared = .545)
Comparison of Mean HSA Government Test Scores between Students Enrolled at Traditional High Schools and Students Enrolled at Magnet High Schools.

**Comparison of HSA English 10 Scores**

The following null hypothesis is associated with research question 3

\[ H_{03}: \text{There is no difference in HSA English 10 test scores between neighborhood school and magnet schools.} \]

A non-significant difference was found in HSA English 10 test scores, \( F(1, 52) = 0.116, p = 0.735 \), between magnet high schools (\( M = 79.452, SD = 12.5243 \)) and traditional high schools (\( M = 80.788, SD = 11.3686 \)). Thus, the null hypothesis was not rejected, and it was concluded that there is not a significant difference in HSA English 10 test scores between traditional and magnet high schools (see Table 5). Students who
attended traditional high schools performed similarly to students at magnet high schools (see Figure 3).

Table 5

ANCOVA Results for the Comparison of English 10 (HSA) Scores between Traditional High Schools and Magnet High Schools

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>5847.499&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4</td>
<td>1461.875</td>
<td>35.949</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>59178.476</td>
<td>1</td>
<td>59178.476</td>
<td>1455.257</td>
<td>.000</td>
</tr>
<tr>
<td>Percent Minority Enrollment</td>
<td>248.422</td>
<td>1</td>
<td>248.422</td>
<td>6.109</td>
<td>.017</td>
</tr>
<tr>
<td>Percent Free and Reduced Meals</td>
<td>839.057</td>
<td>1</td>
<td>839.057</td>
<td>20.633</td>
<td>.000</td>
</tr>
<tr>
<td>Percent Special Education</td>
<td>462.122</td>
<td>1</td>
<td>462.122</td>
<td>11.364</td>
<td>.001</td>
</tr>
<tr>
<td>Type of School</td>
<td>4.722</td>
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<td>4.722</td>
<td>.116</td>
<td>.735</td>
</tr>
<tr>
<td>Error</td>
<td>2114.596</td>
<td>52</td>
<td>40.665</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>373322.310</td>
<td>57</td>
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<td></td>
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</tr>
<tr>
<td>Corrected Total</td>
<td>7962.095</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> R Squared = .734 (Adjusted R Squared = .714)
Comparison of Mean HSA English 10 Test Scores between Students Enrolled at Traditional High Schools and Students Enrolled at Magnet High Schools.

**Comparison of HSA Algebra I Scores**

The following null hypothesis is associated with research question 4:

\[ H_0^4: \text{There is no difference in HSA Algebra I test scores between neighborhood school and magnet schools.} \]

A non-significant difference was found in HSA Algebra I test scores, \( F(1, 52) = 0.015, p = 0.903 \), between magnet high schools (\( M = 81.461, SD = 12.0060 \)) and traditional high schools (\( M = 82.112, SD = 12.0548 \)). Thus, the null hypothesis was not rejected, and it was concluded that there is not a significant difference in HSA Algebra I test scores between traditional and magnet high schools (see Table 6). Students who
attended traditional high schools performed similarly to students at magnet high schools (see Figure 4).

Table 6

\textit{ANCOVA Results for the Comparison of Algebra I (HSA) Scores between Traditional High Schools and Magnet High Schools}

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>5666.213\textsuperscript{a}</td>
<td>4</td>
<td>1416.553</td>
<td>32.068</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>61764.051</td>
<td>1</td>
<td>61764.051</td>
<td>1398.213</td>
<td>.000</td>
</tr>
<tr>
<td>Percent Minority Enrollment</td>
<td>729.601</td>
<td>1</td>
<td>729.601</td>
<td>16.517</td>
<td>.000</td>
</tr>
<tr>
<td>Percent Free and Reduced Meals</td>
<td>414.511</td>
<td>1</td>
<td>414.511</td>
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</tr>
<tr>
<td>Percent Special Education</td>
<td>427.497</td>
<td>1</td>
<td>427.497</td>
<td>9.678</td>
<td>.003</td>
</tr>
<tr>
<td>Type of School</td>
<td>.662</td>
<td>1</td>
<td>.662</td>
<td>.015</td>
<td>.903</td>
</tr>
<tr>
<td>Error</td>
<td>2297.026</td>
<td>52</td>
<td>44.174</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>388971.380</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>7963.239</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{a} R Squared = .712 (Adjusted R Squared = .689)
Comparison of Mean HSA Algebra I Test Scores between Students Enrolled at Traditional High Schools and Students Enrolled at Magnet High Schools.

Comparison of PARCC English 10 Scores

The following null hypothesis is associated with research question 5

H₀ : There is no difference in PARCC English 10 test scores between neighborhood school and magnet schools.

A non-significant difference was found in PARCC English 10 test scores, $F(1, 64) = 2.192, p = 0.144$, between magnet high schools ($M = 15.818, SD = 16.2127$) and traditional high schools ($M = 12.055, SD = 10.0515$). Thus, we fail to reject the null hypothesis, and it was concluded that there is not a significant difference in PARCC English 10 test scores between traditional and magnet high schools (see Table 7). Students who
attended traditional schools performed similarly to students at magnet high schools (see Figure 5).

Table 7

ANCOVA Results for the Comparison of English 10 (PARCC) Scores between Traditional High Schools and Magnet High Schools

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>8374.120&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4</td>
<td>2093.530</td>
<td>28.975</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>11681.119</td>
<td>1</td>
<td>11681.119</td>
<td>161.670</td>
<td>.000</td>
</tr>
<tr>
<td>Percent Minority Enrollment</td>
<td>8.415</td>
<td>1</td>
<td>8.415</td>
<td>.116</td>
<td>.734</td>
</tr>
<tr>
<td>Percent Free and Reduced Meals</td>
<td>2245.743</td>
<td>1</td>
<td>2245.743</td>
<td>31.082</td>
<td>.000</td>
</tr>
<tr>
<td>Percent Special Education</td>
<td>860.851</td>
<td>1</td>
<td>860.851</td>
<td>11.914</td>
<td>.001</td>
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<tr>
<td>Type of School</td>
<td>158.373</td>
<td>1</td>
<td>158.373</td>
<td>2.192</td>
<td>.144</td>
</tr>
<tr>
<td>Error</td>
<td>4624.178</td>
<td>64</td>
<td>72.253</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26769.820</td>
<td>69</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Corrected Total</td>
<td>12998.298</td>
<td>68</td>
<td></td>
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</tr>
</tbody>
</table>

<sup>a</sup> R Squared = .644 (Adjusted R Squared = .622)
Figure 5
Comparison of Mean PARCC English 10 Test Scores between Students Enrolled at Traditional High Schools and Students Enrolled at Magnet High Schools.

Comparison of PARCC Algebra I Scores

The following null hypothesis is associated with research question 6

$H_0$: There is no difference in PARCC Algebra I test scores between neighborhood school and magnet schools.

A non-significant difference was found in PARCC Algebra I test scores, $F(1, 63) = 0.054, p = 0.817$, between magnet high schools ($M = 5.100, SD = 0.5393$) and traditional high schools ($M = 5.000, SD = 0.0000$). Thus, the null hypothesis was not rejected, and it was concluded that there is not a significant difference in PARCC Algebra I test scores between traditional and magnet high schools (see Table 8). Students who
attended magnet schools performed similarly to students at traditional high schools in Algebra I (see Figure 6).

Table 8

**ANCOVA Results for the Comparison of Algebra I (PARCC) Scores between Traditional High Schools and Magnet High Schools**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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</thead>
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<td>Corrected Model</td>
<td>1.606$^a$</td>
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<td>.401</td>
<td>2.713</td>
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<td>Intercept</td>
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<td>1008.331</td>
<td>.000</td>
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<td>Percent Minority Enrollment</td>
<td>.383</td>
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<td>.383</td>
<td>2.588</td>
<td>.113</td>
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<tr>
<td>Percent Free and Reduced Meals</td>
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<td>.012</td>
<td>.078</td>
<td>.781</td>
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<tr>
<td>Percent Special Education</td>
<td>1.103</td>
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<td>1.103</td>
<td>7.458</td>
<td>.008</td>
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<tr>
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<td>.008</td>
<td>.054</td>
<td>.817</td>
</tr>
<tr>
<td>Error</td>
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<td>63</td>
<td>.148</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
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<td></td>
<td></td>
<td></td>
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<td>Corrected Total</td>
<td>10.928</td>
<td>67</td>
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</table>

$^a$ R Squared = .147 (Adjusted R Squared = .093)
Summary

This study examined the differences between academic achievement in traditional high schools and magnet high schools. The researcher failed to reject the null hypotheses for all subjects: Biology, Government, English 10, Algebra I, for both HSA and PARCC tests. No differences were found in standardized test scores between students at traditional high schools and magnet high schools.

Chapter 5 will provide discussions on the findings from the study, conclusions that can be drawn, implications, recommendations for further research, and the relationship between the literature and the quantitative results.
CHAPTER V
DISCUSSIONS, CONCLUSIONS,
IMPLICATIONS, AND RECOMMENDATIONS

This study was conducted to fill a void in the literature that examines the academic achievements of students who attend magnet schools in suburban areas. The proposed study focused on all of the public magnet high schools in an entire mid-Atlantic state with large urban, suburban, and rural areas. Findings from this study should add to the body of literature related to the impact magnet schools have on student academic achievement and could be important for examining the effectiveness of the unique curricula of magnet high schools when compared with traditional high schools.

All of the magnet high schools in this mid-Atlantic state were identified. Next, corresponding traditional/neighborhood high schools were found. The corresponding high schools were in similar neighborhoods in the same county. Data were obtained from the state's department of education website that reports the student performance of all public schools in the state on HSA and PARCC assessments. Data were then entered into spreadsheets to be analyzed using statistical software SPSS.
Discussion

The first research question sought to identify a difference in HSA Biology test scores between traditional neighborhood and magnet high school students. It was found that there is a non-significant difference in HSA Biology test scores between traditional and magnet high schools. Students who attended traditional high schools performed similarly to students at magnet high schools.

The second research question sought to identify a difference in HSA Government test scores between traditional neighborhood and magnet high school students. It was found that there is a non-significant difference in HSA Government test scores between traditional and magnet high schools. Students who attended traditional high schools performed similarly to students at magnet high schools.

The third research question sought to identify a difference in HSA English 10 test scores between traditional neighborhood and magnet high school students. It was found that there is a non-significant difference in HSA English 10 test scores between traditional and magnet high schools. Students who attended traditional high schools performed similarly to students at magnet high schools.

The fourth research question sought to identify a difference in HSA Algebra I test scores between traditional neighborhood and magnet high
school students. It was found that there is a non-significant difference in HSA Algebra I test scores between traditional and magnet high schools. Students who attended traditional high schools performed similarly to students at magnet high schools.

The fifth research question sought to identify a difference in PARCC English 10 test scores between traditional neighborhood and magnet school students. It was found that there is a non-significant difference in PARCC English 10 test scores between traditional and magnet high schools. Students who attended magnet schools performed similarly to students at traditional high schools.

The sixth research question sought to identify a difference in PARCC Algebra I test scores between traditional neighborhood and magnet school students. It was found that there is a non-significant difference in PARCC Algebra I test scores between traditional and magnet high schools. Students who attended magnet schools performed similarly to students at traditional high schools in Algebra I.

The theoretical framework, Robert Marzano’s factors that influence student achievement, says that the student level factors account for the lion’s share of the variance in student achievement (Marzano, 2003, p.125). The findings for all of the research questions was that there is a non-significant difference in HSA and PARCC test scores between magnet
and traditional high schools. These findings are in line with Marzano’s theory because the theory states that the differences in student achievement are due to student level factors. ANCOVA was used to remove the effects of the student level factors, and the results found that there was no significant difference in academic achievement between students at magnet high schools and students at traditional neighborhood high schools.

Home atmosphere, learned intelligence and background knowledge, and student motivation are the three student-level factors in Robert Marzano’s theory that influence student academic achievement. It can be said that magnet school students are more motivated than students who attend traditional neighborhood schools because they have to do more work to get into the magnet school. Extra testing, extra paperwork, and often, extra meetings or interviews are completed to attend a magnet school. Magnet school students are more motivated to learn the content at the magnet school because it is of interest to those students; this is the reason they wanted to go to that school. Marzano (2003) says “if students are motivated to learn the content in a given subject, their achievement in that subject will most likely be good. If students are not motivated to learn the content, their achievement will likely be limited” (Marzano, 2003, p. 144). The home atmosphere of many
magnet school students tends to be of higher socioeconomic status, higher levels of parental education, and more knowledge for parents on supervision techniques and ways they can take an interest in schoolwork and determine the best ways to communicate to enhance academic achievement and expectations (Marzano, 2003, p. 132). Many magnet schools offer classes to parents to enhance the home environment because they see the value added to the student if the home atmosphere has these characteristics. Learned intelligence and background knowledge “can be directly enhanced by deepening the experiential base of students” (Marzano, 2003, p. 143). Since many magnet school students come from homes with higher socioeconomic status than students from traditional neighborhood schools, the experiences that they receive can outweigh the experiences received by neighborhood school students. The background knowledge that a magnet school student has should be higher than a traditional neighborhood student, according to Marzano’s theory. The theory suggests that magnet school students should outperform students at traditional neighborhood high schools due to their home atmosphere, learned intelligence and background knowledge, and motivation. However, the findings of this study do not support that theory since it was found that there is a non-significant difference in all test scores between
traditional and magnet high schools. Students who attended magnet schools performed similarly to students at traditional high schools in all subjects.

The findings of both tests (HSA and PARCC) were similar in that; there were no significant differences. Since there were no significant differences these findings were probably due to chance, or that not enough schools were used in the study to find an actual significant difference.

**Conclusions and Implications**

The key finding of the study was that traditional neighborhood high school students performed similarly to high school students at magnet schools on the HSA Biology, Government, English 10, and Algebra I, and PARCC English 10 and Algebra I tests.

This study offers suggestive evidence that school districts can no longer automatically assume that creating magnet schools will be the next step in increasing student academic achievement.

**Recommendations**

After conducting this research study, future research into a few different aspects should be considered. First, the number of published studies that focus on student academic achievement between magnet and traditional neighborhood high school students is limited. More
research is needed that will focus on the percent minority, percent free and reduced meal students, and percent of special education students at a school and how this affects student achievement.

Second, the findings of this study are limited to the extent that they only included 71 school sites from one state. Replicating this study in other states to include more school sites would be of value since the sample size (71 school sites) is relatively small given the amount of magnet and traditional schools across the country. This small sample size may not have been large enough to find a statistically significant difference. Conducting another similar study with a larger sample size to determine if the results remain the same, would give both studies more validity. Other researchers did not use ANCOVA to remove the effects of the student level factors which could have accounted for their results of higher student academic achievement of students at magnet schools. Having another study completed using this same model would prove useful in determining the cause in differences, if any, in academic achievement.

Other recommendations for further research could include: interviews or surveys completed by students, parents, and teachers to determine how they perceive the differences between magnet and traditional neighborhood high schools. Qualitative research could be done with the interviews or surveys to gain insight into their perspectives
and to answer questions like how does the perception of a school impact student academic achievement? An examination of magnet school and traditional neighborhood curricula to see if the curricula are similar. If they are not similar, how are they different, is one better than the other, and do differences in curricula play a role in increased student academic achievement?

**Summary**

Insights gained through this study should provide policymakers and educational leaders with quantitative data regarding the academic achievements of students who attend magnet high schools and students who attend traditional neighborhood high schools. The findings from this study will make it difficult for educational leaders to say that magnet schools do a better job in increasing student achievement. However, the same findings could prove useful for researchers when conducting new studies.

The insight and knowledge gained from this research study will contribute to the quantitative data that already exists regarding differences in academic achievement between magnet high school students and traditional neighborhood high school students.
References


(Eds.), *School desegregation in the 21st century* (pp. 41-65). Westport, CT: Praeger.


