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Do They Make a Difference? Twin Cities Magnet Schools in the Heart of Metropolitan Inequity and Segregation

Scott A. Thomas
Minnesota State University, Mankato

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by

Scott A. Thomas

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This dissertation has been examined and approved by the following members of the student's committee:

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Dr. Melissa Krull, Advisor

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Dr. Bernadeia Johnson, Committee Member

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Dr. Courtney Bell-Duncan, Committee Member

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DO THEY MAKE A DIFFERENCE? TWIN CITIES MAGNET SCHOOLS IN THE HEART OF METROPOLITAN INEQUITY AND SEGREGATION

SCOTT A. THOMAS

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ABSTRACT

Magnet schools have served as one of the most important and widely-used desegregation tools throughout the United States. Each district, region and state have varying degrees of implementation, policies, and goals for such schools, however, robust evidence of their effectiveness is needed. This study examines a single school district in Minnesota that uses magnet schools to meet a state desegregation order where five elementary magnet schools and five control schools were identified to understand the impact the magnet "treatment" has on achievement for students of color, English learners, and students receiving special education services. This multivariate comparative study uses the Chi-square test of Independence with Yates continuity correction found a significant relationship between school type and achievement in reading, math, and science subjects. Students in magnet schools outperformed their non-magnet control group peers overall. Black, Latino, and Native American students in particular, benefited from the magnet treatment in all subject areas. Students receiving English language and special education services also had a significant relationship between achievement and school type.

CHAPTER I

INTRODUCTION

Racial segregation and desegregation in the United States has long and devastatingly impacted generations of all Americans. The deep roots of segregation stem from racist beliefs, laws, and policies designed to subjugate African Americans, in particular, into a separate and unequal class of citizens. Since emancipation, countless policies have continued to racially separate White from Black in the legal system, housing, education, employment, and economic independence (Jones, 2019). Prohibiting access to education was a central means to generational enforcement, as evidenced by the de jure Jim Crow laws of the southern states following the Civil War and emancipation and the de facto practices found in the North that achieved similar results.

The passage of the Fourteenth Amendment in 1868 allowed for equal protection under the law, due process, and full citizenship for African Americans (*14th Amendment,* 1868). This amendment challenged segregation by overturning the "separate but equal" doctrine initially affirmed in *Plessy v. Ferguson* in 1896. While the Constitution does not explicitly mention education, it is therefore left to the states to address. The first federal case to challenge school segregation was *Mendez v. Westminster* (1946), which declared that segregating Latinos violated equal protection and set a precedent for *Brown* (Valencai, 2005). Most famously, *Brown v. Board of Education of Topeka* (347 U.S. 483, 1954) overturned *Plessy v. Ferguson* and essentially stated that separate is inherently unequal. Desegregation became "positioned as a means to increase racial justice and

equality in schools and the broader society (Radd & Gosland, 2018). However, those precarious and perceived gains through *Brown* were superficial (DeCuir & Dixon, 2004).

Unfortunately, laws or Supreme Court decisions do not guarantee equality in practice. Many states simply did not enforce the laws granting equality and access. More nefarious discriminatory practices emerged that prohibited access to an equal education. Minnesota was one such state (U.S. District Court No. 4-71, 1974).

By 1869, Minnesota was one of only two states after the Civil War to outlaw school segregation by race, and in 1959, statute 123B.30 forbade segregation and withheld funding for classifying or separating students based on their race, color, social position, or national origin (MN § *Ex1959 c 71 art 8 s 8*).

Article XIII Section 1 of the Minnesota Constitution states

> Uniform system of public schools. The stability of a republican form of government depends mainly upon the people's intelligence; it is the legislature's duty to establish a general and uniform system of public schools. The legislature shall make such provisions by taxation or otherwise as will secure a thorough and efficient system of public schools throughout the state. (Minn. Const. art. XIII, § 1)

The phrase "general and uniform" public schools that are "thorough and efficient" (MN Revisor, 2020), often referred to as school adequacy, has challenged the legislature through various lawsuits, including *Booker v. Special School District #1*, which has led to the creation of the Minnesota Desegregation Rule 3535.0100. A report

(MN House Research, 1994) by the Minnesota Legislature House Legislative Analyst states:

> Since racial segregation in schools is believed to produce an inferior educational experience for racial minorities, racial segregation is equated with racial discrimination in education. The operation of racially segregated public schools is integrally related to racial discrimination. The effects of segregation across socioeconomic and race lines suggest that minority children attending middle-income, racially integrated schools generally attain higher academic achievement levels than minority children attending low-income, racially segregated schools (in most situations, the achievement level of white students remains unchanged). Experts argue that racially segregated schools deny minority children the opportunity to prepare to live in a white-dominated society. Inequality in public education imposed by school segregation can be remedied through voluntary or court-ordered integration. (p. 8)

While these laws seem progressive in relation to the era, school segregation by housing was prevalent through racial housing covenants. “The effects still reverberate today: Despite its reputation for prosperity and progressive politics, Minneapolis now has the lowest homeownership rate among African American households of any U.S. city” (Miller, 2020). In terms of disparities in homeownership, employment, and educational attainment, Minnesota is one of the most racially inequitable states in the U.S. (MN Employment & Economic Development, 2020).

To address school segregation, the MN legislature created the MN Desegregation Rule 125.D (1996) to identify racially identifiable schools and districts, require them to submit a plan to integrate schools voluntarily, and provide a funding formula through non-voter approved tax levy (30%) and state aid (70%) to communities to achieve these goals. Many school districts responded by providing choice options. One of the best-known programs was the "The Choice is Yours" program. A partnership between Minneapolis Public Schools (MPS) and several western suburbs created a new district called the West Metro Education Program (WMEP) and the East Metro Integration District (EMID), now known as Equity Alliance MN. These and other districts created magnet schools to develop integrated learning environments for students. The roots of inferior education are most obvious in states where segregation and racism have clear historical roots; however, states like Minnesota were not spared and, in many ways, are much deeper and harder to overcome.

Background of the Problem

The Twin Cities has some of the widest disparities in health, wealth, income, and education by race and is one of the most segregated, predominantly white cities (Orfield & Stancil, 2017). The Twin Cities is also among the most segregated metropolitan areas by race. Our racial achievement disparities are also among the widest in the U.S. We have not made significant progress in these areas as a region.

Minnesota spent over $110 million to support desegregation programs within districts that receive Achievement and Integration Aide to address school segregation and achievement gaps in 171 school districts in 2019-20 (Minnesota Department of

Education, n.d.). Additionally, via the U.S. Department of Education (DOE), Congress provides district funding through a competitive grant called the Magnet Schools Assistance Program (MSAP). The MSAP grant is the only federal support source for desegregation to school districts with court-ordered or federally required desegregation plans in the federal budget. Communities in Minnesota qualify if required under the MN Desegregation Rule to file a plan. In 2019, federal support was $165 million annually through competitive five-year grants. Several Minnesota districts have won tens of millions of dollars from this competitive funding source and developed or redesigned magnet schools as a result.

Today in Minnesota, over 90 identified magnet schools and programs exist within schools and districts (Magnet Schools of America, 2019). Many of these schools are located in the metropolitan Twin Cities, yet no precise data exist on how effectively they serve students, particularly students of color. Magnet schools, according to Magnet Schools of America (2019), the national association of magnet and theme-based schools, are defined as having five distinct characteristics: innovative theme-based curriculum, student and staff diversity is an explicit goal, engagement of community partners to enhance the learning experience and engage families in the planning and functions of the school to serve students effectively. In contrast to charter schools, local public school districts operate magnet schools, have an elected school board, and must meet all state and federal laws and guidelines for accountability.

Neither the DOE nor the Minnesota Department of Education (MDE) classifies magnet schools separately as they do charter schools or private schools. Instead, they are

listed as traditional schools with no differentiation from other typical neighborhood-zoned schools within a district. As a result, neither entity clearly understands how these schools are performing compared to control schools.

Research on magnet schools has shown mixed results (Blazer, 2012). The impact magnet schools have on student achievement varies by state and district. Several variables should be considered, and unfortunately, conclusions drawn about the viability of magnets are based on some of the most inequitable models (i.e., traditional magnets, gifted and talented and academic magnets, etc.) and often include selective academic criteria for admission. Legal challenges to desegregation and using race to desegregate have also made for a broad mix of student assignment and selection approaches in magnet schools.

Contributions to the Problem

In Minnesota, we are among the states with the widest racial achievement gaps in the country.

On average, Minnesota performs well compared to other states on standardized test scores, graduation rates, and college readiness. However, it has some of the largest gaps in the nation on these measures by race and socioeconomic status (Grunewald, 2019).

Many refer to these as opportunity gaps; magnet schools are measured by their achievement and how well they close the gap between White and Asian, Black, and Latino students, instead of the extent of the opportunity afforded to them and quality integration within the school.

MN's Achievement and Integration (AIM) program does not require reporting other than the goals of overall achievement and total elimination of racial disparities. These goals are not specific to the magnet schools, making a policy assessment impossible through districts' reports. When the MN Legislature convened the Integration and Achievement Task Force, which I co-chaired, the recommendations developed by the task force were adopted and have since been implemented, although not to the level that would indicate which methods of integration are effective demographically or academically.

Open enrollment is available to any family in Minnesota who wishes to attend another school or district that has the capacity designated by the district. This long-cherished policy contributes to the White flight seen in more diverse schools trying to convert from neighborhood to magnet schools. Families who access open enrollment must provide their own transportation, making this an opportunity for the well-resourced and can remove white students from the opportunity to engage in a more diverse school experience.

School boards, recognizing that boundary changes are the third rail of school politics, are often reluctant to address neighborhood schools' housing segregation by changing school attendance boundaries. The expense of phasing in changes that do not displace families is also a detractor for school boards. School boards and statehouses have tried to address school segregation and racial achievement disparities with policies and funding schemes with limited success. In Minnesota, 171 districts in the 2019-20 school year participated in the Achievement and Integration Revenue program and

received over $110 million in aid (MDE, 2021). According to a 2019 report to the Minnesota Legislature, 41 racially isolated districts and 54 racially isolated schools in 13 districts received AIR revenue. According to Dr. Parks, the author of the report,

> For the 2015-17 school years, there were 54 racially identifiable schools in 13 districts, and a total of 117 achievement goals were included in plans for those schools. Three of 13 districts reported meeting one of their RIS achievement goals—that's 23 percent of reporting districts. Seventeen percent (*n*=9) of reporting districts said they met each of their integration goals. None of the districts with RIS reported meeting their RIS integration and achievement goals (Parks, 2019, p.6).

Only nine of 54 (17%) racially isolated schools met annual integration goals. We do not currently know how those districts met their goals, nor do we know how students participating in voluntary integration programs like magnet schools are achieving on state tests.

Purpose of the Research

The purpose of this research is to inform policymakers at the state and local levels what students attending magnet schools for student body diversity (part of an MDE-approved Achievement & Integration Plan) are achieving compared to their control school peers. Policymakers must have the information necessary to determine the best course of action to promote two goals: achievement and integration. An analysis of state student achievement data using the Minnesota Comprehensive Assessment (MCA) of magnet schools in the seven-county metro area of the Twin Cities (See map appendix),

where the greatest concentration of magnet schools are located, and therefore most of the revenue utilized for magnets, will be used to inform conclusions about the academic viability of magnet schools. Additionally, the analysis will be used to identify which Title 1 magnet schools are performing better than demographically similar control Title 1 schools. Specifically, the descriptive analysis of student achievement by school type and student groups will offer critical insight. This multifactorial descriptive analysis study will address two research questions:

RQ1) How are elementary students achieving on MCA tests in grades 3, 4, and 5 in federally designated Title 1 magnet schools compared to control Title 1 schools in a metro area school district between 2017 and 2019?

RQ2) How do proficiency levels by student groups (Black, Latino, White, Asian, Native American, SPED, and English Learners) in magnet schools compare to proficiency levels of student groups in control schools between 2017-2019?

Answers to these questions will offer a first-of-a-kind insight into the impact magnet schools may have on student achievement.

Significance of the Research

The first magnet school created for desegregation opened in Tacoma, Washington, in 1968 (MSA, 2021). Today, over 3,500 magnet schools operate in 45 states serving 2.6 million students in 2019-20 (NCES, 2021). Many small-scale studies have been conducted around the United States. The most recent comprehensive report by USDOE was completed in 2003 and was based on students who enrolled in MSAP-funded magnet schools in the 1995-96 academic year. Studies on magnet schools have

lacked comparative control groups (Wang, 2021 p. 27). Other impact studies do not control for selection bias or other variables between districts that would allow for a larger-scale study. Despite their continued popularity and growth, magnet schools have not had robust research since the impact of the 2007 *Parents Involved in Community Schools* decision, which had significant policy impacts. In 2009, President Obama's Race to the Top, a $4.35 billion grant to expand innovations and reforms in K-12 education, caused a surge in charter school expansion, which increased competition from magnet schools - the original public school choice. The research conducted in this study, while not controlling for selection bias due to the inability to identify which students used the lottery, will use a set of control schools. The use of a single district with a common set of policies and practices takes into consideration and lessens the variability of curriculum, transportation, and the availability of other services, including special education and English language services.

Research related to student achievement in magnet schools in Minnesota simply does not exist. Given the unique climate in which magnet schools are cultivated and sustained through Minnesota's Achievement and Integration program and the use of federal Magnet Schools Assistance Program (MSAP) startup grants, magnet schools in Minnesota have unique and prescriptive origins. Given the policy emphasis on achievement in state achievement and integration plans and the use of magnet schools as a common desegregation tool, the data has not existed to demonstrate the effectiveness of the remedy either because they are unaware of the questions to ask, incurious, or disinterested.

Congress, through the U.S. Department of Education Office of Innovation (2016), has invested $669,805,112 between 2010-2019 in magnet school grants through 153 separate awards to school districts with some districts receiving multiple grants. This substantial investment has prioritized desegregation; however, “the original desegregation mission of magnet schools has been shifting to emphasize academic excellence and innovation rather than equity” (Siegel-Hawley, 2012, p.6). The question posed in this study examines the extent to which equity is achieved. All five of the magnet schools within the district received MSAP funds to develop the magnet theme. While innovation and academic excellence are prized components, equity in achievement for the historically and disproportionately underserved must still matter.

MDE does not disaggregate data for magnet schools, nor have they analyzed the performance of magnets in the Twin Cities to determine if excellence, innovation, or equity are being achieved in Minnesota magnet schools. MDE does not have a process to effectively identify or disaggregate which schools are magnet schools. As a result, school identification for the purposes of study is challenging. My research will identify and disaggregate the data and provide descriptive analysis for one district in the metro area. Using one district as a case study rather than a compilation of districts, each with various enrollment possibilities, demographics, curriculum, and other variables, draws academic conclusions that are more meaningful and reliable by eliminating significant variables.

Few questions have been asked about the impact of magnet schools on students receiving special education services and English Learners (ELs). Studies focusing on or including these students in magnet schools typically only mention them in broad

categories and do not study their achievement compared to other non-magnet schools with similar demographics and variables. This study will examine how students receiving special education services and ELs do in magnet schools over three years compared to peers in non-magnet schools. Understanding the impact of magnet schools on these groups in particular improves our understanding and helps draw conclusions for future study.

From a policy and funding perspective, two primary streams of revenue support magnet schools in Minnesota. At the federal level, the Every Student Succeeds Act (ESSA; 2015) reauthorized the Magnet Schools Assistance Program (MSAP), which has been in existence since 1984 and previously as an amendment to the Emergency School Aid Act (ESAA2) in 1976 (USDOE, 2003, p. v). The U.S. Department of Education operates the MSAP federal grant to support the development and implementation of new magnet schools or redesign existing magnet schools for desegregation in public school districts. Reports to congress demonstrate the use of MSAP funding for schools currently funded. However, there has not been a study of the impact of student achievement in previously grant-funded schools since 2003 (AIR, 2003).

As an advocate for magnet schools, while working as the executive director in Washington, D.C., for the National Association of Magnet Schools from 2012-14, I was often asked by congressional staff and USDOE officials and appointees about the impact of magnet schools. Unfortunately, an abundance of achievement data does not exist to validate the program's expense. The MSAP grant program is the only source of funding for school districts to desegregate and the only approach to voluntary integration

supported at the federal level and has remained flat overall for the last decade, with charter schools receiving three times the funding. A study currently underway that has been commissioned by the U.S. Department of Education scheduled to conclude in 2024 limits the participation of students that participated in lotteries in 2018-2019 in new magnet schools only. Due to the COVID pandemic, student achievement measures will be skewed as some states did not conduct state-wide achievement assessments while others did.

Minnesota is one of two states (Connecticut is the other) to have a constitutional amendment commonly referred to as "school adequacy" and, as a result, has had several successful lawsuits that have argued that school segregation is inherently inadequate and have created voluntary choice programs, including magnet schools as the mechanism to desegregate.

At the state level, Minnesota provides funding through the Achievement and Integration program (MN Statute 3535.0100) in the amount of $110 million. The primary mechanism used to desegregate schools is through magnet programs. These funds are in addition to the basic level of funding schools use to operate and are often used for transportation, additional specialist or theme-related staffing, and professional development, among other district-driven activities that may not relate to the magnet schools.

A case pending at the Minnesota Supreme Court (*Cruz-Guzman v. State of Minnesota*, 2017) is close to a tentative settlement agreement with charter school plaintiffs to create other magnet schools in the Twin Cities to address school segregation

and opportunity. (MN House of Representatives, 2021). The possibility that we may spend millions of dollars (MN H.F. 2471) to create new schools that will provide meaningful opportunities for students is close. Yet, the Minnesota Legislature is on the cusp of making policy decisions without knowing what has worked in Minnesota, where magnets are successful, who they are for, and why they are successful. Expanding research on magnet schools in Minnesota is crucial and will fill a significant void in our understanding. We do not know the answers to this question; worse yet, MDE does not answer this question to evaluate policy or inform lawmakers. Regarding fiscal policy, Minnesota spent over $110 million in FY 2021 (Minnesota Office of Management and Budget, 2022) to desegregate our schools yearly. Much of that is spent on magnet school models to provide voluntary choice but does not include the $116 million spent on interdistrict transportation (Minnesota Office of Management and Budget, 2022).

Based on the charts below, neither the MDE nor the Minnesota Office of Management and Budget (OMB) asks districts to report how quality measures are met or which mechanisms are accounting for these gains or lack thereof. Tables 1.1 and 1.2 below indicate the number of racially isolated districts, schools, and racially isolated districts with racially isolated schools. The district intended for the study is in both categories. Others are located on the edges of the metropolitan area or in Greater Minnesota (i.e., Duluth, Rochester, etc.) (MDE, 2022).

Table 1.1

Districts and Goals by the Numbers

Name of Measure	**2016-2017**	**2017-2018**

Number of participating racially isolated districts	40	39
Number of participating racially identifiable schools	55	55
Number of participating districts with racially identifiable schools	15	15

Table 1.2

Progress on Reading, Math & Integration Goals Indicated in District AI Plans

			n
Progress towards goal reducing reading achievement gap	On Track 23.9	Met Goal 46.9	13
Progress towards goal reducing math achievement gap	26.9	4.9	6
Progress towards integration goal	66.8	51.56	66

(Minnesota Office of Management and Budget, 2022)

In a similar fashion to Minnesota for various reasons is Connecticut, which has over 90 magnet schools. As a result of the continuation of the Connecticut school desegregation *Sheff v. O'Neill* (1989) lawsuit, progress has been consistently monitored. That is not the case for Minnesota. According to the MDE website, only one incomplete report to the legislature has been provided despite a legislative requirement to provide a bi-annual report in odd years. In a 2019 report to the MN legislature (MDE, 2019), Dr. Parks wrote:

> When setting their integration goals, districts set participation goals for programs more frequently than they included goals for specific student outcomes. For example, districts would include an enrollment target for a magnet program rather than set a goal to increase positive outcomes for students who enrolled into that magnet program. The higher percentage of integration goals that were met may be a reflection of setting participation targets rather than specifying positive outcomes for students. Some school district staff were uncertain about who was supposed to be integrated, what integration outcomes they were supposed to create, and who was meant to benefit from integration (p. 16).

Not only are districts not reporting gains at magnet schools, but they also do not know who benefits from the strategy. In addition to unclear reporting, few districts made gains in reading and math. The MDE cites 16 of 89 districts with a reading goal that decreased the achievement gap in the legislative report. Six of 81 that had a math goal reported closing their achievement gap. While we are unsure which years these districts are reporting exactly, we also do not know which districts report such gains or how. According to MDE, from 2015-2017, 3.2 percent (n=4) of districts reported meeting their achievement goals. In the same report, 54.4 percent (n=68) of reporting districts said they met their integration goals. 1.6 percent (n=2) of districts reported meeting their integration and achievement goals. There were 54 racially identifiable schools in 13 districts for the same years, and 117 achievement goals were included in plans for those schools. Three of 13 districts reported meeting one of their RIS achievement goals—that's 23 percent of reporting districts. Seventeen percent (n=9) of reporting districts said

they met each integration goal. None of the RIS districts reported meeting their RIS integration and achievement goals (MDE, 2019).

Delimitations and Limitations

Limitations

Research on desegregation and achievement are well established. However, the mechanisms used to desegregate are complex and vary significantly across the country and even within Minnesota. Selecting one suburban Minnesota school district that receives Achievement and Integration (AIM) revenue, has a desegregation plan for racially identifiable schools (RIS) during the study period, and has multiple magnet schools eliminates many limitations. This research will focus on academic achievement rather than integration because not only is achievement more palatable politically and socially, it is the first question which helps inform the integration question.

Using MCA student achievement data for identified schools will have its limitations. A new MCA tool was released in 2016, providing a consistent instrument for the years 2016-17, 2017-18, and 2018-19. Using data from previous years and a revised version of the assessment instrument may yield different results. Using a state-determined threshold for proficiency (yes or no) provides a common measure for reporting and analysis.

Using the Title 1 federal designation is a general approach to identifying demographically similar schools. In this particular school district, I met with the assessment coordinators in the school district to determine which schools would be the best demographically comparable schools. An indicator of family income is based on

overall enrollment, students of color, and the percentage of students who qualify for free or reduced-price meals. For this district, in particular, they designate elementary schools as Title 1 if they are in the top half of schools with the highest enrollment of low-income students. Each magnet school was paired with a Title 1 control school. The district was unable to provide individual data indicating which students qualified for Free or Reduced Price Meals (FRPL). As a result, income is not a variable within the data.

Due to the COVID pandemic, student achievement measures will be skewed as some states, including Minnesota, will not report data in reading and math for 2020 or 2021, and participation in state-wide assessments is inconsistent. The pandemic also altered the quality and quantity of instruction in schools. Remote learning models, staff, and student absences due to illness or quarantine have significantly impacted the quality of engagement, opportunity, and instruction. As a result, my research will focus on three academic years: 2016-17, 2017-18, and 2018-2019 using MCA reading, math, and science assessment data.

One fundamental limitation and criticism of magnet school studies is student selection. Many of the students participate in a lottery and, as a result, may exclude a population that would benefit from such an experience (Wang, 2017). Unable to tell which students are lottery “winners” and students who attend from the neighborhood attendance zone, I will not be able to discern which students are enrolled through the lottery and which are not. Additionally, I will not determine which students of color attended through the lottery or via the attendance area. Ideally, this study would discern which students were in the lottery and compare them to those who were not.

Students with two or more races identified in the state data will not be included for the purposes of this study unless it is for context.

Researcher bias could be a limitation in interpreting the data. As the former executive director of Magnet Schools of America, which serves as the national association of magnet schools, a parent with children who attend magnet schools, and a former principal of two magnet schools in the district studied, my interest in this topic is firsthand, deep, and grounded in the belief that magnet schools work to promote achievement in general. I also served as the Integration & Educational Equity Coordinator that helped develop the first three magnet schools in the district. The questions asked in this dissertation have not been asked or answered by this district or on behalf of the state of Minnesota. We do not know how well they work or have worked to promote academic achievement and racial integration in this state, given the fiscal, legal, and practical barriers and limitations unique to the state. The district has assigned random numbers to the magnet and control schools so the researcher is unable to discern which schools are which and limit bias.

In 2007, in the Supreme Court case of *Parents Involved in Community Schools v. Seattle School District No.1* (aka PICS; 2007), the ruling caused uncertainty about the use of race in lotteries when selecting for enrollment to create diverse schools such as magnets. This caused districts to move away from using race to integrate schools when making enrollment decisions or setting enrollment policies. This new uncertainty caused by the court resulted in many districts moving away from the original mission to integrate. Some districts used various non-racial proxies that include zip code "nodes,"

educational attainment of the mother, free and reduced-price meal eligibility, and attendance at a low-or high-performing school. Some districts use academic criteria to determine eligibility. The wide variability in student selection practices varies significantly within and between states and districts.

Definition of Key Terms

Desegregation: A legal term used to describe the enrollment of students of color compared to white students. This term typically centers on White as the dominant norm as a percentage by which all enrollment should be compared.

Integration: The act of desegregation through the use of voluntary (school choice) or involuntary methods (boundary changes or other legally prescribed remedies).

Magnet Schools: Schools that attract students based on their interest in the curricular and instructional theme offered by the school. (Reiterate that some are designed for integration and achievement due to the statewide desegregation order?)

Minnesota Comprehensive Assessment (MCA): The state-wide assessment used by the Minnesota Department of Education to ascertain student achievement towards state standards in reading and math.

Neighborhood school: Public schools with attendance zoned from nearby neighborhoods or residential areas. Due to housing patterns, these schools typically reflect the racial and economic demographics of the immediate area.

Racially Identifiable District: Defined by MDE, a school district with 20% more students of color than an adjoining school district.

Racially Identifiable School: MDE defines a single school within a district with 20% more students of color than the average of schools at the same level (elementary/secondary).

Voluntary: A method used to create demographic enrollment diversity through the exercise of school choice, as opposed to directives that force enrollment at particular schools.

Summary

There is much we simply do not know but should know about how magnet schools, designed for integration and achievement, are serving students. More specifically, we should know who is and is not benefiting from such a model. While some districts report meeting achievement goals and some are meeting integration goals, not a single one is meeting both. While this study will focus solely on achievement and who benefits, this study will not examine the extent to which a school (or District) has met its integration goal. The purpose of the study is to determine the extent to which magnet schools improve achievement—not integration. In Minnesota, racial integration is based on the proximity to white students. It does not consider the socioeconomic status of families, nor does it take into account the "double segregation" (Orfield, 2014) that low-income Black and Latinx students face. The time, energy, and cost for a magnet school scheme are incredibly high, and we don't even know their impact in our own backyard. While we can certainly look at isolated districts and one state with a state-driven model, we are one of two states with a statewide desegregation order, with magnet schools currently in place with new ones being debated in the legislature.

CHAPTER II

Review of the Literature

Magnet schools are a small but mighty niche in the American education system. While over 4,000 magnet schools exist with over 3 million students enrolled (MSA, 2021), magnet schools are among the most popular school choice forms in the United States. Magnet school enrollment increased from 1.2 million students in 2000 to 2.6 million students in 2015 (U.S. Department of Education, 2016).

Although they have existed in the American education system for over 40 years, research on these schools is minimal due to the complex nature and selectivity of the studies required to make precise determinations about their effectiveness. Much of the research on magnet schools peaked in the 1990s (Harris, 2018) when attention shifted to the rapidly expanding charter sector.

Education is a multi-faceted field of study with complex inputs, history, and variables. This review of the literature will provide the context of the legal landscape, the formation of legal views that have shaped policy, how it has played out in legal and social psychological scholarship leading to the case for magnet schools, and the research related to their impact. Lastly, the theoretical foundation that has guided the theory of action behind magnet schools is intergroup contact theory, which studies the relationship between “in-group” and “out-group” social structures' impact on academic achievement.

2.1 School Segregation: A Legal Summary

In the social sciences research, what does exist is a deep understanding of the social, psychological, and educational impact of racial segregation. Stemming from early court cases that led to the landmark *Brown v. Board of Education* decision in 1954, expert testimony from psychologists and social scientists submitted critical studies to argue the harms of segregation which heavily influenced the unanimous ruling delivered by Justice Warren's decision rather than using legal precedent. The research contained within the amicus, particularly noted in the NAACP brief authored by Thurgood Marshall, cites the work of Gunner Myrdal. Myrdal's 1,500-page landmark study on race relations, *An American Dilemma: The Negro Problem and Modern Democracy* (1944), cataloged the myriad ways in which racial discrimination harmed Black Americans by preventing full participation in American society. The chief research associate for Myrdal was Ralph Bunche, a political scientist who wrote *World View of Race* in 1936, arguing that "race is a social concept which can be and is employed effectively to rouse and rationalize emotions [and] an admirable device for the cultivation of group prejudices" (Rivilan, 2003 n.p).

As influential to the social science research in early school segregation cases was what is often referred to as the "Doll Study" by psychologist Dr. Kenneth and his wife Mamie Clark. Dr. Clark was a psychologist and the first Black president of the American Psychological Association who utilized the best-known psychological research of the time to study the impact of racism on children. Clark, who testified as an expert witness in the *Briggs vs. Elliott* (1952) case that served as a precursor to the *Brown* case, published his research, also cited in the NAACP amicus brief (1952).

Also cited in amicus briefs was the influential qualitative research of Margaret Brennan (1940). Brennan's qualitative studies (1940a, 1940b) on a select group of girls detailed how the racial attitudes of the dominant group (White) impacted the behaviors, values, aspirations, and attitudes of Black girls. Notably, her research outlined the hostile attitudes and "aggressive, anti-social behaviors" Black Americans had towards the dominant class.

In 1950 and 1951, the United Nations Economic, Scientific, and Cultural Organization (UNESCO) published statements on the biology of race and racial differences and released its findings in Paris. The report from world-renowned scientists helped advance the idea that race was a social construct and racial inferiority was false. These clear statements from the United Nations served as absolute truth and highlighted the dark inhumanity of racial segregation in America. The UNESCO statements were used in all five of the combined cases: *Briggs v. Elliott* (1952) filed in South Carolina, *Davis v. County School Board of Prince Edward* County (1952) filed in Virginia, *Gebhart v. Belton* (1952) filed in Delaware, and *Bolling v. Sharpe* (1954) filed in Washington, D.C.

The Supreme Court ruled that racially separate schools are inherently unequal under the 14th Amendment, no matter how similar or equal the resources, which overruled the Briggs v. Elliott case that did not desegregate but sought to equalize schools. Therefore, desegregation, rather than the redistribution of resources, became the approach by school districts.

Some districts redrew attendance boundaries, closed schools, and forced integration, causing White flight to private and suburban schools (Blank, Levine & Steel, 1996). In Boston, protests by White families and community members violently resisted desegregation through “forced bussing.” White families “pulled their children from the public schools and enrolled them in new ‘private’ all-white academies that hijacked public land, school materials, and funds” (Connunigham, 2014, p. 42).

Desegregation and Integration in Schools

Since the *Brown* decision, states, and districts disputed and resisted the Supreme Court ruling of the *Brown* decision, which resulted in what is known as *Brown II* (1955). In this ruling, noting the distinct variables of the collective cases around the country, Justice Warren urged localities to act on the new principles promptly and to move toward full compliance with them "with all deliberate speed" (1955). This statement served as an excuse to delay in de jure southern states and led to desegregation orders for local school districts, which served as a forceful tool to mandate integration. Since the North was de facto segregated, the legal cases following *Brown* became more complex (Orfield, 2014).

Debates about the validity of social science research proved to be an effective strategy to delay the implementation of desegregation orders. As a result, social science researchers and policy-makers sought answers. The congressionally mandated Coleman Report (Coleman, 1966) calls to answer such questions as part of the Civil Rights Act of 1964 (Section 402). Coleman (1966) found that resource differences between Black and White schools were not readily apparent. The most important predictor of a child's

performance in school, Coleman concluded, was not the school building or resources. It was family life and socioeconomic status.

Many studies indicated modest gains in achievement for Black students with minimal impact on White students. Reviews of research by Scholfield (1995) and Linn & Welner (2007) found that the declining achievement gap in the 1970s and 1980s in the areas of reading and math (Mickelson, 2010) was, in part, a result of desegregation. Hochschild & Scovronick (2003) found that social networks also contributed to the positive academic gains of Black students in desegregated schools.

Decades later, the debate about the impact of integration versus resource equalization on student achievement continues. As courts claimed unitary status for school districts, which no longer required them to desegregate, many resegregated within a few years (Orfield, 2014). Smrekar (2009) illustrates how some districts, like Metro Nashville Schools, saw benefits of resourcing predominantly Black schools (as a means to combat the effects of racial segregation) with a longer calendar, before and after-school activities and childcare as well as reduced class sizes as a model for the district that move away from a desegregation model in favor of equalization of "neighborhood schools" that follow de facto segregated housing patterns. Reardon et al. (2012) contend that racial resegregation following unitary status leads to fewer resources in Black schools and lowered achievement.

In 1966, James Coleman (1966) issued *Equality and Educational Opportunity*, a landmark report on the impact of segregation in schools. Among the first in a landmark study that set the standard for studying U.S. schools, his findings identified that White

and minority students attended largely segregated schools. The impact of segregation ultimately led to disparate outcomes among minorities for generations. Minority students were found to be several grade levels below their White counterparts in reading and math overall, even though the report found that schools were similarly resourced. Coleman also found that motivation and mindset are impacted in both segregated and integrated schools for minority students.

Upon recognizing the 50th anniversary of the Coleman report, scholars at Harvard published "Consequences of Segregation for Children's Opportunity and Wellbeing" (McArdle & Acevedo-Garcia, 2017). They state,

> Segregation spatially isolates groups and limits social interaction, and, for children, this isolation occurs during the crucial period when racial attitudes are being formed. The degree of this separation challenges the values of unity and equal opportunity that we as a nation espouse, especially to the extent that purposefully exclusionary policies contribute to high levels of residential segregation. Further, segregation reifies notions of difference and supremacy by making separation into a physical reality (McArdle & Acevedo-Garcia, p.1, 2017). "Segregation fosters powerful perceptions of who belongs where, who deserves 'access'" (Russell, 2004).

What the Literature Says About School Integration

Given the importance of the unanimous *Brown v. Board of Education* Supreme Court decision, research on the effects of racial integration in schools is surprisingly limited and, at times, contradictory. Simultaneously, even fewer studies report on what

makes integration meaningful or even how districts approach the issue of desegregation. According to Cascio (2007):

> Despite the vast body of literature on the patterns, causes, and consequences of school desegregation, studies in this area [integration], have been limited by data availability, relying on samples that are either highly aggregated or not representative of the typical Southern district (p. 77).

The policies that followed *Brown* are varied, and over time, have had a "fading impact" (Reardon, 2012, p.17). Once under court order, school districts have been granted unitary status allowing them to resegregate quickly (Taylor, 2019) and, as a result of achieving unitary status, undoing the initial motivation to offer voluntary incentives such as magnet schools or programs.

The hardships of residential segregation, compounded by the 2007 *Parents Involved* Supreme Court Case made voluntary integration approaches challenging (McDermott, 2010). Politically, socioeconomic integration seemed more palpable (Kahlenberg, 2010; McDermott, 2015), especially since the U.S Department of Education (USDOE) rescinded guidance for race-conscious policies in 2011 and replaced them with 2008 Bush-era guidance that was race-neutral (Taylor, 2019).

Courts ordered desegregation policies that included boundary changes and forced bussing of students and often faced violent resistance from White communities who refused to attend school with Black Americans. These policies were replaced by court-ordered voluntary approaches that were more susceptible to undermining by parents and policymakers and required far more complex policies and design challenges to achieve

racial integration. Interestingly, districts with more diverse and irregular school boundaries were more likely to achieve racially integrated schools than districts following regular housing patterns (Saporito, 2015).

While racial integration has had its detractors, many in the policy community have called for socioeconomic integration following the U.S. Supreme Court PICS case (2007) limitation on using race for school assignment. Researchers Richard Kahlenberg and Halley Potter at the Century Foundation have long argued that socioeconomic integration was not only more publicly palatable, but effective. Citing numerous peer-reviewed articles, they summarize in their 2019 article that "students who attend socioeconomically and racially diverse schools, regardless of a student's own socioeconomic background, have higher outcomes than students in schools with concentrated poverty. They cite 2011 NAEP data pointing to low-income students who attend more affluent schools scored "roughly two years of learning ahead of low-income students in high poverty schools." Kahlenberg (2012) also estimates that if segregation were halved, it would produce a return on investment 3-5 times the cost of the programs" (np). Rucker Johnson (2011) conducted a longitudinal study tracking Black children exposed to desegregation plans from 1960 through the 1980s and found a variety of positive outcomes that include higher income as adults, lower incarceration, and improved health outcomes. In a published 2013 study (Palardy, 2013, p.713), when controlled for economic backgrounds, students who attended more affluent schools were 68 percent more likely to attend a four-year college than peers at high-poverty schools. Students who attend high-poverty schools are more likely to drop out of school (Belfanz

& Legters, 2004). Belfanz & Legters also found that at the height of integration in the 1970s and ’80s, dropout rates decreased in school districts that had the “largest reductions in school segregation” (p. 7).

However, Armor (2018) argues that when controlling for prior achievement using fixed effects models, effects are minimal in socioeconomically integrated settings.

The Case for Magnet Schools

While it can be complex to obtain a comprehensive understanding of what makes these unique schools work, if they do at all, this chapter will provide an overview of the complexities and nuances of the existing peer-reviewed research.

To begin, Goldring& Smrekar (2000) point out:

> “There are numerous evaluations of local school magnet plans that suggest a very complex set of conclusions regarding the utility of magnet schools in achieving racial desegregation. This is expected; districts vary largely in terms of the nature of their magnet school plans (such as types and numbers of options), transportation availability, and overall district enrollment patterns” (p. 17).

The first magnet school opened in 1968 in Tacoma, Washington (Flemming, 1977), due to court-ordered desegregation, which strove to create a racially integrated learning environment for students. Since then, many types and forms of magnet schools have emerged for racial integration (Goldring, 2007).

Research has focused on several types of magnet themes in particular: Science, Technology, Engineering, and Mathematics (STEM); Montessori; and International Baccalaureate (IB). These themes have become more studied in part because the federal

government pushed for STEM education and grants that followed and the corporate interests in Montessori and International Baccalaureate, which operate as private businesses and have financial interests in expansion.

Montessori schools, most popular as a form of early childhood education in both the private and public sectors, have had a great deal of study on the impact of the approach on literacy and math. The most comprehensive study was a quasi-experimental study on third-graders in Montessori and other district magnet schools to control schools for choice. These used end-of-grade state tests of reading and math that were compared using a multivariate analysis of covariance. Researchers found that while Black students did not show measurable gains in math, the gains were more pronounced in English Language Arts (ELA) in comparison to Black students who did not attend Montessori schools (Brown and Lewis, 2017).

Connecticut, along with Minnesota, has what is commonly referred to as "school adequacy" laws that guarantee students the right to an education. In *Sheff v. O'Neill* (1996), the Connecticut Supreme Court ruled that the state must provide a remedy for the inadequacy resulting from segregation (Cobb, 2009). The resulting settlement created several magnet school districts in and around Hartford and in later years, southern Connecticut. The legislation required the department of education to monitor progress. As a result, Dr. Casey Cobb, a researcher at the University of Connecticut, has conducted extensive longitudinal quasi-experimental studies using magnet and control school groups. Connecticut is important because the state requires common access and selection procedures between districts, limiting selection bias and adjusting for income. His

research found that students of color benefited academically from attending integrated schools (Bifulco & Cobb, 2009a; Cobb et al., 2009b). His research found higher graduation rates, attendance, school satisfaction, and enrollment in advanced courses.

The most recent and comprehensive research synthesis on magnet schools and student outcomes was released by Dr. Jia Wang and associates. Dr. Wang's research (2017), which reviewed seven rigorous quasi-experimental evaluations of magnet schools, found that "five of the seven studies showed a statistically significant, positive impact of magnet schools on math achievement, while no studies found that magnet schools negatively impacted student achievement" (Wang 2017, p. 15). Of the 18 separate studies included in this synthesis, results of magnet school effects on student achievement can be roughly categorized as follows: Six studies found broadly positive results in favor of magnet schools (i.e., favorable, statistically significant magnet school effects for both math and ELA); five studies found partially positive results (i.e., statistically significant effects for math but not ELA or vice versa); three studies found positive magnet school effects for an outcome measure tangential to student achievement such as graduation or delinquency rate; one study found mixed results; three studies found no statistical effects, and one study found partially negative results in math. 12 Studies showed positive effects, with half showing statistically significant positive results.

In a separate, long-awaited study published in 2017 of 24 MSAP-funded magnet schools in five school districts in four states, Dr. Wang (2017b) synthesized data across schools with a "multilevel variance-known analysis, using the school-level effects

estimated with a propensity score-matched regression approach" (p. 4). The results showed significant variation in magnet effects on student outcomes, with some magnet schools showing negative effects and some showing positive effects. These variations could be explained by program implementation and magnet support or lack thereof (Wang, 2017). Researching newly funded magnet schools converted from already established neighborhood schools is significant yet limited because these schools have not had ample time to take root and grow a cadre of students with trained teachers. Most schools converted to magnets are placed in areas of high racial segregation as a means of school improvement, which takes time (Goldring, 2009). The transition to becoming a "full magnet implementation" takes at least three years of funding a school receives from the MSAP grant (Betts et al., 2015, p.?).

This literature review found that a familiar cohort of researchers is passionate about school diversity and seeks to understand its levers to achieve such goals. Many of the studies involved in the literature review show mixed results. These studies controlled for variables and often found student matches in control schools with the same demographic characteristics as parent education attainment, home language, etc. Some studies married several data sets, such as Common Core Database and U.S. Census data but began their research subject selection with a review of school policies and categorized them (Taylor, 2019). Michelson (2016) noted:

> To be sure, teachers, curricula, and pedagogy are essential components of the opportunities to learn we give our students. But they are not the only important ones. The social organization of schools and classrooms also contributes to the

> quality of students' education. Whether a school or classroom is racially, ethnically, and socioeconomically diverse or segregated makes a critical difference in K-12 achievement outcomes across the curriculum. (p.43).

Much of the research on magnet schools often coincides with research on racially and economically diverse schools. Research about these schools shows achievement gains in literacy, math, science, and language (Ali & Perez, 2011). In a 2021 qualitative and quantitative study by Brooks & Pack (2021) of 24 magnet schools, while they implemented their magnet program using MSAP funding with matched pairs to examine student achievement on math and reading state tests, researchers used a radius match command (Huber, Lechner, & Steinmayer, 2012). They found that magnet school effects varied greatly by school. They found that "three schools had positive effects of 0.25 or higher in math and three schools had negative effects of -0.25 or greater in math" (p. 39). Reading resulted in similar outcomes. Researchers found that the schools with higher effects also had higher fidelity implementation scores, which means that they implemented the magnet theme in higher dosages and they also had school-wide magnet coordination. When they applied their model using the Hedges H statistics, they found that there was no meaningful difference between magnet and control students in reading with the exception of the magnet schools that had a higher fidelity of program implementation and magnet school coordination. In these schools, they found meaningful differences in favor of magnet schools over control schools.

In a California study in 2008, "researchers observed students enrolled in magnet middle schools (68% vs. 51%) and magnet high schools (73% vs. 45%) were

substantially more likely to graduate on time than their peers who attended traditional schools" (Goldschmidt & Martinez-Fernandez, 2004, p. 31). The authors attribute the stark differences to greater "college-going" resources, student body racial/ethnic diversity, and greater levels of academic engagement in magnet schools resulting from students' having the opportunity to choose a theme that aligned with their learning interests (Goldschmidt & Martinez-Fernandez, 2004, p. 31). However, a limitation of the study was that the researchers did not disaggregate who received such benefits by race or family socioeconomic status.

Intergroup Contact Theory

Understanding the roots of racial hostility and prejudice was deeply studied in the 1940s in the new and emerging field of social psychology. Perhaps one of the best-known studies that widened the field of study of intergroup conflict and cooperation was the Robbers Cave study by Muzafer Sherif in 1953. In his experiment, Sherif selected 20 11-year-old boys to camp in a state park for three weeks. During this study, Sherif observed the development of structures of status, group cultures, and boundaries based on their shared identity as their prior friendships fell to the wayside and their groups competed for prizes. Sharif (1954) argued that hostilities could be overcome only when the goals were mutually beneficial to both groups. Through a series of interventions throughout the three-week study, the conflict shifted to cooperation when he set a portion of the camp on fire. Interestingly, the popular book by William Goldring, *Lord of the Flies* (1954) was published a year later, which some argue is loosely based on the Robbers Cave study.

Understanding the roots of tribalism and competition for resources informed not only the social psychology field but also the study of economics.

Reducing racial hostility towards Black Americans was never a goal of desegregation. Providing African Americans access to opportunity was. However, the prevailing belief of social scientists and psychologists of the 1940s and 1950s was based on the theory that meaningful inter-group contact would change outcomes (increase opportunity) for Black Americans. The idea of socialization and interaction with difference was shaped largely by Richard Allport in his seminal and influential text, *The Nature of Prejudice* (1954), in which he theorized that meaningful intergroup contact would reduce prejudice and, therefore, discrimination between groups. Allport specified four conditions for optimal intergroup contact: equal group status within the situation, common goals, intergroup cooperation, and authority support (Pettigrew, 1998). Every chapter in Allport's book dealt with the possibility that incompatible group goals might be a major source of racial tensions in the United States (Katz, 1991). Oddly, for a discipline that focuses on face-to-face interaction, social psychology rarely decomposes situations into their basic components. Allport's attempt is a prominent exception. And it has proven useful in applied settings, such as in the distinction between racial desegregation and integration in schools (Pettigrew, 1975). While basing his theory on previous psychological research of the early 20th century, Allport could not have imagined the end of du jure discrimination, much less attempts by the government also seeking ways to end de facto discrimination.

Applying Allport's (1954) theory and more recent studies critiquing his hypothesis, Thomas Pettigrew (1971) advanced the theory by examining intergroup contact through sociograms and surveys he designed to understand better in-group and out-group dynamics and the role of status. Pettigrew found that children who lived in "mixed-race" neighborhoods were more likely to have friendships, lowered negative perceptions, and positive interactions with the out-group.

Research by Allport (1954) and Pettigrew (1971) had a significant impact on applying research to policy. The concept and theory of action of magnet schools draw on intergroup contact theory to support the practice of mixed groups with similar (less unequal status), coming together (attracted) for a common cause (magnet theme), and goal (learning). Their research helped spawn the theory of action to reduce prejudice among different groups through contact with authority support (laws and policy). Intergroup contact theory has shown there are positive educational benefits when the out-group and in-group learn in integrated settings, which were discussed earlier in this chapter.

A study by Kahalon et al. (2022) studied whether intergroup contact between Israeli Jewish and Palestinian university students had an impact on higher GPAs. The Israeli Arab and Jewish students who participated in a group dynamics course had higher GPAs than those who did not when controlling for pre-university academic records. The impact was greatest on Arab Israeli students, who are often seen as "out-group," whereas Israeli students are seen as "in-group" and still benefited academically over those who did not participate, albeit at a less significant level. "The quality of contact with Jewish

students was also associated with Arab students' sense of academic belonging" (p. 6). The authors noted that the minority group's exposure to the dominant "in-group" reduced negative perceptions of both dominant and minority groups, and fostered a deeper sense of social belonging.

Challenges to the Research

Given the local policies for admission to magnet schools and variations in demographics, comparing student achievement in magnet schools to local control schools is challenging. Pearson's chi-tests are often used to discover the relationship between these two variables in a localized context. Often, these are schools within an attendance area or school boundary with similar racial and socioeconomic demographic populations. Large urban districts, where magnet schools are typically found, have complex systems, transportation and attendance zones, and often multiple themes are duplicated.

Using data on state tests can be a good measure when comparing treatment and control groups. However, when a deeper analysis is needed, such as determining which students attended the school through a choice mechanism, like a lottery, makes understanding the impact of the treatment on the students within the treatment school impossible. Without an identifier of which students were already zoned for the treatment school, we can't tell the full impact of the treatment without controlling for the selection bias.

One of the most compelling ways to determine if treatment is having an impact on academic achievement is to measure student growth. While this study examines student achievement data over three years, the data can not correlate to student growth because

proficiency cut scores change from year to year, and the data does not account for selective attrition or growth or include which students didn't attend or participate in a particular test in a particular year. While generalizations could be made, this data set is not designed to examine growth. The district was unwilling to include growth scores for the purposes of this study.

A Meta-analysis of Student Academic Outcomes in Magnet Schools

Program Evaluation

Researchers at Stanford partnered with an evaluation firm to study the effects of magnet school "dosage" (Wang, 2017). Dosage was defined as the amount and quality of the magnet-adapted curriculum in elementary and secondary schools in four districts that received Magnet School Assistance Program (MSAP) grant funds from the USDOE. Smrekar (2009) used a qualitative case study method to research magnet schools in metro Nashville to describe what happens to magnet schools once the unitary status is achieved and the impact on student integration and achievement in these schools.

Koedel compared student achievement in three choice programs in San Diego using student achievement data that controlled for variables and student matches. Two offered free public transportation. The third did not. However, he dug deeper to understand the extent to which transportation and other factors served as motivating factors (Koedel, 2019).

Based on current research on magnet school outcomes in districts across the country, I hypothesize that I will see higher achievement in math, reading, and science

within the Title 1 magnet schools than in the non-magnet control schools. I also predict that I will see higher achievement in all three subject areas for Black and Latino students.

Research on Magnet Schools in Minnesota

Scholarship on magnet schools in Minnesota is merely non-existent. Just three papers are found in an online library search. Each of them focuses on single magnet schools, the most recent of which came from 1992. Myron Orfield, a researcher at the University of Minnesota, published an article in a law review on segregation in the Twin Cities in general (2017a) and another on the segregative effects of charter schools (2017b) where he states, "racial integration is more likely to produce academic benefits for nonwhite and low-income students than the creation and maintenance of segregated charter schools" (Orfield, np). Peer-reviewed research on magnet schools in Minnesota simply does not exist, despite the wide range of magnet schools available in the Twin Cities, in particular.

CHAPTER III

METHODOLOGY

How effective are magnet schools at improving achievement outcomes compared to control schools in the same district? How effective are magnet schools at closing achievement gaps in math, reading, and science for students of color compared to peers in control schools in the same district?

This research is a mixed factorial descriptive analysis of student achievement between students who attend magnet and control schools over a three-year study period in one suburban district in Minnesota. The district selected operates under an MDE-approved Achievement and Integration (desegregation) plan, which has racially identifiable schools and is also a racially identifiable district. The research intends to answer the following essential questions: Is there a correlation between Title 1 magnet schools and higher student achievement when compared to non-magnet Title 1schools with similar demographics? Do students who are Black and Latino, as well as students receiving special education, and English language services students, achieve at higher levels than their peers in non-magnet control schools?

Using a mixed factorial analysis to understand the connection between the impact the intervention (magnet schools) had on students in comparison to the control school group (neighborhood schools) is a useful tool for policy analysis. Creswell (1999) suggests that using mixed factorial analysis can provide a deeper analysis to study the effectiveness of a program and inform policy. While this approach is often used in policy analysis, it can also identify areas of success as well as improvement.

This research studies the impact magnet schools have, if any, on reading, math, and science achievement overall compared to similar schools. It also compares the performance of students who attend historically underserved and under-resourced communities of color, including immigrant communities, that receive special education services. The research questions help address the extent to which magnet schools help achieve educational equity.

RQ1) How are elementary students achieving on MCA tests in grades 3, 4, and 5 in federally designated Title 1 magnet schools compared to Title 1 control schools in a metro area school district?

RQ2) How do proficiency levels by student groups (Black, Latino, white, Asian, Native American, SPED, and EL) in magnet schools compare to proficiency levels of student groups in non-magnet Title 1 control schools?

Sample

Magnet schools are a tool most often used to promote integration and achievement. (consider adding the above sentence to your definition of magnet schools) In Minnesota, districts are required to use voluntary measures to achieve racial balance and receive funds to assist in reaching these goals.

My sample selection will come from a suburban school district that uses five elementary magnet schools to achieve integration and improve achievement. At the time of the study, the school district currently has three racially identifiable schools, all of which are current magnet schools and have hovered around the 20% disparity threshold on and off. One of the magnet schools was racially identifiable in 2005 and has remained

one of the most diverse schools in the district but below the 20% threshold. The control schools share a similar economic makeup. All five of the control schools are also Title 1 schools, and similar in size. The math sample from 2017-2019 contains 6,702 magnet assessments and 6,904 control assessments. In reading, the sample size is 6,737 magnet and 6,912 control assessments for the same years. For science, which is an MCA test administered only to 5th graders, the samples include 2,256 magnet assessments and 2,295 control assessments from 2017-2019.

Title 1

The district determines which schools qualify for Title 1 funds by allocating them to the top 50% of elementary schools with the highest number of families who qualify for free or reduced-price meals. The district operates five magnet schools at the elementary level and has a total of 19 elementary schools. Before running a lottery, space is automatically given to students to enroll if they already reside within the magnet school attendance area. Using a random lottery then gives preference to students who reside in the attendance zone of an existing magnet school to attend another magnet school of their choice, followed by a preference for siblings of currently enrolled magnet students. Students from outside the district are drawn last. Any students who have not been placed are put on a waiting list until families decline or space allows. The district provides transportation to any magnet school using the same parameters as are used for neighborhood schools such as walk zones.

Magnet schools are identified as the treatment group or variable, with nearby Title 1 elementary non-magnet schools identified as the control school group. Sites, both

magnet and non-magnet, will be selected from a single relatively large urban school district to ensure a comparative analysis. Standard curriculum, staffing ratios, transportation, translated resources for families about choice options, and other variables such as enrollment and lottery policies help ensure greater consistency and reliability between schools. The sample will consist of 5 magnet schools eligible for Title 1 funding through the study timeframe (2016-2019) and 5 Title 1 eligible traditional schools (control schools) within the identified district to participate in the study. In the study district, the schools that receive Title I funding are the top 10 schools with the highest portion of students who qualify for reduced-price meals based on federal income guidelines.

The district requires that a research request be submitted and approved by the director of the schools at the level being researched. The district approved the request and assigned the assessment coordinator and data analyst to provide the data without student identifiers. As a result, an IRB was not required. Working in partnership with the school district, they identified five matching Title 1 schools with similar populations and have a geographic boundary to the magnet schools. Data were provided in an Exel file that included all 19 elementary schools which were coded as Magnet 1-5, non-magnet 1-5, and other 1-9.

The district magnet and control schools will remain unnamed. Schools will be assigned numbers 1-5 by the district providing the data to ensure student privacy. Data will not include individual identifying information. Students who had an incomplete assessment will be removed from the data. Some data within the spreadsheet will need to

have conversion names from the descriptors of “yes” is = to 1 and “no” is = to 0 to create calculations.

Measure

Research on student achievement is measured using the Minnesota Comprehensive Assessment (MCA), an annual assessment conducted in the spring of each school year. Data from grades three, four and five in 2017, 2018, and 2019 will be collected in math, reading and science. I will use the proficiency measures “yes” or “no” determined by MDE for each year to run a comparative analysis of students in grades three through five. This statistical analysis will utilize Comprehensive R Archive Network (CRAN) software better known as “R” to help test the significance of the relationship between school type and achievement. I will be using Pearson’s Chi-square testing with Yates continuity correction (two or less columns) with a .05. With the support of The Center for Excellence in Scholarship and Research (CESR) at Minnesota State University, Mankato, Chi-square tests to determine p-value using an alpha level of 0.05 to determine significance. Additionally, using the Excel database, I will conduct a comparative analysis of proficiency in reading, math, and science by school type, and demographic group during the study period using aggregated pivot tables.

A statistical model will be designed to compare magnets to similar control schools and compare magnets overall to the district averages they reside within using MCA data from cohorts in grade three (2017) to four (2018) and from grades four (2018) to five (2019). R software will also be used for this process using a chi-square test to measure

effect size between grades, and between schools. The following levels describe how the data analysis will be conducted.

Level 1: Create matched pairs of magnet and control schools (2017-2019) cohort using proficiency data as a baseline in each subject area math, reading and science.

Level 1a: Determine the statistical significance by school type and achievement in math, reading, and science.

Level 2: Compare racial demographic categories of proficiency between students attending magnet and control schools.

Level 2a: Determine the statistical significance between school type and achievement among the racial demographic groups Black, White, Asian, and Latino.

Level 3: Compare proficiency rates of students receiving special education services between magnet and control schools.

Level 3a: Determine the statistical significance between school type and achievement for students receiving special education.

Level 4: Compare proficiency rates of students receiving Engligh Language instruction (EL)

Level 4a: Determine the statistical significance between school type and achievement for students receiving English language services.

Design

In this study, the identified treatment group will consist of five magnet schools qualifying for Title 1 funds during the study timeframe, with a control schools group of an equal number of traditional (control schools) Title 1 schools located in the same district in the metropolitan area of the Twin Cities, Minnesota. The study will determine the impact of the treatment, magnet school theme-based curriculum, on student achievement proficiency. Magnet schools will be coded as M1, M2, M3, M4, and M5. Traditional (control schools) Schools will be coded as C1, C2, C3, C4, C5. Data by individual school will not be compared to a paired control school, but rather considered together by type.

A single district was identified to limit other potential variables, including staffing, funding, curricular variations, and consistent hiring practices of school administrators and staff. Schools within a single district also have common transportation variables and a consistent student lottery/selection process. The hypothesis will be tested to determine if a theme-based integrated magnet school curriculum has an impact on student achievement as measured on state reading, math, and science tests.

Allport (1954) and Pettigrew (1971) use contact theory to understand how prejudice reduction and cooperation between groups improve outcomes under certain conditions. Magnet schools are designed to meet the stated conditions. But will that result in learning at faster and higher levels compared to schools that did not receive the treatment? Racial segregation isn't the fault of the children, but integration is society's way of providing contact between children to reduce future bias and address in-group

versus out-group dynamics. Will it result in higher academic achievement for the out-group as well?

The study will not address the fidelity of implementation (dosage) of the magnet theme, leadership, or other systemic possibilities found in other studies.

CHAPTER IV

RESULTS

This chapter will analyze the combined overall proficiency between magnet and control schools as well as subject areas of math, reading, and science academic proficiency measured by MCA's in the years 2017, 2018, and 2019, followed by the proficiency rates of students who identify as Black, non-white Hispanic/Latino, Asian, and White in magnet schools and control schools. Students who receive special education and English language services are also compared in magnets to control schools. The research questions highlighted stark differences between magnet schools and control schools.

Overall enrollment stayed similar in magnet schools and control schools over each of the three years in the study, allowing for stronger comparative analysis and reliability. The number of assessment results used in the study included 24,805 in math (6702 magnet students, 6904 control schools group, and 11,199 in other schools), 24,854 in reading (6,737 magnet students, 6,912 control schools group, 11,205 in other schools) and 8,345 (2,256 magnet, 2,295 control schools group, and 3,794 in other schools) in science. Of the total 58,004 assessments in math, reading, and science, magnet student assessments totaled 15,695 or 27.1%, control schools group assessments totaled 16,111 or 27.7%, and assessments from the other schools totaled 26,198 or 45.2%. For the comparative analysis between magnet schools and control schools, 31,816 assessment data points were used with 49.3% being magnet students, and 50.6% coming from the control schools.

RQ1) How are elementary students achieving on MCA tests in grades 3, 4, and 5 in federally designated Title 1 magnet schools compared to other similar Title 1 schools in a metro area school district?

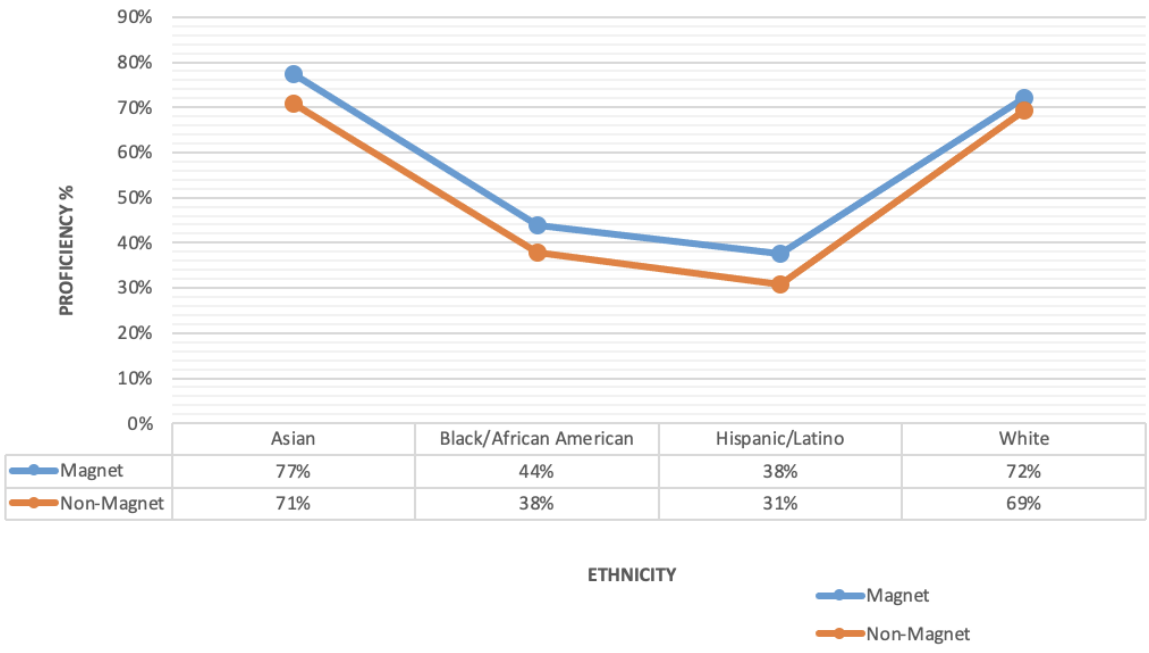
RQ2) How do proficiency levels by student groups (Black, Latino, White, Asian, Native American, SPED, and ELs) in magnet schools compare to proficiency levels of student groups in control schools?

When comparing the overall proficiency of the five magnet schools to their neighboring Title I control schools, the "Other" category reflects all other non-title schools within the district. These "other" schools are less diverse racially and economically and have fewer multi-lingual learners and are not included in the study, however, will be mentioned for perspective. Schools in the study account for approximately half of the elementary students in the district.

As shown in figure 4.1, the combined proficiency in reading, math, and science illustrates the overall relationship between magnet schools and control schools. Using Pearson's Chi-squared test with Yates continuity correction, an α of 0.05, and a null hypothesis, the significance of the relationship is 0.011, meaning there is a 0.95 confidence level. There is a significant relationship between school type and student achievement.

Figure 4.1

Combined Reading, Math, Science Proficiency by Race in Magnet & Control Schools, 2017-2019



	Asian	Black/African American	Hispanic/Latino	White
Magnet	77%	44%	38%	72%
Non-Magnet	71%	38%	31%	69%

Math

Data show that three of the five magnet schools outperformed their control schools in every year of the study. In math, students in magnet schools outperformed control school students in two of the three years. As shown in Table 4.1, magnet students had a proficiency rate of 67.6% (*n*=1217) compared to 65.8% (*n*=1221) of students in the control schools. In 2018, 65.9% (*n*=1175) of students in magnet schools were proficient in math compared to 63.2% (*n*=1130) in non-magnet schools. In 2019, math proficiency continued to drop for all schools in the study with magnet school students having a proficiency rate of 61.8% (*n*=1069) compared to 62.9% (*n*=1090) in control schools.

Table 4.1

Math Proficiency in Magnet and Control Schools, 2017-2019

			Proficient			
			Yes		**No**	
Subject	**Season**	**Type**	**#**	**%**	**#**	**%**
Math	**Spring 2017**	Magnet	1217	67.6%	582	32.4%
		Control	1221	65.8%	634	34.2%
	Spring 2017	**Total**	**4495**	**70.0%**	**1928**	**30.0%**
	Spring 2018	Magnet	1175	65.9%	607	34.1%
		Control	1130	63.2%	657	36.8%

Spring 2018 Total	**4408**	**68.8%**	**1999**	**31.2%**
Spring 2019 Magnet	1069	61.8%	662	38.2%
Control	1090	62.9%	643	37.1%
Spring 2019 Total	**4293**	**67.9%**	**2026**	**32.1%**

Reading

Results in reading proficiency in magnet schools showed a similar trend. In 2017, magnet schools outperformed control schools as shown in table 4.2. Magnet school reading remained higher than control schools in two of the three years. Reading proficiency was 64.1% (*n*=1154) compared to 61.3% (*n*=1136) in control schools. In 2018, while all schools in the study experienced a drop in achievement, magnet school reading proficiency remained higher at 63.7% (*n*=1137) compared to 59.8% (*n*=1069) proficiency in control schools. 2019 followed a trend for all schools in the district, a decrease in reading proficiency. In magnet schools, reading proficiency dropped to 59.6% (*n*=1033) proficient compared to 59.8% (*n*-1038) proficient in control schools.

Table 4.2

Reading Proficiency by School Type, 2017-2019

			Proficient			
			Yes		**No**	
Subject	**Season**	**type**	**#**	**%**	**#**	**%**

Reading	**Spring 2017**	Magnet	1154	64.1%	645	35.9%
		Control	1136	61.3%	716	38.7%
	Spring 2017 Total		**4233**	**65.9%**	**2188**	**34.1%**
	Spring 2018	Magnet	1137	63.7%	648	36.3%
		Control	1069	59.8%	720	40.2%
	Spring 2018 Total		**4234**	**66.0%**	**2180**	**34.0%**
	Spring 2019	Magnet	1033	59.6%	699	40.4%
		Control	1038	59.8%	699	40.2%
	Spring 2019 Total		**4077**	**64.4%**	**2250**	**35.6%**

Science

Science proficiency followed a similar trend as reading and math. Magnets outperformed control schools in two of the three years. However, the differences were greater in science than in reading or math. Science MCA's are only conducted in 5th grade, which may reflect overall exposure to science concepts as part of a magnet school's focus.

In 2017, science proficiency in magnet schools was 68.5% (*n*=411) compared to 62.1% (*n*=389) in control schools. In 2018, the performance gap between magnet schools

was 66.2% (*n*=406) compared to 54.2% (*n*=315) in control schools. 2019 saw a shift in achievement for both magnets and control schools, while the other district schools remained fairly constant over the three-year period. In 2019, magnet school science proficiency dropped to 61.8% (*n*=350) compared to the increase that control schools experienced to 61.7% (*n*=353) proficiency.

Table 4.3

Science Proficiency by School Type, 2017-2019

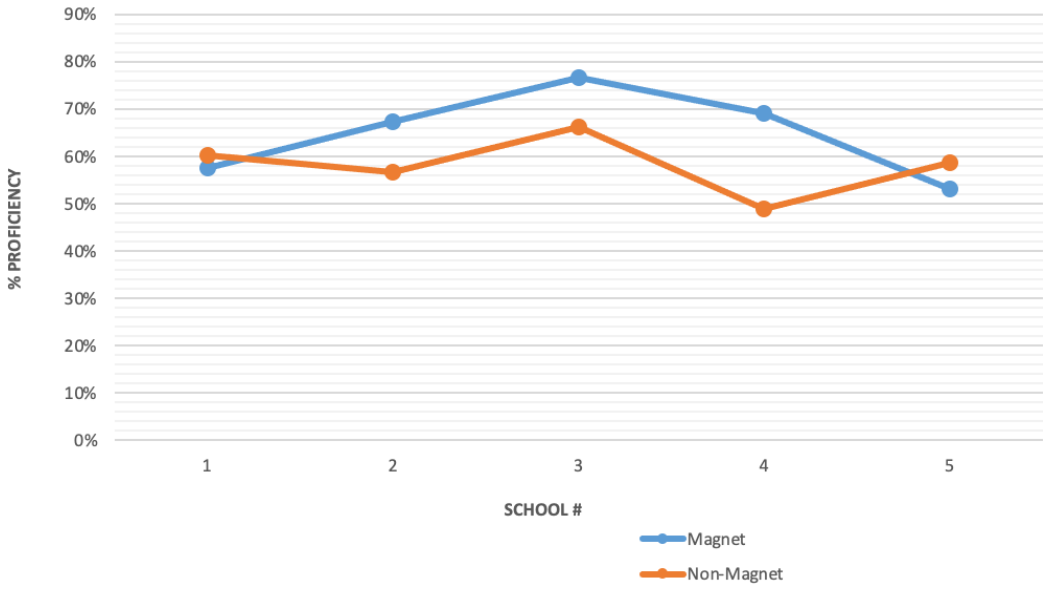
			Proficient			
			Yes		**No**	
Subject	**Season**	**type**	**#**	**%**	**#**	**%**
Science	**Spring 2017**	Magnet	411	68.5%	189	31.5%
		Control	389	62.1%	237	37.9%
		Total	**1487**	**68.1%**	**697**	**31.9%**
	Spring 2018	Magnet	406	66.2%	207	33.8%
		Control	315	54.2%	266	45.8%
		Total	**1439**	**65.9%**	**744**	**34.1%**
	Spring 2019	Magnet	350	61.8%	216	38.2%
		Control	353	61.7%	219	38.3%

Total	**1366**	**65.9%**	**706**	**34.1%**

As shown in figure 4.1, magnet schools one and five perform lower than magnet schools three, four, and five. The table shows combined proficiency from 2017-2019.

Figure 4.2

Science Proficiency by School Type 2017-2019



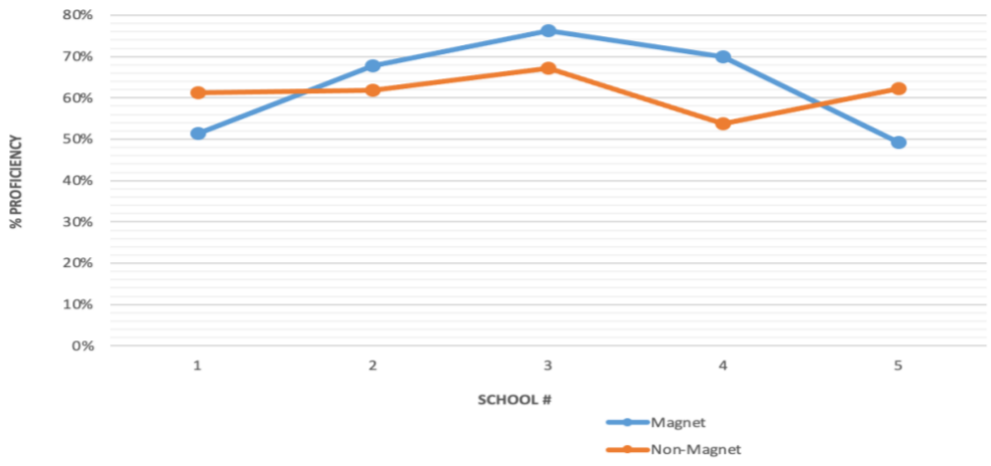
All five of the magnet schools were identified as Title 1 eligible schools, and the study paired them with five Title 1 eligible control schools within the district. With 19 schools overall in the district, the proximity between the schools often means a contiguous attendance zone. The School District provided data and selected the pairings based on, blind labeling each school type one through five. As detailed in Table 5.4,

magnet and control schools #1 had the same overall performance when combining overall proficiency rates in grades 3-5 on reading, math, and science. In school #2, the magnets outperformed the control schools by nearly 10%. Magnet schools #3 and #4 significantly outperformed the control schools, while the comparison between the fifth pairing showed the control school outperforming the magnet.

When combining proficiency rates to gauge an overall sense of academic performance between magnet schools and control schools, three of the five magnets outperform the control schools. Figure 4.2 illustrates magnets #1 and #5 are lower performing compared to their control schools, whereas magnets two, three, and four have higher academic performance than the control schools.

Figure 4.3

Combined Proficiency of Math, Reading, and Science by School Type, 2017-2019



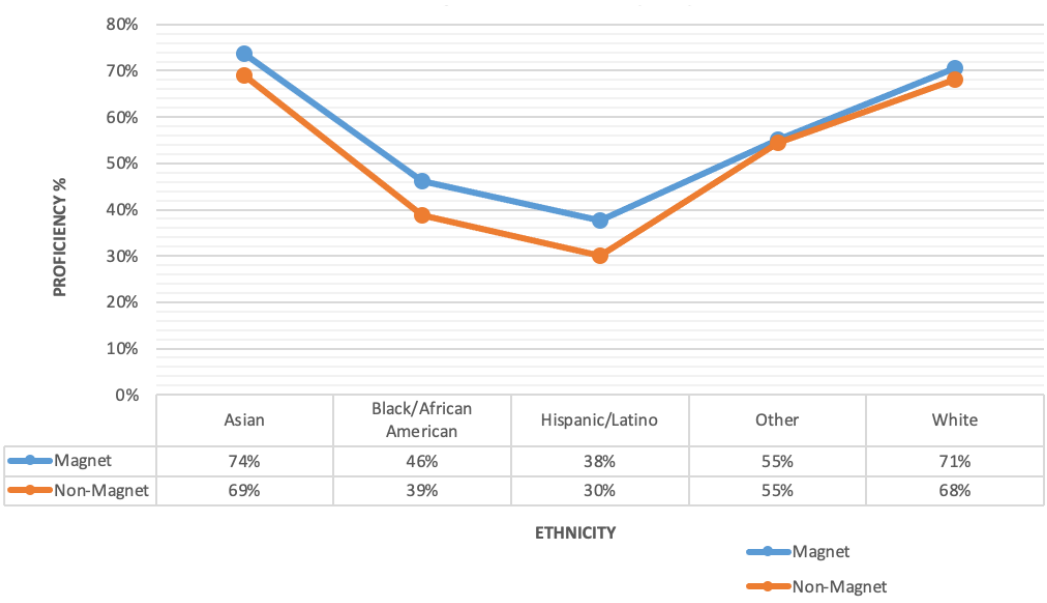
Racial Impact on Magnet Schools

Over the course of the three-year study, Black, Native American, Latino, Asian, and White students in magnet schools, overall, outperformed their peers in control schools in each of three subject areas of reading, math, and science. By applying the intergroup contact theory, the study of in-group versus outgroup academic performance is essential. I have identified Black and Latino students as the out-group, and White students as the in-group to determine if a relationship exists between students who are Black or Latino who attend magnet schools compared to their non-magnet peers.

Figure 4.3 illustrates the higher rates of reading achievement among all racial groups in magnet schools with the exception of "other" which includes the small number of Native Americans and students who identify as two or more races. This data is included for context and is not included in the statistical analysis due to variability and reliability.

Figure 4.4

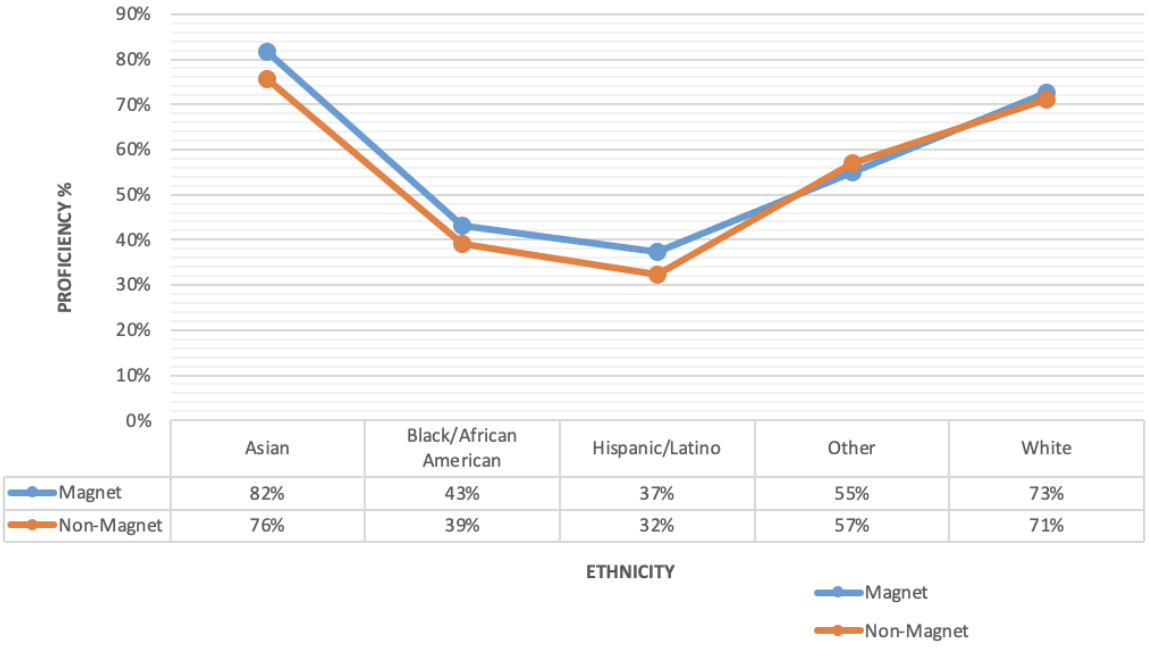
Combined Reading Proficiency by Race, 2017-2019



Proficiency by ethnicity in math showed a similar trend to reading; however, the differences were smaller between magnet and control group peers, and for students who identify as Native American or two or more races, students in the control schools group performed slightly better.

Figure 4.5

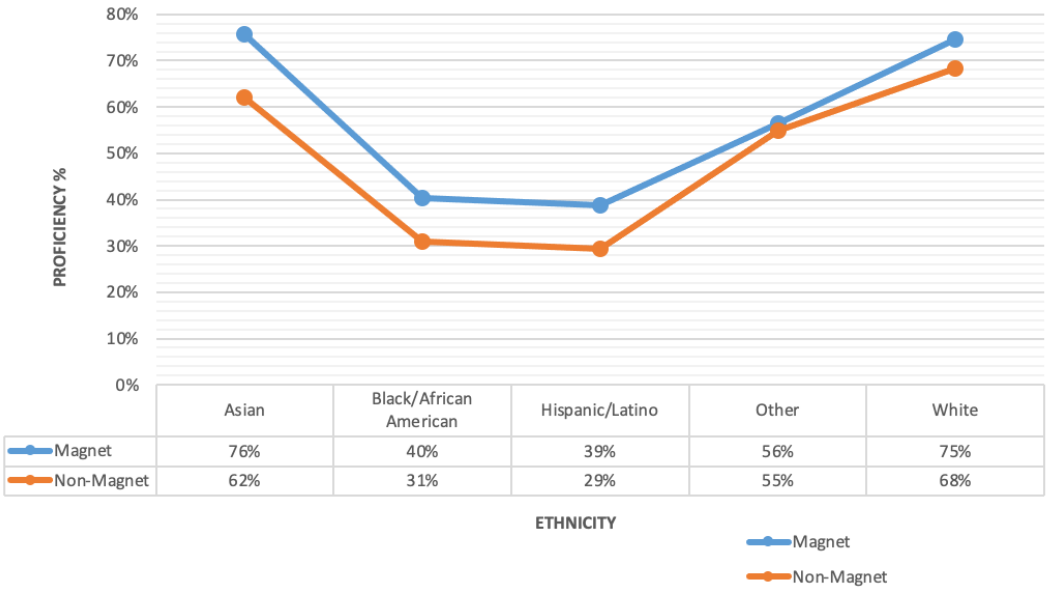
Combined Math Proficiency by Race, 2017-2019



Science proficiency among racial groups followed a similar pattern to reading and math, with Asian, Black, Latino, and White magnet school students performing higher than their control schools peers. As Figure 4.5 indicates, science proficiency between magnet and control school students between 2017-2019, was higher than in the other two subjects assessed. Students of color, including white students in magnet schools, outperform their control school peers.

Figure 4.6

Combined Science Proficiency by Race, 2017-2019



	Asian	Black/African American	Hispanic/Latino	Other	White
Magnet	76%	40%	39%	56%	75%
Non-Magnet	62%	31%	29%	55%	68%

Native American Students

The number of Native American students in the study was much smaller than that of other groups, and as a result, less reliable. Due to the *n*, Native students were not calculated for statistical significance, however, the overall performance data should not be ignored or minimized. The trend of increased achievement included these often overlooked students. In math, Native proficiency in magnet schools was 61.29% (*n*=31) compared to 33.3% (*n*=11) in control schools over the three years. Native students in the "other" schools scored similarly to the control schools within the study: Native proficiency at the "other" schools was just 32.14% (*n*=28). Note that over the three years of the study, Native student enrollment in just five schools was larger than the other 14 schools in the district.

Sixteen of the 15 Native magnet students assessed as proficient in reading meant that 51% (*n*=31) of them were proficient, compared to only 23% (*n*=8) of 34 who were proficient in control schools.

In science, 90% (*n*=11) of Native students in magnet schools were proficient compared to just 27% (*n*=3) in control schools. While the number of the sample is small, the proficiency of Native students who attended magnet schools appears in stark contrast to the Native students who did not attend magnet schools.

Asian Students

While Asian students had a much higher representation on math tests in magnet schools, their proficiency rate from 2017-19 was 81.5% (*n*=881) compared to 75.84% (*n*=447) in control schools. It should be noted that Asian magnet students also outperformed other Asian students in math who also attended the "other" district schools which had a proficiency rate of 77.91% (*n*=860). Chi-square testing shows that there is not a significant relationship between school type and academic performance (χ^2= 0.47163, *df* = 1, p-value = 0.49). The high p-value of 0.49 indicates that there is no significant relationship between school type and proficiency for Asian students.

In reading, Asian students who attended magnet schools had a proficiency rate of 73.36% (*n*=882) compared to 68.9% in control schools. When compared to Asian students who attended the "other" district schools, they continued to outperform, albeit slightly. The "other" schools had a reading proficiency rate of 72.3% (*n*=859).

In science, the differences were starker. Asian students in magnet schools had a proficiency rate of 75.95% (*n*=291) overall, compared to 62.07% (*n*=145) in control schools. Asian students in magnet schools also outperformed the "other" district schools which had a proficiency rate of 71% (*n*=300).

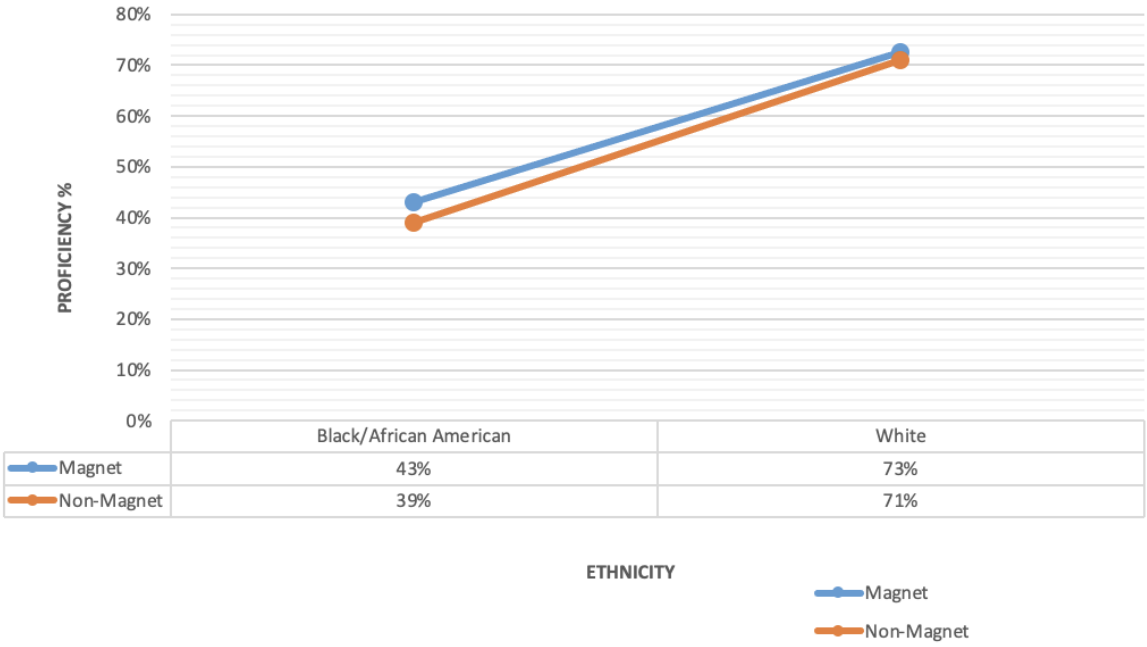
Black Students

For Black students in magnet schools, the achievement gap between White and Black students was smaller (1.91%) over the three years in magnet schools compared to the "other" schools and 2.05% smaller than the Title 1 control schools in the study. This is a remarkable finding. However, the statistical significance (χ^2 = 1.6197, *df* = 1, *p*-value = 0.2031) of the data using Chi-square testing with Yates continuity correction may be more profound in individual schools and subject areas tested. Our high p-value of 0.20, using an α of .05, indicates no significant relationship between school type and proficiency for African American/Black students.

Nonetheless, Black students, overall, perform better on math assessments in magnet schools when compared to the control schools. Overall proficiency of Black students in magnet schools was 43.21% (*n*=1354) compared to 39.66% (*n*=943) in control schools. Note that the number of Black students attending magnet schools is considerably higher than in control schools, and performance is improved. The proficiency gap between Black and White students in math was also the narrowest in magnet schools (29.22%) compared to the control schools (31.37%) and 31.13% at the "other" district schools.

Figure 4.7

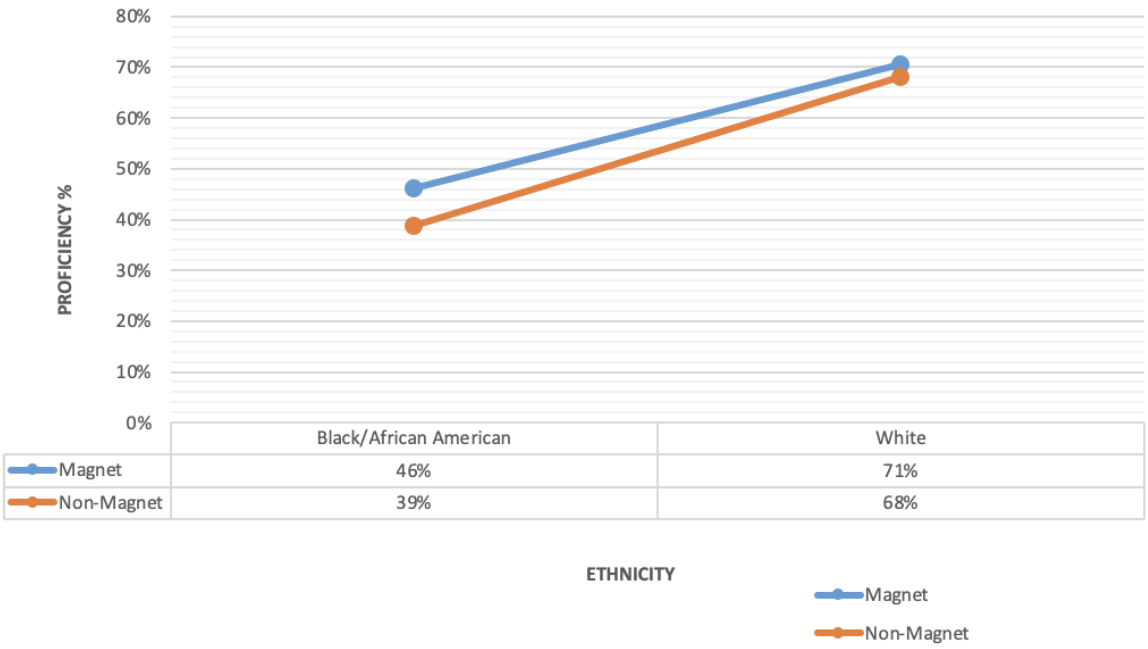
Combined Math Proficiency for Black Magnet & Non-Magnet Students Compared White Magnet & Non-Magnet, 2017-2019



Reading proficiency rates were considerably higher in magnet schools than in the control schools in the study. In magnet schools, reading proficiency for Black students was 45.86% (*n*=1365) compared to 39.3% (*n*=944) in control schools. Black students also had a higher rate of proficiency than the "other" schools in the district, which had a proficiency rate of 44.95% (*n*=841). When comparing racial differences between Black and White students, the proficiency gap was smaller in magnet schools which had a gap of 24.51% compared to control schools with a larger 28.58% gap which was remarkably similar to the "other" district schools, which had a 28.57% gap, which leads me to believe that the reliability is quite high.

Figure 4.8

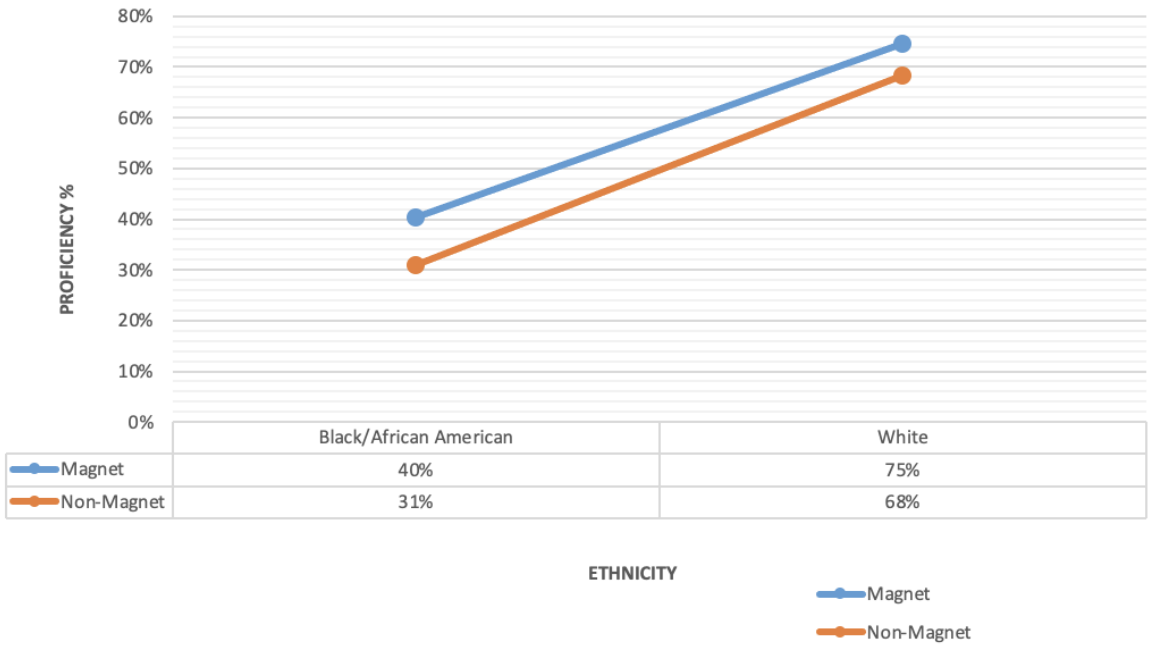
Combined Reading Proficiency for Black Magnet & Non-Magnet Students Compared White Magnet & Non-Magnet, 2017-2019



Science proficiency shown in figure 4.9 shows rates for Black students in magnet schools continued to outperform control schools by 8.99%. Black students had a science proficiency rate of 40.32% (*n*=444) compared to the control schools with 31.33% (*n*=316). Black students in magnet schools also outperformed Black students in the "other" district schools by 1.61%. Interestingly, the achievement differences between Black and White students were most narrow in magnet schools with a proficiency gap of 34.08% compared to 37.36% in control schools and 36.52% in the "other" schools in the district. The science proficiency gap was also narrower in magnet schools compared to control schools.

Figure 4.9

Combined Science Proficiency for Black Magnet & Non-Magnet Students Compared White Magnet & Non-Magnet, 2017-2019



Latino Students

While Latino students overall had the lowest proficiency rates in all subjects, students in magnet schools outperformed their control schools' peers in every subject. In fact, Latino students in magnet schools had a greater, positive disparity in achievement when compared to the control schools.

Combined math proficiency in magnet schools was 37.96% (*n*=785) for Latino students, compared to 32.58% (*n*=887) in control schools.

Combined reading proficiency was also higher for Latino students attending magnet schools, which had a proficiency rate of 37.77% (*n*=797) compared to control schools with a proficiency rate of 30.26% (*n*=889) over the three-year study.

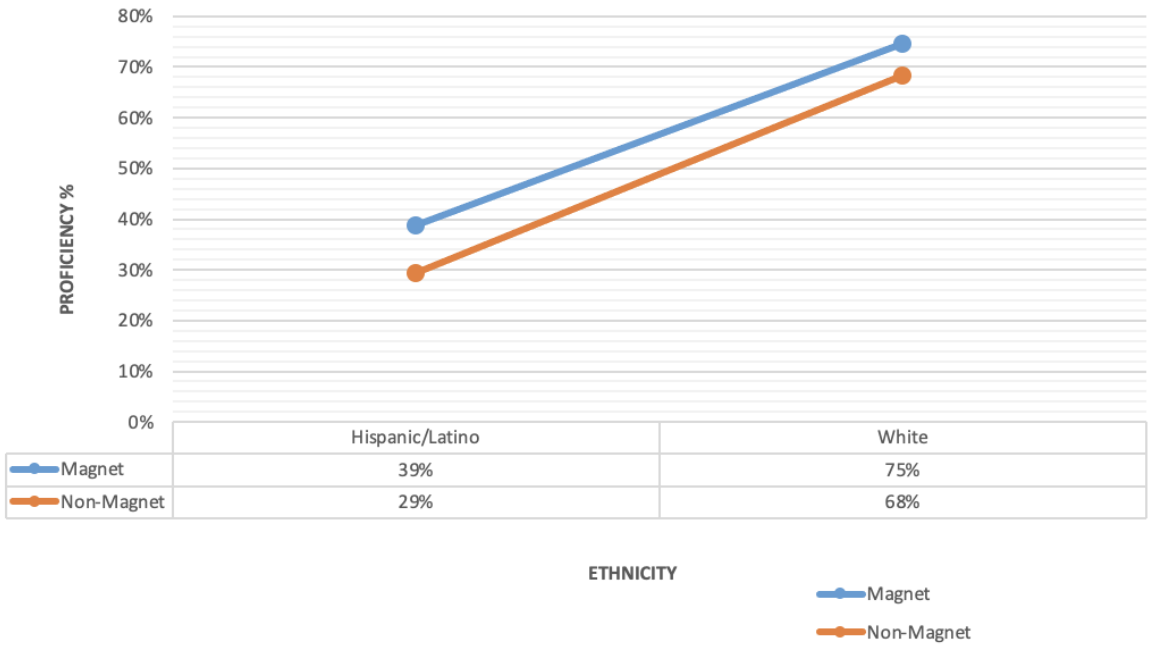
Figure 4.10

Combined Reading Proficiency for Latino Magnet & Non-Magnet Students Compared White Magnet & Non-Magnet, 2017-2019

Fifth graders who took the science MCA had a combined proficiency rate of 38.83% (*n*=273) in magnet schools compared to 29.8% (*n*=302) in control schools between 2017-2019.

Figure 4.11

Combined Science Proficiency for Latino Magnet & Non-Magnet Students Compared White Magnet & Non-Magnet, 2017-2019



White Students

White students in magnet schools had higher proficiency rates than their control school's peers in math, reading, and science. Math proficiency in magnet schools for white students was 72.43% (*n*=3054) compared to 70.83% (*n*=4048) in control schools.

The magnet school impact was observable in reading as well. White students in magnet schools had a proficiency rate of 70.37% (*n*=3064) compared to 67.88% (*n*=4053) in control schools.

Science proficiency for White students had the widest proficiency gap for white students between magnets and control schools, with magnets having a proficiency rate of

74.4% (*n*=1043) compared to 68.69% (*n*=1354) in control schools. Four of the five magnet schools have science as part of the magnet theme.

In these data, White students experience higher levels of proficiency in magnet schools than in the control schools. However, in each subject area, in the "other" schools in the district, White students scored higher in math (4.5% higher), reading (3.15% higher), and science (.83% higher). While these differences are less significant in science, they have greater significance in math and reading. One variability in the data for White students, in particular, is that White students were more likely to attend a magnet school or a Title 1 control school if they qualified for free or reduced proceed meals, meaning that higher poverty among White students *could* be a factor.

Special Education

The MCA proficiency data for students in special education in all three subject areas is lower in magnet schools than it is in control schools and the "other" district schools. While each magnet, control schools, and "other" school have students receiving special education services, center-based programs that serve specific populations of students could be a consideration for further study.

Students receiving special education services in magnet schools had a math proficiency rate of 31.88% (*n*=256) compared to control schools with a proficiency rate of 36.31 (*n*=406). Reading proficiency in magnets was just 29.12% (*n*=237) compared to 33.01% (*n*=370) in control schools. Science followed a similar pattern: magnet school proficiency was 31.62% (*n*=86) compared to 36.12% (*n*=134) in control schools.

The data reflect that students receiving special education services perform lower in magnet schools than in control schools. Further study on why this is the case will provide insight and allow for greater access and equitable outcomes.

Table 4.4

Combined 2017-2019 Subject Proficiency for Students Receiving Special Education Services in Magnet and Control Schools

SUBJECT	Type	Proficient	*n*	%
Math	Magnet	Yes	256	31.88%
	Control	Yes	406	36.31%
Reading	Magnet	Yes	237	29.12%
	Control	Yes	370	33.01%
Science	Magnet	Yes	86	31.62%
	Control	Yes	134	36.12%

Chi-square testing using Yates continuity correction was used to determine if there is a significant relationship between school type and academic performance. Data produced the following results using a .05 α, χ^2= 7.1921, *df* = 1, *p*-value = 0.007323.

Given that the *p*-value 0.007 is below the 0.05 alpha level, there is a significant relationship between school type and proficiency levels for students with disabilities.

English Learners (ELs)

The students developing English language skills are at a unique disadvantage when taking assessments that are not offered in their home language. ELs in magnet schools did have higher proficiency rates than ELs in control schools in every subject. ELs in magnet schools also outperformed Els in the "other" district schools. Math proficiency in magnet schools for ELs was 30.41% (*n*=947) compared to control schools EL proficiency at 23.44% (*n*=866). In reading, the proficiency rate, while lower than math, maintained a similar discrepancy with magnet EL students at 21.92% (*n*=958) proficient compared to just 14.94% (*n*=870) in control schools. Science proficiency for ELs in magnet schools was 15.54% (*n*=193) compared to 9.65% (*n*=228) in control schools.

Magnet schools had a statistically significant relationship between English Learners and school type. Students in magnet schools performed better on subject tests than their control group peers. Data illustrates, using the Chi-square test with Yates continuity correction and a .05 α, χ^2= 4.0452, *df* = 1, *p*-value = 0.0443, leading to a strong conclusion magnet schools have an impact on English Learners. Table 5.1 shows the proficiency rates between magnet and control schools. In each of the three subjects tested between 2017-2019, students in magnet schools outperformed EL students in the control schools consistently by 6.61% on average, with the greatest difference on reading assessments.

Table 4.5

2017-2019 Combined Subject Level Proficiency for EL Students in Magnet and Control Schools

Subject	Type	*n*	% Proficient
Math	Magnet	288	30.41%
	Control	203	23.44%
Reading	Magnet	210	21.92%
	Control	130	14.94%
Science	Magnet	30	15.54%
	Control	22	9.65%

Further study about the type of EL students such as home language, ACCESS level proficiency, income, and selection bias may influence these outcomes and should be studied further. While scores are among the lowest for all the demographic groups in the study, we now have a reliably significant correlation between school type and achievement for EL students.

Summary

In at least one district in Minnesota, magnet schools are making a difference. The comparison between the magnet schools with similar schools in the same district reveals that not only do they perform better than the control schools, but students of color, in

particular, benefit in all three subject areas. While the group of Native American students is small, the impact could be significant. Racialized achievement gaps are smaller in magnet schools than in control schools. Black student assessment data reveals that in reading, math, and science, they benefit from the magnet school treatment. While disparities remain, they are more narrow. For Latino students, proficiency rates are higher in magnet schools than in control schools in every subject area. Scores in all subject areas dropped each year of the study but remained higher overall in magnet schools.

The purpose of this study was to discern if magnet schools made a difference in academic achievement as measured by standardized test scores using MCAs as the measure. Three years of test data containing thousands of data points show that consistently and reliably, there is a significant relationship between magnet school treatment and academic performance. While there is not a demonstration of statistical significance, data show that racial predictability is pervasive, yet the racial disparities gap between Black, Latino, and Native students is smaller at magnet schools than in control schools. Conclusions could be drawn that they are narrowing, not eliminating, the racial achievement gap.

The intent of the research questions was first to determine if magnet treatment impacted achievement and to help identify which schools could tell us more. Three of the five magnet schools in the study started in 2007 and have noticeable higher achievement than the other two, which started in 2016. Questions about the degree to which the schools are racially and economically integrated, school-wide leadership, theme

coordination, and reputation or perceptions of the schools. Two of the newer schools have more complex themes, which may impact their ability to attract new families.

CHAPTER V

CONCLUSION

One of the biggest decisions a family will make, to the extent they have that ability, is to decide where their child will attend school. These decisions draw on a complex set of values and priorities that may depend on the location, theme, reputation, neighborhood appeal, proximity to childcare, and other factors such as the diversity of the student body. But at the end of the day, families who select a school of any type want their child to learn. They choose a school because they want achievement. Few parents select a school because they are making a pro-integrative move, they are choosing a school for the reputation of achievement. The gamble magnet families make often hinges on if it's worth the distance and other possible detractors, such as not attending school with other kids in the immediate neighborhood.

School districts across the country have gambled millions if not billions of dollars in the hopes that magnet schools will help desegregate, offer choice, and maintain enrollment while also claiming that the learning experience is different. The district in this study is no different. Since the district implemented magnet schools in 2007 in an effort to desegregate, student achievement has always been a primary goal. In a 2007 presentation to the school board, student achievement was named as a top priority. In the 15 years since the first magnet schools in the district opened, in-depth research and analysis of the impact they've had on student achievement in general, and on students of color in particular, has not been conducted until now. Other districts receiving Achievement and Integration revenue, and indeed the state of Minnesota, would be well

served to have similar information. A large-scale study on student achievement in magnet schools by the district would add incredible information beyond the study of a single suburban district.

The results yielded in this study add to the body of work that magnet schools do have an impact on achievement. While this study did not examine the "black box" as to what happens in a magnet school that impacts achievement, the larger question of "if" is an essential starting point. While the question about the impact on students on the effects of an integrated learning environment is important, families will select a school for its academic reputation first. School boards and legislatures care about achievement as a politically palatable goal long before they will embrace integration. The body of research questions the role of parent choice but does not address the families who have a magnet school as their primary designation for school attendance.

A future study of the magnet schools within the district should examine the impact on student achievement for the students within the attendance zone who did not participate in the lottery, as magnet schools are often located in areas where poverty and racial demographics are concentrated. The true test of a magnet's success or as a turnaround effort should depend on whether or not the students who were already there have had a positive impact.

Do They Make a Difference?

Three of the five magnet schools in the study opened 15 years ago this year, and two others opened in 2015. All of them were neighborhood schools converted to magnets, and four of the five were racially identifiable by the state of Minnesota through

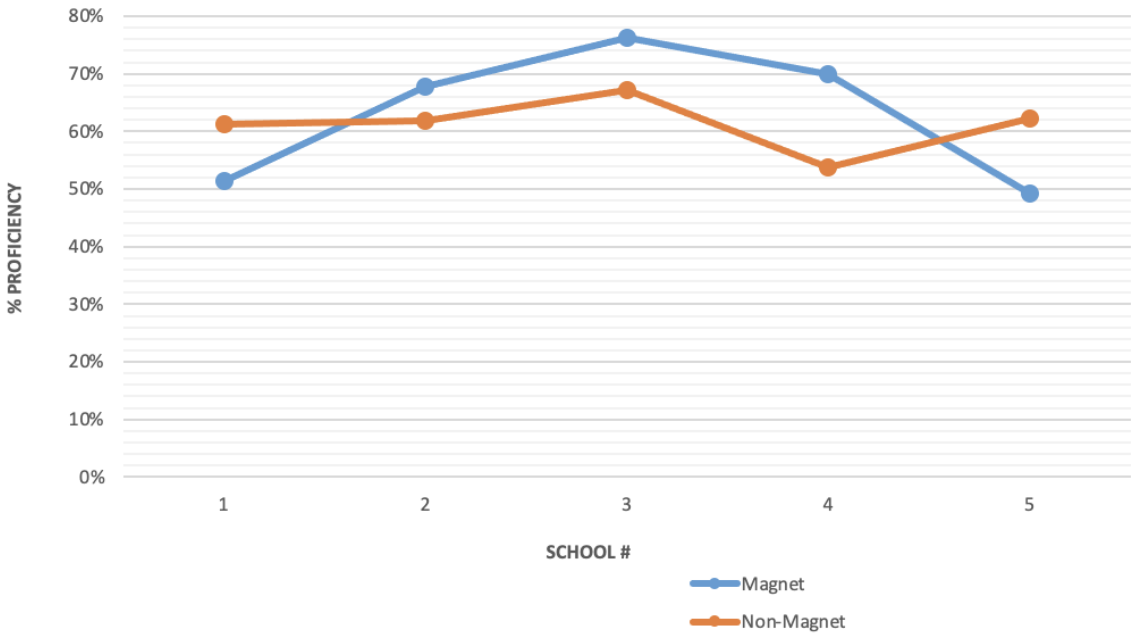
the Desegregation Rule. I had a significant role in this development in Research by Wang, et al. (2017) used a multilevel variance-known analysis method to study 24 magnet schools in four states. This research went more in-depth to explain why there was variability between the schools that showed a positive effect and those which had a negative effect. As in my study of five magnet schools with control schools, three of the five schools showed a positive effect, while two others did not. Further study could show why there are disparities. While I do not know which schools in the study are which, there is a possibility that the two lower-performing magnet schools were implemented differently among other variables.

When data is disaggregated into pivot tables for visual comparison of overall performance, there are consistent data that illustrate higher performance in magnet schools from 2017-2019.

As shown in figure 5.1, there are disparities between schools. Further study should examine the three magnet schools with data that is higher than their matched control school. While this study did not examine schools on an individual basis, a deeper look at these higher performing schools using case study methodology would likely inform our understanding of what makes these schools different. If there are differences in how these schools evolved, or if there were leadership or other systemic changes, staff retention, school milieu, and concentration of students who qualify for free or reduced-priced meals as an indicator of poverty, all of these variables could be more fully understood with deeper study.

Figure 5.1

Combined Proficiency of Reading, Math, and Science by Magnet & Control Schools



Using Pearson's chi-squared test with Yates' continuity correction, with an α value of 0.05, is $\chi 2 = 6.4031$, $df = 1$, p-value = 0.01139, meaning there is a 0.95 confidence level there is a significant relationship between school type and student achievement. Evidence is clear that the magnet school effect is meaningful and significant when compared to similar schools with a similar demographic. When the school district began this journey in 2005, and wrote an MSAP grant to support the development of the three original magnet schools, student achievement was always on the forefront.

While I was unable to include poverty in the data to study the impact of the magnet effect, this data could be extremely useful in helping to explain the extent students are positively impacted, as predicted by similar studies (Kahlenberg, 2012). Socioeconomic integration has often been used in lieu of racial integration as it is seen as more favorable politically.

Do They Make a Difference for Students of Color?

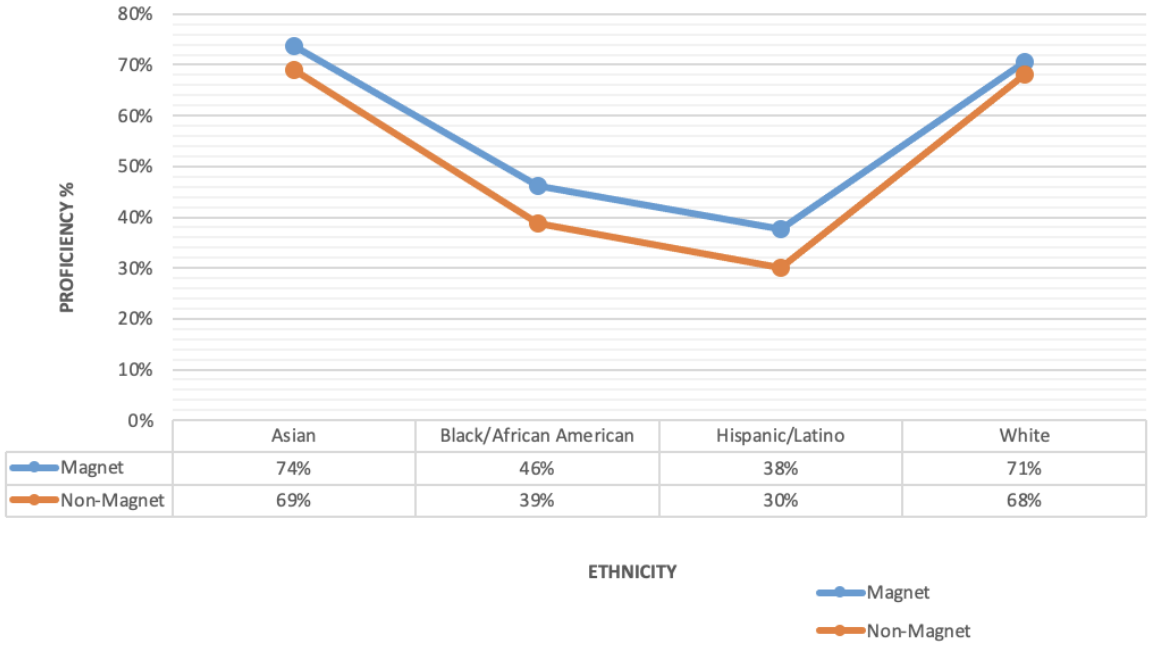
Data from 2017-2019 show that students in eligible Title 1 magnet schools perform higher on reading, math, and science MCA tests than their control-school peers in similar Title 1 eligible schools. The average combined reading proficiency in magnet schools was 57.25%, whereas control schools had an average combined reading proficiency of 51.5%.

Reading

The results are stark. Table 5.2 illustrates overall reading proficiency by racial group.

Figure 5.2

Combined Reading Proficiency by Race



	Asian	Black/African American	Hispanic/Latino	White
Magnet	74%	46%	38%	71%
Non-Magnet	69%	39%	30%	68%

The rates of achievement for Black students is predictably and statistically significant. The achievement gap between White and Black students is smaller in magnet schools and while this is important, there could be other variables at play such as student selection—those willing to participate in the lottery—although we don't know how many Black students are attendance area residents and who opted to join through the lottery. Future studies could look at the Black enrollment across all schools within the district and ascertain which schools specifically are best for Black learners. The same could be said for Latino students. When disaggregating by socioeconomics, the question Kahlenberg (2016) tried to answer in his study could help us understand which schools are the most desegregated, and the impact of low-income students of color attending affluent schools that were left out of the study.

Although Latino students had the lowest rates of proficiency among all racial groups, they seem to benefit from the treatment when compared to their control-group peers. Magnets have a predictable and statistically significant advantage for Latino students. One question that lingers is that many of the MLL students in the district are Latino. This is an area for further study.

While racial predictability and disproportionality exist in all schools within the study, the achievement gap between Black and White students is smaller in magnet schools than in control schools and the other district schools by at least 2% in math and science and 4% in reading.

Asian students, which is a broad identification of students, showed overall they had higher math, reading, and science achievement rates on MCAs from 2017-2019. In magnet schools, they performed even better than their control schools and other school peers. Between Asian and Black or Latino students, the gap was widest; however, in magnet schools, the gap was narrow. This is a diverse group that could certainly support further study.

For Black students in magnet schools, the achievement gap between White and Black students was smaller (1.91%) over the three years in magnet schools compared to the "other" schools and 2.05% smaller than the Title 1 control schools in the study. This is a remarkable finding. However, the statistical significance ($\chi^2 = 1.6197$, $df = 1$, p-value = 0.2031) of the data may be more profound in individual schools and subject areas tested. Although a high p-value of 0.20 indicates that there is no significant relationship between school type and proficiency

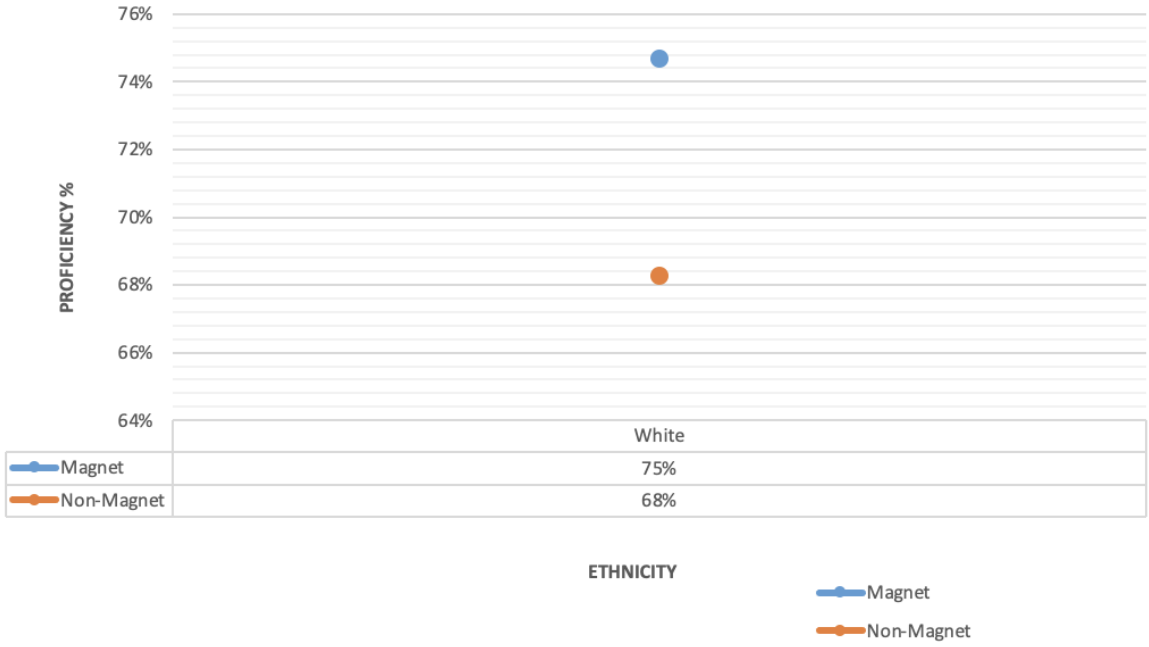
for African American/Black students, three years of data show that Black students reliably perform better year after year in magnet schools in all subject areas. Questions about why and where emerge. Which of the magnet schools demonstrated this, which did not, and why? Were there leaders or teachers of color (out-group teachers) within these schools? As the largest out-group in the district, evidence would suggest that these students perform better in school environments where there is more diversity with other groups of students, including in-group students and teachers.

Latino students are perhaps, the most impacted by school type and academic performance in this study. Related research would indicate that Latino students are most positively impacted by socioeconomic integration (Kahlenberg, 2012; Orfield, 2007). While this study did not include FRPL data, this is an interesting area for future study. Given Latino performance in math compared to control group peers, combined proficiency was 37% in magnet schools and 32% in control schools. While scores remain concerningly low, year over year, school type is the predictor. Reading gaps were wider between school types: 38% in magnet compared to just 30% in control schools. Science was similar with 39% in magnet schools compared to only 29% in control schools. What's remarkable is not just the similarity in proficiency level between all three subject areas, but the predictability that magnet schools are likely the key factor. Future study should focus on and control for ACCESS levels and study students with ACCESS scores of 3 or higher to eliminate any newcomers from this language-based assessment. Future study should also evaluate which students entered the magnet through the lottery and use the zoned students as the control group.

White students (in-group) proficiency comparisons are powerful because they are key for examining the validity of interest convergence (Bell, 1980). Magnet schools were designed to "attract" a broad base of students to create a diverse student body, and that includes White students. Families, when choosing schools, examine the cost-benefit analysis to decide if attending a magnet school, perhaps outside their zoned area, is "worth" it. While there is not a statistically significant relationship between school type and academic achievement, the data does illustrate, like in Figure 5.3 for example, that proficiency on science concepts stands out when math and reading scores are very similar even though they are consistently higher. The case for magnet schools has to be made to every group, and the in-group is no exception.

Figure 5.3

Combined White Student Proficiency on Science MCAs in Magnet & Control Schools



Future studies should disaggregate data and control for FRPL qualifications, as well as zoned versus students who attend through the lottery. This cohort would be fascinating to study in terms of their attitudes towards out-group students and could further validate the impact of magnet schools when compared to control group peers.

Pandemic Impact

The impact of the pandemic dramatically leveled the field between magnets and control schools. Math and science saw the most dramatic decrease in magnet student achievement compared to the control schools. While 2021 was not part of the overall study, the district provided the data for comparative analysis.

In 2021 science, the proficiency gap between magnets and control schools was 48.2% (magnet) and 48.4% control schools (-.2), whereas, in 2017, the proficiency gap in science was 6.4% in favor of magnets.

In 2021 math, the proficiency gap between magnets and control schools was 50.2% (magnets) and 49.6% in control schools (.6%), whereas, in 2018, the proficiency gap between magnets and control schools was 2.5% in favor of magnets.

In summary, the magnet schools had a clear and positive impact on student achievement as measured by MCAs in math, reading, and science. Magnet schools also had a smaller Black-White proficiency gap.

Special Education

The data reflect that students receiving special education services perform lower in magnet schools than in control schools. Further study on why this is the case will provide insight and allow for greater access and equitable outcomes.

Table 5.1

Combined 2017-2019 Subject Proficiency for Students Receiving Special Education Services in Magnet and Control Schools

Test Subject	Type	Proficient	*n*	%
Math	Magnet	Yes	256	31.88%
	Control	Yes	406	36.31%
Reading	Magnet	Yes	237	29.12%
	Control	Yes	370	33.01%

Science	Magnet	Yes	86	31.62%
	Control	Yes	134	36.12%

Chi-square testing was used to determine if there is a significant relationship between school type and academic performance. Data produced the following results: χ^2= 7.1921, *df* = 1, *p*-value = 0.007323. Given that the *p*-value 0.007 is below the 0.05 alpha level, there is a significant relationship between a disabled student's proficiency and the school they attend (magnet vs non-magnet). There is a significant relationship between school type (magnet vs non-magnet) and proficiency levels for students with disabilities.

Given the significance of these results, magnet schools and the school district should urgently consider the types of magnet programming and settings offered in magnet schools and examine what impact, if any, program type has on students with disabilities. While this number does include students who participate in center-based programs, which concentrate students by primary disability such as Autism-Spectrum Disorder (ASD), Severe-Multiply-Impaired (SMI), or Emotional-Behavioral Disorder (EBD), the district could conduct an evaluation that controls for Setting III or IV, which could be done by eliminating MTAS results that were included in this study. Further study of this population of students could also be disaggregated by race and primary disability.

Given the extremely limited data on students with disabilities in magnet schools, this area of study has significant implications for equitable access and achievement. All students, no matter their disability, should have full access to the magnet theme.

Anything short of that could be discriminatory and should be addressed. Qualitative data could also be useful here, as well as additional data that disaggregate by primary disability.

English Learners

Magnet schools had a statistically significant relationship between English learners (EL) and school type. Students in magnet schools performed better on subject tests than their control group peers. Data illustrates, using a .05 α, $\chi^2 = 4.0452$, $df = 1$, p-value = 0.0443 leading to a strong conclusion magnet schools have an impact on English learners. This is an important finding and can inform future research. Immigrant students of all races are an out-group although some are less so than others, based on their racial profile, and may be assumed to be in-group. The school climate and daily interaction with native English speakers may have an influence on these outcomes. Also important for consideration are the wide-ranging experiences and abilities ELs have while acquiring the English language in an academic setting. ACCESS scores, a measure of English proficiency in reading, speaking, listening, and writing, can be used to help identify and control for future studies.

Given the nature of school choice, additional questions about which students enrolled in the magnet schools through the lottery and which are zoned for the magnet school. Magnet schools consistently had a much higher percentage of ELs than the control schools in the study by approximately 20% (n=846 magnet and 698 control). This tells us that ELs have access to magnet schools and that access is having a more positive impact on reading, math, and science achievement.

Intergroup Contact Theory

Allport (1954) believed that four conditions must be met to provide a more level playing field for the out-group in order for them to experience the benefits. Which factors are present in the magnet schools within the study? Could research uncover the extent to which factors are present or missing? The initial hypothesis of intergroup contact theory wasn't intended to examine academic outcomes, but rather the attitudes and behaviors between in-group and out-groups, and the types of interventions that had an impact on those attitudes. Schools are a microcosm of society in many ways. They have cultures that are influenced by community values, history, and experiences as well as social and economic conditions. Schools are not immune to intolerance and discrimination, and in fact, data show achievement disparities exist that are racially predictable and disproportionate.

What takes place in a magnet school is more likely to be unique when the conditions for intergroup contact are intentional. A positive, welcoming school climate is essential for all students and staff to fully thrive academically. Schindler et al. (2016) reported that "the quality of the climate appears to be the single most predictive factor in any school's capacity to promote student achievement" (p.10). The four conditions Allport (1954) identifies (equal group status within the situation; common goals; intergroup cooperation; and the support of authorities, law, or custom) translate easily to school context. Social attitudes between groups create a climate whether they are students or staff. When in-group leaders and teachers assign and empower equal value, authority endorsement ensues, and common goals and cooperation come next. Magnet schools are

especially situated to create the learning experiences through inquiry, project-based learning, the arts, and more.

Behind every data point is a heartbeat of a child who enters school each day with a host of factors that impact their ability or willingness to lead. While the proficiency rates are better in magnet schools, they are still especially abysmal for students of color, EL students, and students receiving special education services. A great urgency related to addressing the school's inability to effectively teach all students should serve as the focus and inquiry. Also behind every data point is a teacher who joins a school community ready to serve. What happens between the student and teacher, as well as between the students together, depends on a variety of conditions and forces. Allport (1954) implies that the outcomes depend greatly on the interactions and boundaries of these interactions. What better place to control these variables than a school.

Emerging Questions

Given the continued and alarming decline of proficiency scores and overall low proficiency in the district, especially among Black and Latino students, questions related to systemic changes, leadership, and magnet fidelity are raised. I wonder what changes have taken place in the overall percentages of low-income students enrolling at the magnets and the control schools. Is poverty being concentrated? What role does socioeconomic status play in the changing proficiency rates?

The magnet schools in the study have attendance areas where the magnet school is the zoned school, and the remaining open seats are filled with those who applied for

the lottery. What percentage of students attend magnet schools through the lottery and how do they perform compared to the zoned students?

School capacity is an essential component of a magnet school with an attendance area zone that gives automatic preference to families within the zone. While some schools have smaller zones enrollment and room for more magnet students, other schools may have smaller magnet enrollment due to higher enrollment from the attendance zone. The district may find that there are common characteristics between the two schools with lower academic achievement that would need to be addressed from a systems level.

While this study is quantitative in nature, qualitative data could reveal more about the impact and importance of these schools. As shown in the body of research, students who attend integrated schools are likely to earn more, have better access to healthcare, lower rates of incarceration, and have a lower bias towards out-group members and vice versa. Students who began as kindergarteners in 2007 are now likely in their early 20s and in a few years more likely to be living independently. A longitudinal study of the magnet students in the original three schools could reveal whether or not the investment made was worth it, as Kahlenberg argues in his 2016 book *The Future of School Integration: Socioeconomic Diversity as an Educational Reform Strategy* (2016) and Rucker Johnson's 2015 study of the long-term impacts of school desegregation and school quality on adult attainment.

Leadership and Theme Fidelity

Within the body of research, school-wide magnet coordination impacts the quality of the magnet school and when there is a high degree of magnet-focused leadership, there

is a positive impact on achievement (Wang, 2018). Future studies should qualitatively examine the impact leadership has had at each of the magnet schools. Three of the five magnet schools had predictably higher proficiency than the other two magnet schools. This researcher wonders why. What leadership changes took place in these schools? Did the school climate change the connectedness between in-group and out-group students? As a former principal of a magnet school, I've often used the analogy that a principal is similar to a pastor. When people search out a church they like, it's the pastor who engages the patron or not. The same is true in magnet schools. If the principal does not appreciate the full purpose and intent of a magnet school, does the theme and support for it get diminished? A large body of research indicates that school leadership matters. My question is, how has leadership and the changes these schools have experienced impacted academic outcomes within magnet schools?

In my opinion, this district is well poised to offer magnet school leadership theme-specific training as well as training on the five pillars of magnet schools. These unique qualities of magnet schools require a different skill set of a leader and unless they are emphasized, the school will be led in a similar fashion as every other school in the district. Attendance at national conferences and workshops could offer valuable perspectives to magnet school leaders in this district. Related to the principal is the role of the magnet school coordinator. Questions posed about principal leadership should also be applied to magnet coordinators.

Declining Achievement

Black and Latino students declined all three years in both reading, math, and science in all 10 schools, both magnet and non-magnet. Systemic issues related to curriculum, theme fidelity, leadership, and school climate could all be reasons, however further investigation is needed. While the decline is alarming, data would indicate that student achievement could have been even higher in previous years. Changes to the state assessment in 2016 and prior years made for an incompatible comparative analysis.

Summary

I had the privilege of supporting the development of the original three magnet schools in the study district, and when we began this journey to desegregate, our team studied magnet schools. At the time, in 2005, research on magnets was sparse. There was conflicting evidence that magnet schools raised achievement. We did learn that the theme fidelity, community engagement, partnerships, and full transportation to choice schools made an impact. We told the school board at the time that student achievement was an essential goal. Today, we are able to clearly say that magnet schools have achieved one of their intended missions, improving achievement, albeit achievement remains incredibly and unacceptably low for Black, Latino, EL, and students receiving special education.

The benefits for students of color, in particular, confirm what I had hoped, that magnet schools make a difference for historically underserved and underrepresented students—and it doesn't come at the "expense" of White students. Interest convergence of the in-group with outgroup benefits has led to a win-win scenario. Magnet schools

create a learning environment that is different. There is a clear relationship between magnet school attendance and achievement.

As the researcher of schools I have poured my heart into as both district and school leader was challenging. To see data that reflects optimism and attainment of goals, it is still disheartening to see we have so far to go. All students can learn at high levels – we already know that. Magnet schools show incredible promise, and are bucking the trend, but there is more to be done.

I believe Ron Edmunds said it best: "We can, whenever and wherever we choose, successfully teach all children whose schooling is of interest to us. We already know more than we need to do this. Whether we do it or not must finally depend on how we feel about the fact that we have not done it so far.''

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