

Disposable Spaces: How Special Education Enrollment Affects School Closures

Urban Education
2025, Vol. 60(1) 154–184
© The Author(s) 2022
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/00420859221126700
journals.sagepub.com/home/uex



Rachel N. Weber¹, Federico R. Waitoller² ,
and Joshua M. Drucker¹

Abstract

Informed by austerity politics, struggling school districts have closed buildings to pursue cost savings. We investigate the factors affecting which schools are shuttered, proposing that the share of students with an Individualized Education Program (SIEP) influences the way building utilization is measured because of the different instructional spaces required. We examine the case of elementary schools in Chicago, where 44 of 402 schools were closed in 2013. Simulating administrative decision-making parameters with a logistic regression model and demographic, student, and school data, we find that Chicago Public Schools was more likely to close school buildings with higher shares of SIEPs. Such punitive measures reflect the politics of austerity and disposability, leaving students with disabilities, particularly those in low-income neighborhoods of color, with fewer educational options.

Keywords

educational equity, disability, ableism, capital budgeting, facilities management

¹Department of Urban Planning and Policy, University of Illinois at Chicago, Chicago, IL, USA

²Department of Special Education, University of Illinois at Chicago, Chicago, IL, USA

Corresponding Author:

Federico R. Waitoller, Department of Special Education, University of Illinois at Chicago,
1040 W. Harrison M/C 147, Chicago, IL 60607, USA.

Email: fwaitoll@uic.edu

Introduction

“We were sometimes in a hallway, moveable trailers, a large janitor’s closet, or the farthest classroom in the basement” (Special education case manager, personal communication, 2018)

Issues of facilities planning, utilization, and space are at the core of debates about special education. Access to educational spaces often is framed as an issue of individual rights for students with disabilities, either by requesting inclusion in “general education” classrooms or by demanding specialized services in separate ones. Disability advocates have fought for equitable access to school buildings and for higher quality instruction to take place in them. Yet students with disabilities are often excluded from general education classrooms and activity rooms and, as the quote above indicates, occupy marginal, invisible, and disposable spaces (Winzer, 2009).

The decisions of school boards to close entire schools reflects the ways educational officials assign relative value to different kinds of students and the spaces they occupy. Urban school districts that are financially struggling adopt austerity policies to shore up their finances and “right-size their portfolio” of school buildings by eliminating those deemed “underutilized.” The Chicago Board of Education, for example, shuttered 47 schools in 2013. The school district in Philadelphia closed 23 schools the same year, New York City Public Schools closed 26 schools, and Saint Louis Public Schools closed 16 schools in 2003 (Garry & Utchielle, 2019).

Students with disabilities may affect decisions about which schools to close because many of them spend most of their school day in smaller classrooms with fewer students than found in a typical general education classroom. Therefore, schools with higher proportions of students receiving such services would look, in the decision-making models used by administrators, as if they are making inefficient use of their classroom space. These schools would be coded as underutilized and may have a greater chance of being closed. Students with disabilities also can contribute to a school being closed for underperformance, as students with disabilities tend to score lower on standardized academic assessments when compared with their non-disabled peers (National Center for Education Statistics, 2020), in part because they do not address learner variability (Hall et al., 2012). Although there has been some research on the factors leading to school closures, little is known about how special education enrollments affect the likelihood of closure.

Using the 2013 round of school closures in Chicago as a case study, we examine the relationship between the share of students with an

Individualized Education Program (SIEP) in a given elementary school and the likelihood of closure. We use a logistic regression model and relevant demographic, student, and school data to simulate administrative decision-making parameters and to test whether and how the enrollment of students with disabilities affects a school's odds of being closed.

The Spaces of Special Education Services

The U.S. experienced booms in school construction in the 1920s and 1930s and again in the 1960s, although, at these times, school buildings were not mandated to accommodate students with physical disabilities (Winzer, 2009). When the Education for All Handicapped Children Act (EHA; PL. 94-142) was passed in 1975, school districts were legally prevented from discriminating against individuals because of a disability.¹ They were required to take actions that would not result in a fundamental alteration or undue burden but instead would ensure that individuals with disabilities received the same benefits and services offered to others without disabilities. Many school districts retrofitted their facilities to higher standards of accessible design.

EHA, now reauthorized as the Individuals with Disability Education Act (IDEA), requires that all children with disabilities have access to a free, appropriate, and public education in the Least Restrictive Environment (LRE). The LRE provision requires that schools provide a range of educational spaces (i.e., a continuum of alternative placements) in which the student can receive needed services (Yell, 2019). These may include a separate facility, a separate classroom that serves only students with disabilities, and/or the general education classroom (Crockett, 2014). A student's IEP team, composed of the parent and an interdisciplinary team of school professionals, makes decisions about services and placement according to students' individual needs. The team assigns the number of minutes students will receive services in different educational spaces. In some cases, the team considers a specialized setting the LRE for a student (Crockett, 2014).

IDEA requires that IEPs detail how each student will receive individualized and specialized instruction. Because the set-up of general education classrooms is not always modified to accommodate such individualized instruction, many students with disabilities spend most of the school day in a separate classroom or school (U.S Department of Education, 2018). When instructors use a classroom to provide intensive reading, math, or social or life skills, SIEPs receive individualized instruction for part of the school day in "resource rooms" (Hallahan et al., 2019). The term "self-contained classroom" refers to separate classrooms in which SIEPs spend most of the school day with a small number of peers. In addition, some

school districts offer specialized programs located only in certain schools as a way of centralizing services that potentially benefit from economies of scale. For instance, the Chicago Public Schools (CPS) offers “cluster programs,” which are classrooms that provide specialized services to students whose learning needs deviate from the normative parameters of the general education classroom (e.g., a specialized classroom for students with autism).

Special education classrooms (i.e., resource rooms, self-contained, and cluster program classrooms) require a smaller number of students per classroom. According to the State of Illinois Administrative Code 226.730 (b) and (c), for instance, the number of students with disabilities permitted in a separate special education classroom is 15 if students receive special education services for 20% of the school day in the special education classroom, ten if students receive these services for 20–60% of the school day, and eight if the students receive these services for more than 60% of the school day. Thus, if students need more individualized and extensive academic, emotional, and behavioral support, it is likely that they will spend more time in a classroom with a smaller number of students.

Nationally, 33% of students with disabilities ages 6 to 21 spend less than 80% of the school day in the general education classroom (U.S Department of Education, 2018). Students with extensive support needs may spend even less time there. For instance, almost half of students with intellectual disabilities and 46% of students with multiple disabilities spend less than 40% of the school day in the general education classroom (U.S Department of Education, 2018). Rates of placements in resource rooms or self-contained classrooms vary widely by states (Kurth et al., 2014). Urban school districts, particularly those districts with the largest student enrollments, have the lowest rates of inclusion in the nation (Brock & Schaefer, 2015; Grindal et al., 2019). For example, Chicago’s rates of inclusion of SIEPs in the general education classroom are lower than national averages: only 5% of students with intellectual disabilities and 24% of students with autism spend more than 80% of the school day in the general education classroom (Illinois State Board of Education, 2010). The same rates of inclusion at the national level are 17% and 40%, respectively (U.S Department of Education, 2018).

Racial inequities are also evident in the placement patterns of SIEPs. Ferri and Connor (2005) noted that, after *Brown v. Board of Education*, ability was the primary vehicle for racial segregation, what the authors called “second generation segregation.” Recent studies have documented the pervasiveness of this segregation (Grindal et al., 2019). In Chicago, Waitoller and Maggin (2020) found in a longitudinal study that White students with

disabilities were twice as likely as African American students to spend more than 80% of the day in the regular classroom.

In this paper, we neither condemn nor laud segregated schooling arrangements, a goal beyond the scope of this research. Instead, we point out that such arrangements are the most common ways for school districts in the United States to teach and provide individualized instruction for SIEPs, particularly for those with extensive support needs.

School Closures, Austerity Measures, and the Disposability of Disability

Our framework for understanding the relationship between SIEPs and school closures draws not only from education and disability studies but also from scholarship in urban political economy that seeks to understand the specific nature of neoliberal educational regimes. School closures can be thought of as a kind of expenditure reduction that, along with the privatization of public property, agency consolidation, and reduction of inter-governmental revenues, are referred to collectively as “austerity” (Peck, 2012). Austerity policies are underpinned by efficiency logics to shrink the size of government and by the idea of governments taking responsibility for their fiscal conditions (Hackworth, 2015; Peck, 2012). Public agencies are expected to run their operations like a business, seeking both cost savings and opportunities for revenue generation (Davidson & Ward, 2018). Any property owned by a public agency beyond that which they require to serve their narrowly defined mission is considered surplus, inherently wasteful, and, therefore, disposable (Bierbaum, 2020; Christophers, 2018).

To more efficiently manage their holdings, urban school districts in the U.S. have sought to better calibrate student enrollments with the square footage available in buildings through the quantification of utilization. School buildings that are not utilized at full capacity have the same costs for maintenance and operations. These school buildings that are not considered efficiently utilized are candidates for closure (Bierbaum, 2020; Weber et al., 2020). School districts often sell off these school buildings to the private sector who could, hypothetically, find a more economically productive use for them. Relinquishing publicly owned property to the private market is expected to raise needed funds and bring about efficiency gains by streamlining the district’s holdings, despite evidence to the contrary (Christophers, 2018; Sunderman et al., 2017).

Sunderman et al. (2017) call closures a “high-risk/low-gain” strategy for realizing cost savings and remedying low student performance, but the

efficiency argument has proved useful to government agencies in the years since the global financial crisis of 2007–09. The irony is that this kind of “self-discipline” often “descend(s) into auto-evisceration or incapacitation” (Peck, 2012, p. 631), such that school districts may be unable to adequately meet their remits. The capacity of a school district to provide quality educational services may wane. Or, should the number of school-age children increase (or the standards for utilization change, possibly because of a pandemic), the district may lack both the buildings to accommodate them or the funds to construct new schools. Rounding out the vicious circle, a lack of public capacity then provides further justification to cut their budgets and seek privatized and punitive solutions to public problems (Peck, 2012).

Austerity measures place a special burden on people with disabilities and their families who are expected to overcome misfortunes on their own and aspire to ableist ideals that reflect narrow and individualistic conceptions of personhood (Goodley et al., 2014). By ableism we refer to “a network of beliefs, processes and practices that produces a particular kind of self and body (the corporeal standard) that is projected as the perfect, species-typical, and therefore essential and fully human” (Campbell, 2009, p. 5). Ableist practices in education force students to conform to normative ways of doing, learning, and being in educational spaces (e.g., learning at a certain pace with a particular teacher-student ratio) while disciplining those who cannot measure up (Hehir, 2002). Further penalizing these students, austerity measures cut the specialized services needed to help them to stabilize the school district’s budget (Waitoller, 2020). In other words, while the pressure for students with disabilities to perform in the market economy has grown, access to social services have declined as austerity regimes stress more fiscal responsibility and accountability. Students with disabilities are treated as a burden to the state because they cannot conform to ableist ideas of what it means to be a student in an austerity environment. Drawing from Mitchell (2015), they are peripheral embodiments who cannot be included even within the most liberal notions of diversity due to ableist educational policies and practices.

School closures undertaken to cut operating expenses may contribute to ableist practices that further marginalize students with disabilities. As reviewed in the prior section, SIEPs frequently spend more time in separate and smaller classrooms outside general education classrooms (which budget-conscious school districts encourage larger numbers of students to occupy, leading to overcrowding). Such placement patterns are likely to affect the district’s definition of classroom and building utilization and therefore its algorithms for (dis)investment in school facilities. Utilization is a measure of the number of students per classroom, and SIEPs tend to utilize classroom space

at lower densities due to their individual needs. While those classrooms and schools serving students with disabilities may seem underutilized, they may, in fact, be utilized according to the individual needs of those students as established by their IEPs. Administrators of large school districts make budget decisions at a distance and according to logics that may have little connection to the learning environments within schools. Their attenuated understandings of space utilization may render invisible the existence and needs of special education students. Students of color with disabilities may be especially harmed due to the long history of residential and school segregation based on race and their disproportional placement in more segregated educational environments (Waitoller, 2020), which may make their schools more susceptible to closure.

In this paper, we examine whether school closings challenge, reflect, or reinforce ableist assumptions about the use of educational spaces and, whether—intentionally or unwittingly—they discriminate against students with disabilities, treating them as disposable.

Prior Research on Building Utilization and School Closures

Prior studies have analyzed the *effects* of closures on student achievement and other outcomes (Brummet, 2014; Engberg et al., 2012; Gordon et al., 2018; Kirshner et al., 2010). Despite the number of studies, the results are mixed depending on the quality of the schools that students transfer to in the wake of a closure, the age of the students, and the time that transpires between the shock of the closure and the outcome being measured.

Less attention has been dedicated to understanding the factors that may *cause* or increase the probability of closing particular schools in the first place. We know that closure decisions take place in “pluralistic” contexts where different stakeholders have divergent interpretations of the performance and reputations of particular schools (Basu, 2007; Deeds & Patillo, 2015; Good, 2019). Teachers, students, and parents emphasize the importance of community and belonging while administrators must balance student and fiscal performance (Bierbaum, 2018). In large urban school districts, administrators in the central office apply technical-rational criteria about efficient space usage at a distance. Such decisions are neither devolved to the individual schools nor informed by information about the idiosyncratic and varied environments of individual schools (Goertz & Hess, 1998; Honig & Coburn, 2008). Capital budgeting decisions, such as those to close or open a school in a particular neighborhood, are interactive processes that stretch

across district departments and scales of the educational system (and may also be shaped by the political priorities of the mayoral administration and individual legislators; Lipman, 2011).

Those scholars examining the determinants of school closures have focused on neighborhood- or building-related variables. For example, Dean (1982) found that older schools that were more expensive to operate and those that had higher shares of minority and low-income students were more likely to be shuttered. Reading scores were also inversely related to closure. This study did not find that utilization was significant, did not include neighborhood characteristics, and did not distinguish between schools with low or high shares of special education students.

Burdick-Will et al. (2013) examine school openings and closures in Chicago between 2000 and 2010 (so did not include the large number of closures that occurred in the city in 2013). Looking only at elementary schools, they find that neighborhood disadvantage (an index that measures education, poverty, and unemployment in the areas surrounding the school) affected the probability of school closure. However, once they account for individual school characteristics, neighborhood variables become insignificant.

Weber et al. (2020) examined not only the 2013 round of closures in Chicago but also the earlier wave of closures that took place during the previous mayoral administration. Each wave of closures was different, indicating that the priorities of the two separate political administrations mattered. Under Mayor Richard M. Daley's administration, the stated rationale for closures was poor academic performance; schools with low test scores and graduation rates were put on probation and subject to closure if standards were not raised. In keeping with the official justification for school actions, the study found that the share of students not meeting target scores on standardized tests predicted disciplining through closure and reconstitution. But, as critics argued, proximity to a charter school also increased a school's chances of closure during this period—possibly because the charter school “creamed” enrollments from nearby public schools (see also Farmer et al., 2020). Proximity to the Central Business District increased a school's chance of closure, which could reflect Mayor Daley's strategy to transform perceptions of neighborhoods near the Loop in hopes of attracting more affluent households to these growing areas (Lipman, 2011; Smith & Stovall, 2008). Their most troubling result was that, even controlling for the share of low income students, changes in enrollment, and student test scores, their independent variable measuring the share of Black students was positive and significant.

Their findings for the wave of closures initiated by Mayor Rahm Emanuel were less provocative. In keeping with the official justification, poorly utilized schools were more likely to be closed. The only other significant variable was

the variable measuring the distance to new schools—the farther away a school was from a newly constructed school, the greater its chances of closure. If new schools were built for the growing ranks of Latinx students in Chicago and if selective enrollment schools were being constructed in higher income neighborhoods, this finding makes sense. The share of Black students and geography become less significant in the second wave, suggesting that the Emanuel administration stuck to its original intention more than Daley's did. However, the explanatory power of the second wave model was weaker, so it is possible that the authors omitted important variables.

These prior studies generate insights about the factors administrators may have taken into account when deciding which schools to close: building age and utilization, academic performance, the race of the student body, change in enrollments, and measures of neighborhood disadvantage are all associated with a greater chance of closure. However, few of these studies have a clear understanding of what takes place within the “black box” of the school building. In particular, none broached the topic of SIEPs, despite their potential correlation with utilization and academic performance as well as other significant variables in their models. Thus, we draw from these previous studies to develop controls and variables of interest while testing a novel hypothesis: we propose that SIEPs utilize school buildings differently than those students without IEPs and that official decision-making models treat this different usage as underutilization, leaving these schools vulnerable to closure.

The Case of Chicago's 2013 School Closures

Our study is based on the case of Chicago's 2013 school closures amidst budgetary constraints and declining enrollments. When Mayor Rahm Emanuel was sworn in in 2011, he inherited a \$1 billion budget deficit and a struggling school district (Dardick, 2013). The deficit was caused by numerous factors, some affecting other large, urban school districts in the U.S. such as growing pension costs and declining federal support. Other factors were more Chicago-specific, such as the use of risky debt instruments to underwrite new school construction in the 2000s (Kass et al., 2019). The Mayor convened a Commission on School Utilization, which attributed the district's budget woes to exogenous population decline, not to its fiscal hijinks. It declared that student enrollments had shrunk by over 100,000 students since 2000 and solicited information on school utilization from the Board (Lutton & Vevea, 2012).

Although the Board recognized that the “wide variability among building types and ratios of non-instructional spaces to instructional spaces does not render an equitable or reliable measure of space utilization” (CEFTF,

2014), district administrators established cut-off criteria for utilization. It set thirty students as the ideal number of students for a fourth grade classroom. The district measured utilization based on the number of students per homeroom classroom, where homerooms were estimated at 76% of the total classrooms available in the facility (the remaining classrooms were assumed to be “ancillary” ones for science labs, music, art, and special education instruction).

The district did not appear to weight the utilization figures by the number of students with IEPs in each school (ancillary classrooms did not figure into the final measure of utilization) or to treat schools with sizeable special education programs any differently in their calculations. These schools were included in the spreadsheet produced by school administrators but not called out, and no other measure of students with disabilities by school was included (CPS, 2013a). Using this student-classroom ratio as the benchmark, the Board proposed that school buildings were “efficient” if their enrollments were between 20% below or 20% above the ideal enrollment (calculated by multiplying the number of homeroom classrooms by 30, i.e., a school’s “design capacity”). Applying this standard, they determined that 330 of its schools were underutilized (*ibid.*).

Aldermen lobbied vigorously to save the schools in their wards (Ahmed-Ullah et al., 2013). The Chicago Teachers Union and parents criticized the 30-student-per-classroom measure of utilization. To combat the view held by administrators, they argued that schools were more than just buildings to be efficiently utilized (Deeds & Pattillo, 2015). For example, they pointed out that those schools that were more integrated with the community tended to have more classrooms to accommodate non-school activities, such as political meetings, work readiness programs, and childcare.

Nonetheless, CPS took a cost-based technocratic approach; it projected that closing underutilized schools would save the district \$560 billion on capital costs and \$43 million in operating expenses (CPS, 2013b). In addition to the utilization rate, CPS considered the cost to maintain each school, i.e., the capital expenditures required to keep the facility in good working order, in its model. It also measured student achievement through its own rankings of performance and the number of years each school had been on probation (CPS, 2013a).

In May of 2013, the Board voted to close 47 schools (and to close two additional ones the following year) in what some considered was the largest mass closure of schools in recent U.S. history. Because relocating high school students could potentially incite gang violence in a city with rapidly changing “turf” boundaries, most of the schools closed were elementary and middle schools.

At the time of the closures, researchers pointed to the discriminatory effects of the closures. Black students comprised 37% of the CPS enrollment yet 88% of students in the schools closed were Black and 79% qualified for free/reduced lunch services (de la Torre et al., 2015). Anecdotal and empirical evidence suggested that schools with more students receiving special education services were disproportionately affected. Of the nearly 11,000 K-7 students who were forced to switch schools because of the closures, almost 2,000—close to one in five—received special education services, and most of these students were Black (Radinsky and Waitoller, 2013). The average share of SIEPs in a given CPS school was 13% while the share of SIEPs in closed schools was 17% (de la Torre et al., 2015). Importantly, one third of the closed schools had cluster programs serving primarily Black students with serious disabilities that require extensive educational supports (e.g., autism) (*Ibid.*).

School closures shaped the educational experiences and options of SIEPs, but did special education services and the share of SIEPs play a role in the decision to close schools in the first place?

Research Design and Data

We hypothesize that schools that teach a larger share of students with disabilities use space in a different manner than those with smaller shares and that this use is largely invisible to school district administrators making facilities decisions. We expect schools with larger shares of SIEPs to be candidates for closure if underutilization is a primary motivation for this kind of spatial restructuring. We rely on quantitative data and statistical models but recognize the role played by our identities, commitments, experiences, and membership within particular communities.²

Our dataset contains one record for each school open in 2010. Individual school data were obtained from Chicago Public Schools, WBEZ, and the Illinois State Board of Education. We only collected data for elementary schools because high schools generally were not closed during this period. Because of the unique nature of their student bodies or governance structure, we excluded charter, pre-kindergarten, alternative, and contract schools. We do include special education, career, classical, magnet, neighborhood, regional, and selective enrollment schools.³

The binary outcome variable we examine is whether a school operating in 2010 was shuttered in 2013.⁴ Of the 402 schools in our sample, 44 (11%) were closed in 2013. Table 1 presents descriptive statistics for variables characterizing CPS elementary schools, distinguishing between those that were closed and those that remained open in 2013.⁵

Table 1. Descriptive Statistics for Closed and Not Closed Schools, 2012.

Observations	Total		Closed		Not Closed	
	402		44		358	
Variable	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Students with an Individualized Education Plan (share)	0.133	0.108	0.184	0.191	0.127	0.091
A2A Utilization Rate (share)	0.979	0.429	0.532	0.112	1.034	0.421
School Climate Score	2.978	1.546	2.295	1.374	3.061	1.547
Meet or Exceed Test Scores (share)	0.724	0.137	0.628	0.098	0.736	0.136
Enrollment Change 2006–2013 (share)	−0.057	0.301	−0.258	0.166	−0.033	0.305
Black Students (share)	0.503	0.435	0.861	0.250	0.459	0.433
Low Income Students (share)	0.853	0.235	0.976	0.030	0.838	0.245
Building Age 2010 (years)	69.460	33.097	70.864	31.112	69.288	33.370
Selective School	0.109	0.313	0.023	0.151	0.120	0.326
Census Tract School Age Population Change 2000–2010 (share)	−0.157	0.291	−0.312	0.186	−0.138	0.296
Census Tract Median Family Income 2010 (thousands of dollars)	44.039	19.772	30.682	10.946	45.681	19.999
Census Tract Black Population 2010 (share)	0.449	0.429	0.772	0.319	0.409	0.424
Census Tract Median Housing Value Change 2000–2010 (share)	0.853	0.401	0.975	0.586	0.838	0.370
Distance to Nearest Charter School (miles)	0.770	0.770	0.514	0.363	0.801	0.801
Distance to Nearest New Public School (miles)	1.236	0.874	1.436	0.659	1.212	0.895
Distance to Central Business District (miles)	7.312	3.338	6.674	3.094	7.390	3.363

Note. All variables pertain to 2012 unless otherwise specified.

Our hypothesis variable is the accounting of students with an Individualized Education Program in the year 2012. Because the number of SIEPs reflects each school's size, we construct the variable as a share of total enrollment. SIEP data come from the CPS annual report on student enrollment, which reflects student enrollment on the 20th day of the school year (CPS, 2012). The mean share of SIEPs per school is 13.3% for the whole sample. Closed schools tended to host greater shares (18.4%) of SIEPs than those schools that did not close (12.7%).

Four "special education schools" had shares of SIEPs over 90% in 2012: Rudolph, Blair, Buckingham, and Near North.⁶ (The two remaining special education schools, Beard and Christopher, had SIEP shares of 84 and 67%, respectively.) Some magnet schools had very small shares of SIEPs. Due to our concern for the impact of a small number of specialized schools on the final results, we constructed a dummy variable to indicate whether a school had a selective enrollment admissions process. Selective enrollment means that students outside the local attendance boundary can attend the school only if they meet certain qualifications—either taking a test for an accelerated instructional program or by placement according to their IEP. The latter placement is decided by the student's IEP team, which includes the parent of the student, in accordance with a full academic and psychological evaluation and an assessment of the student's individual needs.

Control Variables

Utilization. As we described above, CPS devised generic measures of utilization that could be applied across schools. CPS considered an average of 30 students per homeroom to indicate adequate utilization. To determine a utilization rate, each school's "design capacity" (sometimes called "maximum capacity") was calculated as the number of homerooms in 2012 multiplied by 30. This figure was then compared to the number of students enrolled in the school during the 2012–2013 school year. The resulting fraction was considered the school's "utilization rate" (CPS, 2013a).

Parent and community organizations Apples to Apples (A2A) and Raise Your Hand jointly published a report criticizing CPS' utilization rate for failing to account for the actual physical sizes and uses of individual schools and classrooms (Apples to Apples, 2013). They conducted research into CPS Guidelines on Class Limits and emphasized that even CPS had treated 30 students as the target capacity that should not be considered an efficient number of students for each classroom. Their research led them to propose instead a standard of 25 students per classroom as the "ideal program enrollment" with 30 students as a recommended maximum.

Our analysis used the A2A utilization rates as the data were more complete and the 25-student standard was more restrictive (fewer schools appear under-utilized). Fifteen schools lacked an A2A utilization rate for 2012. For eight of these schools we counted the number of classrooms in the school building (from CPS Facilities Reports), multiplied by 0.769 (the multiplier used by CPS) to estimate homerooms, and compared actual enrollment in 2012 to A2A ideal enrollment from the classroom count. For the remaining seven schools, we estimated the number of homerooms from the utilization rate provided by CPS, multiplied by 25 students to estimate capacity, and compared capacity to actual enrollment.

Using this blunt measure of spatial efficiency, schools that closed had a 53% utilization rate on average, falling well below CPS' ideal utilization range of 80 to 120%. Schools that were not closed were much better utilized; on average, they were 103% occupied. As we suspected, the SIEP shares were significantly and inversely correlated with the A2A utilization rates. Both utilization rate and share of SIEPs are included in our model, however, as their empirical overlap is relatively small, producing a pairwise (Pearson product-moment) correlation of -0.14 .

We merged our sample of public schools with data from various sources to provide additional information about the other characteristics of each school that might affect closure. For the final models, we winnowed the independent variables down to those correlated with the probability of closure or significant in previous empirical studies. We excluded variables close to or exceeding a pairwise correlation coefficient of 0.6 (such as percent Black residents in the school's census tract, which was highly correlated with utilization rate) to avoid multicollinearity.

School climate. One of our contributions, and an advancement over previous studies of closures in Chicago, is to incorporate school climate. Each school is its own organizational ecosystem; various aspects of that ecosystem affect its functioning and ability to provide an effective learning environment. The University of Chicago Consortium on School Research in partnership with CPS developed an instrument, the "5Essentials Survey," to characterize school climate along five dimensions: leadership, teaching, family involvement, supportive and safe environment, and instruction. The instrument has been administered to faculty, students, and parents annually since 2012 and has been validated empirically (Hart et al., 2020). Each of the five dimensions or "essentials" receives a score based on the average response value and a final score summarizes a school's performance on all five essentials as a group. We used the final score in our models. On average, closed schools

had substantially less favorable school climates than those that remained open.

Student performance. Before 2013, schools could be closed because of poor performance. CPS uses its own performance rankings but these have changed several times in recent years (for example, in 2013 CPS moved from a three-tiered to a five-tiered rating system). Because of these fluctuations, we instead proxy student performance with a school's share of students that "meet or exceed" expected scores on the obligatory Illinois Standards Achievement Test (ISAT, which measures the achievement of students in reading and mathematics in grades three through eight). Data were obtained from Illinois State Board of Education (ISBE) School Report Cards. Schools with higher test scores are less attractive candidates for closure as low utilization issues may be outweighed by a desire to keep classes small if students are thriving (or, at least, testing well).

Schools where SIEPs comprise a larger share of enrollment are less likely to report ISAT scores because many of these students are exempt from taking standardized tests. The state of Illinois allows one percent of students per grade level in a school district to take the Illinois Alternate Assessment, which is not comparable to the ISAT since it "is intended for students with the most significant cognitive disabilities... These students have intellectual functioning well below average...that exists concurrently with impairments or deficits in adaptive functioning ..." (ISBE, 2010). For the five schools that did not report the share of students meeting expected ISAT scores, we substituted the mean share across our sample.⁷

Enrollment. The utilization rate captures the occupation of a school building in one year (2012). Demand for educational services, however, is a dynamic process that administrators likely observe over time and is best represented by enrollment change by school. ISBE and CPS provided information on average daily attendance of registered students from 2006 to 2013. Average daily attendance is the total number of days of student attendance divided by days in the regular school year. We use this measure to proxy enrollments in 2012 and calculate enrollment change from 2006 to 2013. We expect that declining demand for education in the school's service area would lead to closure.

Race and income of students. Large urban school districts have never distributed funding or cutbacks equally, with low-income Black students disproportionately harmed by decisions to cut development or operating expenditures (Caref et al., 2012; Ewing, 2018). The closures of 2013 were perceived as

yet another way of making Black students bear the brunt of disruptive change while the city attempted to hold onto White and higher income households (Cucciara, 2008; Lipman, 2011; Smith & Stovall, 2008). We include the shares of Black students and low-income students in each school in 2012, data provided by the CPS. On average, closed schools had greater shares of Black students (86%) than schools that remained open (46%). Closed schools had nearly 98% low-income students, compared with 84% in the schools that stayed open. Black students with disabilities are more likely to be segregated in separate classrooms than their White counterparts in both neighborhood and charter schools (Waitoller & Maggin, 2020). As such, larger percentages of Black students with disabilities in a school may increase the likelihood of the school being perceived as underutilized.

Neighborhood demographics. Neighborhood characteristics influence student outcomes like academic performance and mental health (for literature review, see Formoso et al., 2010). CPS may take the demographics of a school's host neighborhood into account when making programming and planning decisions. For example, more English as a Second Language services would be needed in neighborhood schools where immigrant populations are increasing. CPS has been accused of closing and then reopening schools as selective enrollments in gentrifying areas (that often have fewer and more affluent children) while permanently closing schools in majority Black neighborhoods (Lipman, 2011; Smith & Stovall, 2008).

Choosing a spatial unit of analysis to capture a school's "neighborhood" can increase the potential for bias due to the unit's relationship with other factors. For example, census tracts are drawn according to population size, which may interact with the independent and dependent variables. To reduce bias, Burdick-Will et al. (2013) overlay uniformly-sized geographies on census tracts. Despite this innovation, they found that neighborhood characteristics did not exert significant power over closure and opening decisions. Although Weber et al. (2020) do not account for potential spatial bias, they also found little evidence that the demographics of the area surrounding each school affected closures (they examined both high schools and elementary schools). These findings could reflect the fact that many Chicago students do not attend their assigned neighborhood school (Perez & Smith Richards, 2016).

We recognize the potential for such bias but expect that the uniform population size of the tracts obviates the need for constructing additional spatial layers, particularly since neighborhood factors may not be a strong predictor of closure. Therefore, we used 2010 census tracts as our spatial unit of analysis, applying a crosswalk from the Longitudinal Tract Database to match

2000 with 2010 geographies. We include two variables from the Decennial Census of Population and Housing, one economic (median family income by 2010 census tract) and one demographic (change in census tract school-age population, 2000 to 2010), that may affect either CPS' planning decisions or the relative political power of neighborhood residents to resist administrative decisions, attract public investment, or suffer privation.

Neighborhoods with schools that closed in 2013 were, on average, substantially poorer and experienced much larger decreases in their school-aged populations (ages 5–18) between 2000 and 2010. Closed schools were more prevalent in areas that were majority Black on the South and West Sides. Neighborhoods with closed schools were 77% Black, while neighborhoods with schools that remained open were, on average, 41% Black.

Proximity of competition. Spatial measures of competing supply are provided by the distance (in miles) from each school address to the closest charter and newly-constructed schools. Proximity to these alternatives is likely to influence not only student demand for public school services, but also how administrators value preexisting schools in their vicinity. Charter schools, for example, can siphon off higher performing students from nearby public schools, weakening the sending school's performance and depleting it of students (Farmer et al., 2020; Institute on Metropolitan Opportunity, 2014). Because the majority (54%) of charter schools in Chicago are high schools, this effect may be less pronounced for elementary schools. Nevertheless, we measured the distance between each school and the closest elementary charter school. Charter school addresses are from the CPS school locator website. On average, the closed school buildings in our sample were located about 0.5 miles from the closest elementary charter school, while those that remained open averaged 0.8 miles distant (with a larger standard deviation of about 0.8 miles).

The same kind of cannibalization could occur when a new public school is opened in the vicinity. Yet in our sample, closed schools were located farther away from new schools (1.4 miles on average) than schools that remained open (1.2 miles). New schools were sited in areas that had, on average, a large share of Latinx residents and experienced population growth between 2000 and 2010.

Redevelopment pressure. We also measure a school's distance to the central business district of Chicago (taken as the intersection of State and Madison streets). More spatially isolated schools may be less visible and easier to close without serious political fallout. On the other hand, CPS may have wanted to close schools that were more central due to pressure to redevelop

these areas (from both private developers and the development-oriented agencies of the City of Chicago) (Lipman, 2011; Smith & Stovall, 2008). The descriptive statistics are more consistent with the latter factor: on average, closed schools were located slightly closer to the core—6.7 miles versus 7.4 miles for schools that were not closed. The redevelopment argument also holds in observing that housing prices increased at a faster rate between 2000 and 2010 in the census tracts surrounding closed schools.⁸

Building quality. Older schools are denigrated for lacking structural integrity, adequate amenities, and efficient building systems, though these features are determined less by age than by the degree of maintenance and investment the building has received over time. Because age may proxy quality, we include *Building Age* in 2010, derived from CPS Energy Star and Facilities Reports. On average, closed and open schools were nearly the same age (71 and 69 years old, respectively).

These descriptive statistics provide some indication that special education services, race, and utilization may have factored into CPS' decision to close specific schools in 2013. A multivariate statistical estimation allows us to control for simultaneous determinants of closure and more accurately estimate treatment effects.

Regression Model

To analyze the relationship between school closures and the share of SIEPs by school, we analyze a binary logistic (logit) model, which estimates the logarithm of the odds of an event occurring as a linear combination of predictor variables. The model is:

$$\ln\left(\frac{P_i}{1 - P_i}\right) = \beta_0 + \beta_1 X_{1,i} + \dots + \beta_k X_{k,i} \quad (1)$$

where X are the predictor variables, P_i is the probability that school i experienced closure in 2013, and the regression coefficients β represent the relationship of X to the odds of a school closing. With this model, we control for many of the school characteristics that could have contributed to the closure decision.

A limitation of this cross-sectional research design is that we cannot determine what caused the factors that have a strong and significant relationship with closures. For example, we are unable to infer if prior CPS policies for keeping SIEPs outside the general education classrooms caused the underutilization measured in 2012. We also do not know the extent to which the

closure of one school affected the closure decision for a nearby school (“spatial spillovers”). CPS may have wanted to ensure that closed schools were not located near each other so that students could be reassigned to a nearby open school. We believe correcting for residual spatial relationships is likely to have little influence on the final estimates (see Burdick-Will et al., 2013). We did not break down the share of SIEPs in schools by disability category or rate of inclusion in the general education classroom. Finally, it is possible that the relatively small number of closures compared to the total number of schools could yield biased coefficients. Logistic regression uses maximum likelihood estimation, which is consistent but only unbiased asymptotically, i.e., with large enough sample sizes. Our dataset contains 44 school closure cases. Although there is no definitive threshold, we cannot rule out the possibility of some small-sample bias.

Findings

Table 2 reports the results of the logistic regression relating the binary school closure variable to the share of SIEPs in each school, along with the control variables that are interesting in their own rights as potential predictors of closure. The (unadjusted) odds ratio is the quotient of the likelihood of the target event (school closure) with the independent variable increased by one unit and the likelihood of the target event without a change in the independent variable. Because many of the independent variables are measured as shares, a one-unit increase—from zero to 100%—is not an ideal reference point for interpreting the relationship to school closure. Table 2 provides the odds ratios associated with a one-percent change rather than a unit increase for each variable measured as a share. The standardized odds ratio represents the estimated change in the likelihood of school closure associated with an increase of one sample standard deviation in the independent variable.

There is no universally accepted goodness-of-fit measure for logistic models. The Akaike and Bayesian information criteria are model fit statistics helpful for comparing equivalently structured models. The Pseudo R^2 (Cox and Snell, 1989) is the ratio of the likelihoods; its value of 0.25 indicates that the models explain a considerable portion of the pattern of school closure, though school closure outcomes probably are associated with and negotiated through other idiosyncratic school-specific factors as well.

The estimated coefficient of the share of SIEPs is positive and statistically significant. A gain of one percent in the share of students with individualized education programs is associated with an increase in the odds of school closure of 5.3%, holding the other predictor variables constant.

Table 2. Results of Logistic Regression: Dependent Variable = School Closure, 2013.

Variable	Coefficient	Std. error	p value	Odds ratios		
				Unadjusted	1 Percent	Standardized
Observations	402					
Log likelihood	-82.186					
Akaike Information Criterion	194.372					
Bayesian Information Criterion	254.319					
Pseudo R ²	.246					
intercept	-11.050	9.144	.227			
Students with an Individualized Education Plan (share)	5.182	2.156	.016**	178.074	1.053	1.749
A2A Utilization Rate (share)	-5.867	1.479	.000**	0.003	0.943	0.081
School Climate Score	-0.296	0.145	.041**	0.743		0.632
Meet or Exceed Test Scores (share)	0.024	2.203	.991	1.024	1.000	1.003
Enrollment Change 2006–2013 (share)	-0.165	0.833	.844	0.848	0.998	0.952
Black Students (share)	1.091	0.896	.224	2.977	1.011	1.608
Low Income Students (share)	11.931	8.366	.154	151,857.825	1.127	16.570
Building Age 2010 (years)	0.012	0.007	.080*	1.012		1.483
Selective School	0.360	1.233	.771	1.433		1.119
Census Tract School Age Population Change 2000–2010 (share)	-0.953	1.305	.465	0.385	0.991	0.758
Census Tract Median Family Income 2010 (thousands of dollars)	-0.010	0.023	.603	0.990		0.821
Distance to Nearest Charter School (miles)	0.364	0.484	.452	1.439		1.324
Distance to Nearest New Public School (miles)	0.330	0.295	.264	1.391		1.334
Distance to Central Business District (miles)	-0.098	0.071	.168	0.907		0.721

** Significant at 95% confidence level. * Significant at 90% confidence level.

Notes. All variables pertain to 2012 unless otherwise specified. Logistic model estimated by maximum likelihood. Pseudo R² is Cox and Snell (1989). Probability values of coefficients estimated with Wald's Chi-square test. Standardized odds ratio refers to an increase of one sample standard deviation for each independent variable.

The variation in SIEP share across schools demonstrates the practical importance of this relationship: a 10.8% increase (one standard deviation) in the share of SIEPs tracks with an increase in the odds of closure of nearly 75%.

The share of SIEPs is not equally distributed across Chicago schools. Magnet schools have very low shares, and a few schools have very high shares, especially those identified by CPS as “special education schools.”

We added the *Selective School* dummy to test whether the handful of special education and other selective enrollment schools are integral to the results or if the positive relationship between SIEP share and closure holds more generally across Chicago. The coefficient on this binary variable is positive but insignificant. Thus, the magnet and special education schools with restrictive admission criteria do not control the significant finding with regard to the share of SIEPs.

A robustness check that excluded the six special education schools from the dataset yielded a 20% smaller association between the share of SIEPs and school closure and reduced the coefficient's statistical significance below the traditional 90% confidence threshold. The implication is that these special education schools are important contributors to the overall relationship.⁹ To further evaluate the impact of these six special education schools, we introduced a log-transformed version of the share of SIEPs as a way to moderate the influence of outliers. Although the transformed variable exhibited a slightly weaker association with school closure, the relationship remained robustly significant, exceeding the 95% confidence threshold, reinforcing the conclusion that the special education schools do not by themselves generate the observed association between the share of SIEPs and school closure.

We also tested whether the relationship between the share of SIEPs and school closure is different for larger and smaller schools. We created two dummy variables to indicate very small schools, those with fewer than 200 students enrolled in 2012 (roughly the smallest 5% of schools in our sample), and somewhat small schools with 200 through 249 enrollees (the next 5% of schools). Introducing dummy variables neither yielded significant coefficients nor substantively changed the relationship between the share of SIEPs and school closure.¹⁰

Spatial inefficiency was the primary reason offered by the Emanuel administration for the 2013 round of closures. As explained earlier, the lower the utilization rate, the fewer students occupying available space in a building. The negative and significant coefficient on the utilization rate variable is consistent with expectations, as is the strength of the relationship.¹¹ A single percentage point rise in utilization rate relates to a more than 5% drop in the odds of the school being closed. A standard deviation increase in utilization rate (0.43) is associated with a greater than twelve-fold decrease in the closure odds. Thus, the difference of slightly more than 0.5 between the average utilization rate for schools that remained open and those that closed in 2013 certainly accounts for much of the observed distribution in school closures.

Two other variables demonstrate significant relationships to school closure. School climate measures student, faculty, and parent perceptions of

whether the school offered an effective educational environment. Not surprisingly, schools with worse climate scores had greater probabilities of closure. A one-point decrease in climate is associated with a 25% increase in closure likelihood. The average climate score for schools that remained open was 0.77 points higher than for schools that closed. Building age is significant at the 90% but not the 95% confidence level. A school building built one year earlier is related to about one percent greater odds of closure. The average building age, however, is similar for closed schools and those that remained open.

The other control variables are not statistically significant. The signs on the variables largely make sense according to the officially stated reasons for closure and the findings from previous studies. The model does suggest that student performance, indicated by the share of students meeting or exceeding expected test scores, is inversely related to the likelihood of closure, but with minimal magnitude. The strikingly large estimated coefficient for the share of low income students likely is due to the observed mean being close to the maximum value, leaving little room for variation. (Across all observations the mean is 85%; for closed schools it is nearly 98%.) The lack of significance of this variable and of the neighborhood-based controls does not mean they were not related to the closure decision, as they likely contributed in combination to the overall explanatory power of the model. Including them increases our confidence in the accuracy of the estimated coefficients on the hypothesis variables.

From our model results, a profile of a “typical” closed school emerges. It is one that had the responsibility to provide legally-entitled services to a large proportion of SIEPs, a less effective learning environment (as measured by the school climate survey), and a surplus of space in a vintage structure.

Discussion

Urban school districts across the country have shuttered school buildings, ostensibly to mitigate budget deficits. Prior research describes how parents, students, and neighborhoods have suffered from austerity cuts and closures (Engberg et al., 2012). While taxpayers wait for the expected cost savings to materialize, closures have caused many students to lose ground academically (Gordon et al., 2018; Kirshner et al., 2010), schools to lose teachers (Lee & Sartain, 2020), and neighborhoods to lose important anchor institutions (Ewing, 2018). In many cases, the physical structures of closed schools remain, their spectral presence a reminder of the lack of care and protection provided to people of color (Ewing, 2018).

Previous studies of the causes of school closures in Chicago have underscored the significance of utilization, academic performance, and the race and income of students (Burdick-Will et al., 2013; Weber et al., 2020). Yet, none of these studies made the connection between special education enrollment and school closures, despite large number of SIEPs in the CPS system and the linkages between students with disabilities and building utilization. Our findings shed light on the complex forms of exclusion experienced by students with disabilities. We found that, even accounting for underutilization, those schools with greater shares of students with IEPs, more negative parent perceptions of school climate, and older buildings were more prone to closure. Our study contributes to prior work examining whether disability is related to a school's administrative and budgetary vulnerability within a school district and whether austerity disproportionately affects the educational experiences of SIEPs (Waitoller, 2020).

The significance of these variables may indicate that decisions based on a technical definition of utilization did not account for the additional space necessary to accommodate the one-on-one nature of special education. While those classrooms and schools serving students with disabilities may appear underutilized, they may be sufficiently used according to the individual needs of those students as established by their IEPs. Schools with larger concentrations of SIEPs require more resource, breakout, and activity rooms. These extra classrooms, so important to the school experience for children with disabilities, often are treated as "wasted" space in technical assessments of building utilization. Although administratively rational, a one-size-fits-all measure that simply compares the number of students to the number of classrooms insufficiently reflects the nature of how educational spaces are used. Thus, relying on such utilization criteria to close schools embodies a form of ableism.

It is also possible that the observed positive relationship between the share of SIEPs and closure was not a spatially mediated one but rather one related to the time and expense of a fiscally-strapped school district providing these specialized services. The cost of providing services to SIEPs may have biased administrators against schools with relatively high shares of these students and led to a noticeable deterioration in perceived school climate, a variable that was also statistically significant in our models. School districts across the country have been found to limit services for special education (Karp, 2017), which could cause other aspects of organizational functioning to break down and put a school with a high share of SIEPs on an administration's watch list. The relationship between performance and SIEP is less clear; we find no evidence in our model that test scores were related to the

2013 closures or that the share of SIEPs significantly shaped performance outcomes.

Arrangements for providing special education services in schools in the U.S. are problematic in many ways. Although we are not defending or criticizing the practice of segregated classrooms, we see that when facilities planning decisions ignore the value of these classrooms or render these separate, ancillary spaces invisible, they disproportionately affect students with disabilities.

Our analysis reveals how building utilization formulae may rationalize and reinforce ableism and disability in favor of an imagined ideal student that can learn in a classroom with a 30-to-1 student-teacher ratio. Students with disabilities are forced to comply with standards of efficient space usage that do not include them while simultaneously managing with fewer services because of budget cutbacks. Such contradictory pressures further marginalize SIEPs and prevent them from benefiting from the opportunities ostensibly provided by their educational experiences. Yet when students with IEPs fail to thrive in such environments, that failure is attributed to individual characteristics such as their disability (or race or gender) or a lack of grit, rather than to the political-economic structures that condition success or failure for particular groups of students.

Schools that enroll a disproportionately higher number of SIEPs are the ones most vulnerable to austerity. The race and income of students and neighborhoods does not appear to have been directly related to school closure in our models. Nevertheless, the patterns of closures that occurred in Chicago likely harmed students of color living in neighborhoods of concentrated poverty most, given the historically strong correlations among race, disability, and utilization in CPS (Waitoller, 2020; Weber et al., 2020). Making matters worse, cities like Chicago are increasingly investing tax revenues in selective enrollment schools in gentrifying neighborhoods and charter schools in lower income neighborhoods (Farmer et al., 2020; Smith & Stovall, 2008). These school types serve lower proportions of students with support needs than neighborhood schools (Waitoller et al., 2017). Therefore, taking an austerity approach to capital budgeting not only leaves students with disabilities and their parents with fewer educational options but also exacerbates the polarization of schooling that already exists within urban school districts.

We recommend that school district administrators conduct substantive analyses of the likely impacts of capital and fiscal decisions (e.g., school closures, the roll out of charter schools, accountability-based budgeting) on students with disabilities. Given their extreme vulnerability, these students and their families deserve a privileged seat at the table when considering such

issues. We also suggest that administrators acquire a more nuanced understanding of how disabled students and their teachers use educational spaces so that administrative decision-making metrics, such as utilization rates, better account for this variation on the ground.

Authors Note

This research was funded by the Institute of Research on Race and Public Policy at the University of Illinois at Chicago.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Institute for Research on Race and Public Policy.

ORCID iD

Federico R. Waitoller  <https://orcid.org/0000-0002-7051-4328>

Notes

1. Section 504 of the Rehabilitation Act of 1973 and the American with Disabilities Act of 1990 also provide the legal framework outlawing discrimination against students with disabilities.
2. Weber is a White, cis-gendered woman who does not identify as a person with a disability. She has examined the privatization of public infrastructures and been involved in community-based struggles to challenge these decisions. Waitoller is a White Latino, heterosexual, cisgender, immigrant male whose first language is Spanish and who does not identify himself as a person with a disability. His interest in examining the effects of disposability and neoliberal informed policies on students with disabilities comes from his own biography experiencing such policies in the 1990s in Argentina as well as his continuous work to understand and dismantle intersecting forms of injustices for students of color with disabilities. Drucker identifies as a White non-Latino, and not as a person with a disability. His interest in educational practices stems partly from the many teachers within his extended family, and he has researched how post-secondary education impacts economic development and human capital accumulation. His two children attend non-CPS public schools. The authors are engaged scholars who, during the years of the school closures, presented their research to the Board, elected officials, community organizations, and the Chicago Teachers Union.

3. We exclude Montefiore from the analysis as it was treated distinctly (and controversially) by Chicago Public Schools (e.g., presenting misleading information, removing staff) and has an ambiguous closure date.
4. Four additional elementary schools were closed in 2011 or 2012: Guggenheim and Price were closed for “poor performance”; Lathrop and Avondale for “low enrollment.” All closures occurred under the Emanuel mayoral administration, which began in 2011. To assess robustness with regard to these earlier closures, we tested models including these four schools. For 2012 school features we substituted the final year of operation. These models yielded results substantively equivalent to those presented.
5. All variable pairs from Table 1 produce Pearson product-moment correlations less than 0.6 in absolute value, and only a few pairs exceed 0.4, supporting their independent inclusion and interpretation.
6. Montefiore also had a share above 90% but is excluded (see note 2).
7. Mean substitution is a simple and common method for imputing missing data. Compared to more complicated imputation methods, the drawbacks are that mean substitution is more likely to impart bias if the observations involved are atypical, and it tends to reduce sample variance. For this study, with a small fraction of cases missing data only for one characteristic (that ultimately shows no substantial relationship to school closure), we judge the disadvantages to be minimal.
8. Neither of these differences is statistically significant at the 90 % confidence level. The probability values for independent sample t-tests (assuming equal variance) are 0.15 for distance to the CBD and 0.13 for median housing value change.
9. We tested models with two selectivity dummies identifying magnet and special education schools separately in which the coefficient of SIEP share also became insignificant but remained positive.
10. Combining the very small and somewhat small schools into a single “small schools” category generated substantively equivalent results.
11. We found some indications of nonlinearity in the relationship between utilization rate and school closure. Specifying the utilization rate in quadratic form reveals a possible inverted-U shaped relationship, such that an increase in utilization rate starting from a relatively low utilization rate is associated with a higher closure likelihood, whereas an increase in utilization rate from a high utilization rate is related to a lower likelihood of closure (results available upon request). Model diagnostics do not clearly favor one form over the other.

References

- Ahmed-Ullah, N., Chase, J., & Sector, B. (2013, May 23). CPS approves largest school closure in Chicago’s history. *Chicago Tribune*. <https://www.chicagotribune.com/news/ct-xpm-2013-05-23-chi-chicago-school-closings-20130522-story.html>
- Apples to Apples. (2013). Space utilization: Does central office use 36 as the average maximum class size or not? <https://cpsapples2apples.com/2013/01/24/space-utilization-does-central-officeuse-36-as-the-average-maximum-class-size-or-not/>.

- Basu, R. (2007). Negotiating acts of citizenship in an era of neoliberal reform: The game of school closures. *International Journal of Urban and Regional Research*, 31(1), 109-127. <https://doi.org/10.1111/j.1468-2427.2007.00709.x>
- Bierbaum, A. H. (2018). News media's democratic functions in public education: An analysis of newspaper framings of public school closures. *Urban Education*, 56(9), 1485-1519. <https://doi.org/10.1177/0042085918756713>
- Bierbaum, A. H. (2020). Managing shrinkage by "right-sizing" schools: The case of school closures in Philadelphia. *Journal of Urban Affairs*, 42(3), 450-473. <https://doi.org/10.1080/07352166.2020.1712150>
- Brock, M. E., & Schaefer, J. M. (2015). Location matters: Geographic location and educational placement of students with developmental disabilities. *Research and Practice for Persons with Severe Disabilities*, 40(2), 154-164. <https://doi.org/10.1177/1540796915591988>
- Brummet, Q. (2014). The effect of school closings on student achievement. *Journal of Public Economics*, 119, 108-124. <https://doi.org/10.1016/j.jpubeco.2014.06.010>
- Burdick-Will, J., Keels, M., & Schuble, T. (2013). Closing and opening schools: The association between neighborhood characteristics and the location of new educational opportunities in a large urban district. *Journal of Urban Affairs*, 35(1), 59-80. <https://doi.org/10.1111/juaf.12004>
- Campbell, F. (2009). *Contours of ableism: The production of disability and abledness*. Palgrave Macmillan.
- Caref, C., Hains, S., Hilgendorf, K., Jankov, P., & Russell, K. (2012). "The Black and White of Education in Chicago's Public Schools." Research Report for the Chicago Teachers Union. Chicago, IL. Accessed November 13, 2016.
- Chicago Educational Facilities Task Force (CEFTF). (2014). Planning for the future of Chicago's public schools. www.isbe.state.il.us/cef/pdf/ceff-annual-rpt12-13.pdf.
- Chicago Public Schools (2013a). CPS Utilization Data. https://cps.edu/About_CPS/Policies_and_guidelines/Pages/facilitystandards.aspx
- Chicago Public Schools (2013b). Media briefing March 21. <https://cbschicago.files.wordpress.com/2013/03/cps-briefing.pdf>
- Chicago Public Schools (2012). School Data. <https://cps.edu/SchoolData/Pages/SchoolData.aspx>
- Christophers, B. (2018). *The new enclosure: The appropriation of public land in neoliberal Britain*. Verso Books.
- Cox, D. R., & Snell, E. J. (1989). *Analysis of binary data* (2nd ed.). Chapman and Hall/CRC.
- Crockett, J. (2014). Reflections on the concept of the least restrictive environment in special education. In B. Cook, M. Tankersley, & T. Landrum (Eds.), *Special education past, present, and future perspectives from the field: Advances in learning and behavioral disabilities* (Vol. 27, pp. 39-61). Emerald. Billingsley, B. S.
- Cucciara, M. (2008). Re-branding urban schools: Urban revitalization, social status, and marketing public schools to the upper middle class. *Journal of Education Policy*, 23(2), 165-179. <https://doi.org/10.1080/02680930701853088>
- Dardick, H. (2013). Absent pension reform, city faces \$1 billion hole. Chicago Tribune. August 1.

- Davidson, M., & Ward, K. (Eds.). (2018) *Cities under austerity: Restructuring the US metropolis*. SUNY Press.
- Dean, J. T. (1982). Criteria to determine which schools to close: The role of subjective as well as objective considerations in New York city. *Urban Education, 17*(3), 323-350. <https://doi.org/10.1177/004208598201700304>
- Deeds, V., & Pattillo, M. (2015). Organizational “failure” and institutional pluralism: A case study of an urban school closure. *Urban Education, 50*(4), 474-504. <https://doi.org/10.1177/0042085913519337>
- de la Torre, M., Gordon, M. F., Moore, P., & Cowhy, J. (2015). *School closings in Chicago: Understanding families' choices and constraints for new school enrollment*. University of Chicago Consortium on Chicago School Research.
- Engberg, J., Gill, B., Zamarro, G., & Zimmer, R. (2012). Closing schools in a shrinking district: Do student outcomes depend on which schools are closed? *Journal of Urban Economics, 71*(2), 189-203. <https://doi.org/10.1016/j.jue.2011.10.001>
- Ewing, E. (2018). *Ghosts in the schoolyard: Racism and school closings on Chicago's south side*. University of Chicago Press.
- Farmer, S., Poulos, C. D., & Baber, A. (2020). Challenging the market logic of school choice: A spatial analysis of charter school expansion in Chicago. *Journal of Urban Affairs, 42*(4), 511-533. <https://doi.org/10.1080/07352166.2018.1555437>
- Ferri, B. A., & Connor, D. J. (2005). Tools of exclusion: Race, disability, and (re)segregated education. *Teachers College Record: The Voice of Scholarship in Education, 107*(3), 453-474. <http://dx.doi.org/10.1111/j.1467-9620.2005.00483.x>
- Formoso, D., Weber, R. N., & Atkins, M. S. (2010). Gentrification and urban children's well-being: Tipping the scales from problems to promise. *American Journal of Community Psychology, 46*(3), 395-412. <https://doi.org/10.1007/s10464-010-9348-3>
- Garry, V., & Utchielle, S. (2019). The upside to one urban district's school closings: African Americans achieve in income balanced schools. *Education and Urban Society*. <https://doi.org/10.1177/0013124518819758>
- Goertz, M. E., & Hess, G. A. Jr. (1998). Processes and power in school budgeting across four large urban school districts. *Journal of Education Finance, 23*(4), 490-506. <http://www.jstor.org/stable/40704040>
- Good, R. M. (2019). Neighborhood schools and community development: Revealing the intersections through the Philadelphia school closure debate. *Journal of Planning Education and Research*. <https://doi.org/0739456X19839769>
- Goodley, D., Lawthom, R., & Runswick-Cole, K. (2014). Dis/ability and austerity: Beyond work and slow death. *Disability & Society, 29*(6), 980-984. <http://dx.doi.org/10.1080/09687599.2014.920125>
- Gordon, F. M., de la Torre, M., Cowhy, J. R., Moore, P., Sartain, L., & Knight, D. (2018). *School closings in Chicago: Staff and student experiences and academic outcomes*. University of Chicago Consortium on Chicago School Research.
- Grindal, T., Schifter, L. A., Schwartz, G., & Hehir, T. (2019). Racial differences in special education identification and placement: Evidence across three states. *Harvard Educational Review, 89*(4), 525-553. <https://doi.org/10.17763/1943-5045-89.4.525>

- Hackworth, J. (2015). Rightsizing as spatial austerity in the American rust belt. *Environment and Planning A: Economy and Space*, 47(4), 766-782. <https://doi.org/10.1068/a140327p>
- Hall, T. E., Meyer, A., & Rose, D. H. (2012). *Universal design for learning in the classroom: Practical implications*. The Guilford Press.
- Hallahan, D. P., Kauffman, J. M., & Pullen, P. C. (2019). *Exceptional learners: an introduction to special education* (14th ed.). Pearsons.
- Hart, H., Zou, A., Young, C., Allensworth, E., & Chen, A. (2020). Supporting School Improvement: Early Findings from a Reexamination of the 5Essentials Survey. <https://consortium.uchicago.edu/publications/supporting-school-improvement>
- Hehir, T. (2002). Eliminating ableism in education. *Harvard Educational Review*, 72(1), 1-33. <https://doi.org/10.17763/haer.72.1.03866528702g2105>
- Hong, M. I., & Coburn, C. E. (2008). Evidence-based decision-making in school district central offices: Toward a policy and research agenda. *Educational Policy*, 22(4), 578-608. <https://doi.org/10.1177/0895904807307067>
- Illinois State Board of Education (ISBE) (2010). Guidelines for the Illinois Alternative Assessment. https://www.isbe.net/Documents/IAA_Particip_Gdlines.pdf
- Institute on Metropolitan Opportunity. (2014). Charter schools in Chicago: No model for educational Reform. Retrieved October, 2014, from <https://news.wttw.com/sites/default/files/article/file-attachments/Chicago-Chararters.pdf>.
- Karp, S. (2017). CPS Secretly Overhauled Special Education at Students' Expense. WBEZ. October 16.
- Kass, A., Luby, M. J., & Weber, R. (2019). Taking a risk: Explaining the use of complex debt finance by the Chicago public schools. *Urban Affairs Review*, 55(4), 1035-1069. <https://doi.org/10.1177/1078087417748782>
- Kirshner, B., Gaertner, M., & Pozzoboni, K. (2010). Tracing transitions: The effect of high school closure on displaced students. *Educational Evaluation and Policy Analysis*, 32(3), 407-429. <https://doi.org/10.3102/0162373710376823>
- Kurth, J. A., Morningstar, M. E., & Kozleski, E. B. (2014). The persistence of highly restrictive special education placements for students with low-incidence disabilities. *Research and Practice for Persons with Severe Disabilities*, 39(3), 227-239. <https://doi.org/10.1177/1540796914555580>
- Lee, H., & Sartain, L. (2020). School closures in Chicago: What happened to the teachers? *Educational Evaluation and Policy Analysis*, 42(3), 331-353. <https://doi.org/10.3102/0162373720922218>
- Lipman, P. (2011). *The new political economy of urban education: Neoliberalism, race, and the right to the city*. Routledge.
- Lutton, L., & Vevea, B. (2012, December, 10). Truth squad: Enrollment down in CPS, but not by much. WBEZ. <http://www.wbez.org/news/truth-squad-enrollment-downcps-not-much-104297>
- Mitchell, D. (2015). *The biopolitics of disability: Neoliberalism ablenationalism, and peripheral embodiment*. The University of Michigan Press.
- National Center for Education Statistics (2020). The condition of education 2020. <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2020144>

- Peck, J. (2012). Austerity urbanism. *City*, 16(6), 626-655. <https://doi.org/10.1080/13604813.2012.734071>
- Perez Jr, J., & Smith Richards, J. (2016, January, 8) Chicago's neighborhood schools hurting as choice abounds. *Chicago Tribune*. <http://www.chicagotribune.com/news/ct-chicago-schools-choice-neighborhood-enrollment-met-20160108-story.html>
- Radinsky, J., & Waitoller, F. (2013). *CPS proposed school actions: Impacts on students*. Chicagoland Researchers and Advocates for Transformative Education.
- Smith, J., & Stovall, D. (2008). 'Coming home' to new homes and new schools: Critical race theory and the new politics of containment. *Journal of Education Policy*, 23(2), 135-152. <https://doi.org/10.1080/02680930701853062>
- Sunderman, G., Coghlan, E., & Mintrop, R. (2017). *School closure as a strategy to remedy low performance*. National Education Policy Center.
- U.S Department of Education (2018). 40th annual report to congress on the implementation of the Individuals with Disabilities Education Act, 2018. <https://www2.ed.gov/about/reports/annual/osep/2018/index.html>
- Waitoller, F. R. (2020). *Excluded by choice: Urban students with disabilities in the education marketplace*. Teachers College Press.
- Waitoller, F. R., & Maggin, D. (2020). Can charter schools address racial inequities evidenced in placement patterns in the least restrictive environment? A longitudinal study in Chicago public schools. *Remedial and Special Education*, 3, 127-138. <https://doi.org/10.1177/0741932518800392>
- Waitoller, F. R., Maggin, D. M., & Trzaska, A. (2017). A longitudinal comparison of enrollment patterns of students receiving special education in urban neighborhood and charter schools. *Journal of Disability Policy Studies*, 28(1), 3-12. <https://doi.org/10.1177/1044207317694846>
- Weber, R., Farmer, S., & Donoghue, M. (2020). Predicting school closures in an era of austerity: The case of Chicago. *Urban Affairs Review*, 56(2), 415-450. <https://doi.org/10.1177/1078087418802359>
- Winzer, M. A. (2009). *From integration to inclusion: A history of special education in the 20th century*. Gallaudet University Press.
- Yell, M. (2019). *The law and special education*. Pearson.

Author Biographies

Rachel N. Weber is a professor in the Department of Urban Planning and Policy at the University of Illinois at Chicago. Her research focuses on the relationship between finance and urban built environments, particularly instruments (tax increment financing, auction rate securities, mortgage-backed securities) and infrastructures (school facilities, toll roads, commercial real estate).

Federico R. Waitoller is an associate professor at the department of special education at The University of Illinois at Chicago. His research examines the experiences of students with disabilities with market-driven educational reforms and teacher learning and pedagogies for inclusive education. His latest book is *Excluded by Choice*:

Urban Students with Disabilities in the Education Marketplace by Teachers College Press.

Joshua M. Drucker is an associate professor of Urban Planning and Policy at the University of Illinois Chicago. His research is in state and local economic development, particularly industrial development, business incentives, entrepreneurship, and science and innovation policy. He teaches economic development planning, public policy analysis, and methods for urban planners.