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The State of School Segregation in Texas and the Factors Associated with It

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School Segregation Harms Children of Color

In 1957, a group of nine Black teenagers bravely confronted the Arkansas National Guard, which blocked them from entering their recently integrated high school after Brown v. Board of Educ., 347 U.S. 483 (1954). The standoff ended only after President Eisenhower ordered federal troops to escort these students into their school (Fitzgerald, 2007). By refusing to be turned away from their rightful place in an integrated school, the children became known as the "Little Rock Nine." They pushed the United States to honor the constitution's equal protection clause enshrined in the 14th amendment. Furthermore, their stoic steadfastness in the face of racial hatred provided future civil rights leaders a powerful image of justice to evoke and remind the public of this nation's promise to treat all people equally, especially in education through desegregation. Unfortunately, since the 1970s, desegregation efforts failed to keep the promise of equality in the 14th amendment. Desegregation efforts stalled in the past three decades, even as the percentage of Black and Hispanic students around the country increased dramatically (Reardon & Owens, 2014). Consequently, according to Reardon & Owens (2014), students of color in high poverty schools—one measure of segregation—was highly segregated in 2016 with 46.6% of students of color in high poverty schools compared to 8.3% of White students.

As a result of these disappointing desegregation outcomes, Black and Hispanic children in segregated schools suffer academically. According to Condron et al. (2013), Black and Hispanic children who attend segregated schools have poorer academic outcomes than those from more integrated schools. These researchers used multiple regression analysis in their study of 4th grade scores from the National Assessment of Educational Performance (NAEP) and found a strong negative relationship between school segregation and NAEP scores in both reading and math. Hanushek et al. (2009) found similar results in a study using stacked panel data from Texas that measured the current and cumulative past inputs to student achievement, including segregation. They determined these negative effects of segregation were much more pronounced for Black versus Hispanic students. Condron et al. (2013) argued that segregated Black and Hispanic children earn lower standardized test scores because their schools received fewer state and local resources than integrated schools. Another concern raised regarding race-based school segregation is school funding. Public school funding comes from property tax revenue, which is higher in White, property-rich neighborhoods (Bischoff & Reardon, 2014). Kreisman and Steinberg (2019) provide evidence of the relationship between school funding and student achievement using data from Texas. They found that a $1,000 increase every year in foundation funding is associated with a 0.1 standard deviation increase in reading scores and a 0.08 increase in math (Kreisman & Steinberg, 2019).

Investigating school segregation by race and ethnicity in Texas is critical when considering the state's demographics and past reports on school segregation. Texas public schools are becoming increasingly Hispanic with every passing year (Musgrave, 2019). Orfield et al. (2016) pointed out that as the Hispanic population grows, Texas consistently ranks as the third most segregated state by ethnicity nationwide. This researcher determined the level of segregation by using an exposure index that measures Hispanic students' exposure to white children. By contrast, according to the Texas

Education Agency (2020), the statewide percentage of black public-school students has remained steady over the past five years. However, Orfield et al. (2016) reported that black student is the second-highest in the country using the same exposure index.

This study investigated school segregation by race and ethnicity in Texas and tackled the following research questions:

1.) What is the current state of school segregation by race and ethnicity in Texas, and how does it differ between public charter and traditional public schools?

2.) What factors are associated with variations in segregation in Texas public schools?

One goal of this research was to examine school segregation by race and ethnicity in Texas. This will help Texas voters and lawmakers decide whether further actions are necessary to decrease school segregation. Additionally, I tested for the existence of relationships that past researchers uncovered between various factors and school segregation by race and ethnicity. Understanding associated factors could help researchers who study segregation explain the conditions under which these relationships do not exist.

This paper starts with a brief overview of the history of segregation through the lens of critical race theory. Next, a literature review is provided, which discusses the factors that past researchers have found to be associated with school segregation by race and ethnicity. The paper then includes segregation measurement and methodology sections, which review methods used to measure school segregation. This paper subsequently reports results on school segregation in Texas and analyzes study findings.

Brief History of School Segregation

When Dr. Martin Luther King Jr. delivered his "I Have a Dream" speech in 1963 at the March on Washington for Jobs and Freedom, his words stirred support among the American public for racial equality and integration. He delivered his speech 73 years after the United States passed the Morrill Act in 1890, which banned new land-grant colleges from using race as an admissions criterion (Boucher, 2017). Dr. King's speech also took place 9 years after Brown v. Board of Educ. (1954), which declared that de jure segregation of Black and Hispanic students was a violation of the Equal Protection Clause of the Fourteenth Amendment (Brown v. Board of Educ., 1954). Soon after Dr. King's speech and amidst a national civil rights movement, President Johnson signed the 1964 War on Poverty Act and the 1965 Elementary and Secondary Education Act, two pieces of legislation which increased education and social safety net funding for low-income students and families (Zeitz, 2019). Brown v. Board of Educ. (1954) and Dr. King's speech were turning points that rebuked a long history in America of white supremacy and discrimination that falsely characterized Black and Hispanic students as inferior and subhuman (Hasian, 1996). However, these events were not the only pivotal strides in history to end school segregation. One pivotal court case successfully challenged the segregation of Hispanic students prior to 1954. In Mendez v. Westminster School District of Orange County (1947) the United States Court of Appeals for the Ninth Circuit ruled that children of Mexican descent could not be segregated into separate schools because Mexicans are White. In this case, the court also rejected schools' official justification for segregating over 90% of Texas Hispanic students—that they would get better language support in segregated environments (Heilig & Holme, 2013).

In the decade following Dr. King's famous speech, many districts integrated their schools to varying degrees, voluntarily and by state or local order (Schertzer & Walsh, 2019). Yet, for decades after these court decisions, most Black and Hispanic students still attended majority-minority schools (Thompson Dorsey, 2013). To avoid school integration, many White families moved their children out of integrated districts. Over time, this White flight accounted for up to 60% of segregation between schools (Schertzer & Walsh, 2019). As a result, white flight seriously undermined desegregation efforts.

Desegregation efforts then weakened even further due to a series of crucial court cases. The all-White Supreme Court decided in Milliken v. Bradley (1974) that federal courts could not force school districts to be a part of a desegregation order unless there was evidence of equal protection violations (Reardon & Owens, 2014). In addition, in Board of Education in Oklahoma City Public Schools, Independent School District No. 89 v. Dowell (1991), the Court ruled that a school that had eliminated de jure segregation would no longer require desegregation supervision by the district courts (Reardon & Owens, 2014). In Freeman v. Pitts (1992), desegregation efforts weakened even more, when the majority-White Supreme Court established six "Green Factors" that permitted school districts to claim the elimination of de jure and de facto segregation if they addressed five of the six factors. These factors included the integration of the following: student demographics, faculty demographics, staff assignment, transportation, extracurricular activities, and facilities (Thompson Dorsey, 2013). Therefore, schools could claim that they eliminated segregation even though they had not fully integrated Black and White students (Thompson Dorsey, 2013; Wilson, 2016).
In Texas, during the years after Brown v. Board of Educ. (1954), the courts placed 60 school districts under integration orders. And as of 2014, twenty-four desegregation orders were still in place despite the existence of the Supreme Court's Green Factors. Reardon & Owens (2014) argue that school segregation by race and ethnicity still persists in Texas. They indicated minority students in high poverty schools—one measure of segregation—was highly segregated in 2016 with 46.6% of students of color in high poverty schools compared to 8.3% of White students. Furthermore, Heilig & Holme (2013) found that Hispanic students in Texas were highly segregated based on ethnicity, poverty, and language ability (Heilig & Holme, 2013).

Literature Review

The history of segregation in the United States provides an essential backdrop to the literature discussing five main factors associated with school segregation by race and ethnicity. These five factors are residential segregation, socioeconomic status, school accountability scores, school safety, and charter schools. Each factor will be discussed in greater detail.

Residential Segregation

Past studies indicated that school segregation is positively associated with patterns of residential segregation (Frankenberg, 2013; Orfield, 1985). As residential areas become more diverse, so do demographics in schools. For instance, in Frankenberg's (2013) study on the relationship between residential and school segregation, the researcher examined dissimilarity indices for residential and school segregation in 362 major metropolitan areas from the U.S. Census and National Center for Education Statistics from 2000 to 2012. Dissimilarity indices showed that segregation increased with higher levels of dissimilarity between neighborhood and school (Frankenberg, 2013). Using regression analysis, Frankenberg found that every one index point increase in residential segregation was

associated with a one index point rise in school segregation. However, when she disaggregated her data by state, she noticed that this relationship was slightly weaker in southern states compared to the northern states. The relationship was also weaker when analyzing Hispanic students only (Frankenberg, 2013).

Frankenberg's (2013) work reinforced what Orfield (2013) argued for decades that segregated schools were linked to segregated neighborhoods. Orfield (2013) indicated that starting in the 1960s, states began to push municipalities to implement integration mandated by Brown v. Board of Educ. (1954). Many states and municipalities complied by decoupling school attendance zones from neighborhoods, which were highly-segregated. However, Orfield (2013) pointed out that the following Supreme Court decisions weakened the decision in Brown v. Board of Educ. (1954): Milliken v. Bradley (1974), Board of Education in Oklahoma City Public Schools, Independent School District No. 89 v. Dowell (1991), and Freeman v. Pitts (1992). As a result, schools started to become just as segregated as neighborhoods (Orfield, 2013).

Socioeconomic Status

Previous research also indicated that school segregation is negatively associated with socioeconomic status because income determines what housing people can afford and therefore influences residential segregation. Iceland and Wilkes (2006) conducted a study to determine the relationship between socioeconomic status and residential segregation using multivariate analysis on data from the United States Census Bureau on 331 American metropolitan areas between 1990 and 2000. These researchers determined that socioeconomic status had a strong negative association with residential segregation, especially for Hispanic people (Iceland & Wilkes, 2006). Bischoff and Reardon (2014) conducted a similar study on 117 American metropolitan areas between 1970 and 2009 using the United States Census Bureau data. They found a strong positive relationship between income inequality and residential segregation. This means that as income inequality increased, so did residential segregation and, therefore, school segregation. They also found that this residential segregation was most significant among Black and Hispanic people (Bischoff & Reardon, 2014).

School Accountability Scores

Some past studies have uncovered a positive relationship between accountability scores and school segregation. For instance, Davis et al. (2015) conducted a study to determine the relationship between accountability regimes created under the No Child Left Behind (NCLB) Act and school segregation. These researchers conducted multiple regression analysis using 1987-2011 data from the annual Common Core Data (CCD) census along with enrollment and population data from the United States Census Bureau. They determined that Black-White school segregation increased with the passing of NCLB and that these segregation effects were the strongest in states that had preexisting accountability regimes. They attribute this increase in segregation to White parents moving their children to whiter schools with higher accountability ratings (Davis et al., 2015).

Heilig and Holme (2013) conducted a similar study to determine the relationship between school accountability rating and segregation by race and ethnicity. They conducted logistic regression using 2011 data from the United States Census Bureau and 2011 accountability ratings data from the Texas Education Agency. They found a strong negative association between school accountability rating and segregation by race and ethnicity, especially Hispanic students (ELLs; Heilig & Holme, 2013).

School Safety

Researchers use the term school safety in a variety of ways. For instance, Lenzi et al. (2017) used a broad definition of school safety in their study of 49,638 California students ages 10 to 18 participating in the 2010–2012 California Healthy Kids Survey. These researchers defined school safety as the absence of bullying, fighting, and violent crime. They also included in their definition of psychological safety when, for instance, students earn bad grades (Lenzi et al., 2017). By contrast, our definition of school safety aligns with Mayer and Jimerson (2018), who framed the concept within a discussion of school violence. These researchers presented models for the prevention, identification, and eradication of violence in schools (Mayer & Jimerson, 2018).

Past studies also showed a negative relationship between school violence and segregation of students by race and ethnicity. For example, Eitle and Eitle (2003) conducted a study using 1999-2000 data from the Florida Department of Education on student enrollment and violent incidents in 67 urban and suburban school districts. They also used county demographics data from the United States Census Bureau. These researchers conducted multiple regression analyses, using two segregation indices (dissimilarity and racial inequality) for the independent variables and incidences of school violence for the dependent variable. Meanwhile, they controlled for school characteristics. Eitle and Eitle (2003) found a negative relationship between school segregation and violence and a positive relationship between racial inequality and violence.

Eitle and Eitle (2003) use social strain and social control frameworks to explain their findings. Social strain occurs when different races and ethnicities mix, and hostility or stereotyping ensues, putting a strain on social relationships. The social control framework indicates that people who experience the indignities associated with racial inequality come to distrust the education system, including school rules. As a result, they commit more violent offenses (Eitle & Eitle, 2003). Several studies in the past tested social strain and social control theories. Most recently, Paez (2018) studied cyberbullying within the framework of social strain theory. Cyberbullying involves harassing and demeaning emails, text messages, and social media posts (Paez, 2018). Paez (2018) used data from the 2009/2010 Health Behavior in School-Aged Children (HBSC) study and conducted a multivariate logistic regression analysis to identify significant factors associated with engagement in cyberbullying. Results show that students who experienced strain engage in cyberbullying (Paez, 2018).

Charter Schools

Past research presents mixed results on the relationships between charter schools and school segregation. Wilson (2019) argued that charter schools are the new driver of school segregation in the United States. She argues that predominantly-White charter schools are creating enclaves where White parents can segregate their children from students of color (Wilson, 2019). Furthermore, Kotok et al. (2017) conducted a study in Pennsylvania that revealed the transfers of Black and Latino students from traditional public to charter schools tended to create higher levels of segregation. Stein (2015) conducted a similar study in Indianapolis and found that the introduction of school choice in charter schools increased levels of racial isolation. However, unlike in Pennsylvania charter schools, segregation as racial isolation occurred in Indianapolis, because White families tended to choose schools with higher percentages of White students.

By contrast, Rapp and Eckes (2007) studied data from 32 states and found that charter schools were slightly more segregated, but were not actively segregating students. These researchers demonstrated

that segregation in charter schools resulted from parent choice, a lifting of mandatory desegregation orders, and the language in statutory requirements for charter schools. Furthermore, Mickelson et al. (2018) and Jacobs (2011) argue that charter schools mirror community segregation and parent preferences for neighborhood schools, which perpetuates historical segregation by race and ethnicity. Vasquez Heilig et al. (2016) argued that some charter schools in Texas actually chose specifically to open in and serve these specific residentially segregated communities.

Finally, Abioye (2019) points out that the charter school movement for accountability and social justice began as early as 1990 in West Oakland, California, which was an epicenter of the Black Panther Party and civil rights movements. The author indicates that the two charter schools that opened there had a majority-Black student population, faculty, and leadership, which was a source of pride. According to Abioye (2019), these two schools were gathering places that strengthened the African American community (Gintis, 2012).

Methods and Data Source

In this section, we begin with a description of measuring school segregation. As Reardon and Owens (2014) indicate, a researcher's choice of segregation measurement has a major impact on their perception of it. After discussing segregation measurement, we explain our statistical methods and data sources.

Measuring Segregation

Some researchers conceive of segregation as separateness and measure it by the degree of isolation one group has from another (Massey & Denton, 1988; Orfield, 2001). These researchers would consider a school with 97% Hispanic students ethnically segregated because the student body is almost completely isolated from non-Hispanic children. Other researchers view segregation as unevenness between groups (James & Taeuber, 1985; Massey & Denton, 1988). They accordingly would consider a school segregated if its student demographics diverged from the racial and ethnic makeup of other schools in and out of the district, or if these demographics diverged from those of the community (i.e., county, city or zip code). These two different views of segregation have led to the development of 20 varying indices (Frankel & Volij, 2010). And as Kotok et al. (2017) point out, researchers could use these 20 indices to reach several different conclusions about levels of segregation in Texas.

Reardon and Owens (2014) indicate that there is no "correct" way to measure segregation. The choice of measurement depends on whether researchers focus on the peer effects or compositional effects of segregation (Reardon & Owens, 2014). Peer effects result from the transfer of achievement norms that occur in integrated schools from White to non-White students (Reardon & Owens, 2014). Researchers who focus on peer effects use isolation metrics that measure exposure to White students. For example, Fiel (2013) conducted a study on school segregation using 1993 to 2010 national data from multiple sources and determined that Black isolation decreased by 6.3% while Hispanic isolation increased by 7.6%. He argues that Hispanic isolation increased because of population changes. Furthermore, Siegel-Hawley & Frankenberg (2012) found that isolation of Black students from their White peers increased in many southern metropolitan areas by up to 10% in the ten years leading up to 2009.

By contrast, researchers who focus on compositional effects measure segregation using unevenness metrics. For example, the Atkinson Index measures within-district segregation by subtracting the sum, over all schools in a district, from some weighted geometric average of the percentages of each group who attend the school (Frankel & Volij, 2010). These weights are nonnegative and add up to one, e.g. 1-(.5)^a (.2)^b- 〖(.5)〗 ^a 〖(.8)〗 ^b where .5 and .2 are a school's racial or ethnic demographics. The variables a and b are the weights that add up to 1. These weights account for the relative sizes of schools within a district (Frankel & Volij, 2010).

Conger (2005) conducted a study on school segregation of New York City elementary students focusing on compositional effects. He used data from 1995-1996 and 2000-2001, and a measurement called the Segregation Index, which is a measure of demographic unevenness. He determined that the segregation of Black students stood at 45%, and the unevenness of Hispanic students was 32%. These percentages indicated the racial and ethnic segregation in New York City elementary schools, with 100% being the maximum level of segregation and 0% being the minimum, meaning schools were completely integrated (Conger, 2005). We provide this context for 45% and 32% because the meaning of percentages can vary by different types of segregation measurement.

This study measures segregation as unevenness rather than isolation and exposure for a couple of reasons. First, van Ewijk and Sleegers' (2010) meta analysis of many school segregation studies indicates that peer effects on student achievement are generally small and vary greatly by race and ethnicity. As a result, the isolation and exposure metrics concerned with peer effects do not measure the most critical aspects of school segregation. Second, as Schaeffer (2019) from the Pew Research Center reported, Texas is second only to California in the number of counties that have become majority non-White in the past two decades due to a birth rate that is higher for Hispanics than for White people. Schaeffer (2019) predicted that the trend will continue and suggested that schools in these increasingly non-White counties could become more racially and ethnically isolated as the proportion of White students decreases. Therefore, isolation and exposure metrics would actually be measuring demographic changes unrelated to traditional segregation caused by White flight or zoning policies.

Furthermore, the methods in this study differ from the 20 segregation indices Kotok et al. (2017) described. Those 20 indices measure unevenness through demographic composition differences between schools within a district or between districts, in contrast to our methods measuring compositional differences between a school and a distinct geographic area (Frankel & Volij, 2010). As a result, our methods did not require adjustment for relative school sizes within a district, unlike the Atkinson Index, because we compared school demographics to those of a geographic area. We measured segregation of Black students—in both traditional public and public charter schools—by subtracting the percentage of Black students for each school from the percentage of Black people in each campus' respective zip code. We then took the absolute value of the difference. For instance, if a school had a student population that was 10% Black and the campus zip code was 50% Black, then the school's level of segregation was 40%. A 0% would mean that a school's Black population mirrors neighborhood demographics, and therefore has no segregation. Using these methods, segregation could be as large as 100%, depending on the relative makeup of school and zip code populations. We used the same methods for measuring segregation of Hispanic students.

We separated Texas school districts by school type to conduct our statistical analysis and modeling. We used a dummy variable, coding traditional public schools as "0" and open-enrollment public

charter schools as "1." As described in Chapter 11 of the Texas Education Code, traditional Texas public schools are part of the independent school districts that have existed in the state since the late 1800s. Open-enrollment charter schools are part of open-enrollment charter districts, which the Texas Legislature created in 1995 as a part of Senate Bill 1. According to Chapter 12 of the Texas Education Code, these open-enrollment charter districts include traditional campuses, dropout recovery schools, and residential treatment centers. Open-enrollment charter schools do not include virtual campuses or private tuition-based schools. Open-enrollment charters also do not include home-rule charters described in Chapter 12 of the Texas Education Code or district-charter partnerships created as a part of Senate Bill 1882 in the 85th Texas Legislative Session.

We separated our segregation data by charter versus traditional public schools, because there are few important systematic differences between these school types in Texas that could lead to different levels of segregation. First, according to the first section in Chapter 12 of the Texas Education Code, one of reasons the Texas Legislature created public charter schools was to improve student achievement by providing school choice to students in failing schools. Many failing schools in Texas are majority-minority (Sepulveda, 2019). Therefore, one of public charters' priority populations by default are Black and Hispanic students (Vasquez Heilig et al., 2016). Second, some public charters were founded to cater to specific racial, ethnic and cultural demographics (Vasquez Heilig et al., 2016). Third, public charters in Texas a percentage of teachers of color that is two times that of traditional public schools, which could attract more families of color (Texas Education Agency, 2020).

Statistical Analysis and Models

After measuring Black and Hispanic segregation by school type, this study involved descriptive statistics for each independent and dependent variable in its sample of Texas school districts, e.g. the sample size, mean, standard deviation, the minimum, the maximum and skewness. The study then involved a pair of two-sample t-tests in determining how segregation differs between public charter and traditional public schools. The first t-Test included the segregation measurements of Hispanic students in charter versus traditional public schools. The second t-Test included segregation measurements of Black students in charter versus traditional public schools.

Last, two rounds of multiple regression analyses were conducted to determine which factors were associated with Black and Hispanic segregation. Independent variables in the first and second round included the following: % EcoDis Students; Accountability Score; Safety Funding Per Pupil; and Charter Schools. We used the following variables to control for community and school characteristics: % Black by Zip Code; % Hispanic by Zip Code; % White by Zip Code; % White Teachers; Discipline Students; Enrollment Size; and Median Income. The dependent variable in this first round was segregation of Black students, and the dependent in the second round was segregation of Hispanic students. The multiple regressions were conducted in SPSS using the listwise function to achieve the largest possible effect size. We hypothesized that these two rounds of multiple regression analysis would generate statistics to enable us to build the following two equations to estimate segregation of Black students (a) and Hispanic students (b).

$$BlackSeg=B_0+B_1\cdot\%\ Black\ by\ Zip\ Code+B_2\cdot\%\ Hispanic\ by\ Zip\ Code+B_3\cdot\%\ White\ by\ Zip\ Code+B_4\cdot\%\ White\ Teachers+B_5\cdot\%\ EcoDis\ Students+\ B_6\cdot Discipline\ Students+B_7\cdot Accountability\ Score+B_8\cdot Enrollment\ Size+B_9\cdot Safety\ Funding\ Per\ Pupil+B_10\cdot Median\ Income+B_11\cdot Charter\ School+U$$

HispSeg=B_0+B_1·% Hispanic by Zip Code+B_2·% Black by Zip Code+B_3·% White by Zip Code+B_4·% White Teachers+B_5·% EcoDis Students+ B_6·Discipline Students+B_7·Accountability Score+B_8·Enrollment Size+B_9·Safety Funding Per Pupil+B_10·Median Income+B_11·Charter School+U

In regression equations (a) and (b), B_0 is the intercept constant, U is the error term and B_i are the coefficients estimated in the regression analysis for each independent variable. Estimated coefficients represent the predicted change in BlackSeg and HispSeg for a one-unit change in the independent variables. These estimated coefficients—including their standard errors, standardized coefficients, t-statistics, and p-values—appear in Tables 1 and 2 in the Appendix.

Data Sources for Study

The 2018 school enrollment rates for calculating the segregation of Black and Hispanic students came from the Texas Education Agency's (TEA's) 2018 PEIMS (Public Education Information Management System) Standard Reports. The United States Census Bureau's American Community Survey provided 2018 population rates for Hispanic and Black people by zip code and county, in addition to 2018 data on median income. Finally, school-level datasets for the following came from the TEA's 2018 Texas Academic Performance Reports: the percentage of economically disadvantaged students, the percentage of White teachers, the percentage of students in the discipline population, school accountability scores, and safety and security funding per pupil.
The study sample included 6,089 schools. Because a random sample of data by zip code from the American Community Survey was used, the 6,089 sample of schools was the result of a probability sample that is generalizable to the population of schools in Texas.

Results

After conducting the pair of two-sample t-tests, we determined that the mean levels of segregation of Black students in public charters and traditional public schools were 10% to 7%, respectively. We found a statistically significant difference between these means at a 0.05 alpha level, meaning that segregation of Black students was slightly higher than in public charter schools. By contrast, the average levels of segregation of Hispanic students in public charters and traditional public schools were 16% to 15%, respectively, which was not a statistically significant difference at a 0.05 alpha level.

Factors Associated with Segregation of Black Students

Table 1 in the Appendix presents results from the second multiple regression analysis, the beta coefficients of which constitute the regression model. According to the standardized beta coefficients β column, % Black by Zip Code had the strongest positive relationship to segregation of Black students. Every 1% increase in % Black by Zip Code was associated with a 0.18% increase in segregation of Black students. The % EcoDis Students had the second strongest positive relationship to the segregation of Black students. Every 1% increase in % EcoDis Students was associated with a 2.4% increase in segregation of Black students.

Three variables with the strongest negative relationship to segregation of Black students include the following: % Hispanic by Zip Code, % White Teachers, and the Enrollment Size. The five remaining variables—% White by Zip Code, Accountability Score, Safety Funding Per Pupil, % White Teachers, and Charter School—had the weakest (but still statistically significant) negative

relationship to segregation of Black students. Every 1% increase in % Hispanic by Zip Code was associated with a 0.082% decrease in Black segregation. Every 1% increase in Accountability Score was associated with a 0.002% decrease in Black segregation. Every 1% increase in Safety Funding Per Pupil was associated with a 0.005 decrease in Black segregation. Every 1% increase in % White Teachers was associated with a 5% decrease in Black segregation.

BlackSeg=B_0+0.18·% Black by Zip Code-0.082·% Hispanic by Zip Code-4.087·% White by Zip Code-0.046·% White Teachers+2.358·% EcoDis Students-0.033·Accountability Score-0.002·Enrollment Size-0.005·Safety Funding Per Pupil+1.648·Charter School+U

Factors Associated with Segregation of Hispanic Students

Table 2 in the Appendix presents results from the first multiple regression analysis modeling segregation of Hispanic students. The values in column B are the beta coefficients in the regression model. According to the standardized beta coefficients in the column labeled β, the four beta coefficients with the strongest relationship to Hispanic segregation include the following: % EcoDis Students, % Hispanic by Zip Code, % Black by Zip Code and % White by Zip Code. Because the coefficient for % EcoDis Students is positive, it is positively associated with Hispanic segregation. For every 1% increase in % EcoDis Students, segregation of Hispanic students increased by 17%. By contrast, % Hispanic by Zip Code, % Black by Zip Code and % White by Zip Code was negatively associated with Hispanic segregation. Every 1% decrease in Hispanic students was associated with 0.24% decrease in Hispanic segregation. Every 1% decrease in White students was associated with a 0.09% decrease in Hispanic segregation. And every 1% decrease in Black students was associated with a 0.20% decrease in Hispanic segregation.

Discipline Students, Accountability Score, Enrollment Size, and % White Teachers also had negative beta coefficients, meaning that they were negatively associated with Hispanic segregation. Every 1% increase in Discipline Students was associated with a 3.5% decrease in Hispanic segregation. And every 1% increase in Accountability Score was associated with a 0.05% decrease in Hispanic segregation. Every school enrollment increase of 1 student was associated with a 0.002% decrease in Hispanic segregation. Finally, every 1% increase in % White Teachers was associated with a 0.09% decrease in Hispanic segregation.

Based on this multiple regression analysis, we modified our hypothesized model from the methodology section to the following:

HispSeg=B_0-0.242·% Hispanic by Zip Code-0.201·% Black by Zip Code-9.119·% White by Zip Code-0.089·% White Teachers+17·% EcoDis Students -3.492·Discipline Students-0.052·Accountability Score-0.002·Enrollment Size+U

Discussion

Results from this study provide evidence to support claims by Reardon and Owens (2014) and others that segregation of Black and Hispanic students still exists in Texas public schools. However, we measured segregation as unevenness metrics by examining the difference of demographic compositions between school and zip code. The findings in this study suggest that school segregation is less severe than indicated in studies that measure segregation using isolation metrics. Furthermore, contrary to previous studies by Conger (2005) and others, the average segregation of Hispanic students

was higher than the segregation of Black students. Finally, results were just as mixed as previous studies on the differences of segregation by school type. Segregation exists in both traditional public and public charter schools, but Black students are slightly more segregated in charters.

Factors Associated with Segregation of Black Students

The studies reviewed in the literature indicated that socioeconomic status, school safety, and charter schools should be positively associated with the segregation of Black students. The literature review further indicated that school accountability scores should be negatively associated with the segregation of Black students. Our study results provide evidence to confirm the positive association between socioeconomic status, school safety, and charter schools and school segregation of Black students. Our study results also provide evidence to support a negative association between school safety and the segregation of black students. The coefficients for % EcoDis Students and Charter Schools were positive, but the coefficients for Accountability Score and Safety Funding Per Pupil were negative.

Factors Associated with Segregation of Hispanic Students

The literature review indicated that socioeconomic status should be positively associated with the segregation of Hispanic students. The results of this study confirm findings from Iceland and Wilkes (2006) and Bischoff and Reardon (2014) because the coefficient for % EcoDis Students was positive. The literature review furthermore indicated that school safety and charter schools should be positively associated with the segregation of Hispanic students. However, our study results only provide evidence of negative associations between school accountability scores and the segregation of Hispanic students. The coefficient for the Accountability Score was negative. However, in our model, a 1% increase in the segregation of Hispanic students would be associated with a 20% decrease in accountability score, which is equivalent to a drop of 2 letter grades in the Texas A – F system. Alternatively, a 1% decrease in the segregation of Hispanic students would be associated with a 20% increase in the Accountability Score. Therefore, we should not expect to see monumental changes in the segregation of Black students in the presence of radically changing accountability scores.

By contrast, our study results do not provide evidence for negative associations between the segregation of Hispanic students and the factors Median Income and Charter School. These two factors did not end up in our final regression model because they were not statistically significant. One possible reason for the statistically insignificant relationship between Safety Funding Per Pupil and the segregation of Hispanic students is that the relationship between violence and integration that Eitle and Eitle (2003) discuss may look different for the integration of Hispanic versus Black students. This is an area that requires more research. A possible reason for the statistically insignificant relationship between Charter Schools and the segregation of Hispanic students is the pervasiveness of Hispanic segregation of all public schools, including traditional public campuses. The t-test we conducted in this study, finding no statistically significant difference in the segregation of Hispanic students, supports this explanation.

Conclusion

Over sixty years ago, the Supreme Court ordered United States schools to desegregate. The Little Rock Nine and others then fought resistance to integration for many years after the Court's

decision. And only by the 1970s did hundreds of the most resistant school districts nationwide began to integrate after the Court ordered them to implement desegregation plans. The Little Rock Nine pushed the United States to honor the constitution's equal protection clause enshrined in the 14th amendment. Furthermore, their steadfastness provided future civil rights leaders a powerful image of justice to evoke and remind the public of this nation's promise to treat all people equally, especially in education through desegregation. However, desegregation efforts have stalled in the past three decades, even though the population of Black and Hispanic students nationwide has increased dramatically (Reardon & Owens, 2014).

This study investigated the current state of school segregation by race and ethnicity in Texas, and how it differs between public charter and traditional public schools. We also investigated the factors associated with variations in segregation in Texas public schools. Additionally, this study offers new insights on some differences in the segregation of Hispanic students, which were not discussed in past research. Therefore, researchers must study these differences in more depth. It is also important for the public and their lawmakers to consider these differences when making decisions about future efforts to further desegregate Texas public schools.

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Appendix

Table 1

Results from Multiple Regression Analyses, Dependent Variable "Segregation of Black Students"

Independent	B	SE B	β	t	p
% EcoDis Students	2.358**	0.531	0.071	4.44	0.000
% Black by Zip Code	0.18**	0.016	0.281	11.46	0.000
Enrollment Size	-0.002**	0.000	-0.114	-9.8	0.005
% Hispanic by Zip Code	-0.082**	0.007	-0.230	-12.08	0.000
% White Teachers	-0.046**	0.006	-0.142	-7.5	0.000
Charter Schools	-1.648**	0.361	-0.055	-4.56	0.002
% White by Zip Code	-4.087**	1.289	-0.072	-3.2	0.007
Accountability Score	-0.033**	0.012	-0.034	-2.73	0.000
Safety Funds Per Pupil	-0.005*	0.002	-0.027	-2.13	0.034

Note. The *N* in this multiple regression was 6,087 and the effect size of model including all independent variables was 0.257 or 25.7%. EcoDis = Economically Disadvantaged.

* The single asterisk * and double asterisk ** indicate that the unstandardized coefficient was statistically significant at the 0.05 and 0.01 levels of alpha, respectively.

Table 2

Results from Multiple Regression Analyses, Dependent Variable "Segregation of Hispanic Students"

Independent	B	SE B	β	t	p
% EcoDis Students	16.923**	0.79	0.376	21.43	0.000
Median Income	0.0000643**	0.000	0.054	2.79	0.005
% Hispanic by Zip Code	-0.242**	0.012	-0.499	-20.05	0.000
% White Teachers	-0.089**	0.009	-0.199	-9.85	0.000
% Black by Zip Code	-0.201**	0.026	-0.226	-7.85	0.000
Enrollment Size	-0.002**	0.000	-0.066	-5.40	0.000
% White by Zip Code	-9.119**	1.926	-0.118	-4.73	0.000
% of Discipline Students	-3.492**	0.906	-0.047	-3.86	0.000
Accountability Score	-0.052**	0.018	-0.039	-2.94	0.003

Note. The *N* in this multiple regression was 6,087 and the effect size of model including all independent variables was 0.168 or 16.8%. EcoDis = Economically Disadvantaged.

* The double asterisk ** indicates that the unstandardized coefficient was statistically significant at the 0.01 level alpha.