

**Exploring Educational Inequities: School Boundary Zones and Academic Achievement  
among Economically Disadvantaged Black High School Students in an Urban Midwestern  
District: A Companion Dissertation**

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**Exploring Educational Inequities: School Boundary Zones and Academic Achievement  
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**June 17, 2024**

Submitted in Partial Fulfillment of the Requirements for the  
Doctor of Educational Leadership Degree.

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## **Abstract**

An urban district in the Midwest faces increasing stakeholder pressure to redraw long existing school boundary zones to assign students to schools closer to home. High school compositions have changed due to population shifts, urban sprawl, and residential segregation. Black-White and socioeconomic achievement gaps exist in this district, and schools with higher levels of poverty and racial diversity report lower levels of academic achievement. This quantitative study uses retrospective data to assess the impact of current school boundary zones on academic achievement for students who are Black and economically disadvantaged, considering each school's racial and economic composition and teacher experience. The sample includes 11th-grade students from the district's five traditional high schools who attended their assigned school for 162 days prior to the SAT School Day in the spring of 2022 and 2023 ( $n = 2012$ ). Descriptive and inferential statistics are used to describe the population and answer research questions. The findings indicated that student race, socioeconomic status, and high school attended impact SAT scores. Chi-square and ANOVA revealed significant differences in student body compositions across the five schools but no significant differences in educator experience. Despite significant differences in the racial and socioeconomic compositions of the high schools, there were no significant differences in SAT scores for students who are Black and economically disadvantaged. The implications of the research results include recommendations to address disparities in academic achievement in the district and to consider school assignment policies that balance schools socioeconomically and attract affluent students to schools with higher concentrations of poverty and diversity. This is a companion dissertation; a second study focused on 5th-grade students in the same district.

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Lastly, and most importantly, I want to express my deepest gratitude to my family—my husband Brian and my three sons, Jared, Ethan, and Conor. They mean the world to me, and perhaps the biggest sacrifice these last three years was the time not spent with them. I am profoundly grateful for their patience, love, and belief in me. They are my biggest supporters, and I share this accomplishment with them.

## **Dedication**

I was raised by three dear people who believed I could be anything I wanted to be. Albert and Sarah Brandt were my great-grandparents who adopted me when I was a baby. From early on, they knew that I loved school. Together with my grandmother, Ettie Reutter, they made sure that I had everything I needed and loved me unconditionally. I truly felt like I was the most important person in the world to each of them. How lucky I was! As the years went by, they saw that I was smart and believed I would “make a doctor someday.” I know that an Ed.D. isn’t exactly what they had in mind, as they only really knew medical doctors. They passed away over twenty years ago, yet I can’t help but smile as I think about how proud they would be today. I am a first-generation college graduate who now has earned the title “Dr. Hoover.” I am who I am because of them and all they did for me, and I dedicate this dissertation to my Pop, Mom Brandt, and Granny.

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## **CHAPTER 1. INTRODUCTION**

### **Introduction to the Problem**

Across the United States, students who are Black and economically disadvantaged (ED) have lower academic outcomes when compared to their White peers who are within the same school district. The Black-White achievement gap and the affluent-poor achievement gap have widened for students within the same school district. On average, the Black-White gap widened by 6% from 2009 to 2019, and these gaps accelerated in districts where there was increasing racial and economic segregation (Johnson, 2019; Matheny et al., 2023). In the current sample and nationwide, students are commonly assigned to schools based on their residential address. When neighborhoods are highly segregated, both racially and economically, so are schools. This urban, Midwestern school district faces increasing stakeholder pressure to redraw long-standing district boundary zones initially created to increase school diversity. Stakeholders voice concerns about students' time on buses and the distance between home and school. Center-city neighborhoods are the most likely to be impacted by boundary zone changes. Many students in these neighborhoods are Black and ED. Before making changes to the school boundary zones, it is important to understand the school factors that contribute to increased outcomes for these students.

### **Background and Context**

The urban school district in this study has 22,000 K-12 students in 40 schools. With an annual budget of \$274 million, it has 3,900 staff members, including 1,700 educators. Thirty of its educators have less than five years of teaching experience, whereas 25% have over 20 years of teaching experience. 54% of students are from low-income families, 16.5% are students with

disabilities, and 3.5% are English Language Learners. The three largest subgroups are White, 67.4%; Black, 14.7%; and Multiracial, 9.8%. The most recent public data for the Midwestern urban district is from the 2018-19 school year; state accountability grades have not been recalculated since school closures due to COVID. For the 2018-19 school year, this district was rated a "C" based on proficiency, growth, and college and career readiness. In grades 3-8, the district was behind the state average in English Language Arts, Math, and Reading. The graduation rates and diploma strength for the district are both below the state average. 84.9% of students earned a diploma, compared to 87.0% within the state. The strength of the district diploma was 64.2% compared to the state at 79.1%; this number is based on the types of diplomas earned by graduates. In this district, 24.4% of students earned the General diploma, compared to 9.0% in the state. 45.2% of students earned the Core-40 diploma, compared to 50.8% in the state; this diploma is an indicator of college readiness. 30.4% of students earned an Academic or Technical Honors diploma, compared to 40.3% in the state.

The district has multiple school configurations, including schools with students in grades K-5, K-6, K-8, 6-8, 7-8, and 9-12. In addition to traditional schools, there is a virtual school and various magnet programs, including a career and technical school and an Early College program. Pre-K programs are offered at multiple sites, prioritizing schools in high-poverty neighborhoods. Two alternative schools exist, serving students in grades 6-12. Schools are organized into six zones for support by the district office. Three of the four elementary zones are designated as the School Support Network. Schools in this network are high-poverty schools designated by the state as Comprehensive or Targeted Support and Improvement schools, meaning they have chronically underperforming subgroups. In most cases, these schools are also Title I schools. In

addition to more district support, schools in these zones get priority staffing of new teachers, more in-building instructional and behavioral coaches, smaller class sizes, and yearly retention stipends for teachers.

There have been several strategic initiatives to increase equity in the district. In high schools, one such initiative is the work with Equal Opportunity Schools to increase the number of underrepresented students, specifically students of color and low income, in the most rigorous coursework. Schools have expanded dual credit and Advanced Placement (AP) offerings and have intentionally recruited underrepresented students into these classes. Under this partnership, overall AP enrollment has increased 135%. Underrepresented student enrollment in AP has increased 250% during this same time. In addition, the Advancement Via Individual Determination (AVID) program has recently been added at three of the five high schools to help close the college opportunity gap by equipping teachers with strategies of support and rigor for students. All elementary schools have High Ability programming for students. In addition, 16 of 22 elementary schools and six of 18 secondary schools have grant-funded after-school programs, such as 21st Century Community Centers Learning Programs, based on the needs of their students and families. These programs provide academic enrichment opportunities outside of regular school hours. Over 575 students attend these programs each week.

In recent years, three new schools have been built outside of the city limits, on the far northern side of the county, to accommodate the growth and development of suburbs. Despite the new school locations being on the far north side and within the same high school attendance boundary, the school district has not redrawn the school boundary zones. The same school boundary zones have existed in the district for over 30 years, and families, as well as community

members, have been vocal about the hardships the location of these new schools has placed on families. Simultaneously, there is a nationwide bus driver shortage that impacts these schools (Lieberman, 2022). The district is no longer able to offer bussing to all students; however, because of the location of the new schools and lack of sidewalk access and public transportation, all students unable to provide their own transportation to the new schools require a bus which, in turn, amplifies the strain on buses for all others. Given the vocal community and the transportation issues, the district is considering redrawing school boundary zones to align more with neighborhood schools. Redrawing school boundary zones would have the potential benefit of students attending school closer to home, thereby making the school more accessible to families. There is a large amount of research on academic outcomes for students who are Black and ED and the schools they attend. A review of the literature suggests that students who are Black and ED disproportionately attend schools with higher concentrations of poverty and lower academic achievement (Condrón et al., 2012; Liou, 2019; Owens, 2018; Taylor & Frankenberg, 2021). Given the current circumstances and pressing decision, it is important to investigate whether students who are Black and ED are performing better than their similar peers at different schools within the district.

### **Statement of the Problem**

An urban school district in the Midwest is facing numerous challenges from population shifts over time, including increased school segregation, differences in enrollment, and an inability to meet the demand for bus transportation. One of the five high schools was relocated to accommodate increased housing development in the county, creating a hardship for students and families who are now further from their assigned school. Longstanding school boundary zones

have not been redrawn for over 30 years. As stakeholders advocate for boundary changes, concerns arise over the impact of potential redistricting for students who are Black and ED as there are Black-White and economic achievement gaps in the district. This study aimed to address the impact of current school boundary zones on academic outcomes for this marginalized student group. It is important to understand school factors associated with improved academic outcomes before implementing any boundary adjustments.

### **Purpose of the Study**

The purpose of this research was to examine the impacts of school boundary zones on academic outcomes for high school students who are Black and ED in an urban school district in the Midwest. As part of a companion study, this researcher focused on high school outcomes, while another focused on elementary school outcomes for students in the same district. Changing school boundary zones for this Midwestern, urban school district will impact all students, whether directly by assigning students to new schools or indirectly by changing the composition of the schools they attend. Given the composition of the center-city, the distance some students travel for high school presently, and the district achievement gap, it is particularly important for stakeholders to understand the impacts of school attended on academic outcomes for students who are Black and ED before making decisions.

### **Research Aims**

The first aim of this study was to examine the relationship between race, socioeconomic status, and school attended on academic outcomes. The second aim of this study was to examine the differences between the schools that may contribute to the differences in academic outcomes. This study will be used to inform school district administrators and school boards who are

working on school assignment policies. In a school district that has not changed its school boundary zones in over 30 years, it is necessary to examine how Black, ED students are performing when compared to their similar peers who reside in different school boundary zones. These findings could inform decisions for this particular school district, as well as guide policies that create conditions for schools that contribute to statistically significant differences for students who are Black and ED.

### **Research Questions**

1. How do race, socioeconomic status, and school attended impact SAT scores among 11<sup>th</sup>-grade students?
2. How do race and socioeconomic status moderate the relationship between school attended and SAT scores among 11th-grade students?
3. What differences exist in mean 11th-grade SAT scores between high schools for students who are Black and economically disadvantaged?
4. What differences exist in school factors of racial composition, socioeconomic composition, and educator experience?

### **Hypotheses**

Hypothesis 1: Race, socioeconomic status, and school attended will be significant predictors of 11th-grade SAT scores.

Hypothesis 2: The impact of school attended on SAT scores will be significantly different for 11th-grade students who are Black and economically disadvantaged.

Hypothesis 3: There will be statistically significant differences in 11th-grade SAT scores between schools for students who are Black and economically disadvantaged.



Hypothesis 4: There will be statistically significant differences between high schools in racial composition, socioeconomic composition, and years of educator experience.

## **Research Methods**

This study examined the impacts of school boundary zones on academic outcomes for high school students who are Black and ED in a Midwestern urban school district. To investigate the first hypothesis, a regression model was used to determine which factors best predict academic achievement. Specifically, this tested the direct effects of race, socioeconomic status, and school attended on academic outcomes for students. A regression model also tested the second hypothesis to see if race and socioeconomic status moderated the relationship between school and SAT scores. For the third hypothesis, an Analysis of Variance (ANOVA) was conducted to compare mean SAT scores for students who are Black and ED living in the school boundary zone for each high school to determine if statistically significant differences exist between the means. For the fourth hypothesis, the racial and socioeconomic compositions of schools and the percentages of novice teachers with 0-2 years of experience at each school was compared using chi-square analyses. Chi-square was used because this data is percentages as opposed to means. Finally, an additional ANOVA was conducted to determine if there are statistically significant differences in mean years of educator experience between each high school.

This study examined SAT scores from the spring 2022 and 2023 SAT School Day administrations for students in 11<sup>th</sup>-grade who are Black, Multi-Racial, or White and have been enrolled in their school assigned by the school boundary zone for at least 162 days of that school

year. This retrospective data was disaggregated to include only those students who meet the criteria for inclusion in the study.

### **Companion Dissertation**

This research is part of a companion dissertation, a collaborative inquiry among two researchers who share mutual research interests. Undertaking a companion dissertation, where one researcher focuses on elementary students' outcomes while the other examines outcomes for high school students within the same district, offers a unique and comprehensive perspective on the K-12 span of the local educational system. Schools in this district are organized into high school feeder patterns. The elementary schools have attendance boundaries that are most commonly based on the surrounding neighborhood. The high school attendance boundaries are formed by assigning elementary schools to a high school. This was done over 30 years ago as a way to increase diversity within high schools. This companion dissertation enables comparative analysis between the two educational levels, shedding light on potential disparities or consistencies in both school composition and educator experience that may impact student outcomes. This approach contributes to a more comprehensive understanding of the district's educational landscape and can inform school boundary zone policy and intervention strategies that ultimately improve overall student outcomes and educational equity.

### **Definition of Terms**

**21st Century Community Learning Centers Program-** Competitive, grant-funded program that provides afterschool and summer learning opportunities in every state. Programs are selected for funding based on their ability to meet the needs of families and students and alignment between the school and state educational priorities (IDOE, n.d.).

**Advancement Via Individual Determination (AVID)**- A K-12 program that fosters a safe and open culture, high expectations for teachers and students, and collaboration in all classrooms to close the opportunity gap by preparing all students for college and career readiness and success in a global society (AVID, n.d.).

**Comprehensive Support and Improvement**- Any public school identified as a Title I school with an overall federal rating in the lowest achieving 5% of schools or a high school with a 4-year graduation rate below 67% (IDOE, n.d.).

**Economically disadvantaged (ED)**- Students who qualify for free or reduced lunch according to United States Department of Agriculture income guidelines (IDOE, n.d.).

**ILEARN**- Indiana's Learning Evaluation and Assessment Readiness Network (ILEARN) is the summative accountability assessment for Indiana students in grades three through eight and high school biology. ILEARN measures student achievement and growth according to Indiana Academic Standards (IDOE, n.d.).

**SAT**- SAT is a standardized, multiple-choice test from the College Board that encompasses math and evidence-based reading and writing. The SAT Total Score range is 400-1600 (College Board, n.d.).

**School boundary zone**- In this study, a school boundary zone is a geographical area designated by the school district that assigns students to a particular school.

**School demographics**- In this study, school demographics are statistical information that describes a school's population and organization.

**Socioeconomic status-** In this study, socioeconomic status (SES) for students refers to the social and economic circumstances that impact a student's or their family's financial and social well-being.

**Targeted Support and Improvement-** Any public school with one or more student groups performing in the lowest achieving 10% of their student group for two consecutive years with a "did not meet expectations" rating (IDOE, n.d.).

**Title I-** Title 1 is part of the Elementary and Secondary Education Act, which provides financial assistance to local education agencies and schools with high percentages of students from low-income families. These funds help ensure that all children meet challenging state academic standards (IDOE, n.d.).

## CHAPTER 2. LITERATURE REVIEW

### Introduction to the Literature Review

This chapter provides a brief review of research literature related to education inequities. It begins with an examination of the historical backdrop of residential and school racial segregation, providing a foundation for understanding the context within which the research is situated. Both Black-White and socioeconomic achievement gaps are discussed, including factors contributing to these. Next, there is an overview of the research on school assignment policies, including potential impacts on segregation. Last, there is an explanation of three theories that shape the conceptual framework of this study. Through an examination of these critical areas, the literature review establishes a comprehensive foundation for the dissertation.

### Review of the Research Literature

#### *Racial Segregation*

##### **Significant Court Cases.**

Racial segregation has been a long-standing issue in the United States for hundreds of years, impacting many aspects of life, including education. Despite the adoption of the Fourteenth Amendment in 1868, giving equal protection to all and making intentional discrimination unlawful, public schools remained largely racially segregated. Legal challenges at the time only upheld the right to a public education but did not require racial integration. "Separate but equal" was at the heart of *Plessy v. Ferguson* (1896), but this ruling was not applied to public schools until the landmark ruling in *Brown v. Board of Education of Topeka* in 1954, which declared that separate, segregated schools were "inherently unequal" and therefore unconstitutional (McCarthy et al., 2019). *Brown II v. Board of Education* (1955) emphasized the

urgency of desegregation by stating that it should proceed "with all deliberate speed." While this affirmed the necessity of change, it failed to define the extent of integration necessary or give an exact timeline (Johnson, 2019; McCarthy et al., 2019).

In the immediate years after the Brown cases, little school integration occurred. By 1968, only six percent of the districts later court-mandated to integrate had made substantial efforts to do so (Johnson, 2019). Recognizing the need to expedite the objectives of *Brown*, the Supreme Court reinforced its commitment through pivotal court cases (McCarthy et al., 2019; Rivkin, 2016). The case of *Green v. County School Board of New Kent County* (1968) addressed the issue of "token segregation" efforts by districts that did not go far enough to achieve racial integration of schools. Subsequently, *Swann v. Charlotte-Mecklenburg Board of Education* (1971) mandated busing of students to integrate schools. This case was particularly noteworthy, as it acknowledged residential segregation as a barrier to school integration (Green & Gooden, 2016). By 1972, there had been significant progress, with 56% of the districts eventually subject to court-ordered integration having implemented desegregation plans (Johnson, 2019).

Other legal challenges continued, testing the limits of the courts to address *de jure* and *de facto* segregation. *De jure* segregation is a result of laws or government entities; it is unlawful. Conversely, *de facto* segregation is created by circumstances outside of the law and is not unlawful (Rivkin, 2016). A critical case illustrating the limitations of the courts is *Milliken v. Bradley* (1974). This lawsuit aimed to challenge school segregation in Detroit, Michigan, pushing for redistricting into suburban areas where schools were predominately White. Detroit was like many urban areas in the United States that had seen a migration of Whites to suburbs, leaving Blacks in the cities. In the *Milliken v. Bradley* ruling, the Supreme Court determined that

courts would not require boundary changes to integrate schools unless there was "proof of intentional discrimination" by states or suburbs. Without evidence of *de jure* segregation, the courts would not force integration plans. This limited the court's ability to address *de facto* segregation, a move that critics argued represented a significant regression from the principles established in *Brown*. Other, future litigants often found the burden of proof too great. In the years following the *Millikan* decision, many inner cities became largely nonwhite and poor (Houck & Murray, 2019; Rivkin, 2016).

### **Residential Segregation.**

Throughout history, people moved into areas that were racially and socioeconomically homogenous (Holme et al., 2016; Orfield, 2001; Saporito & Sohoni, 2006). Federal programs and banking practices facilitated home purchases and relocation for Whites, while Blacks were left in areas with fewer resources and concentrated poverty (Holme et al., 2016; Houck & Murray, 2019; Rivkin, 2016). The White migration to suburbs resulted in racial and economic isolation that remains in many areas today (Condrón et al., 2013; Rivkin, 2016). In the United States, there are often significant racial and economic differences between cities and suburbs. Affluent communities use tax policies, house prices, and zoning to curtail entry of people without financial means. Over time, these exclusionary and discriminatory practices have ensured that many socioeconomically disadvantaged families and Blacks reside in cities where the cost of living is lower (Holme et al., 2016). Even today, as suburbs have become more diverse, segregation by race and poverty remain (Orfield & Frankenberg, 2014).

### **School Composition.**

Absent desegregation policies, school compositions are primarily the result of geographical segregation. This is evident when comparing districts that abandoned once court-ordered desegregation plans to those that kept those practices in place (Reardon et al., 2012). In some areas where there has been significant migration of Whites to suburbs, school district secession has occurred, resulting in new, smaller districts with separate governance and funding. These suburban districts are often more affluent and less racially diverse than the districts left behind (Houck & Murray, 2019).

The United States is increasingly diverse, and White school enrollment percentage has decreased as the White population continues to decline (Rivkin, 2016). Despite a lower percentage of White students in the population overall, White students, more than any race, remain more educationally isolated by attending schools that are majority White (Kucsera et al., 2015; Orfield & Frankenberg, 2014). Even when districts use a free market approach, White students' choice of school increases segregation due to White students leaving the traditional public school. This is especially true for Whites whose neighborhood school is more racially diverse and low-performing (Saporito & Sohoni, 2006).

At the same time that White isolation in schools is increasing, the number of schools with heavy concentrations of nonwhite students has more than tripled. Black racial desegregation reached its peak in 1998 when Blacks had the greatest representation in majority White schools. Since then, there has been an increase in school segregation (Orfield, 2016). This segregation goes beyond race. Racial and socioeconomic segregation is prevalent in many schools today and is described by Orfield as "double segregation" (2016, pp.1-9).

### **School Choice.**



*School choice* is a contemporary school reform initiative empowering families to choose their child's school. Whether magnet, charter, or private, school choice allows students to leave underperforming schools assigned by their address. Proponents of school choice argue that this is a way to raise school quality by introducing competition among schools for students. The theory is that schools will work hard to improve in order to attract students. Critics argue that school choice can further segregate schools, especially given financial constraints in accessing schools. Transportation is one such barrier (Condliffe, 2015). Historically, disadvantaged students are less likely to attend a choice school than White, affluent students (Denice, 2022; Hammond & Wu, 2022). White students are more likely to exercise school choice or attend a private school as their percentage of nonwhite neighbors increases or as the percentage of nonwhite students in their school boundary zone increases (Saporito & Sohoni, 2006). The result is that more disadvantaged students are left behind in traditional public schools (Ni, 2012). Private, charter, and magnet schools increase school segregation (Saporito & Sohoni, 2006).

### **Significance.**

The differences in opportunities for students attending schools characterized by intense segregation, both in terms of race and poverty, are evident in the literature. Such schools often have fewer resources and more barriers when compared to schools with a majority of White or Asian students (Kucsera et al., 2015; Houck & Murray, 2019). The period of time with the greatest racial integration of schools coincides with the most substantial reduction in the Black-White achievement gap. Long-term, Black students with more exposure to integrated schools saw greater increases in social capital and better jobs compared to Black counterparts who had less exposure to integrated schools (Anstreicher, 2022). Still today, researchers continue to

document the enduring benefits of desegregation of schools for Black students, including better test scores, higher graduation rates, and increased college enrollment (Anstreicher, 2022; Orfield, 2001; Kucsera et al., 2015; Reardon et al., 2022).

Schools with higher Black enrollment have higher levels of poverty and lower academic achievement. The size of the achievement gap is highly correlated with racial segregation, as Black students often find themselves in schools characterized by concentrated poverty. In addition, the more racially and socioeconomically segregated a school district is, the more likely the achievement gap within is to widen (Reardon et al., 2022). Ignoring race, students in low-poverty schools have better academic outcomes than those in high-poverty schools. In a study with more than 100 million test scores from public school students, reducing Black student exposure to poor classmates was highly correlated to reductions in the achievement gap. Because race is so often linked to poverty, widespread efforts to reduce Black student exposure to high poverty would also result in racial desegregation (Reardon, 2015; Reardon et al., 2022).

### ***Educational Inequality***

#### **Coleman Report.**

A decade after the *Brown v Board of Education of Topeka* decision, the federal government commissioned a study of the state of education in the United States as part of the Civil Rights Act of 1964. Sociologist James Coleman led this research to determine the extent of racial segregation in American schools and to understand the educational opportunities for students of different races and socioeconomic groups (Rivkin, 2016). Published in 1966 as the Equality of Educational Opportunity, commonly known as the Coleman Report, the study highlighted significant variations in educational opportunities among students of different racial

and socioeconomic groups. Further, it claimed that factors such as family background, peers, and teacher effectiveness mattered more than increased funding to schools and asserted that Black students have higher achievement in racially integrated classrooms. Despite ten years passing since *Brown*, the report underscored the high levels of racial segregation that remained in schools, with the majority of Black and White students attending schools that were 90-100% their same race (Coleman et al., 1966). These findings spurred further school integration efforts. In *Green v. County School Board of New Kent County* and *Swann v. Charlotte-Mecklenburg Board of Education*, the Supreme Court made clear its commitment to integration and expectation that that local school districts ensured it occurred (Green & Gooden, 2016; McCarthy et al., 2019)

### **The Black-White Achievement Gap.**

The Black-White Achievement gap describes the disparity in the academic performance between Black and White students. In nearly every school district in the United States, White students outperform Black peers (Atterberry et al., 2021; Reardon et al., 2018). Significant gaps exist between achievement for Black and White students, a phenomenon extensively studied in educational research (Atteberry, 2021; Fahle et al., 2018; Hanushek & Rivkin, 2009; Owens, 2018; Reardon et al., 2022). *Brown v. Board of Education of Topeka* identified segregation as a possible cause for these differences, and research since the Coleman Report has frequently reported lower test scores in schools with a higher percentage of Black enrollment (Card & Rothstein, 2006).

The two decades spanning from the mid-1960s to the mid-1980s saw a reduction in the achievement gap. However, the Black-White gap widened again in the early 1990s (Orfield,

2001). Near the end of that decade, some states experienced a narrowing of the gap again, and others saw greater expansion (Reardon et al., 2013). Overall, the Black-White achievement gap has narrowed nationally over the last 50 years (Matheny et al., 2023). While this suggests progress with regard to educational equality, the persistence of the gap means there is more work to be done. Despite some advances, academic, social, and economic differences persist for Blacks and Whites. Examining individuals aged 20-24, Blacks are far less likely to graduate from college or be employed and far more likely to face incarceration than White peers (Hanushek & Rivkin, 2009).

In American high schools, Black students lag behind White peers in standardized test performance, college and career readiness, and graduation rates. Herberger et al. (2020) studied the relationship between student race, school and neighborhood racial and socioeconomic composition, and student college and career readiness based on ACT scores. There was a significant correlation between ACT scores and student race, socioeconomic status, neighborhood diversity, and school composition. Black students were more likely to be ED, live in poor neighborhoods, attend high-poverty schools, and score lower on the ACT than White students. A second national study examined the impacts of school and neighborhood composition on SAT scores for Black students and found that both neighborhood and school segregation negatively impact SAT scores of Black students. Further, the SAT score gap between Black and White students is larger in cities that are more racially segregated (Card & Rothstein, 2006). A third study focused on high-achieving, Black high school students, following them from grade nine through grade twelve. In this national sample, the achievement gap widened despite similar test scores at the beginning of high school. Three factors contributing to

the gap increase are the student's socioeconomic status, the school's socioeconomic composition, and course tracking. The gap widens in situations where the student is ED, attends a high-poverty school, or fails to access rigorous coursework. High-achieving Black students were less likely than White peers to take advanced coursework. This suggests that social class leads to opportunity gaps for students (Kotok, 2017).

### **Segregated Schools.**

Separating school factors from neighborhood factors is difficult, particularly since students are often assigned a school based on where they live (Burdick-Will, 2017; Francies & Kelley, 2021). The Black-White achievement gap tends to be the largest in highly segregated cities (Fahle, 2018; Jang & Reardon, 2019; Matheny et al., 2023; Owens, 2018). A large, multi-city study on SAT scores of students in the 1998-2001 graduating cohorts found that the Black-White achievement gap is wider for students in cities that are more segregated and that neighborhood segregation consistently negatively impacts test scores (Card & Rothstein, 2006). A subsequent study a decade later found similar results, revealing greater variance in test scores within states characterized by higher racial and socioeconomic segregation (Fahle et al., 2018). Another large study using 1992-2009 national student data found that racial segregation of schools is a factor in the Black-White achievement gap, likely due to resource stratification and the economic differences between Blacks and Whites. More Whites live in resource-rich environments, and the benefits of this are apparent in school readiness and experiences outside of school that they bring with them each day. In contrast, more Black students come from resource-poor environments and lack the out-of-school experiences and resources that aid in school success (Condron et al., 2012). Racial segregation exists between and within schools, impacting

Black students' access to rigorous coursework and experienced teachers (Reardon et al., 2022). School segregation within schools, often driven by course tracking, contributes to Black students taking lower-level classes, even in affluent schools (Condrón, 2012; Kotok, 2017).

Concentrated poverty is prevalent in schools that are racially minority-segregated (Darling-Hammond, 2018; Orfield, 2001; Reardon et al., 2022). A majority of Black students attend schools that are more than 75% socioeconomically disadvantaged (Darling-Hammond, 2018). Reardon (2015) investigated if a school's racial composition or socioeconomic (SES) level mattered more for student outcomes. In a study using over 100 million student test scores, he analyzed segregation according to 16 different measures. He found that school poverty rate had the most significant correlation to the Black-White achievement gap. High-poverty schools were less effective than low-poverty schools at reducing the achievement gap of Black students. He attributed this to school quality, considering the skills of the teachers, school resources, family background, and student needs. Another study, using data from two national cohorts, reinforces these conclusions. Family background, peer characteristics, and school segregation correlate more highly to student outcomes than school funding and resources (Holas, 2015).

### **School Funding.**

Segregated schools often lack equal resources (Condrón, 2012). The primary funding source for schools is local property taxes, with state grants attempting to equalize disparities caused by differences in tax revenue. Affluent states and communities spend as much as three times what poor states and communities spend per pupil. The result of funding discrepancies is different teacher salaries, class sizes, and learning experiences. Students who attend high-poverty schools are less likely to have experienced teachers, high-achieving peers, and adequate

materials and resources. This results in fewer educational opportunities (Darling-Hammond, 2018).

For over fifty years, the federal government has attempted to mitigate achievement gaps through various programs, including Title I, the largest program, which allocates federal dollars to high-poverty schools. Despite these efforts, there is little evidence that compensatory education has successfully mitigated the impacts of poverty on student achievement. Students living in highly concentrated areas of poverty are overwhelmingly Black and Latino, not White (Orfield, 2001). School districts have employed strategies to offset the impacts of economic and racial segregation with varying success. State-level variances also exist. While some states have successfully narrowed the Black-White achievement gap, others have not (Reardon et al., 2013). The longer a student remains in a racially segregated, high-poverty school, the wider the achievement gap grows (Reardon et al., 2022).

### ***Factors that Impact Student Achievement***

Many factors impact student achievement, including peers and teachers (Hanushek & Rivkin, 2009). The groundbreaking Coleman Report, published in 1966, sought to identify the contributors to differences in academic outcomes among students of different races and socioeconomic backgrounds (Rivkin, 2016). Contrary to assumptions that funding and facilities were primary culprits, the findings were that family background and peers mattered more. It also noted that teacher quality impacted Black student achievement more than their White counterparts, and fewer Black students had high-quality teachers (Coleman et al., 1966). In the years since the Coleman Report, there has been extensive research on the impacts of peers and teachers on student achievement (Clotfelter et al., 2007; Reardon, 2015).

## **Peers.**

Social capital and academic habits of students within a school influence student achievement (McMillian et al., 2018). Students learn more when their peers are high-achieving (Hill et al., 2023). Sanders et al. (2018) found that positive peers increase school attendance, engagement, achievement, and the likelihood of graduation for low-achieving students. Further, their research showed that having positive peers can overcome neighborhood and home barriers for students. Black and low-income students benefit from high-achieving peers inside the classroom and other opportunities that peer networking within more affluent schools provides (Diem, 2015).

There is a strong link between racial segregation and Black student achievement (Matheny et al., 2023; Reardon et al., 2022). The Black-White achievement gap is higher in more segregated cities (Card & Rothstein, 2006). If school composition mirrors that of the surrounding neighborhood, the school would be predominantly Black if the surrounding neighborhood is. Overcoming the challenges that students bring to school daily is a formidable task, which is apparent when contrasting schools that are majority Black versus majority White (Condrón et al., 2013). A higher concentration of Black students in a school lowers Black student achievement (Hanushek et al., 2009; Rivkin, 2016). The Black-White achievement gap grows in these environments, with Black student achievement dropping, while White student achievement is impacted very little in the same school (Hanushek et al., 2009; Hanushek & Rivkin, 2009).

Socioeconomic segregation impacts Black and White students differently. On average, White student achievement increases, as White students are more likely to be in a school with more affluence. Conversely, Black students are more likely to be in a high-poverty school, and



their achievement decreases (Matheny, 2013). Overall, student achievement is lower in schools with higher poverty (Holas, 2015; Orfield, 2001). There is a strong correlation between the percentage of poor students in a school and low test scores (Orfield, 2001; Reardon, 2015). Some research indicates that poverty matters more than race when it comes to educational outcomes for students (Reardon, 2015). Black students, in particular, are negatively impacted by poor peers in school. As their exposure to more affluent peers increases, so does their achievement (Matheny et al., 2023; Reardon, 2015). Furthermore, low-poverty schools are more effective at closing the achievement gap than high-poverty schools (Reardon, 2015).

### **Teacher Experience.**

The impact of teacher quality on student academic outcomes is widely acknowledged, with near universal agreement that it is the most important school determinant of student achievement. Teacher factors such as education level, licensure acquisition method, and years of teaching experience are frequently examined in research seeking to identify the most influential aspect of teacher quality in shaping student achievement. However, research is inconclusive, partly due to the challenge of isolating the teacher factor. The literature contains studies that yield different results (Clotfelter et al., 2007; Huang et al., 2009; Rivkin et al., 2005).

Etim et al. (2020) investigated the years of teacher experience in high-performing middle schools compared to low-performing schools in North Carolina. Using data from 425 middle schools, they found that high-performing schools had a higher percentage of experienced teachers and concluded that having a more experienced staff predicted stronger school performance (2020). This is in agreement with other research in North Carolina. In a study encompassing all 117 districts across ten years of data, teacher experience was positively

correlated with student achievement (Clotfelter et al., 2007). Two additional studies found that more years of teaching experience were positively associated with student GPA (Castellane, 2019; Clotfelter et al., 2010). In contrast, Huang and Moon's research involving 53 schools in a Mid-Atlantic state found that total years of teacher experience is not a significant predictor of academic achievement but that years spent teaching at the same grade level is (2009).

Intuitively, novice teachers are less effective than experienced teachers. They are learning how to manage a classroom and experiencing the curricular and pacing demands of the job for the first time. There is significant growth in teacher effectiveness during the first year, with slightly more growth in years two and three. After this, teacher effectiveness plateaus (Rivkin, 2005; Jacob, 2012). Recognizing this, policymakers have shown interest in incentivizing more experienced teachers to stay in struggling schools (Houck, 2010).

A contributor to the achievement gap is inexperienced teachers, and they are disproportionately teaching Black and poor students (Clotfelter et al., 2005; Reardon, 2015; Rivkin et al., 2005). Research has shown that Black students and low-income students are less likely than White students and affluent students to have qualified teachers, and teacher quality "mediates the relationship between school composition and student achievement" (McMillian et al., 2018, p.846). Metropolitan Nashville Public Schools attempted to offset the adverse effects of school resegregation by allocating additional financial resources to high-poverty and high-minority schools. Despite their intentional efforts, experienced teachers continued to leave these schools for schools that were more White and affluent. The result was a higher percentage of inexperienced teachers in high-poverty, high-minority schools (Houck, 2010).

### ***School Assignment***

Education is a determinant of economic outcomes for students with life-long implications. Those with higher levels of education typically have more wealth, higher incomes, better health, and more access to resources (Condrón et al., 2012). Education provides an opportunity for social mobility that should not be denied based on where one lives. Given the importance of educational achievement and the implications for status attainment in the United States, the school one attends matters and is, therefore, a "vital issue for families and communities" (Alexander & Parcel, 2022, p.745).

School corporations often create school boundary zones to assign students to a particular school (Herberger et al., 2020). The first boundaries were created decades ago to increase racial integration in districts across the country. Since court-ordered desegregation mandates have ended, school racial and economic segregation has increased (Orfield & Frankenberg, 2014; Welsh, 2019). One reason is the migration of White, middle-class families to the suburbs. School districts often respond by building new schools in the suburbs to accommodate the growing enrollment instead of redrawing new boundary lines to maintain or increase diversity within existing schools (Siegel-Hawley, 2013). Nationally, White students are the most racially isolated of all students (Orfield & Frankenberg, 2014).

The student body in the United States is more diverse than ever before, but individual schools are increasingly less diverse due to school segregation (Orfield & Frankenberg, 2014; Francies & Kelley, 2021). In the last 30 years, racial segregation has increased by 35% in the 100 school districts serving the greatest number of Black students (Reardon et al., 2022). In order to prioritize diversity and equity within school districts, policymakers have altered their approach. Several race-neutral policies have been implemented in metropolitan school districts nationwide

that account for parental education levels, family income, student achievement, and neighborhood composition (Diem, 2015). Three common approaches used to assign students to schools are based on neighborhood attendance zones, socioeconomic factors, or student choice (Welsh, 2019). All approaches have advantages and disadvantages in convenience, familiarity, school outcomes, and student opportunities (Castro et al., 2022; Alexander & Parcel, 2022; Holme et al., 2016).

### **Neighborhood Boundary Zones.**

Using surrounding neighborhoods to define geographic school boundaries is the most convenient option for families and districts. Closer proximity to school means shorter commute times for students; some can even walk. Many families prefer the familiarity of neighborhood schools; they know what to expect and how to navigate the system as needed. In addition, they develop relationships with other families and school staff members, which can provide a support system and a sense of community. The longer a family lives in a given neighborhood, the more likely they will prefer a neighborhood school assignment (Alexander & Parcel, 2022).

Residential segregation leads to segregated neighborhood schools (Welsh, 2019). White families prefer to live in predominantly white communities, which adds to neighborhood racial segregation and majority White schools (Saporito & Sohoni, 2006). Black and low-income students are increasingly at schools with students similar to themselves (Welsh, 2019). Excluding race, income segregation has increased in recent years, leaving stark differences in access to resources between high-income and low-income areas (Owens, 2018).

Some argue for a different approach to combating the Black-White achievement gap and the effects of concentrated poverty in schools. Despite the history of segregated schools and

outcomes for Black students, some believe a better present-day solution is to reallocate resources to underperforming schools rather than change school boundary policies. This keeps students closer to home and with similar peers and reduces transportation costs (Gamoran & An, 2016).

A resource-allocation approach was taken in Metropolitan Nashville Public Schools (MNPS) as they faced resegregation due to a change from race-based to neighborhood-based school assignments. The district created enhanced-option schools in low-income neighborhoods with significant additional funding to lower class size, provide after-school programs for students, extend the school calendar, and provide stipends and additional teacher training. Despite an increase in school racial and socioeconomic segregation, students who attended enhanced option schools saw increased student outcomes (Houck, 2010; Gamoran & An, 2016). Other school districts with similar practices of investing more in high-poverty schools, specifically to lower student-staff ratios, have seen improved achievement in high school outcomes for low-income students (Weathers & Sosina, 2019).

### **Socioeconomic-Based Policies.**

To prioritize an increase in race and class diversity, some districts use a socioeconomic-based assignment policy that requires students to be transported away from neighborhoods to schools that are more racially and economically diverse (Carlson et al., 2020). Under this approach, school districts assign students to schools by analyzing demographic data, such as income levels and housing patterns, to identify clusters of different socioeconomic groups within the district. Proponents of this approach argue that this will also lead to more racial diversity because of the relationship between racial segregation and concentrated poverty (Diem, 2015; McMillian et al., 2018). Research has shown both individual and social benefits to integration,

including increased graduation rates, college attendance, and adult income (Welsh, 2019). Critics argue that this approach subjects Black and low-income students to long bus rides, hostility, and microaggressions as they interact with students and adults who either do not welcome them or who are not prepared for this integration (Welsh, 2019). Others fear adverse effects on middle-income students through increased exposure to low-income peers (Diem, 2015).

Several large cities utilize socioeconomic-based school assignment policies. Research indicates that the socioeconomic makeup of a school plays a significant role in shaping student outcomes, influencing academic achievement both within the school setting and in networking opportunities beyond (Diem, 2015). In an extensive study of Omaha Public School's income-based school assignment policy, Diem (2015) found that, beyond positively impacting the lives of low-income students, there was no adverse effect on middle-income students, provided the majority of students at the school were middle-income, and there was some degree of ability grouping. Similarly, Wake County School District implemented a broad, income-based assignment policy across the district that resulted in increased integration for students previously assigned to majority-minority neighborhood schools. Importantly, this approach had only minimal impact on other students in the district (McMillian et al., 2018; Carlson et al., 2020). This policy shift allowed low-income students to attend schools with increased resources and more affluent peers (Carlson et al., 2020).

### **Choice-Based School Assignment Policies.**

Choice-based school assignment policies empower students and families to participate actively in selecting schools. In theory, this is a way to disrupt the likelihood that a school will mirror its surrounding neighborhood. Proponents assert that this approach offers alternatives to

underperforming public schools, while opponents contend that school choice often results in increased segregation (Denise, 2022; Hammond & Wu, 2022). This is partly due to who takes advantage of school choice and how decisions are made. The utilization of school choice is influenced by factors such as race and income, with White and high or middle-income students more likely to exercise choice options than Black and low-income students. Moreover, research indicates that White families, who are often better informed about available choices, tend to select schools with more White and affluent students than their neighborhood schools (Welsh, 2019; Denise, 2022).

More people look to charter schools when their assigned public school is low quality (Denise, 2022). Preferences in school selection vary among racial groups. Black families generally prefer schools with higher Black enrollment, and White families prefer schools that are predominantly White (Hailey, 2022). High school students, rather than parents, make a majority of the decisions about which school to attend, and it is often a social decision based on where their friends attend, the convenience to employment for themselves or their parents, and the degree of hardship to get to that school (Condliffe et al., 2015).

Magnet programs and charter schools provide another way to desegregate schools if they are strategically placed, have enrollment procedures to promote diversity, and remove transportation barriers (Bulkley et al., 2022). Without some intentionality to control segregation, they can have the opposite effect. Saporito and Sohoni's research of the twenty-two largest school districts in America showed that public schools are more segregated when students attend private, magnet, and charter schools than if they attended their assigned neighborhood schools (2006). Rich et al. (2021) found similar results in their research using data from 1500

metropolitan school districts from 2000-2010. They found that districts with charter schools had a 12% increase in Black-White school segregation.

### **Controlled-Choice School Assignment Policies.**

Controlled-choice school assignment policies seek to strike a balance between school choice and broader district objectives. In the pursuit of increasing racial and socioeconomic diversity across schools, controlled-choice policies allow parents to express preferences for their student's educational placement while also allowing school districts to implement criteria towards achieving district goals. When districts consider magnet schools or other school choice policies as a way to reduce segregation, they often institute a controlled-choice policy.

Hammond and Wu (2022) studied Wake County Public School System's approach wherein students can opt for a school outside of their neighborhood through magnet, calendar transfer, or hardship transfer programs. One of the ways the district controls school enrollment is by allocating half of the seats within a given magnet school to students in the neighborhood, with the remainder open for external applications. This strategy, coupled with considerations like sibling attendance, proximity to home, capacity, and neighborhood demographics, reflects a deliberate effort to shift affluent families to these magnet schools, thereby addressing socioeconomic imbalances.

Beyond the magnet school program, Hammond and Wu (2022) also studied the impact of hardship and calendar transfers in Wake County Public Schools. Some schools in Wake County are on a year-round calendar. The district chooses which calendar each school will follow, and by doing so, they can limit transfers and reduce further segregation. Hardship transfers are reserved for students who demonstrate difficulty attending their district-assigned school.



Transportation or school performance are two reasons for hardships transfers. Despite the reason, the district determines which transfers are granted and denies those that would result in further segregation. The approach in Wake County is important because there was a reduction in racial and socioeconomic segregation.

### **Conceptual Framework**

The research design was created based on the learnings from the preceding literature review and three theoretical frameworks. The combination of this learning led to the identification of independent variables and the formation of hypotheses. Value-added theory guided thinking about teacher quality and how teacher experience, as a potential indicator of teacher quality, impacts student outcomes. Social Capital Theory was applied to analyze correlations between percentages of ED peers and academic achievement. Additionally, Cultural Capital Theory was employed as a framework to scrutinize the influence of student body diversity on academic outcomes of individual students. Together, these theories provide a comprehensive foundation for investigating several factors that influence student academic achievement.

### ***Value-Added Theory***

Much of the research on teacher quality is grounded in value-added theory. Teacher value-added measures the ways in which teachers impact student achievement. In recent years, many states have incorporated student growth, typically test scores, into the teacher evaluation system (National Council on Teacher Quality, 2019). Policymakers' interest in this concept cites evidence connecting standardized test scores to life success and how a teacher impacts these results (Bacher-Hicks & Koedel, 2022). Research by Chetty et al. (2014a) found a significant

causal relationship between teacher value-added measures and student test scores, using a sample of 2.5 million test scores and twenty years of data. Multiple studies have investigated high value-added teachers and their impacts on student achievement, college attendance, and earning potential (Chetty et al., 2014b; Gildraine & Pope, 2021; Hanushek & Rivkin, 2012).

Value-added theory in education has also faced criticism. Characteristics of teachers that are easiest to measure, such as advanced degrees, years of teaching experience beyond the initial years, and method of obtaining licensure, rarely explain substantial and consistent variations in student outcomes. As a result, current value-added analysis focuses on teachers who consistently yield high student results. This is an outcome-based measurement of teacher quality rather than one that focuses on teacher inputs. Student and family backgrounds, school compositions, and the ways students are assigned to teachers complicate calculations about value-added teaching. Beyond the difficulty in measuring and defining teacher quality, critics also believe there is an overreliance on standardized test scores, which introduces bias and ignores other measures of student success (Hanushek & Rivkin, 2012).

### ***Social Capital Theory***

Rooted in sociology and economics, social capital is a resource available to an individual through relationships with members of one's social network (Miekiewicz, 2021). Social capital is fundamental to the work of James Coleman. In the 1966 report, *Equality of Educational Opportunity*, he wrote of the significance of social resources from community, family, and peers on educational outcomes. School resources alone do not determine academic success for students. Social capital plays a vital role in educational attainment, as students benefit from the

experiences and opportunities their social connections provide. Social capital builds human capital through the knowledge and skills acquired as part of one's education (Coleman, 1988).

Social capital can lead to higher academic achievement and school success. Students are exposed to teachers and peers at school, and they have access to social capital through these relationships. In a study involving six high schools, researchers studied how at-risk students generate and sustain school-based social capital. The findings were that cultivating and leveraging school capital is easier in smaller schools and harder to develop in schools where student needs are the greatest (Lee & Croninger, 2001).

### ***Cultural Capital Theory***

Cultural capital theory, in the field of education, explores how cultural practices and resources influence educational success. Attributed to French sociologist Pierre Bourdieu, this theory is part of a broader sociological framework applied to education and sociology. Bourdieu posits that schools often favor students of the higher social class and that this, in turn, becomes the dominant culture of the school (1977). While Bourdieu's work was about class-based cultural capital, others argue that race is another dimension. Race is fundamental to one's culture, and people of different races experience cultural capital differently (Cartwright, 2022). White culture is the dominant culture of American schooling, creating behavioral and social norms. The Black-White achievement gap remains in schools today, and researchers continue to study the role of social and cultural factors on Black underperformance (Williams, 2015).

### **Summary**

This literature review examined historical and legal aspects of racial segregation in American education. Both *de jure* and *de facto* segregation played significant roles in forming

the educational landscape. In the absence of desegregation policies, residential segregation shapes schools, leading to disparities in resources, opportunities, and outcomes. Research indicates that Black students are more likely to attend schools with concentrated poverty than their White peers. Differences in peers and educator experience also favor White students. Despite progress in narrowing the achievement gap over the last 50 years, recent trends indicate that schools are resegregating nationwide. As policymakers seek solutions to promote educational equality, researchers are investigating various school assignment policies and their impacts on student achievement and segregation. Four policies were examined: neighborhood-based, socioeconomic-based, choice programs, and controlled-choice programs, each with benefits and drawbacks.

The literature review concluded with a brief discussion of three theories guiding the research design. Value-added theory informed the choice of educators' years of experience. Social capital theory guided the evaluation of school poverty percentages. Cultural capital theory informed the analysis of the racial composition within schools. This research investigated how or if the independent variables predicted SAT performance for high school students who are Black and ED across five different high schools.

## **CHAPTER 3. METHODOLOGY**

### **Purpose and Introduction**

The purpose of this research was to examine the impacts of school boundary zones on academic outcomes for high school students who are Black and ED in an urban school district in the Midwest. This comes at a time when the district is considering the need to redraw school boundary zones that have been in place for over three decades. Like many others, this district uses students' addresses to create school boundary zones (Hammond & Wu, 2022). Many districts, including this one, historically used race-based plans to integrate schools racially (Diem, 2015). Over time, new housing development and urban sprawl have changed school populations and meant longer commutes to schools for some students. These factors and bus driver shortages have increased pressure on the school district to consider changing school boundary zones.

This chapter explains the methodology used to answer the four research questions and test the corresponding hypotheses. A description of the school district and the methods used to obtain and clean the data sample is provided. SAT scores were used to represent student academic achievement and a rationale for choosing SAT is given. Each statistical test used to analyze the data set is discussed.

### **Research Questions**

As school leaders consider changing school boundary zones, it is important to understand if and how race, socioeconomic status, and school attended impact student outcomes. This is particularly critical for students who are Black and ED since, as a group, academic outcomes have lagged behind their White peers (Condron et al., 2012). They are also likely to be disrupted

by changing boundary zones, given the composition of the neighborhoods most divided under the current, long-standing, race-based high school assignment plan. This quantitative study used two years of retrospective data to answer four research questions.

1. How do race, socioeconomic status and school attended impact SAT scores among 11th grade students?
2. How do race and socioeconomic status moderate the relationship between the school attended and SAT scores among 11th-grade students?
3. What differences exist in mean 11th-grade SAT scores between high schools for students who are Black and economically disadvantaged?
4. What differences exist in school factors of racial composition, socioeconomic composition, and educator experience?

### **Methodology and Research Design**

This cross-sectional research study used retrospective data from 2022 and 2023 obtained from the Office of Accountability at the district office. This study focused on SAT total scores of students who attended one of the five traditional high schools in this district and who are Black, White, or Multiracial. The SAT is administered to all 11th-grade students in Indiana on a designated school day, and those results are the ones included in this study. Teachers and school administrators are certified to administer and proctor the SAT in accordance with the College Board's requirements. The Office of Accountability oversees all test security measures, including training staff. On the test day, students in grade 11 are assigned to testing locations within their school, typically a classroom or the media center. The data set was provided in an Excel sheet with additional student-level information, including socioeconomic status, race, school

assignment, and the number of days the student had been enrolled at their district-assigned school. Students not enrolled at their school assigned by the school boundary zone for 162 days immediately prior to the test were excluded. This exclusion criterion aligns with the state accountability requirement for enrollment, which links students' outcomes to their school only when the student has been enrolled for at least 90% of the school year or 162 days.

The first aim of this study was to examine the relationship between race, socioeconomic status, and school attended on academic outcomes. The first hypothesis was that the three independent variables of student race, socioeconomic status, and school attended would be significant predictors of the dependent variable, which is SAT scores. A regression model tested the direct effect of the independent variables on the dependent variable. Results indicated which predictors were significant.

The second hypothesis was that race and socioeconomic status would moderate the relationship between school and test scores. This means that the relationship between school and SAT scores vary based on race and socioeconomic status categories. A regression model was used to test the impact of independent variables on the dependent variable. This time, interaction terms of EDXschool and BlackXschool were added as independent variables alongside race, socioeconomic status, and school.

The study's second aim was to examine the differences between the schools that may contribute to differences in test scores for students who are Black and ED. The first hypothesis for this aim was that schools in this district would have significantly different test scores for this subgroup of students. An analysis of variance (ANOVA) was conducted to test this. An ANOVA is a statistical technique used to test for differences in three or more means. This district has five

high schools, so five means were used, each representing SAT Total Score. If there were statistically significant differences between scores, a Tukey's post hoc test was used to compare means between individual pairs of schools. This compares all school mean scores to each other in pairs and allows the researcher to see specific pairs of schools with significant differences.

The second hypothesis for aim two was that there would be statistically significant differences in racial composition, socioeconomic composition, and years of educator experience between high schools. To test this hypothesis, chi-square analyses were conducted to examine the percentages of minority students, ED students, and teachers with 0-2 years of teaching experience across schools. Additionally, an ANOVA was used to compare the mean years of educator experience among schools as a further assessment of teacher experience.

#### **Research Site, Target Population, Sampling Method, and Related Procedures**

All participant and school-level data were obtained from the school district office. The Office of Accountability provided the data in Excel sheets; pseudonyms replaced student and teacher names. Student participants attended one of five high schools in this urban, Midwestern school district. The five high schools differed in size, student body composition, and educator experience; details are provided in Table 1.



**Table 1***Public School Data for 2019-20 State Accountability*

School	Total enrollment	ED	White	Non-White	Educators with 0-2 years of experience	Expenditure per pupil	Letter grade
	<i>n</i>	%	%	%	%	\$	A-F
District	22,191	53	67	33	18	9,404.51	C
School A	631	68	35	65	19	11,192.55	B
School B	940	44	80	20	18	10,316.25	A
School C	923	54	54	46	16	9,752.91	B
School D	1455	30	80	20	15	8,948.05	A
School E	1101	38	87	13	11	9,836.73	B

For the school years ending in 2022 and 2023, there were 1284 and 1341 11th-grade students enrolled at the five traditional high schools in this district, respectively. This study included all 11th-grade students from the population who were Black, Multiracial, or White, had a valid SAT score from the SAT school day administration in their junior year, and had been enrolled in their district-assigned school for 162 days prior to the SAT day. Student race, socioeconomic status, and school attended were included in the data provided. All students who met this criteria were included in the study. Students who had not attended the school assigned to them based on their school boundary zone for 162 days prior to the SAT were excluded.

School-level data for each of the five traditional high schools was also obtained. Each high school's racial composition was provided in percentages of White, Multiracial, Black, and Other. Socioeconomic data for each school was given as a percentage of students who qualified

for Free/Reduced lunch. Lastly, educator experience in years was provided by listing pseudonyms for each teacher or administrator within the school and their years of experience

### **Instrumentation**

SAT was used to measure academic outcomes in this study. SAT is a standardized, multiple-choice test from the College Board. Nearly 2 million students took the SAT in 2023, with 1.3 million students participating in the SAT School Day, a day where students take the SAT at their school for no charge (College Board, 2023). The SAT Total Score is the combination of scores for Math and Evidence-Based Reading and Writing. Each section is scored separately, with a score range of 200-800. Those scores are added together to make the SAT Total Score, which ranges from 400 to 1600. SAT answer sheets are scored electronically to ensure accuracy (College Board, n.d.).

The utilization of SAT offers several merits. First, it is externally validated, so both its content and scoring are reviewed and verified by experts. This ensures consistency in scoring. Second, it has been used in numerous studies focusing on the achievement gap, which is relevant to this research. It is designed as a measure of college readiness. Third, it is easily accessible, as all Indiana high school students must take the SAT as a graduation component as outlined in the Indiana code. This district gives it to all students on SAT School Day with trained educators at the school administering the SAT under similar conditions, which supports test reliability. SAT replaced the ISTEP+ assessment in the 2021-2022 school year. It is given in the spring, and there is a makeup window for students who are absent on the test day.

There are several criticisms of the SAT. First, it is no longer required by many colleges and universities. High school grade point average and course rigor may be better predictors of

college success. Second, some believe the SAT is both socioeconomically and culturally biased. Wealthy families may pay for specific test preparation that others cannot afford. The content and format may favor one culture over another. Third, some argue that it is a narrow assessment of knowledge and skills and does not measure the full range of what a student knows. Last, students who are not good test takers are disadvantaged (Mattern et al., 2011).

### **Data Collection**

Retrospective data from 2022 and 2023 were used for this study. All data were obtained from the school district's Office of Accountability or Human Resources. The following steps were taken to acquire and prepare the data for research analysis:

**Step 1:** The researcher requested the student data set from the Office of Accountability.

This request was in writing and described, in detail, what was needed, with instructions to replace all names with numbers to ensure anonymity. The data set included all students who were in grade 11 during the spring of 2022 and 2023 and had a valid SAT score.

Data for each student included the SAT Total Score, the school boundary zone, the name of the school presently attending, free or reduced lunch eligibility status, days enrolled at the present school, and ethnicity. Before being given to the researcher, student names were replaced with numbers to ensure anonymity. After coding, the Office of Accountability kept the key linking the assigned number back to the student in the event that there is a need to verify data. The data set was in an Excel sheet that could be sorted by school.

Step 2: The researcher removed students who did not attend the school assigned by the district, students who were not enrolled in their assigned school for 162 days prior to taking the SAT, and any students with missing data.

**Step 3:** The researcher requested school-level data from the Office of Accountability.

The data set included the percentage of White and non-White students and the percentage of students eligible for free or reduced lunch by school for each of the five high schools.

**Step 4:** The researcher requested data from the Office of Human Resources. This data was provided in an Excel sheet arranged according to high school and included the number of years of teaching experience for each teacher and administrator. Before sending it to the researcher, all teachers' names were removed, and numbers were used in their place. After coding, the Office of Human Resources kept the key linking teacher names to the assigned number. The Office of Human Resources could verify the information if a data point is questioned.

**Step 5:** The researcher saved all data to their password-protected computer for their exclusive use. Data was transferred to SPSS as needed to answer the research questions.

### **Data Analysis Procedures**

Data was analyzed using IBM SPSS Statistics 29.0. Descriptive statistics were calculated, including means, medians, standard deviations, counts, and percentages. Following independent t tests, Cohen's  $d$  was used to estimate effect sizes where  $d = 0.2$  indicates a small effect,  $d=0.5$  indicates a medium effect, and  $d = 0.8$  indicates a large effect (Cohen, 1998). Following ANOVA, partial eta-squared was used to estimate the effect size and was interpreted as .01 small,

.06 medium, and .14 large. Alpha was set at 0.05 for all statistical analyses. The sections below describe specific statistical procedures to test each hypothesis.

### Research Question 1

How do race, socioeconomic status, and school attended impact SAT scores among 11th-grade students?

The independent variables are race, socioeconomic status, and the school attended. The dependent variable is SAT scores. Using SPSS, a regression model tested the direct effect of the three independent variables on the dependent variable. An output table provided *p*-values associated with each coefficient. For each independent variable, a *p*-value less than an alpha level of .05 indicated a statistically significant effect on the dependent variable. This study's results indicated if race, socioeconomic status, or the school impacts SAT scores.

### Research Question 2

How do race and socioeconomic status moderate the relationship between the school factors and SAT scores among 11th-grade students?

Race and socioeconomic status of students are likely to influence the school's impact on SAT scores. Because of this, another regression was done using interaction terms of EDXschool and BlackXschool. These interaction terms are products of the mean-centered independent variables. They allowed the researcher to examine whether another independent variable influenced the effect of one independent variable on the dependent variable. Here, they measured indirect effects on SAT scores alongside race, socioeconomic status, and school attended. The results of this regression analysis told if indirect effects significantly influence SAT scores.

### Research Question 3

What differences exist in mean SAT scores between high schools for students in grade 11 who are Black and economically disadvantaged?

An ANOVA was conducted to compare mean SAT Total Scores by high school for students who are Black and ED. Alpha was set at .05 meaning that a p-value less than .05 indicates a statistically significant difference in mean SAT Total Scores across the five schools. If there was a statistically significant difference, a Tukey's post hoc test was used to compare all school mean scores to each other.

#### Research Question 4

What differences exist in school factors of racial composition, socioeconomic composition, and educator experience?

A chi-square test was performed to compare the proportion of minority students, ED students, and educators with 0-2 years of teaching experience within each school. Alpha was set at .05. In addition, an ANOVA was used to compare the mean years of educator experience across schools. A Tukey's post hoc test would then be used to identify which pairs of schools have statistically significant differences in mean educator experience for a significant ANOVA.

Combined with the data from Research Question 3, this data allowed an analysis of school factor differences to statistically significant SAT score differences for Black and Low-income students. This is valuable information to understand what factors may contribute to better academic outcomes. If outcomes can be predicted based on certain factors, those creating school boundary assignment policies could strive to recreate those conditions in schools and ensure students who are Black and ED are assigned accordingly.

#### **Assumptions, Limitations, Scope, and Delimitations**

For this study, it was assumed that students in this study who are Black and ED are similar to one another. A second assumption was that students gave their best effort on the SAT and that these SAT scores represent students' knowledge and skills. A final assumption was that student addresses and free or reduced eligibility information were honestly reported and accurate.

There were several limitations to this study. One limitation was the enrollment criteria of 162 days for inclusion. This is the number of enrollment days the Indiana Department of Education requires for school accountability and represents 90% of a school year. Students who have high mobility were excluded. A fear in doing so was the reduction of the sample size. A second limitation was that student attendance was not taken into account. Student attendance impacts the days of instruction received and could impact SAT scores. A third limitation was in generalizability to other school districts in the United States. While this is an urban district in the Midwest, unique circumstances may prevent these findings from being generalized to other areas.

This study included students in grade 11 in the spring of 2022 and 2023 in an urban Midwestern school district who had valid SAT scores and attended the school assigned to them by address for 162 days prior to the assessment. Students meeting the criteria were matched with their school. All students in this school district who met this criteria were included in the data set for this study. Students who did not attend the school assigned to them based on their school boundary zone for 162 days prior to the SAT were excluded from the study.

This research study had two aims. The first was to assess how the three independent variables of race, socioeconomic status, and school attended influenced a student's SAT scores.

The study's second aim was to examine the differences between the schools that may contribute to differences in test scores for students who are Black and ED. This study used retrospective data that was provided to the researchers using pseudonyms to maintain anonymity of students and teachers. The district and school names were also omitted from the study in further efforts to protect anonymity.

There were delimitations in sampling. All participants were from one urban, medium-sized school district in the Midwest. The subgroup of particular focus were 11th-grade students who are Black and ED, which was a relatively small population compared to the overall student enrollment within the district. There were also delimitations in that other factors, such as neighborhood, family peer influences, access to rigorous coursework, and teacher credentials, may impact academic outcomes for students.

## **Summary**

This chapter explained the methodology used in this research study to investigate the four research questions and corresponding hypotheses. This cross-sectional research used retrospective data from the spring administrations of SAT School Day for years 2022 and 2023. Criteria for inclusion in the study was provided to ensure clarity of the research sample. SAT was chosen as the test instrument because it is a widely recognized, standardized test given to all juniors during the school day on a specific date each spring, adding to reliability and validity of the results. All statistical tests used to answer the research questions were provided with a rationale for their use. Finally, research assumptions and limitations were considered.



## CHAPTER 4. DATA ANALYSIS AND RESULTS

### Introduction

The ultimate purpose of this quantitative research study was to understand how school factors influence academic achievement for students who are Black and ED. This information could inform future school assignment policies and district strategies aimed at improving outcomes for marginalized students. Chapter 4 includes the results and data analysis for this study that used regression, ANOVA, and chi-square tests to answer four research questions:

1. How do race, socioeconomic status, and school attended impact SAT scores among 11th-grade students?
2. How do race and socioeconomic status moderate the relationship between school attended and SAT scores among 11th-grade students?
3. What differences exist in mean 11th-grade SAT scores between high schools for students who are Black and economically disadvantaged?
4. What differences exist in school factors of racial composition, socioeconomic composition, and educator experience?

### Descriptive Statistics

Eleventh grade students from five high schools in a single urban, Midwestern school district were included in this study according to research criteria of attending the school assigned by the school boundary zone for a minimum of 162 days prior to the SAT School Day test administration for school years 2021-22 and 2022-23. The five high schools from which the student sample was taken varied by size, racial composition, and economic composition. Table 2 includes demographic data from the 2022-23 school year for each of the five high schools from

which the sample was taken. All students enrolled in one of the five schools on the last day of the school year were reported in the table. The schools differed by overall enrollment, with a range of 821 students. The smallest high school was School A with 598 students, and the largest was School D with 1619 students. The range of percentages of ED students was 38.0%. School D had the lowest percentage at 36.6%, and School A had the highest percentage at 74.6%. The range of White student percentages across the schools was 51.0%, with the lowest percentage at School A of 31.4% and the highest at School E of 82.4%. The range of Black student percentages was 32.1%. School E had the lowest percentage of 6.0%; School A had the highest percentage at 38.1%. The range of Multiracial student percentages was 6.0%, from 7.0% at School E to 13.0% at Schools A and C. The range of Other student percentages was 13.0%, from 4.6% at School E to 17.6% at School A.

**Table 2**

*School Demographic Data*

Location	Enrollment <i>n</i>	ED %	White %	Black %	Other %	Multiracial %
School A	598	74.6	31.4	38.1	17.6	13.0
School B	1043	54.7	76.8	8.4	6.8	8.0
School C	1111	60.3	48.5	23.4	15.0	13.0
School D	1619	36.6	74.5	8.2	9.2	8.1
School E	1233	44.0	82.4	6.0	4.6	7.0

There were 2651 11th-grade students for school years 2021-22 and 2022-23. Students were excluded from the study population according to three criteria. First, they had to attend the school where they took the SAT for at least 162 days. Second, they had to attend the school assigned by their school boundary zone. Third, they had to have a valid SAT score from taking the test on the official SAT school day. Using these criteria, the original population was reduced

to 2012 students. Table 3 shows this data for all students with a separate column for Black students. The column for “All Students” includes students who identify as Black, White, Multiracial, and Other.

**Table 3**

*Population Reductions Based on Study Criteria*

Criteria	All Students		Black Students	
	<i>n</i>	%	<i>n</i>	%
Original Population	2651	100	354	100
162+ Days Enrolled	2587	97.6	333	94.1
162+ Day Enrolled at Assigned School	2101	79.3	252	71.2
162+ Days Enrolled at Assigned School with SAT School Day Score	2012	75.9	250	70.6

Using this criteria, 639 students were excluded from the study; 104 of those students were Black. By percentage, 24.1% of all students and 29.4% of Black students were excluded. Out of the 250 Black students in the sample, 183 were ED. Given that one of the research aims was to examine the impact of school assigned on academic outcomes for this group of students, it is important to note that this group represents 9.1% of the overall sample population.

Table 4 shows the number of students in the sample population from each school with the mean SAT Total score. The range of SAT scores was 1080. The lowest score was 440, and the highest was 1520. The mean score was 969.76, with a standard deviation of 175.36.

**Table 4***Sample Enrollment and SAT Scores by School*

School	<i>n</i>	%	<i>M</i>	<i>SD</i>
A	220	10.9	880.73	143.90
B	348	17.3	984.91	172.58
C	375	18.6	931.07	167.85
D	668	33.2	1007.41	177.23
E	401	19.9	978.93	174.03
Total	2012	100.0	969.76	175.36

Students represented four racial groups: White, Black, Multiracial, and Other. White students represented the majority of the sample population at 70.2%. Black students were the second largest subgroup at 12.4%. Multiracial students represented 8.1% of the population. All other racial groups made up 9.2% of the sample and, for purposes of this study, were reported as “Other.” The numbers of students by racial group are reported in Table 5.

**Table 5***Sample Enrollment by Race*

Student Race	<i>n</i>	%
Black	250	12.4
Multiracial	163	8.1
Other	186	9.2
White	1413	70.2
Total	2012	100.0

Table 6 includes the mean SAT Total score by Racial group. An ANOVA was used to determine if there were statistically significant differences in mean SAT scores between racial groups. There were statistically significant differences between racial groups ( $p < .001$ ). Partial eta-squared indicated a medium effect size of race on SAT scores ( $\eta^2 = 0.10$ ). More specifically, using Tukey’s post hoc tests, there were statistically significant differences ( $p < .05$ ) in SAT

scores between Black students and the racial groups of White, Other, and Multiracial. There were also statistically significant differences in SAT scores between White students and the other racial groups ( $p < .001$ ). There was not a statistically significant difference in SAT scores for students who are Multiracial or Other ( $p = 1.00$ ).

**Table 6**

*Mean SAT Scores by Race*

Race	<i>n</i>	<i>M</i>	<i>SD</i>
Black	250	856.44	135.09
Multiracial	163	908.59	144.46
Other	186	910.48	159.93
White	1,413	1004.67	174.48

Mean SAT scores for the sample population according to socioeconomic status are presented in Table 7. An independent *t*-test was used to determine if there were statistically significant differences in mean SAT scores between students who are and are not ED. The results showed significant differences between socioeconomic groups for SAT scores ( $p < .001$ ). Cohen's *d* indicated that socioeconomic status had a medium effect on SAT scores ( $d = 0.743$ ).

**Table 7**

*Mean SAT Scores by Socioeconomic Status*

ED	<i>n</i>	<i>M</i>	<i>SD</i>
Yes	823	897.45	147.43
No	1189	1019.81	175.73

Table 8 contains the mean SAT scores by subgroup by school. The mean score for each racial group is provided first, and then within each racial group, scores are further delineated based on socioeconomic status.

**Table 8***Mean SAT Scores by School by Subgroup*

Subgroup	School A	School B	School C	School D	School E	Overall
Black	833.56	889.60	848.43	887.12	851.44	856.44
ED	838.25	883.18	833.82	871.94	813.85	847.21
Not ED	816.88	936.67	877.14	921.25	972.50	881.64
Multiracial	840.94	913.48	912.09	936.36	940.95	908.59
ED	831.92	877.14	856.90	862.14	905.38	860.42
Not ED	880.00	970.00	1026.43	971.00	998.75	977.61
Other	861.90	965.93	874.29	936.79	972.00	910.48
ED	840.00	931.50	837.06	860.43	937.00	866.42
Not ED	942.22	1064.29	958.67	995.33	1042.00	990.61
White	956.16	1001.54	983.35	1032.70	987.76	1004.67
ED	910.73	937.44	954.34	949.47	917.88	936.30
Not ED	1014.38	1033.06	1001.13	1055.86	1017.54	1033.98
Overall	880.73	984.91	931.07	1007.41	978.93	969.76

Table 9 serves as a way to examine the Black-White achievement gap by school. It includes SAT scores by school for Black and White students and calculations for the within-school and district achievement gap. The largest within-school achievement gap was at School D, and the lowest within-school gap was at School A. Both Black and White students at School A had the lowest mean scores of the five high schools for their racial group. To calculate the district achievement gap, the mean score for Black students by school was compared to the overall mean score for White students across the district. In this calculation, the achievement gap was the widest for Black students attending School A. Given that the study aims to understand

how school assignment impacts academic achievement, the overall district score for White students is a more complete way to compare Black to White student performance as it reduced the impact of low scores within a particular school for all subgroups.

**Table 9**

*Black-White Achievement Gap*

School	Black Student SAT Scores <i>M</i>	White Student SAT Scores <i>M</i>	Within School SAT Gap	District SAT Gap
A	833.56	956.16	122.60	171.11
B	889.60	1001.54	111.94	115.07
C	848.43	983.35	134.92	156.24
D	887.12	1032.70	145.58	117.55
E	851.44	987.76	136.32	153.23
Total	856.44	1004.67		148.23

Table 10 contains data to examine the socioeconomic achievement gap by school. In every school, students who are not ED had higher SAT scores than ED peers. School A had the lowest mean SAT score, and School D had the highest. Within-school gaps differ from the gaps when comparing an individual school’s scores to the overall scores for the district. School A had the lowest scores for all students, whether ED or not. This resulted in the lowest within-school achievement gap, 84.61 points. However, when comparing the ED students within School A to the overall district mean SAT score for students who are not ED, the gap widened to the largest achievement gap at 163.31 points.

**Table 10***Socioeconomic Achievement Gap*

	ED Student SAT Scores	Not ED Student SAT Scores	Within-School SAT Gap	District SAT Gap
School	<i>M</i>	<i>M</i>		
A	856.50	941.11	84.61	163.31
B	922.67	1029.90	107.23	97.14
C	885.05	980.39	95.34	134.76
D	916.88	1042.34	125.46	102.93
E	908.43	1016.74	108.31	111.38
Total	897.45	1019.81		122.36

**Detailed Analysis*****Research Question 1***

*How do race, socioeconomic status, and school attended impact SAT scores among 11th-grade students?*

The first hypothesis was that the three independent variables of student race, socioeconomic status, and school attended would be significant predictors of the dependent variable, SAT scores. A regression model was used to test the direct effects of the independent variables on the dependent variable, SAT scores. The results showed that the overall regression model was statistically significant ( $p < .001$ ). Reference categories for categorical variables included Black race, not ED, and attendance at School D. All independent variables directly impacted SAT scores ( $p < .05$ ). School B did not significantly impact SAT scores ( $p = .317$ ), but other schools did. The coefficient of determination,  $R^2$ , represents the proportion of the variance in the dependent variable explained by the combination of independent variables. Here,  $R^2 = .17$ , suggesting that 17% of the variance in the SAT scores was explained by the independent variables of student race, socioeconomic status, and school attended.



The equation to predict SAT scores is represented by  $\hat{y} = b + m_1x_1 + m_2x_2 + m_3x_3$ , or in this research,  $\hat{y} = 951.43 + \text{Socioeconomic Status}(m_1) + \text{Racial Identity}(m_2) + \text{School Attended}(m_3)$ . The predicted SAT score is represented by  $\hat{y}$  in the equation. The y-intercept, represented by  $b$ , equals 951.43, which is the SAT score predicted for a Black student at School D who is not socioeconomically disadvantaged, as set by the constant in the regression. The variable  $x$  represents each of the independent variables of student socioeconomic status, race, and school attended. The slope,  $m$ , represents each unstandardized Beta, which tells the impact of each variable on the SAT score. These values are shown in Table 11. For each of the  $x$  variables, since they are all dichotomous, the use of “1” for yes and “0” for no results in the inclusion or exclusion of that particular variable. For example, to predict a student’s SAT Total score that is ED, White, and attended School A, the equation would be  $\hat{y} = 951.43 + (-88.71) + (96.72) + (-52.43)$ . The predicted score for this student is 907.09.

**Table 11**

*Race, Socioeconomic Status, and School Impact on SAT Scores*

Category	Variable	Unstandardized Beta	Standardized Beta	Sig. $p$
School D (constant)		951.43		<.001
ED	$x_1$	-88.71	-.249	<.001
Multiracial	$x_2$	34.23	.053	.035
Other	$x_3$	41.29	.068	.008
White	$x_4$	96.72	.252	<.001
School A	$x_5$	-52.35	-.093	<.001
School B	$x_6$	-10.64	-.023	.317
School C	$x_7$	-35.38	-.079	<.001
School E	$x_8$	-28.81	-.066	.005

The Variance Inflation Factor, VIF, was calculated for each independent variable to check for multicollinearity. All were well below 10, with a maximum VIF value of 2.3, indicating no assumption violation. Next, Cook's Distance and leverage values were reviewed to check for outliers. There was one statistical outlier with an SAT score of 1520 when the predicted score was 1019; however, this data point was checked for accuracy and did not significantly influence the model and was therefore not removed.

In summary, student race, socioeconomic status, and school attended had a statistically significant impact on SAT scores. An equation was written to predict SAT scores for this sample based on the independent variable combinations,  $\hat{y} = 951.43 + \text{Socioeconomic Status} + \text{Racial Identity} + \text{School Attended}$ .

### ***Research Question 2***

*How do race and socioeconomic status moderate the relationship between school attended and SAT scores among 11th-grade students?*

The hypothesis was that race and socioeconomic status would moderate the relationship between the school attended and SAT scores, meaning the impact of the school attended on SAT scores would be different for students of different races and socioeconomic statuses. This was tested using a regression using interaction terms of EDXschool and BlackXschool. These terms allowed the researcher to determine if indirect effects significantly influence SAT scores. In this regression model, both interaction terms were included alongside race, socioeconomic status and school attended. Neither interaction term significantly impacted SAT scores, BlackXschool ( $p = .729$ ), and EDXschool ( $p = .408$ ). Since BlackXschool was less significant than EDXschool, the interaction term BlackXschool was removed, and the regression was rerun. This was to ensure

that one interaction term was not masking the other. Again, there was not a significant indirect effect ( $p = .445$ ).

**Table 12**

*Interaction Term Impact on SAT*

Category	Unstandardized Beta	Standardized Beta	<i>p</i>
Constant	1010.90		<.001
ED	-98.50	-.276	<.001
School D	34.09	.092	<.001
Black	-89.39	-.168	<.001
BlackXschool	9.50	.009	.729
EDXschool	-14.15	-.023	.408

In summary, race, socioeconomic status, and school attended impact SAT scores directly and more significantly than their role as moderators in relation to the school attended. The indirect effects are not significant, and race and socioeconomic status do not appear to alter the relationship between the school attended and SAT scores. Instead, school attended also displays a direct relationship with Sat scores.

***Research Question 3***

*What differences exist in mean 11th-grade SAT scores between high schools for students who are Black and economically disadvantaged?*

In this district, students who are Black and ED had the lowest mean SAT scores when compared with other subgroups, as shown in Table 8. As a group, their mean SAT score was 847.2 ( $SD= 129.63$ ). Of the 2012 students in the sample, only 183 were Black and ED. The range of sample size between schools was 44. School E had only 13 students, and School A had 57. Table 13 includes the mean SAT scores for these students according to the high school attended.

Mean scores differed by as much as 69.33 points, with schools B and E having the greatest difference.

The research hypothesis was that there would be a statistically significant difference in SAT scores across schools for students who are Black and ED. The researcher believed this would be the case because of the differences in the composition of the schools, which will be examined next. An ANOVA revealed that there were no statistically significant differences in SAT scores for these students ( $p = .319$ ).

**Table 13**

*Mean SAT Scores for Black and Economically Disadvantaged Students*

School	<i>n</i>	<i>M</i>	<i>SD</i>
A	57	838.25	119.11
B	22	883.18	135.20
C	55	833.82	136.66
D	36	871.94	137.88
E	13	813.85	102.84
Total	183	847.21	129.63

Because of the small samples and the lack of statistical significance, additional ANOVAs were run as sensitivity analyses, separating race and socioeconomic status into distinct samples. The second ANOVA was performed to see if there were differences for ED students, regardless of race. There were statistically significant differences for ED students between the five schools ( $p < .001$ ). An estimated effect size, partial eta-squared, revealed a small effect ( $\eta^2 = .024$ ). A Tukey's test showed statistically significant differences in SAT scores for ED students between schools A and B, A and D, and A and E. School A had the lowest mean SAT score in each pair. As example, the mean SAT score was 62.41 points lower at School A than at School B for ED students. Table 14 shows the mean score difference for each pair of schools with  $p$  values. No

statistically significant differences existed between School C's mean SAT scores and any other school.

**Table 14**

*Schools with Significant Score Differences for ED Students*

School Pairs	Mean Difference	<i>p</i>
A and B	-62.41	.002
A and D	-56.62	.004
A and E	-48.17	.039

A third ANOVA revealed no statistically significant difference between SAT scores across schools for the 250 Black students ( $p = .158$ ,  $\eta^2 = .027$ ). Removing ED as an independent variable increased the number of students in the regression by 67, meaning 67 were Black and not ED. The data revealed a notable disparity, with 73% of Black students identified as ED compared to 36% for all others students included in the study. While these findings are important, they are beyond the aims of this study.

In summary, there was no statistically significant difference in SAT scores across the five high schools for Black and ED students. The researcher went beyond the research aims, separating the two independent variables to see if either alone impacted SAT scores. While there were no significant differences for Black students, there were statistically significant differences in SAT scores between School A and three other schools for students who are ED.

***Research Question 4***

*What differences exist in school factors of racial composition, socioeconomic composition, and educator experience?*

The researcher hypothesized that there would be statistically significant differences between the five high schools in racial composition, socioeconomic composition, and educator experience. The range of White students by percentage at each school was 53.6%. School A had the lowest percentage of White students at 33.2%; School E had the highest percentage at 86.8%. The range of non-White students by percentage was 53.6%. School E had the lowest percentage at 13.2%; School A had the highest percentage at 66.8%.

A chi-square test was performed to see if there were statistically significant differences in percentages of non-White students across the five high schools. For this test, the percentage of White students was compared to the percentage of students who identified as Black, Multiracial, or Other. There were statistically significant differences ( $\chi^2 = 277.23, p < .001$ ). Given the differences, five separate chi-square tests were conducted to compare each high school's non-White population percentage to the percentage of non-White students in the remaining sample. All showed statistically significant differences ( $p < .001$ ). The results are in Table 15.

**Table 15**

*Racial Composition of High Schools*

Location	White %	Non-White %	$\chi^2$	<i>df</i>	<i>p</i>
School A	33.2	66.8	162.14	1	<.001
School B	78.4	21.6	13.60	1	<.001
School C	53.3	46.7	62.93	1	<.001
School D	77.7	22.3	26.66	1	<.001
School E	86.8	13.2	65.64	1	<.001
Total Population	70.2	29.8	277.23	4	<.001

Next, a chi-square test was performed to see if there were statistically significant differences in percentages of students who are ED across the five high schools. There were

significant differences ( $\chi^2= 155.88, p < .001$ ). Given the differences, five separate chi-square tests were conducted to compare each high school’s percentage of ED students to the percentage of ED students in the other four schools. The percentages of ED students differed by as much as 36.5%. School A had the highest percentage at 71.4%, and school E had the lowest percentage at 34.9%. Schools A, C, D, and E were significantly different from the rest of the district ( $p < .05$ ). School B was not significantly different ( $\chi^2= .192, p = .661$ ). The percentage of ED students at School B was closest to the district overall. The results are in Table 16.

**Table 16**

*Socioeconomic Composition of High Schools*

Location	ED	Not ED	$\chi^2$	df	p
	%	%			
School A	71.4	28.6	94.80	1	<.001
School B	42.0	58.0	.192	1	.661
School C	51.7	48.3	22.36	1	<.001
School D	27.8	72.2	70.56	1	<.001
School E	34.9	65.1	7.44	1	.006
Total Population	40.9	59.1	155.88	4	<.001

Two statistical tests were used to determine if there were statistically significant differences in educator experience. First, an ANOVA was used to compare mean years of educator experience by school. Means ranged from 13.71 to 16.12 years, and the mean for all five high schools was 14.99 years. There was no statistically significant difference between the five high schools ( $p = .492, \eta^2 = .009$ ). Means by school are reported in Table 17.

**Table 17***Mean Years of Teacher Experience*

School	<i>n</i>	<i>M</i>	<i>SD</i>
A	55	15.45	12.03
B	76	13.94	12.23
C	79	13.71	10.61
D	85	15.90	10.32
E	70	16.12	10.24
Total	365	14.99	10.61

A chi-square test was performed to investigate whether there were differences in the percentages of new teachers with 0-2 years of experience between the five high schools. There was no statistically significant difference between schools ( $\chi^2= 4.718, p < .319$ ). School E had the fewest number of new teachers and represented 16.1% of all new teachers in the five high schools. Within School E, new teachers represented 12.9% percent of their teaching staff. School A had 23.2% of all new teachers in the district and had the highest percentage of new teachers within a school at 23.6%.

**Table 18***Percentage of New Teachers by School*

Location	New Teachers		Experienced Teachers	
	<i>n</i>	%	<i>n</i>	%
School A	13	23.2	42	13.6
School B	10	17.9	66	21.4
School C	14	25.0	65	21.0
School D	10	17.9	75	24.3
School E	9	16.1	61	19.7
Total	56	100.0	309	100.0

In summary, the hypothesis was partially supported. There were statistically significant differences in the percentages of non-White students in the five high schools. Each high school



was significantly different than the remaining schools. Likewise, there was a statistically significant difference in the socioeconomic composition of the five high schools. Schools A, C, D, and E were significantly different from the other four schools, but School B was not. Chi-square and  $p$  values were calculated and reported for the individual schools and the overall sample. There was not a statistically significant difference between mean years of educator experience or the percentage of inexperienced teachers.

Table 19 shows rank order based on three factors analyzed for this research question. The percentages of students who were ED, the percentage of students who were non-white, and the percentage of new teachers were assigned a ranking. Mean years of educator experience was not included to avoid doubling the influence of educator experience. For each factor, a score of “1” corresponds to the lowest percentage. Ranking for the three factors were summed to get a total by high school. Based on the literature review and conceptual framework, SAT scores are predicted to be higher for schools with lower scores. Table 20 shows the ranking based on the school factors alongside SAT score rankings for all students and the three subgroups of Black, ED, and Black and ED. In Chapter 5, there will be a discussion of these rankings and how they relate to mean SAT scores, as well as how they relate to the literature review and conceptual framework.

**Table 19***Rankings Based on School Factors*

School	ED		Non-White		New Teachers		Total	School Factors Predictor Score
	%	Rank #	%	Rank #	%	Rank #		
School A	71.4	5	66.8	5	23.2	4	14	<b>5</b>
School B	42.0	3	21.6	2	17.9	2	7	<b>3</b>
School C	51.7	4	46.7	4	25.0	5	13	<b>4</b>
School D	27.8	1	22.3	3	17.9	2	6	<b>2</b>
School E	34.9	2	13.2	1	16.1	1	4	<b>1</b>

**Table 20***Rankings of School Factors Predictor Score and SAT Scores by Subgroup*

School	School Factors Predictor Score	Mean SAT All	Mean SAT Black	Mean SAT ED	Mean SAT Black and ED
	Rank #	Rank #	Rank #	Rank #	Rank #
School A	5	5	5	5	4
School B	3	2	1	1	2
School C	4	4	4	4	3
School D	2	1	2	2	1
School E	1	3	3	3	5

**Summary**

Descriptive statistics were provided for context and to show differences in the five high schools based on student enrollment and subgroup performance on SAT. Statistical tests were conducted to answer four research questions. First, a regression model was used to determine that student race, socioeconomic status, and school attended impact SAT scores. An equation

was written to predict SAT scores based on combinations of the independent variables. Second, a regression was used to determine whether race and socioeconomic level moderate the relationship between school attended and SAT scores. It was determined that the direct effects of race and socioeconomic status are greater than the indirect effects examined by creating interaction terms. Third, while there are statistically significant differences in SAT scores for students who are ED, a regression showed that there was no statistically significant difference in SAT scores for students who are Black and ED. This research hypothesis was rejected but potentially underpowered due to the small number of students in this sample who are both Black and ED. Fourth, there was a statistically significant difference in the racial composition of the high schools in this study. Additionally, each school was different than the remaining sample. There was also a significant difference in the socioeconomic composition of the high schools, and each school was different from the sample created by the remaining four schools with the exception of School B. There were no significant differences in mean years of educator experience or the percentage of inexperienced teachers at the five schools.

## CHAPTER 5. CONCLUSIONS AND DISCUSSION

### Introduction

This quantitative, cross-sectional study examined academic outcomes for 11th-grade students in an urban school district in the Midwest that has received increasing stakeholder pressure to redraw long-standing school boundary zones. Current school boundary zones were drawn over 30 years ago to increase diversity within the high schools. The five high schools in this district are located in different areas of the city and serve students of all races and socioeconomic statuses. Because of school assignments by neighborhoods and neighborhood racial and socioeconomic segregation, the high schools differ in size and have different student compositions. Faced with the possibility of redrawing school boundary zones to assign students to schools closer to home, the researcher sought to understand the academic implications of the current policy by examining academic outcomes, defined in this study by SAT scores. This is especially important for students who are Black and ED since they are a low-performing subgroup in the district and are likely to be impacted by changing boundary zones either directly by assignment to a new school or indirectly through changing compositions of schools. This research is part of a companion study. Another researcher focused on 5th-grade students in the same district.

There were two research aims. The first was to examine the relationship between race, socioeconomic status, and school attended on academic outcomes. Three research questions aligned with this aim. 1) How do race, socioeconomic status, and school attended impact SAT scores among 11th-grade students? 2) How do race and socioeconomic status moderate the relationship between school attended and SAT scores among 11th-grade students? 3) What

differences exist in mean 11th-grade SAT scores between high schools for students who are Black and ED? The second aim of this study was to examine the differences between the five schools that may contribute to the differences in academic outcomes. A fourth research question aligned with this aim. 4) What differences exist in school factors of racial composition, socioeconomic composition, and educator experience?

The literature review and three theoretical frameworks served as a basis for the research design. The historical context for the study is explained through examining landmark court cases, racial and school segregation, education inequalities, and school assignment policies. The decision to include teacher experience data came from research on value-added theory. With a sample of over 2.5 million test scores over 20 years, Chetty et al. (2014a) found a significant causal relationship between teacher value-added measures and student test scores. Much research exists on what teacher factors impact quality. One of those factors is experience. Research has shown that inexperienced teachers contribute to the achievement gap, and Black and ED students are more likely to have inexperienced teachers than their White or affluent peers (Clotfelter et al., 2005; Reardon, 2015; Rivkin et al., 2005). Social capital theory and cultural capital theory informed the decision to compare school compositions for percentages of students who are Black and ED. One's peers impact educational attainment, and student achievement is lower in schools that are higher in poverty (Holas, 2015; Orfield, 2001). In addition, Black students are more likely to be in high-poverty schools (Matheny, 2013). Furthermore, Black student achievement is lower in schools with higher concentrations of Black students (Hanushek et al., 2009; Rivkin, 2016). Together, these theories form the foundation for this investigation of how the identified school factors influence academic outcomes.

This study's data were retrospective from the Office of Accountability in a single school district. The sample included students from the five traditional high schools who attended their district-assigned school for at least 162 days during the tested year and had a valid SAT score from the SAT School Day. Using these criteria, the original population was reduced from 2651 students to the sample population of 2012 students, 250 of whom were Black and 183 were Black and ED. Statistical tests were performed using SPSS to answer the research questions.

This chapter provides the final analysis and discussion of the research findings. Each research question will be answered with a discussion of its significance to this study. Implications of the research for school board policy and practice will be provided as it relates to this district and beyond. Limitations, suggestions for future research, and recommendations will be given. These research findings can inform immediate decisions for this district while also contributing to the body of research on school assignment policies and practices, particularly given the unique conditions and strategies within this district.

### **Discussion of the Results**

Research results were analyzed through the lens of the literature review and the conceptual framework. White students outperformed Black students at every high school in the district, regardless of socioeconomic status. White students had the highest mean SAT scores of all races, and the sub-group with the highest mean SAT score was White students who were not ED. In contrast, students who are Black and ED had the lowest SAT mean scores. This aligns with national trends where Black and ED students perform lower than their White and affluent peers. Ultimately, the researcher wanted to know if there were differences in SAT scores for these students based on the school attended and, if so, to understand the differences in school

conditions that may impact these differences. It was determined that there were no significant differences in SAT scores for students who are Black and ED regardless of the high school attended, despite differences in student body compositions. Four research questions were answered in this study.

### ***Research Question 1***

*How do race, socioeconomic status, and school attended impact SAT scores among 11th-grade students?*

This question sought to understand how student race, socioeconomic status, and school attended impact SAT scores. A regression model was used to test the direct effects of the independent variables on the dependent variable, SAT scores. The results showed that all of these factors impact student achievement. Using reference categories of Black race, not ED, and attendance at School D, being White had the most significant and positive effect on scores overall. Being ED had the most negative impact. The third largest impact came from attending the high school that had the highest concentration of Black and ED students; this was a negative impact. The hypothesis was confirmed.

The results from this study support existing literature on the Black-White and socioeconomic achievement gaps. Student outcomes are better in schools with less poverty (Reardon et al., 2022). Additionally, schools with higher Black enrollment have higher levels of poverty and lower academic achievement (Matheny, 2013). Regardless of the school attended, White students outperformed their Black peers. Results were similar to those of a study that examined the relationship between race, socioeconomic status, and ACT scores. Black students had lower ACT scores than White students, and Black enrollment coincided with higher school

poverty rates (Herberger et al., 2020). Schools A and C have the highest percentages of Black and ED students and the lowest test scores. This supports Orfield’s research on “double segregation” that exists in public schools today, where schools are segregated by race and poverty (2016). Schools B, D, and E have the three highest percentages of White students, the lowest percentages of ED students, and the highest overall SAT scores.

Table 9 compares SAT scores by school for Black and White students and calculations for the within-school and district achievement gap. The largest within-school achievement gap was at School D, which has the lowest percentage of ED students. This contradicts the research that says low-poverty schools are better at reducing the Black-White achievement gap (Reardon et al., 2018; Atterbery et al., 2020). School A had the lowest within-school achievement gap and the highest number of ED students. School A had the lowest mean SAT scores for both White and Black students and was shown to be the school with the greatest negative impact on SAT scores. Regardless of race, students at School A underperformed all other schools in the study, but the gap between races was the smallest.

A district achievement gap was calculated to see how Black students at each school compared to the mean district score for White students. This was important to consider, given how different performance is by school. In this calculation, the achievement gap is the widest for Black students attending School A. School C has the second highest percentage of ED students and is second behind School A for the largest Black-White achievement gap in the district. Given that the study aims to understand how school assignment impacts academic achievement, the overall district score for White students is a more complete way to compare Black and White student performance. Looking at the achievement gap in this way, the research in this district



aligns with studies by Reardon et al. (2016) and Atterberry et al. (2020). The Black-White achievement gap for the district is wider at schools where there are more Black and ED students than it is for Black students who attend schools with less Black and ED students.

The economic achievement gap trends similarly and supports what is present in the literature when looking at district mean SAT scores for students who are not ED. Table 10 contains the means and achievement gap calculations. In every school, students who are not ED had higher SAT scores than their ED peers. This agrees with the literature; student achievement is lower in schools with higher poverty (Holas, 2015; Orfield, 2001). School A had the lowest mean SAT scores and the highest percentage of ED students. School D had the highest mean SAT scores and the lowest percentage of students who were ED. Within-school achievement gaps differ from the gaps when comparing an individual school's scores to the overall scores for the district. School A had the lowest scores for all students, whether ED or not. This resulted in the lowest within-school achievement gap, 84.61 points. However, when comparing the ED students within School A to the overall district mean SAT score for students who are not ED, the gap widened to the largest achievement gap at 163.31 points. This suggests that looking at within-school gaps is insufficient when considering redrawing boundary zones as overall student performance, regardless of race or socioeconomic, is lower in schools with higher concentrations of Black and ED students.

### ***Research Question 2***

*How do race and socioeconomic status moderate the relationship between school attended and SAT scores among 11th-grade students?*

This question sought to understand how race and socioeconomic status of students influence the school's impact on SAT scores. The hypothesis was that the relationship between the school attended and SAT scores would differ for students of different racial or socioeconomic backgrounds. Specifically, the researcher wanted to see how the school attended impacted Black student performance on SAT compared to other races and how school attended impacted SAT scores for students who are ED compared to those who are not. The results indicated that the indirect effects measured by the interaction terms were not statistically significant. Race and socioeconomic status did not moderate the relationship between school attended and SAT scores, and therefore, the hypothesis was rejected.

Prior research showed that Black students are more likely than White students to attend schools with high poverty and that their achievement decreases within those schools (Matheny, 2013). Schools with less poverty are also better at closing achievement gaps (Reardon, 2015). While the difference in mean scores in this study showed a smaller achievement gap for schools with less poverty, there was no statistically significant difference based on school attended. The impact of school attended did not vary significantly for Black students compared to students of other races. Likewise, the influence of the school on SAT scores did not differ significantly for students based on their socioeconomic status. The impact of race and socioeconomic on SAT scores was not dependent on individual school characteristics and practice. While the direct effects of race, socioeconomic status, and school attended were significant, the interaction between those variables did not significantly impact scores. This means that while race and socioeconomic status independently influence SAT scores, attending different schools does not exacerbate or mitigate these effects in a statistically significant way. This agrees with results

from Research Question 1, which found that race and socioeconomic status were the two most significant impacts on SAT scores. Differences in schools were insufficient to alter the results for Black or ED students significantly.

### **Research Question 3**

*What differences exist in mean 11th-grade SAT scores between high schools for students who are Black and economically disadvantaged?*

The question sought to understand how the school attended impacted SAT scores for Black and ED students. These students had the lowest mean SAT scores in the district compared to all other combinations of race and socioeconomic status. This echoed broader observed patterns in educational research. The researcher hypothesized that there would be statistically significant differences for these students at certain schools because of different school compositions and teacher factors. This would support the conceptual framework based on social capital, cultural capital, and value-added theories. Schools with lower concentrations of Black and ED students could, in theory, allocate existing resources and disproportionately support these students, resulting in higher achievement. This was not the case, and the hypothesis was rejected.

Regardless of school attended, there were no statistically significant differences in mean SAT scores for students who are Black and ED. Surprisingly, the lowest mean score for this subgroup was at School E, with the lowest concentration of Black and ED students,  $n = 13$ . While the lack of statistical significance in mean SAT scores across different schools suggests a consistent influence of race and socioeconomic status on academic achievement, the small sample sizes per school highlight the need for cautious interpretation and the possibility of

underestimating the true variability in the data. Additionally, 73% of all Black students in the sample were ED, compared to 36% of students of all other races. This disparity highlights the disproportionate representation of ED students who are Black, adding to the complexity of needs for this population of students. This suggests that while the school attended did not significantly impact SAT scores, broader systemic issues related to race and socioeconomic status continue to impact academic achievement for these students. The school attended was not sufficient to overcome these challenges.

Because of the small samples and the lack of statistical significance, the researcher separated the variables to examine Black and ED student performance across schools. While there were no statistically significant differences in Black student SAT scores, there were significant differences for ED students at School A (74.6% ED) compared to School B (54.7% ED), School E (44.0% ED), or School D (36.6% ED). These findings suggest that school-level factors play a more significant role in shaping the academic outcomes of ED students compared to Black students. Reardon's research found that student's socioeconomic status was a better predictor than race for academic outcomes (2015). In this district, that was not the case. Race, specifically White versus Black, was the biggest predictor of SAT scores. It is important to recognize, however, that a disproportionate number of Black students were also ED and that very few Black students were not ED. In this sample, a majority of Black students were also ED; whereas a majority of White students were not.

#### **Research Question 4**

*What differences exist in school factors of racial composition, socioeconomic composition, and educator experience?*

This question was answered to understand how the five high schools differed and to relate those differences to academic outcomes for students who are Black and ED. The researcher hypothesized that there would be statistically significant differences between the five high schools in racial composition, socioeconomic composition, and educator experience and that these differences would contribute to differences in academic outcomes for students who are Black and ED. Given that there were no significant differences in SAT scores for students who are Black and ED, the results were analyzed to understand if high school compositions were as different as anticipated. There were statistically significant differences in the racial compositions of the five high schools, and each school differed from the others combined. This suggests that the influence of the student body's racial composition, as predicted by the interpretation and application of cultural capital theory for this study, did not significantly impact test scores for students who are Black and ED. Black student scores did not vary significantly based on access and use of cultural capital from school composition.

There was also a statistically significant difference in the percentages of ED students across the five schools. Schools A, C, D, and E significantly differed from the rest of the district. The research hypothesis was partially confirmed. School B was not different. Despite the differences in socioeconomic compositions of the schools, there was no difference in SAT outcomes for students who are Black and ED, regardless of school. This suggests that the influence of student body socioeconomic composition, as predicted by the interpretation and application of social capital theory for this study, did not significantly impact test scores for this group of students. Students who were Black and ED did not realize significant differences in academic outcomes based on access and use of social capital from school composition.

There was no statistically significant difference in mean educator experience between the five high schools, nor were there statistically significant differences between schools in percentages of inexperienced teachers. The hypothesis that there were differences in educator experience by school was rejected. Research presented in the literature found that higher-performing schools typically have more experienced teaching staff and that Black and low-income students are disproportionately taught by inexperienced teachers (Clotfelter et al., 2005; Etim et al., 2020; Reardon, 2015; Rivkin et al., 2005). Based on educational research on value-added theory regarding teacher experience and the research findings from Question 1 showing the impact of the school attended on SAT scores, the researcher expected to see statistically significant differences in teacher experience when comparing high schools; however, this was not the case.

Table 19 in Chapter 4 ranked schools according to the percentages of ED students, non-White students, and new teachers. Based on educational research and the conceptual framework, it was predicted that schools with a lower ranking, meaning lower concentrations of non-White students, poverty, and inexperienced teachers, would have higher academic outcomes for students. Excluding School E, the ranking based on school factors predicted the mean SAT score rank for all students and the Black and ED subgroup. Black students and ED students performed best at School B, which was not predicted based on school factors. This may be an indicator of within-school support for these students. Schools A and C had the highest concentrations of non-White and ED students and the lowest mean SAT scores for all students, Black students, and ED students. Excluding School E, these schools ranked lowest for the subgroup of students who are Black and ED. School E underperformed what the school factors predicted for all students and

subgroups. They had the smallest number of students who were Black and ED, which raises questions about the reasons for this underperformance. Further research would be needed to examine other factors, including student belonging, need, and support.

These results and raw percentage suggest that the non-White racial density within a high school was the biggest predictor of SAT performance for all students. This was also the finding in Research Question 1, where being White had the biggest positive impact on test scores. Students in Schools A and C had consistently lower test scores than students in the other three schools, and Schools A and C were more different racially than socioeconomically when compared to Schools C, D, and E. Schools C, D, and E were more than 75% White. While all data was discussed, results were only statistically significant for ED students, not Black students. ED students did significantly better at schools with lower concentrations of non-White students.

### **Discussion of the Results in Relation to the Literature and Conceptual Framework**

This research investigation was conducted out of a necessity to understand how school boundary zones impact academic achievement for students who are Black and ED. Research questions were based on a conceptual framework that included elements of social capital theory, cultural capital theory, and value-added theory. The results were analyzed through the lens of the conceptual framework and in relation to prior research.

#### ***Racial Segregation***

This urban city has become increasingly racially and economically segregated as White, affluent families have moved to the suburbs. Some schools have become increasingly more segregated along with these population shifts. This echoes national trends from larger cities present in the literature (Orfield, 2016). Attendance at Schools A and C had the largest negative

impact on SAT scores. These schools had the highest densities of ED and Black students and experienced “double segregation” (Orfield, 2016, pp.1-9). Results from this study support prior research where students in schools with higher Black student populations have higher levels of poverty and lower academic achievement (Card & Rothstein, 2006; Reardon et al., 2022).

### ***Educational Inequality***

Educational inequity has been researched extensively. The Equality of Educational Opportunity Report, published in 1966, found disparities in educational opportunities for students of different racial and socioeconomic backgrounds. Despite *Brown v Board of Education*, nearly every school remained majority racially homogenous (Coleman et al., 1966). The Black-White gap narrowed following increased school integration efforts but remains today with some evidence that it is increasing (Orfield, 2001). The results from this study showed a Black-White achievement gap throughout the district and in every school. The biggest difference in test scores came from the independent variables of race for Black and White students. There was a positive impact on test scores for White students and a negative impact on test scores for Black students. This supports prior national research showing that White students have higher standardized test scores than Black students (Herberger et al., 2020). This also suggests agreement with literature findings that Black students are more likely to be ED, attend high-poverty schools, and have lower standardized test scores (Card & Rothstein, 2006). In this district, Black students were more likely to attend Schools A and C, where there was more poverty, more Black students, and lower test scores than at the other three high schools in the district. More Black students in this district were ED than any other race.

### ***Factors that Impact Student Achievement***



The influence of peers and teachers on student achievement appeared repeatedly in the literature. Prior research shows that students are influenced by the academic habits of their peers (McMillian et al., 2018). Further, Black student achievement is lower in schools with a high concentration of Black students and more poverty (Hanushek et al., 2019; Holas, 2015; Orfield, 2001; Rivkin, 2016). Schools in this district had statistically significant differences in racial and socioeconomic school compositions but not in educator experience. There were differences in mean SAT scores in alignment with the research on school compositions, but these differences were not statistically significant for Black students. There were statistically significant differences in scores between schools for ED students, but those differences diminished when combining the Black race with ED. This contradicts research suggesting poverty impacts test scores more than race (Reardon, 2015). In this district, race impacted scores more than poverty, but it is important to note that a majority of the Black students in the district were also ED. This intersectionality of race and economic disadvantage may amplify the individual effects of each factor on academic achievement. Students who belong to both marginalized groups are more likely to face compounded challenges and barriers to academic success, including systemic inequities and access to opportunities and support. The cumulative effect of multiple marginalizations can contribute to widened achievement gaps and perpetuate cycles of educational inequality.

### ***Conceptual Framework***

This study was designed after reviewing prior research on school factors that influence the academic achievement of Black and ED students. The impact of student race and the school's racial composition were included as a consideration of cultural capital theory. Student

socioeconomic status and the socioeconomic composition of the school were included based on research on social capital theory. The last independent variable in the study was teacher experience, which included both the percentage of inexperienced teachers and mean years of educator experience by school. This was determined based on research on teacher value-added theory.

Race, socioeconomic status, and school attended significantly impacted SAT scores. Being Black had the largest negative impact on test scores, and scores were lowest in the two schools with the largest concentration of Black students, suggesting that a more diverse student body has a negative impact on academic outcomes. Prior research indicated that Black student achievement is lower in schools with higher concentrations of Black students (Hanushek et al., 2009; Rivkin, 2016). Despite not being statistically significant, mean SAT scores for Black students were lower at Schools A and C, where concentrations of Black students are higher. Nationally, White culture is dominant in most schools, and future research could investigate how that impacts Black students in this district (Williams, 2015). Based on school factors, School E should have been the best placement for students who were Black and ED; however, the opposite was true. Future research is recommended to examine similar schools to understand Black student performance considering other factors, such as sense of belonging, teachers' expectations of Black students, and access to cultural capital.

Educational research using social capital theory says students learn more when their peers are high-achieving (Hill et al., 2023). Specifically, Black students experience greater academic success through social connectedness by way of accessing social capital (Lee & Croninger, 2001.) In this research, students who were not ED outperformed their ED peers, with low

socioeconomic status being the second largest negative impact on test scores. Students who were Black and ED had the lowest performance in the two schools with the highest concentrations of poverty, suggesting the possible impact of low social capital. Conversely, the school with the lowest percentage of ED students, School D, had the highest mean SAT scores overall and second highest mean scores for students who are Black and ED. School D is the district's newest, largest, and most suburban school. It is also the furthest away from the center-city core.

There was no statistically significant difference in educator experience across the high schools. This was how value-added theory informed the study, so no data discussed supported its influence. Future research in this district could examine which teachers are assigned to students who are Black and ED within a school. This would allow an understanding of how course tracking contributes to Black student success. Prior research found that within-school segregation and course tracking resulted in Black students being taught by less experienced staff than White peers (Reardon et al., 2022). This research did not connect students to specific teachers. This is a limitation of using school-level data. It is unknown which teachers, with what level of experience, actually taught students who were Black and ED.

## **Implications**

The results of this study add to the existing literature on the impact of school assignment policies on student achievement. Several aspects of this study make it unique. First, this is a single-district study in an urban district. A single School Board controls policy and funding and has the discretion to allocate resources as it determines best. A single superintendent and district administration oversee all schools and can influence principal and teacher development, initiatives, interventions, and support within the district. All high schools are in the same city,

except one in the county, just outside city limits. Many of the city's neighborhoods are racially and economically segregated, leading to schools that are increasingly segregated as White, affluent families migrate to the suburbs. While charter, private, and parochial schools exist, most students attend the city's public schools. In a literature review, the researcher found no studies of similar size and context to this. Additionally, this research is part of a companion study in the same district involving fifth-grade students at the elementary schools that feed into these five high schools.

The results of this study have implications for the local School Board and school administrators. Much of what was learned mirrors national trends in educational research. The first implication is to inform school assignment policies. Locally, students are assigned to schools based on their neighborhoods. School boundary zones have remained unchanged for over 30 years. Facing increasing stakeholder pressure to redraw these boundary zones, the district should consider the impact of the current and any future assignment policy on its students, with implications for different racial and socioeconomic groups and with an understanding of neighborhood compositions. For example, changing school boundary zones to assign students to the closest school will likely change school demographics and may change students' academic performance. The school with the highest mean SAT scores is School D, and it would become less racially and socioeconomically diverse based on the surrounding neighborhoods. The School Board and district administration should carefully consider the potential implications of any change on equity, diversity, and academic outcomes for students.

A second implication is the need to address disparities in academic achievement in the district. There are Black-White and socioeconomic achievement gaps. Black students

consistently lag behind their White peers. This was the case in every school in the study. The same is true for ED students. Regardless of the school attended, these students have lower SAT scores than peers who are not ED. Race and socioeconomic status impact academic outcomes, and school-level factors do not moderate these relationships in this district. Students from certain racial and socioeconomic backgrounds achieve higher or lower academic outcomes despite the school they attend. Within schools, there is a need for targeted interventions and support to address achievement gaps. At the district level, there is a need to address systemic inequalities and promote equitable outcomes for all students.

Families and students must be made aware of the academic challenges students may face based on their school assignment and what support is available within each school. This is timely as some have expressed a desire for changes in school assignment policies. This is especially crucial for marginalized populations. Proximity to school can create hardships for families and limit opportunities for students. On the other hand, if the primary purpose of school is to provide the best education possible for students, academic achievement by school should also be considered. As decisions are made, engaging students and families in meaningful dialogue about the benefits and potential negative implications of any future school assignment policy will be necessary.

Addressing systemic inequities requires a comprehensive approach that goes beyond individual schools or districts and engages the entire community. Given the statistically significant differences in outcomes for ED students across schools and the lack of differences for Black students, collaboration between schools and the community will be necessary to address the specific needs of students and families. Tutoring, counseling, and mentorship programs can

help students achieve academic success. Beyond school, the community can help families in need with housing and food insecurities to promote overall well-being and better prepare students to engage in their education. Six hundred thirty-nine students were excluded from this study based on the requirement of 162+ days of school enrollment at their district-assigned school and a valid SAT School Day score. Some of these students were transient and changed schools because of factors outside their control, like a change in residence or other hardships such as transportation.

Understanding the impact of school compositions on academic outcomes can inform decisions aimed at prioritizing educational equity and improving academic achievement for all students. This research provides valuable insights into the complexity between race, socioeconomic status, school composition, and academic achievement. By addressing the identified gaps and understanding how contextual factors influence student outcomes, practitioners can work towards creating more equitable educational environments for all students.

## **Recommendations**

### ***Socioeconomic-based School Assignment Policy***

The recommendation is that this district create a school assignment policy that balances schools socioeconomically. In this model, there were statistically significant differences in the socioeconomic compositions of schools and SAT scores for these students. The school with the highest percentage of ED students also had the lowest scores for this group. The three schools where these students performed statistically better differed from School A in socioeconomic

composition by 20% or more. This information could be used to set thresholds for school compositions.

Fear of increasing segregation, the reliance on bus transportation, and the current shortage of bus drivers prevent a recommendation for school choice. A school choice policy could create opportunities for some while limiting opportunities for vulnerable populations. Public transportation does not currently reach School D, the highest-performing and newest school. As discussed in the literature review, drawing boundaries to achieve racial balance is no longer permissible in the United States. Given that a majority of Black students are also ED, there is a possibility that boundaries created based on socioeconomic levels could achieve some racial balance.

Considerations for this recommendation include what it would mean for the racial composition of schools, how it would impact the distance from school to home by student, and the timeline for change. This urban city is racially and socioeconomically segregated, with concentrations of residential poverty closer to some schools than others. Given the location of School D, it may be difficult to balance the school socioeconomically without long commutes for students. Since this was one of the primary concerns lifted by stakeholders, it must remain at the forefront. Additionally, balancing solely by socioeconomic status may segregate schools more racially than they are presently. Some schools could have higher concentrations of White and ED students but fewer Black students. Another challenge in implementing changes to school assignments is minimizing the impact on students. Students typically stay in high schools for four years and ideally would not have the disruption of change during those years. Some families purchase homes based on schools. Giving families and students time to adjust to any new school

assignment policy will be important, as well as considering those already in attendance at a school based on the current policy.

### ***Investment and Innovation***

This district is urged to invest and innovate inward to create conditions that encourage affluent students to attend schools with higher levels of diversity and poverty. This strategy could withstand continued population migration to suburbs as neighborhoods change. Presently, the largest, most affluent, highest-performing school is also the newest, School D. Creating innovative models at schools with larger vulnerable student populations is one way. Putting high-interest, specialized magnet programs inside these buildings could incentivize students to attend these schools. Inspired by the Wake County Public School model, a certain percentage of program enrollment could be allocated to marginalized populations, with the remaining seats open to others (Hammond & Wu, 2022). Another idea is strategically investing in facility renovations at certain schools to attract families by incorporating enhanced safety and security, technology integration, flexible learning spaces, health and wellness areas, and state-of-the-art athletic facilities.

Challenges for this recommendation include bus transportation, identification of programs that would attract students to schools, and capital. The national bus driver shortage was a catalyst for public concerns over present school assignments. Any new policy must account for the number of students dependent on bus transportation to prevent further systemic inequities for students. Stakeholder input is critical to know what programs or conditions would incentivize affluent students and families to choose a school with higher diversity and poverty. Changes to



buildings require capital investment. The district must consider the cost of any new capital project and weigh its benefits toward the overall goals.

### ***Focus on Systemic Inequities***

There is a need to focus on systemic inequities through a comprehensive review of instructional practices, tracking systems, and discipline policies. To combat the Black-White and economic achievement gaps, implement targeted interventions and resources to support the academic achievement of students who are Black and ED across all schools in the district. This includes adding tutoring programs, culturally responsive teaching practices, mentorships, and evidence-based interventions aligned with students' needs. Ensure these students have access to advanced coursework and adequate support to be successful. In addition, review and combat any disproportionality in discipline and special education over-identification. Finally, staffing policies and practices should be created to ensure highly effective teachers teach vulnerable populations. Due to the concentration of vulnerable populations in various buildings, the district must be willing to allocate resources disproportionately according to need. While schools may have had interventions and supports in place, they were not enough to close achievement gaps.

### **Limitations**

This study was conducted by a practitioner interested in informing decisions about boundary assignments in a single school district. The decision to focus on one district in the Midwest is a limitation. This urban district has five traditional high schools and uses longstanding boundary zones to assign students to schools. A single School Board creates policies for the school district, and the central office controls funding and overall operational administration for schools.

The study's inclusion criteria resulted in small sample sizes, especially for students who are Black and ED. To be included, students had to attend the school assigned by the district and be enrolled at the school where they took the SAT for at least 162 days. This excluded transient students, many of whom are ED. Students who attended a different school from the one assigned by a school boundary zone were removed, including the 466 students at the alternative or innovative model high schools. Of the 466, 56 students were Black and ED. Two of the four non-traditional schools were alternative high schools with a combined enrollment of 233 juniors. Of those, 52 were Black and ED.

Beyond school attended, other factors potentially impacting students' academic outcomes were not considered. Attendance, discipline, student sense of belonging, courses taken, interventions, and teacher assignments were not included. Student attendance is different from their school enrollment. The study did not consider the number of days in attendance and in class. While this decision is consistent with the state's accountability model for SAT scores, it is unclear how a student's attendance impacted outcomes in this study. The same is true for disciplinary measures, which could result in a loss of class time. While some school factors were considered, the specific courses students took and any interventions provided were not. It is unclear if all students had access to the same level of coursework or if there was a degree of tracking within a school, thus limiting access to certain courses for some students. The number of students who receive special education services or have 504 plans was not considered. Finally, while there were no statistically significant differences in mean educator experience and the percentages of inexperienced teachers, there was no consideration of which teachers taught which students.

The reliance on SAT scores for academic outcomes is another limitation. GPA, graduation rates, and the type of diploma earned are alternative ways to measure academic success. The decision to focus on the SAT was because it is a long-recognized, externally validated, standardized assessment given to all juniors in this state on the SAT School Day. Further, it is the state's accountability assessment for high schools. Critics of the SAT argue that is a narrow, socioeconomically and culturally biased assessment that is no better at predicting college success than GPA and the rigor of high school coursework taken (Mattern et al., 2011).

Factors external to school were not included. Beyond using addresses for school assignment, no consideration was given to the neighborhood factors such as median home price, safety, and access to libraries and community support and resources. Characteristics of students' families, such as education level of parents or guardians, family structure, and the level of family engagement in school were also beyond the scope of this research.

This research study focused on one indicator of academic achievement, but it is unknown how student performance influences preference for schools. Since stakeholders have specifically voiced concerns over distance from school, the School Board and district administrators are encouraged to engage stakeholders in decisions, considering implications of changes for school composition, academic achievement, transportation, and distance from school. By sharing predictions based on this research, current students, and neighborhood demographics, the school district could help families anticipate the impact of potential changes to current boundary zones.

### **Recommendations for Future Research**

There are many ways to expand upon this research by examining additional factors that are internal and external to schools. A first recommendation is to investigate other measures of

academic achievement, beyond SAT. Future research could include GPA, graduation rate, and diploma type earned, to compare results for students who are Black and economically at different high schools. Similarly, a second recommendation is to analyze which courses Black and ED students are taking to see if they are accessing rigorous coursework and experienced teachers. A comparison of these students to their White and non-ED peers could reveal disparities in coursework and potentially within school segregation.

A third recommendation is to look at factors beyond academic achievement. Students sense of belonging within each school is an example. In addition, a future study could determine what matters most to students and families. While this study focused on academic outcomes, students and families may prioritize other factors, such as distance to school, course offerings, extra curriculars, facilities, school diversity, or other students who attend.

A final recommendation is to go beyond school boundary assignments to analyze student academic achievement by neighborhood. Given a purpose of this study was to understand how the present school assignment policy impacts academic outcomes for students, it would be beneficial to understand the impact certain neighborhoods have on academic outcomes, particularly high-poverty neighborhoods. Knowing the impact of neighborhoods could inform where new boundary zones are drawn.

## **Conclusions**

The overall goal of this quantitative, cross-sectional study was to understand how school factors impact academic achievement for a marginalized population: students who are Black and ED. Retrospective data were obtained from the district's Office of Accountability and contained two consecutive years of SAT data for 11th-grade students who had attended their assigned

school for a minimum of 162 days before the SAT School Day. White students in this district were the highest-performing subgroup of students, and Black students were the lowest. This was true regardless of the school attended. Black students had the lowest SAT scores at every school compared to other races. Students who are both Black and ED were the lowest-performing subgroup in the study, and there were no statistically significant differences in their performance across schools. School factors did not change academic outcomes for these students, even though there were statistically significant differences in the racial and socioeconomic compositions of schools.

The findings from this study were analyzed through the lens of the conceptual framework grounded in cultural capital, social capital, and value-added theories. These theories were used to identify independent variables of race, socioeconomic status, and school attended. School factors, including student body composition and teacher experience, were also examined to see what impact they had on academic outcomes for students who are Black and ED. The research findings relate to prior research on Black-White and economic achievement gaps and provide implications for policy and practice, particularly in this district.

Recommendations included a socioeconomic-based school assignment policy to balance schools across the district, innovation to attract affluent students to schools with higher concentrations of poverty and diversity, and investment in interventions and support to combat systemic educational inequities faced by students who are Black and ED. Future research was suggested to understand the impact of transiency, attendance, within-school segregation, course selection, student belonging, and teacher expectations on outcomes for students who are Black and ED. Factors external to school could provide additional information to inform future

policies, including the impact of neighborhoods and family engagement. This study provides a foundation for this district and others faced with increasing school segregation, population shifts, bus transportation shortages, and disparities in student outcomes.

## **CHAPTER 6. COMPARATIVE ANALYSIS OF TWO COMPANION DISSERTATIONS**

### **Introduction**

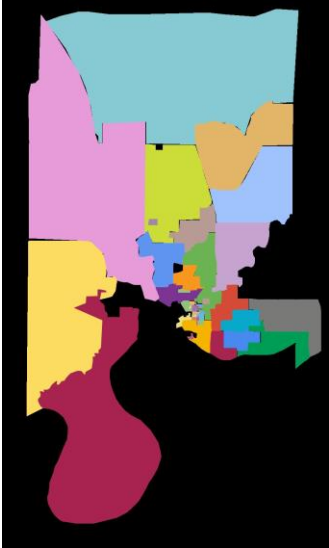
This chapter will include a comparison of two companion dissertations, each dissertation focused on the academic outcomes for students who are Black and ED, using standardized test scores. The first companion dissertation focused on 5th-grade students and the state accountability assessment, ILEARN. The second companion dissertation focused on 11th-grade students and the graduation requirement exam, SAT. The purpose of each companion dissertation was to determine if performance for a specific subgroup of students was better, the same, or worse across schools and factors that may be contributing to the outcomes. Additionally, policies, including school assignment, redistricting, and resource allocation, are governed by a single school board with one superintendent. Results from each companion dissertation will be used to provide a holistic view of student performance and contributing factors to making strategic decisions.

Students in this district are assigned to schools based on their residence. There are five traditional high schools that 22 elementary schools feed into, known as feeder patterns. All schools in both dissertations are within the same school district. This urban school district spans 236 square miles, covering the city and the entire county. Students reside in the inner city and suburbs, and schools are located in both areas. Generally, elementary school boundary zones include students in the neighborhoods closest to the school. Figure 1 shows the 22 elementary school boundary zones, each with a different color. High schools, however, have boundary zones that were created over 30 years ago to integrate schools racially. Figure 2 shows the five high school boundary zones; notice that each extends south to the river. Because of population

migration to the northern part of the district, two new schools were built. This was a relocation of one high school that was more centrally located. The other new school was an elementary school that feeds into the newly built high school.

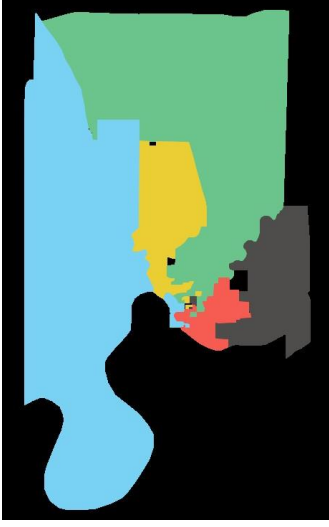
**Figure 1**

*Elementary School Boundary Zones*



**Figure 2**

*High School Boundary Zones*





## **Comparative Data from Companion Dissertations**

### ***Research Question 1***

*How do race, socioeconomic status and school attended impact standardized test scores among 5th and 11th grade students?*

Race, socioeconomic status, and school attended impacted standardized test scores for 5th and 11th grade students. In both studies, a regression model was used to determine the impact of race, socioeconomic status, and each school attended on test scores. An equation to predict standardized test scores was created, using the highest performing school, Black race, and not ED. The high school equation used School D, while the elementary school equation used School O, which is a feeder of High School D.

All non-Black races had positive impacts on test scores for elementary and high school students. Being ED had a negative impact on test scores for elementary and high school students. The independent variables with the largest impact on high school SAT scores were White (positive), ED (negative), and High School A (negative). The independent variables with the largest impact on elementary school ISTEP scores were Elementary School G (negative), Elementary School I (negative), and Elementary School N (negative). Elementary School I and N are feeder schools of High School A. Of the student races in the study, White had the largest positive impact on test scores for both grade levels. Being ED had a negative impact on test scores at both grade levels.

### ***Research Question 2***

*How do race and socioeconomic status moderate the relationship between school attended and test scores among 5th and 11th grade students?*

Results from each companion study were different. Race, but not socioeconomic status, did moderate the relationship between school attended and test scores among 5th-grade students. This means that the impact of the school is different based on race in elementary schools. However, race and socioeconomic status did not moderate the relationship between school attended and test scores for 11th-grade students.

### ***Research Question 3***

*What differences exist in mean standardized test scores between schools for students who are Black and economically disadvantaged (ED)?*

Results from each companion dissertation were different. There were statistically significant differences between certain elementary schools. Namely, there were differences between Elementary Schools I and R, as well as School O with nine other schools. The results for School O were not included in the companion study, however, because there were only two Black and ED students at the school. Students at Elementary School I performed significantly lower than School R. Elementary School I is a feeder school for High School A. In contrast to elementary schools, there was not a significant difference in test scores between high schools for students who were Black and ED.

### ***Research Question 4***

*What differences exist in school factors of racial composition, socioeconomic composition, and educator experience?*

Both studies showed significant differences in racial composition between schools. Seventeen elementary schools showed significant differences, as well as all five high schools. Similarly, both studies showed significant differences in socioeconomic composition between

schools. Eighteen elementary schools had significant differences in socioeconomic composition, as well as four high schools. When comparing educator experience, only elementary schools had significant differences. There were significant differences in mean years of experience between elementary schools. Elementary School I was different from eight other schools. The percentage of new and experienced teachers was also significant between elementary schools. Elementary School I, had the highest percentage of new teachers, representing 39.3% of their teaching staff. Elementary Schools M and N also have high percentages of new teachers within their schools, representing 38.1% and 37.5%, respectively.

## **Discussion**

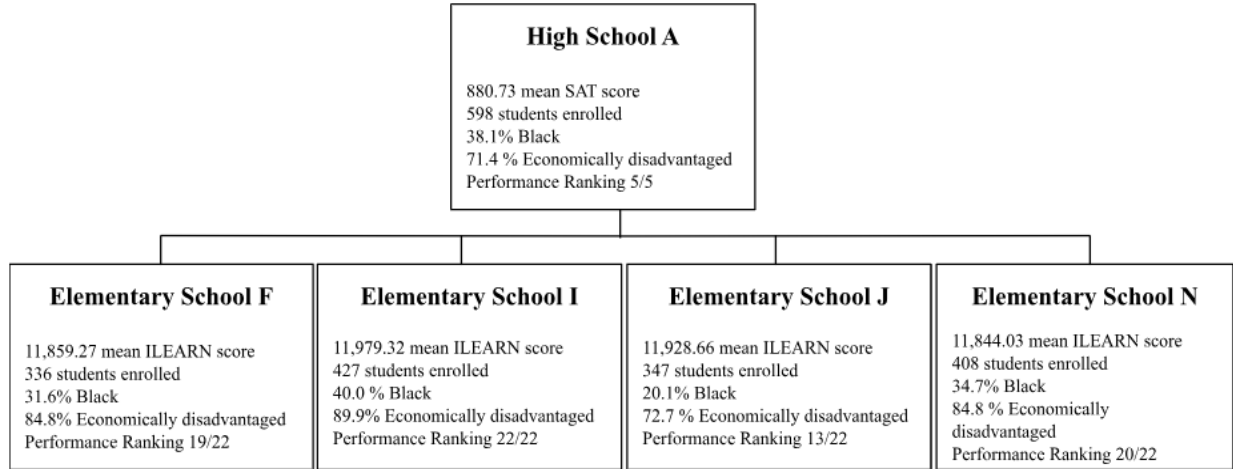
Based on the results of questions 1-4, two high school feeder patterns were examined, the highest and lowest performing, to draw conclusions about what may be happening longitudinally. Figure 3 shows High School A and its elementary school feeders. High School A had the most negative impact on SAT scores of any high school, and was the lowest-performing high school in the district. Elementary Schools F, I, J, and N are the feeder schools for High School A. Schools F, I, and N are ranked in the bottom five elementary schools for performance. All feeder schools for High School A are in the bottom 50% of elementary schools for academic performance. Figure 4 shows High School D and its elementary school feeders. High School D, the highest-performing high school in the district, had the most positive impact on SAT scores of any high school. Its feeder schools are Elementary Schools E, G, O, P, Q, and U. Fifty percent of High School D's feeder schools are ranked in the top five for academic performance out of the 22 elementary schools. Two are in the bottom 50%.

The racial and socioeconomic compositions of High School A and its feeder schools differed significantly from the district. The racial composition of High School D and feeders E, O, P, Q, and U differ significantly from the district. The socioeconomic composition of the high school and feeders E, G, O, P, and Q differed from the district. While the high school had no differences in educator experience, some of its feeders did. A Tukey's post hoc test revealed differences for elementary schools feeding into High Schools A and D. School pairings with differences include: Schools I and Q, Schools I and F, Schools Q and N, Schools E and P, Schools G and P.

High School A impacted SAT scores most negatively, and Elementary School I impacted ILEARN scores most negatively. Elementary School I is a feeder of High School A. High School A contained the largest percentage of Black and ED students. Elementary School I contained the third-highest percentage of Black students and the second-highest percentage of ED students. High School D was the highest-performing high school and contained the highest-performing elementary school feeder, Elementary School O. High School D had the lowest percentage of ED students and the second lowest percentage of Black students. Elementary School O had the lowest percentage of ED students and the fifth lowest percentage of Black students.

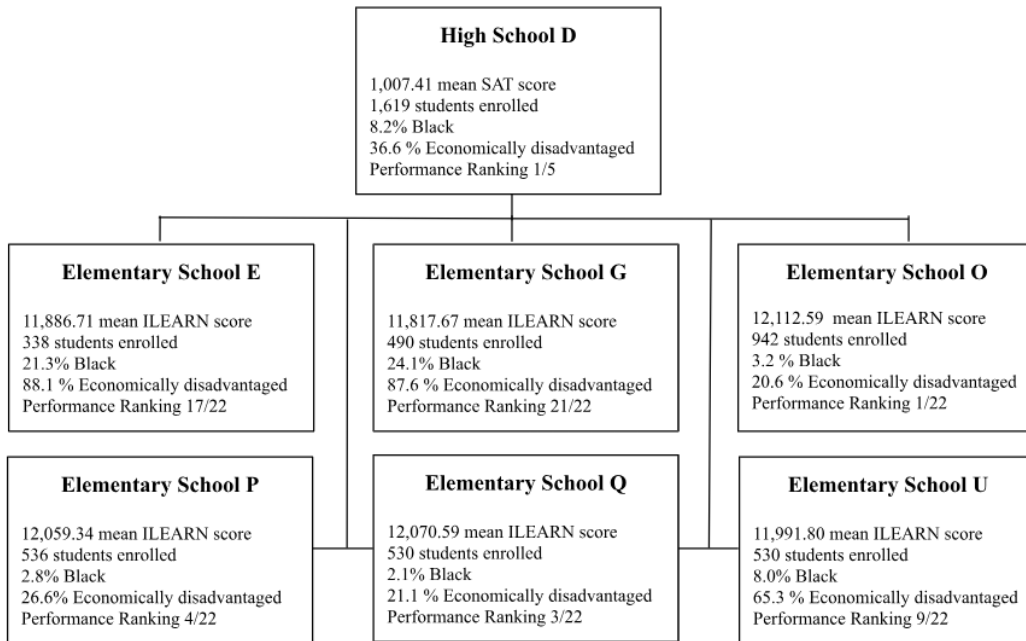
**Figure 3**

*High School A Feeder Pattern Statistics*



**Figure 4**

*High School D Feeder Pattern Statistics*



Schools were ranked according to the school-level factors identified through a literature review and according to the conceptual framework. The three school-level factors were socioeconomic composition, racial composition, and educator experience. Schools were ranked in each category from lowest to highest percentage. Then, those rankings were summed to get a total by school. For elementary schools, the total was then divided by the number of feeder schools per high school to get a mean. The ranking for high school matched the ranking for the mean feeder school score. This was expected based on school assignment boundaries and utilization of a high school feeder pattern. While the composition of high schools matched the collective composition of their feeder schools, there were several elementary schools that were very different within the same feeder pattern. Table 21 shows the school rankings with elementary school feeder patterns.

**Table 21***Feeder School Patterns with Rankings Based on School Factors*

High School	Elementary School	ED	Non-White	New Teachers	Total	Overall Ranking	Feeder School Mean	Feeder School Ranking
	Feeders	<i>Rank #</i>	<i>Rank #</i>	<i>Rank #</i>			<i>M</i>	<i>Rank #</i>
<b>School A</b>		5	5	4	14	<b>5</b>	52.5	<b>5</b>
	School F	16	18	14	48	17		
	School I	21	21	22	64	22		
	School J	13	14	12	39	13		
	School N	17	22	20	59	20		
<b>School B</b>		3	2	2	7	<b>3</b>	36.5	<b>3</b>
	School B	22	11	11	44	15		
	School L	6	6	7	19	5		
	School M	20	19	21	60	21		
	School S	7	7	9	23	7		
<b>School C</b>		4	4	5	13	<b>4</b>	37.0	<b>4</b>
	School A	14	20	10	44	15		
	School H	15	15	8	38	12		
	School K	8	12	16	36	11		
	School R	11	17	2	30	9		
<b>School D</b>		1	3	2	6	<b>2</b>	27.2	<b>2</b>
	School E	19	16	17	52	19		
	School G	18	13	18	49	18		
	School O	1	5	15	21	6		
	School P	4	4	1	9	1		
	School Q	2	3	4	9	1		
	School U	10	10	3	23	8		
<b>School E</b>		2	1	1	4	<b>1</b>	23.0	<b>1</b>
	School C	5	1	6	12	4		
	School D	9	8	13	30	9		
	School T	12	9	19	40	14		
	School V	3	2	5	10	3		

Based on the conceptual framework, these school factors should have predicted student academic outcomes. High School E should have been the highest performing since they were ranked number one; however, High School E was the third highest performing out of the five

high schools. High School D was the highest-performing. This could be because rank order neglects the magnitude of differences in individual factors or because other within-school factors not included in the study make the difference. A natural break occurs in total scores between the two lowest-performing high schools (A and C) and the three highest-performing high schools (B, D, and E). There were statistically significant differences in racial and socioeconomic compositions of the high schools; however, there were not significant differences in educator experience.

From an elementary perspective, High School D would have been presumed to be the highest performing based on the elementary feeder schools. Three of the six elementary schools were in the top five rankings for all categories except one, while one school was in the middle, and two schools were near the bottom. Given that there was no weight based on the size of school, all rankings and scores were calculated evenly, although the elementary Schools O, P, and Q are much larger than elementary schools E, G, and U.

### **Headlines from Both Studies**

1. White students had higher standardized test scores than other races at both grade levels.
2. Black students had lower standardized test scores than other races at both grade levels.
3. Students who are ED underperformed their non-ED peers at both grade levels.
4. Black-White and socioeconomic achievement gaps existed at both grade levels.
5. The factors analyzed through the conceptual framework predicted student performance differences, especially between High School A and its elementary school feeders compared to High Schools D and E and their elementary school feeders.



6. The schools with the highest test scores had the lowest percentage of ED students at both grade levels.
7. Students who were Black and ED did not perform significantly better in almost any school, which suggests the independent variables measured were not enough to overcome the systemic inequities.

### **Implications of the Results for Practice**

The most evident implication from these studies is the need for targeted support for students who are Black as well as students who are ED, regardless of school or grade level. White students consistently outperformed all other races, while Black students performed the lowest. The same is true for students who are not ED. Students who are not ED outperformed those who were, regardless of school or grade level. These studies did not include supports that were available for students; however, it is evident that any and all supports provided were insufficient to overcome the academic disparities.

A second implication from these studies is the need to balance school student composition, both racially and economically at all grade levels. Academic performance for all students was highest at schools with the lowest percentage of ED students. The same is true for Black students in schools where there were lower concentrations of Black students. Students, regardless of race or economic status had better academic outcomes when they attended a school with lower concentrations of Black and ED students. This may be due to the greater needs of students who are Black and/or ED and the amount of need concentrated within a given school.

A third implication is to redistribute teaching staff so that new teachers are proportionate across all schools. This would ensure that students with the most need do not have the least

experienced teachers. This could be accomplished through hiring practices and policies. The trend from these studies was that schools with a higher percentage of new teachers had larger concentrations of Black and ED students. This was most evident in elementary schools where there is the greater variance in student body compositions.

### **Implications of the Results for Future Research**

Further research is needed to examine possible effective interventions with students who are Black and/or ED, regardless of grade level or school composition. Additional research is also needed to determine how cultural capital theory impacts academic outcomes on students, beyond just racial composition of schools. This would include cultural competence, cultural pedagogy, and diversity of teaching staff. Additionally, more investigation is needed into social capital theory, specifically neighborhood composition and social networks for students and families that are beyond the school walls. By the design of rebalancing schools, access to social capital should improve within schools due to the more proportional distribution of all students; however, further research is needed to determine how students leverage social capital. Finally, continued research is needed related to the value-added theory. In the current studies, value-added was only focused on teacher experience. In future research, value added should also investigate the quality of instruction that is happening in the classroom by new and experienced teachers.

These studies examined academic outcomes for two different cohorts of students during the same years. A future study could examine the same cohort from 5th to 11th-grade to see if outcomes change based on school composition. The current school boundary assignment is a high school feeder pattern. Elementary schools that feed into high schools may have very different school compositions. Some students attend elementary schools that are predominantly

white and affluent, while others attend elementary schools that are more racially diverse with high levels of poverty. Those students feed into the same high school. It would be interesting to examine how academic outcomes change over time as school compositions change.

## **Conclusion**

This comparison of two companion dissertations allowed for an analysis of academic outcomes for students who are Black and ED in an urban, Midwestern school district. Through analysis of the five high school feeder patterns including 22 elementary schools, students who are Black and ED did not perform significantly better in almost any school, which suggests the independent variables measured were not enough to overcome the systemic inequities. Unfortunately, there were no elementary or high schools that were able to overcome the Black-White or socioeconomic academic gaps that are pervasive in the United States. While there were differences in some schools for academic outcomes of students who are Black and ED, neither any of the high schools nor 20 of the elementary had statistically significant differences for these students. In two elementary schools that had statistically significant differences, students performed better in environments with lower concentrations of poverty, fewer Black students, and fewer new teachers. This finding aligns with existing research and the conceptual framework.

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## Appendix

### PERMISSION TO CONDUCT RESEARCH

Office of the Superintendent

January 3, 2024

Tori Colson, Ed.D.  
University of Southern Indiana  
8600 University Blvd  
Pott College of Science, Engineering, and Education  
Education Center, 1103A  
Evansville IN 47712

Dear Dr. Colson,

The [REDACTED] approves Darla Hoover's request to conduct research in our school corporation. This approval extends to data collection related to her proposed dissertation study. Our approval begins January 1, 2024 and will be in effect until this research is completed and a final defense has been scheduled.

Sincerely,

[REDACTED]

[REDACTED]  
Superintendent

cc: Darla Hoover