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# Unequal Foundations: Racial Disparities in School Building Conditions in New York State

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# Unequal Foundations: Racial Disparities in School Building Conditions in New York State

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**Abstract**

School infrastructure is a critical yet often overlooked factor shaping student health, learning, and well-being. This study examines racial disparities in public school building conditions across New York State using data from building inspections linked to demographic and fiscal data. Schools serving more students of color are significantly more likely to have poor overall conditions, inadequate ventilation, mold, and reduced access to athletic fields, gymnasiums, and health offices. A Kitagawa-Oaxaca-Blinder decomposition shows that local property taxes are the largest contributor to racial gaps in building quality, while progressive state building aid helps reduce these disparities. These findings highlight persistent infrastructure inequities and the need for targeted investments to ensure all students have access to safe and supportive learning environments.

## Introduction

Recent research underscores the critical role that the physical school environment plays in shaping student health, well-being, and educational achievement. Studies indicate that increased capital investment in schools leads to significant improvements in student learning outcomes (O'Hagan, 2025; Biasi, Lafortune, & Schönholzer, 2025; Hong & Zimmer, 2016). Furthermore, poor environmental conditions within school buildings—such as air quality, exposure to toxins, and extreme temperature—can impair learning and increase disruptive behavior (Gilraine, 2023; Park et al., 2020; Persico & Venator, 2021; Chung et al., 2025). Beyond these factors, additional building features including classroom space, athletic and artistic facilities, and safety systems, can influence not only education quality but also overall student well-being (Boese & Shaw, 2005; Gunter & Shao, 2016; Michael et al., 2015; Simons et al., 2010).

Despite the importance of these building conditions, access to high-quality school infrastructure remains uneven. A national report conducted in 2012-13 documented that public schools with a student body composed of 50 percent or more minority students frequently reported "fair" or "poor" building conditions, more so than schools with a lower percentage of minority students (Alexander & Lewis, 2014). A similar disparity appears in schools predominantly serving students from lower socioeconomic backgrounds, with these institutions more likely to have inadequate facilities compared to more affluent schools (Alexander & Lewis, 2014).

Our research provides the first comprehensive analysis, to our knowledge, of the specific nature of these disparities in school building conditions across student demographics. Using detailed building inspection reports from public schools in New York State along with federal and state data on students and schools, we aim to illuminate the extent of, and sources of, these disparities. This study thereby addresses three questions: (1) What is the overall state of school

building conditions in New York State outside of New York City, focusing on building aesthetics, environmental conditions, and recreational facilities? (2) How do these conditions vary among student racial and ethnic groups? And (3) What role do structural factors, such as school funding sources, play in explaining any racial gaps in school building conditions?

Using several data sources matched at the school and district levels, we analyze disparities in school building conditions by student racial composition. We extract data from the 2015 New York Building Condition Survey to capture building condition measures, including: building aesthetics (overall building condition, appearance rating, lighting quality, cleanliness rating, classroom noise, and presence of vermin); environmental conditions (heating, cooling, and ventilation system conditions, water system conditions, mold); and health and recreational facilities (playground equipment, athletic fields, stadiums, gymnasiums, swimming pools, and health offices). Additionally, we link this school-level data to student demographics and school characteristics from NCES's Common Core of Data, New York's School Report Card, Urban Institute poverty estimates (MEPS), and district fiscal data from the State Comptroller. We first perform descriptive comparisons across predominantly white and predominantly non-white schools and then conduct a Kitagawa-Oaxaca-Blinder (KOB) decomposition of the racial gaps in school building conditions, exploring potential explanatory factors (Blinder, 1973; Kitagawa, 1955; Oaxaca, 1973).

Our analysis reveals significant racial disparities in school building conditions across New York State. Schools serving predominantly Black and Hispanic students experience significantly worse facility conditions than those serving mostly white students. Concerning building aesthetics, predominantly non-white schools are 12 percentage points less likely to have good lighting quality and 15 percentage points less likely to receive a good cleanliness rating. Regarding environmental

conditions, schools serving mostly students of color are 25 percentage points less likely to have satisfactory ventilation system condition, 20 percentage points less likely to have satisfactory humidity conditions, and 7 percentage points more likely to have mold exposure, than schools serving mostly white students. Finally, related to health and recreational facilities, predominantly non-white schools are 19 percentage points less likely to have athletic fields and 25 percentage points less likely to have a stadium. These facilities are also on average in worse condition. Additionally, mostly non-white schools are 12 percentage points less likely to have a health office than schools serving mostly white students. Across all but two measures (satisfactory cooling system condition and satisfactory playground condition), white students attend schools with superior building conditions in New York.

Results from the KOB decomposition indicate that differences in local property taxes explain the largest share of the racial gap in overall school building conditions. This finding aligns with the strong association between property wealth levels and community racial composition, driven by historical exclusion of families of color from property ownership in the United States (Derenoncourt et al., 2024). It therefore makes sense that property taxes emerge as a significant driver of racial gaps in school infrastructure quality. The statistical decomposition also indicates that school building condition gaps would be larger across student racial groups if it were not for the distribution of state building aid. New York State currently uses a progressive formula to provide additional revenues to districts seeking building capital improvements (NYC Independent Budget Office, 2024), and our analysis suggests that this aid program successfully narrows gaps between schools serving predominantly white students and schools serving predominantly students of color. Overall, the findings from this study underscore the need for targeted financial

investments to improve school infrastructure for students in historically marginalized communities.

**Literature Review**

Over the past decades, several governmental reports have raised concerns about the inadequate level of funding for school infrastructure. The Government Accountability Office (GAO, 1995) and the National Center for Education Statistics (NCES, 2000) emphasized the need for increased investment in school infrastructure to enhance the overall condition of school buildings nationwide.

Building on earlier concerns about overall underfunding, more recent research has uncovered disparities in capital spending among districts. This matters because unequal funding can lead to unequal facility conditions, as school infrastructure is primarily financed through local resources (Duncombe & Wang, 2009). As school districts typically finance capital improvements for building renovations or new school construction by issuing long-term bonds, states tend to provide less financial support for capital investment (Duncombe & Wang, 2009; Handel & Hanushek, 2023). As a result, districts with limited fiscal capacity may struggle to maintain and improve school facilities, perhaps leading to disparities in school facilities conditions (Sielke, 2001). Indeed, high-poverty school districts spent 37% less per school on capital investments compared to low-poverty districts in the U.S from 2009 to 2018 (Filardo, 2021). Importantly, these disparities also exist by race/ethnicity. Native American, Black, and Hispanic children are more likely to attend schools with lower facility investments and spending on maintenance and operations (Filardo, 2021).

Substantial research has explored the effect of capital spending on students' outcomes. Capital spending is used for a variety of purposes, ranging from building repairs and maintenance

of buildings to new construction projects that address the specific needs of local communities, such as sports complexes, playgrounds, and school transportation systems (Duncombe & Wang, 2009). Given its diverse uses, studies have examined the impact of school capital spending on various outcomes, including students' performance (e.g., test scores, attendance, high school graduation, and college going), behaviors, and community house prices (Baron et al., 2024; Biasi et al., 2025; Hong & Zimmer, 2016; Neilson & Zimmerman, 2014; Jackson & Mackevicius, 2024).

However, findings in the literature remain inconclusive. Some studies find sizable and positive impacts of capital spending (e.g., Neilson & Zimmerman, 2014; Lafortune & Schönholzer, 2022; Biasi et al, 2025). They argue that these benefits come primarily from improved facility quality, such as renovation and new construction (Lafortune & Schönholzer, 2022; Biasi et al, 2025). However, other studies suggest small or delayed impacts of capital spending (e.g., Cellini et al., 2010; Goncalves, 2015; Hong & Zimmer, 2016; Conlin & Thompson, 2017; Rauscher, 2020; Enami et al., 2021; Baron et al., 2024). Furthermore, these studies have conflicting findings on the role of capital spending in addressing disparities. Some argue that high-poverty school districts experience greater benefits compared to their low-poverty counterparts (e.g., Rauscher, 2020, Biasi et al., 2025; Baron et al., 2024), whereas others find no evidence that capital spending reduces student outcome gaps (e.g., Goncalves, 2015).

Another strand of literature examines the impact of building conditions and facility improvements on student outcomes. First, some studies investigate the relationship between overall building conditions and student or teacher outcomes, with inconsistent findings. Some studies find unclear associations between overall building conditions and students' outcomes, whereas others find a significant influence of school facility conditions on student performance (Bailey, 2009; Gunter & Shao, 2016; Stewart, 2010). A second set of studies focuses on the effects

of specific facility improvements, particularly renovations related to air quality, such as air filtration systems and HVAC upgrades. This research generally finds that such improvements have positive effects on academic outcomes and student behavior, such as reductions in absenteeism and suspensions (Gilraine, 2023; Sorensen et al., 2024).

Taken together, the existing literature reveals a gap in our understanding of school building conditions. First, there is little understanding in how disparities in school building conditions exist across student groups. While a couple of studies have documented the effects of capital spending and facility improvements and their roles in addressing disparities, a critical first step could be to examine the extent and nature of these inequities themselves. Second, a thorough investigation is needed to identify the factors contributing to disparities in school building conditions. Most studies emphasize capital spending as the primary determinant to create disparities in school building conditions. Given the multiple purposes of capital spending (Duncombe & Wang, 2009), and its relation to other community characteristics, identifying the sources of building condition inequities is essential. Third, limited research has explored disparities in access to physical activity and recreational facilities, such as playgrounds, athletic fields, and swimming pools. Beyond improvements in instructional spaces, holistic school infrastructure development including facilities for physical education and recreation can shape student outcomes (Michael et al., 2015). Using the Whole School, Whole Community, and Whole Child (WSCC) framework developed by the Centers for Disease Control and Prevention (CDC), Michael et al. (2015) found evidence that safe, healthy, conducive, and positive school environments were associated with improved health behaviors and academic achievement.

Building on these insights, we aim to examine disparities in school building conditions across students from different racial and ethnic backgrounds. To guide our analysis, we also draw

on the WSCC model that provides a comprehensive approach to promoting student well-being by recognizing multiple components of the school environment (Chiang et al., 2017). Our focus is on two key elements of this framework – physical environment and physical education and activity. Physical environment includes both external and internal conditions of school buildings, encompassing maintenance (e.g., leaks, broken facilities), renovation (e.g., ventilation, moisture, temperature, noise, and natural and artificial lighting), protection from chemical hazards, cleanliness, and infrastructure. Physical education and activity refer to the accessibility and quality of spaces that promote all students' engagement in active physical activity at school, including gymnasiums, athletic facilities, and access to free drinking water in activity areas (Chiang et al., 2017; Solomon et al., 2018). By integrating these dimensions, we seek to explore how disparities in school buildings exist and what contributing factors shape the disparities.

**Data**

Using several data sources matched at the school and district level, we analyze disparities in school building conditions across student demographics in New York public schools outside New York City. This study extracts data from the New York Building Condition Surveys of 2015. The survey includes information on building aesthetics (e.g., building appearance rating, quality of lighting, cleanliness of the environment), environmental conditions (e.g., mold in a classroom or common areas, evidence of vermin in classrooms, lead water systems, HVAC system conditions), and health and recreational facilities (e.g., playground, athletic fields, health offices). Exact survey questions used are provided in Appendix Table A1. We converted several variables into binary measures based on their original reporting. Variables initially coded using a Likert scale were reclassified into binary categories, such as 1 for "good" and 0 for "poor", or 1 for "satisfactory" and 0 for "unsatisfactory," depending on the context of the question.

Additionally, we link the school-level data from the New York Building Condition Surveys to directory and enrollment data from the NCES's CCD and the Urban Institute's MEPS. We also supplement this with school district fiscal data from the NYS Comptroller, including information on capital expenditures, local property taxes, state building aid, federal building aid, school donations, and bond revenues. Merging these data sources together results in a sample of 2,352 unique schools.[1] Of these, 1,409 are elementary schools; 369 are middle schools; 436 are high schools; and 138 have some other grade configuration. Appendix Figures A1, A2, and A3 show the number of schools in our sample by school level and student composition type.

**Methods**

*Descriptive comparisons*

We first summarize school building conditions across building aesthetics, environmental conditions, and health and recreational facilities. These initial summaries provided insights into the patterns of facility quality across public schools in New York State. We then investigate disparities in school building conditions across student racial composition groups. Specifically, we classify schools into three categories[2]:

- Mostly white: More than 80% of enrolled students are white.
- Mixed: Between 50% and 80% of enrolled students are white.
- Mostly non-white: More than 50% of students belong to non-white racial groups.

We conduct group mean comparison t-tests to assess statistical differences in building conditions. To contextualize this comparison of schools by student racial/ethnic background, we also classify

[1] Our sample excludes the Board of Cooperative Educational Services (BOCES) because these are not traditional public schools in New York State.
[2] We opt for this simplistic classification scheme to allow for a decomposition of gaps and to ensure that each category has enough schools. Future research could examine in more detail differences across students from specific racial/ethnic backgrounds.

schools based on poverty measures derived from Urban Institute's MEPS, which provides data for the estimated and modified estimates of the percentage of children living in poverty at each school.[3] Finally, we compare schools based on NCES geographic locale classifications: city, rural, suburb, and town.

*Statistical decomposition*

To understand the underlying factors contributing to racial gaps in school building conditions, we apply the KOB decomposition to the gap in school building conditions between predominantly white and predominantly non-white schools. The KOB method, in general, decomposes a difference in outcome means across two groups into three components: (1) that attributable to differences in observable characteristics (endowments); (2) that attributable to differences in how those observable characteristics affect the outcome (coefficients); and (3) that attributable to the interaction between differences in characteristics and differences in the effects of those characteristics (interaction) (Kitagawa, 1955; Oaxaca, 1973; Blinder, 1973). Mathematically, we can present this decomposition of the gap in outcomes $\Delta Y$ as follows:

$$\Delta Y = E + C + I, \text{ where:}$$
$$E = \{E(X_W) - E(X_{NW})\}\beta_{NW}$$
$$C = E(X_{NW})(\beta_W - \beta_{NW})$$
$$I = \{E(X_W) - E(X_{NW})\}(\beta_W - \beta_{NW})$$

In these equations, $X_W$ and $X_{NW}$ represent the vector of explanatory variables for predominantly white (W) and predominantly non-white (NW) schools, respectively. $\beta_W$ and $\beta_{NW}$ represent the coefficients of association between the explanatory variables and the outcome. The endowments component (E), therefore, equals the size of the gap if the coefficients on explanatory factors

[3] For this supplementary analysis we create the following categories: low poverty (schools with fewer than 10% of students in poverty); medium poverty (schools with fewer 11-20% of students in poverty); and high poverty (schools with more than 20% of students in poverty). MEPS percent poverty estimates are typically much lower on average than percent free or reduced-price lunch eligible values (Gutierrez, Blagg, & Chingos, 2022).

were equal across groups ($\beta_{NW}$), but the expected values of the explanatory factors differed across groups. The coefficients component (C) equals the outcome gap if, instead, the explanatory factors were held constant ($X_{NW}$), but the association between those factors and the outcome varied across groups. Finally, the interaction component (I) equals the outcome gap resulting from the interaction of both the endowment and coefficient differences across the two groups.[4]

For this study, the outcomes (Y) are aggregated indices of adequate building condition indicators across three categories – building aesthetics, environmental conditions, and recreational facilities—plus the average of these three indices. We hypothesize several potential structural and contextual factors (X) that could explain differences in these school building conditions across student racial groups. First, differential access to financial resources could contribute to school building condition gaps. We explore multiple potential sources of revenue differences: property taxes, state aid for capital expenses, federal aid for capital expenses, bond revenues, and school donations. We also examine whether geographic locale shapes school building condition gaps by including urbanicity measures, such as city, town, rural, and suburb. We further examine year of building construction as a potential explanatory measure. Finally, we include basic school characteristics, including number of students enrolled and school level, such as elementary, middle, high, and other, to account for potential differences across school sizes and grade levels.

We should note that this decomposition is purely descriptive and could contain bias due to omitted variables or reverse causality. The KOB approach helps us to understand which structural factors are correlated with school building conditions and therefore could explain some part of the racial gap. However, it does not necessarily identify the *causal* sources of building condition gaps.

[4] We use the Jann (2008) Stata command `oaxaca' to perform this three-fold decomposition.

## Results

### *Overall school building conditions*

Before examining racial disparities in exposure to adequate school building conditions, we provide an overarching descriptive summary of school building conditions in New York. Figure 1 presents average school building conditions across the three identified categories, respectively: (a) building aesthetics, (b) environmental conditions, and (c) health and recreational facilities. Overall, there is clear variance in school building conditions across the state, and significant room for improvement in the health and safety qualities of these buildings. In panel (a), across our sample, 84 percent of schools have at least satisfactory overall building condition. 85 percent have good quality lighting and 75 percent have a good appearance rating, indicating that a fair number of schools remain under quality standards in these items. However, 93 percent of schools possess a good cleanliness rating, 94 percent have no excessive classroom noise, and 95 percent have no identified vermin, including rodents, insects, or cockroaches, indicating generally positive conditions.

In panel (b), we found that a substantial share of schools is not equipped with systems that support adequate environmental conditions. Only 49 percent of schools have a central HVAC system, 67 percent a satisfactory ventilation system, and 62 percent satisfactory humidity conditions. Most schools meet satisfactory conditions in other items–88 percent a satisfactory cooling system, 94 percent a satisfactory heating system, and 92 percent with no reported mold exposure. Scarcely any schools have lead water systems, and 97 percent have satisfactory water system conditions.

Regarding health and recreational facilities in panel (c), 68 percent of all schools have a playground (62 percent in satisfactory condition); 88 percent have athletic fields (80 percent in satisfactory condition); 32 percent have an external stadium (29 percent in satisfactory condition);

95 percent have a gymnasium, and 13 percent have a swimming pool. In addition, 90 percent of schools have a health office located in the building. Overall, we observe that not all students in New York have equivalent access to health and recreational facilities in adequate condition.

***School building conditions by student racial composition***

Table 1 presents average school building conditions by the racial composition of the school. Appendix Tables A2 and A3 provide the same comparisons for elementary schools and middle and high schools separately. In each of these tables, the first column shows average values for mostly white schools (>80% students white). The second column shows average values for schools with mixed racial composition (50-80% students white). And the third results column shows average values for schools with mostly non-white students (over 50% students Black, Hispanic, Asian, Native American, multiracial, or another race/ethnicity.). The fourth column presents a simple means comparison test between mostly white and mostly non-white schools, with asterisks designating statistical significance level from the t-test.

Beginning with building aesthetics, we observe that schools with mostly Black, Hispanic, and other racial minority group students have lower rated conditions than predominantly white schools. Specifically, their buildings are 8.1 percentage points less likely to be rated as being in satisfactory or better condition overall. School buildings with predominantly non-white students are also 17.3 percentage points less likely to have a good building appearance rating, 12.2 percentage points less likely to have a good lighting quality rating, and 14.6 percentage points less likely to have a good cleanliness rating, than school buildings with predominantly white students. Mostly non-white schools are also 2.5 percentage points more likely to have vermin (rodents, insects, or cockroaches), although this difference is only marginally significant ($p<0.1$). There are no significant differences in classroom noise levels.

Moving to environmental conditions within schools, there are a few significant differences across school types. As seen in Table 1, predominantly non-white schools are 25.9 percentage points less likely to have a ventilation system in satisfactory condition, 20.0 percentage points less likely to have satisfactory humidity conditions, and 7.1 percentage points more likely to have mold, than their predominantly white counterparts. Schools serving mostly racial minority students are also 2.3 percentage points less likely to have a satisfactory heating system, although that difference is only marginally significant ($p<0.1$). There is also one slightly counterintuitive result: predominantly non-white schools have slightly more satisfactory cooling systems (3.6 percentage points higher). This result may reflect differences across urban and rural schools in cooling systems (see Appendix Tables A4 and A5).

Finally, there are notable differences in the presence or absence of health and recreational facilities across schools based on the racial composition of students. Presented in the third panel of Table 1, mostly non-white schools are 19.4 percentage points less likely to have athletic fields, 24.7 percentage points less likely to have an external stadium, 2.5 percentage points less likely to have a gymnasium ($p<0.1$), and 3.3 percentage points less likely to have a swimming pool, than predominantly white schools. Athletic fields and external stadiums are also in significantly better condition in predominantly white schools than in predominantly non-white schools. Finally, mostly non-white schools are 11.5 percentage points less likely to have a health office than mostly white schools. Schools serving more non-white students are *more* likely to have satisfactory playground equipment, although this partly reflects differences in school grade configurations, since elementary schools hold the opposite pattern across school racial composition (Appendix Table A2). Taken together, these findings suggest greater access to recreation, activity, and

healthcare, in schools serving mostly white students than in schools serving mostly Black, Hispanic, and other racial minority students.

There could be many different reasons that racial minority students experience worse school building conditions on average than do white students. One preliminary possibility to explore is that students of color are more likely to attend schools with higher student poverty concentration, serving communities with fewer financial resources. In Appendix Tables A6 and A7, we present comparisons in school building conditions for elementary and secondary schools, this time across low-, medium-, and high-poverty schools. Although there are some notable differences between low- and high-poverty schools, in general the differences in school building conditions are more modest and less significant than between schools of different student racial compositions. This suggests that student or community poverty is not the only relevant factor. A second possibility is that students of color more likely attend urban schools, which could tend to be in worse physical condition, whereas white students are more likely to attend rural or suburban schools. We correspondingly compare school building conditions across rural, town, suburban, and urban settings in Appendix Tables A4 and A5 for elementary schools and secondary schools respectively. There is some evidence of an urban-rural disparity in school building conditions, as there is an average gap (for instance) in overall school building conditions of around 7 or 8 percentage points between urban and rural schools. Some part of the racial gap in school building conditions could therefore be related to average building differences across geographic locales.

***Decomposition of racial gap in school building conditions***

In order to more fully explore the structural or contextual factors contributing to student racial gaps in school building conditions, we proceed to a statistical decomposition of these gaps. We do not decompose each of the 24 building condition measure gaps separately, but instead use

aggregated indices: (1) a building aesthetics index averaging scores in that category; (2) an environmental conditions index, also averaging scores in that category; (3) a health and recreational facilities index, calculated in the same way; and (4) an overall building conditions index, calculated as the average of the first three indices. Table 2 presents the findings from the three-fold KOB decomposition of the gap in each index between mostly white schools and mostly non-white schools.

The first panel in Table 2 provides an overall summary of the decomposition. The total racial gap in the overall index is 0.083, 0.089 for the building aesthetics index, 0.060 for the environmental conditions index, and 0.100 for the health and recreational facilities index. These all represent sizable gaps, given that the standard deviations of these indices range from 0.14 to 0.17. The remainder of the summary panel indicates how much of the gap is due to differences in endowments, or differences in potential contributing factors between white and non-white schools; how much is due to coefficients, or differential *effects* of those potential contributing factors on school building conditions by school racial composition; and how much is due to interactions, or the interaction between endowment differences and coefficient differences. For most indices, the coefficients component of the racial gap is most substantial, suggesting that contributing factors (e.g. school characteristics and school funding) have different associations with school building conditions in mostly white schools as compared to in mostly non-white schools, in ways that exacerbate inequality.

Looking at specific contributing factors, we calculate for each covariate included in the decomposition the percent of the total race gap in building conditions explained by that covariate. Figure 2 summarizes this information for the overall building conditions index. Appendix Figures

A4, A5, and A6 correspondingly present this information for the building aesthetics index, environmental conditions index, and health and recreational facilities index.

Focusing on overall building conditions, a few important points emerge. The largest single contributor to the racial gap in overall school building conditions is per-pupil property taxes, explaining 30 percent of the total gap – nearly a third. This implies that differences in community property wealth, and therefore differences in local revenues, are a major reason why students of color attend schools with poorer building infrastructure than white students. The second largest contributor to the race gap is school donations per pupil, again suggesting that white communities use their access to wealth to donate to schools and create inequities in building conditions. There is also one factor that explains a large, *negative*, portion of the race gap in overall building conditions (-17 percent): per-pupil state building aid. This finding implies that the racial gap in school building conditions would be larger if it were not for the presence of state building aid. State building aid is distributed by the state to school districts needing to make capital improvements using a formula that provides more financial assistance to districts serving higher-need student populations. Therefore, our result indicates that the progressive formula for state building aid is successfully helping to equalize the gap in school building quality between schools serving disadvantaged racial groups and schools serving more advantaged racial groups.

**Discussion**

This study documents the variety of ways in which New York's school buildings provide better, safer, and healthier environments for white students than for students of color. These disparities include differences in building aesthetics (e.g. lighting quality and cleanliness), environmental conditions (e.g. HVAC system conditions and toxin exposures), and health and recreational facilities (e.g. access to health offices and athletic fields). Given the mounting evidence showing

that both school environmental conditions (Gilraine, 2023; Park et al., 2020; Persico & Venator, 2021; Chung et al., 2025) and capital spending on buildings (Biasi et al., 2025; Lafortune & Schönholzer, 2022; Neilson & Zimmerman, 2014; O'Hagan, 2025) affect student outcomes, these racial disparities in building conditions could act to widen existing racial achievement and attainment gaps. Apart from the implications for educational achievement, these results raise concerns for the health and well-being of students of color attending schools with inadequate or unhealthy building conditions.

We find through decomposition analysis that, even after controlling for school type, level, size, and geographic locale, racial gaps in local property taxes explain nearly a third of the racial gap in school building conditions. This supports prior research documenting the limited fiscal capacity of school districts in poorer communities to finance school facility improvements (Sielke, 2001; Filardo, 2021). It also illustrates how racial wealth gaps can translate directly into racial gaps in education conditions when capital projects need to be primarily financed locally (Derenoncourt et al., 2024). Similarly, donations to public schools – a more common phenomenon in wealthier communities (Nelson & Gazley, 2014) – contribute significantly to the observed racial gaps in school building conditions. A more optimistic finding from our decomposition analysis is that state building aid partially compensates for the gap caused by local revenue differentials. This result suggests that racial gaps in school building conditions could be narrowed significantly with increased progressive investment in state aid for building improvements.

Capital financing for school buildings follows a different budgetary process than that of operational expenditures of school districts. Our research shows the stark disparities in building environments that this current system creates (or maintains) for public school students. State policymakers should consider increased regular investment in school buildings, considering the

potentially large benefits for students' health, well-being, and learning (Bailey, 2009; Biasi et al, 2025; Lafortune and Schönholzer, 2022; Lemaster, 1997; Neilson and Zimmerman, 2014; Sorensen et al., 2024). They should also consider refining funding formulas to provide even more progressive provision of building financial aid to high-need school districts. For example, although Governor Hochul's 2025-26 budget provides high levels of foundation aid funding aimed at improving educational outcomes across New York, it reduces building aid from the prior year, which could exacerbate racial gaps in school building financing and conditions. Finally, states should systematically pursue the collection and transparent publication of school facility infrastructure data to allow researchers, policymakers, and practitioners to better track school conditions and infrastructure needs.

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## Tables and Figures

Table 1. School Building Conditions by Student Racial Composition

| | Mostly white (1) | Mixed (2) | Mostly non-white (3) | Difference (3-1) |
|---|---|---|---|---|
| **Building aesthetics** | | | | |
| Overall building condition satisfactory | 0.857 | 0.852 | 0.776 | -0.081** |
| Appearance rating good | 0.896 | 0.879 | 0.723 | -0.173** |
| Lighting quality good | 0.785 | 0.768 | 0.663 | -0.122** |
| Cleanliness rating good | 0.967 | 0.946 | 0.821 | -0.146** |
| No excessive classroom noise | 0.928 | 0.955 | 0.944 | 0.016 |
| No vermin (rodents, insects, cockroaches) | 0.948 | 0.974 | 0.923 | -0.025+ |
| *Building aesthetics average* | *0.897* | *0.896* | *0.808* | *-0.089*** |
| **Environmental conditions** | | | | |
| Central HVAC system | 0.529 | 0.444 | 0.499 | -0.030 |
| Cooling system | 0.951 | 0.936 | 0.954 | 0.003 |
| Cooling system satisfactory | 0.869 | 0.887 | 0.906 | 0.036* |
| Heating system satisfactory | 0.938 | 0.950 | 0.915 | -0.023+ |
| Ventilation system satisfactory | 0.768 | 0.660 | 0.509 | -0.259** |
| Humidity condition satisfactory | 0.685 | 0.618 | 0.486 | -0.200** |
| No lead water system | 0.999 | 0.996 | 1.000 | 0.001 |
| Water system condition satisfactory | 0.968 | 0.977 | 0.963 | -0.005 |
| No mold | 0.940 | 0.925 | 0.869 | -0.071** |
| *Environmental conditions average* | *0.850* | *0.821* | *0.789* | *-0.061*** |
| **Health and recreational facilities** | | | | |
| Playground equipment | 0.657 | 0.684 | 0.694 | 0.036 |
| Playground condition satisfactory | 0.580 | 0.640 | 0.645 | 0.066* |
| Athletic fields | 0.922 | 0.925 | 0.728 | -0.194** |
| Athletic fields condition satisfactory | 0.820 | 0.850 | 0.665 | -0.155** |
| External stadium | 0.428 | 0.295 | 0.181 | -0.247** |
| Stadium condition satisfactory | 0.386 | 0.266 | 0.162 | -0.224* |
| Gymnasium | 0.957 | 0.947 | 0.933 | -0.025+ |
| Swimming pool | 0.152 | 0.113 | 0.119 | -0.033** |
| Health offices | 0.930 | 0.921 | 0.815 | -0.115** |
| *Health and recreational facilities average* | *0.648* | *0.627* | *0.549* | *-0.099*** |
| *Schools* | *481* | *568* | *360* | |

*+p<0.1; *p<0.05; **p<0.01.*

*Note*. Means or proportions of each variable by group presented in columns 1-3. Column 4 presents a comparison of group means t-test between mostly white and mostly non-white schools.

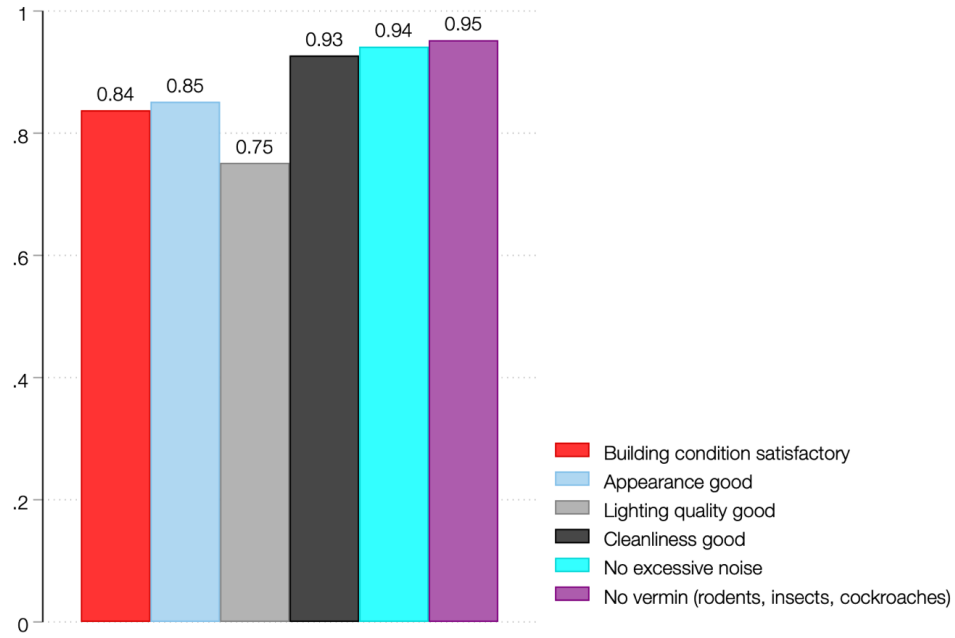
Table 2. Threefold Decomposition of Race Gap in School Building Conditions

| | Overall conditions index | Building aesthetics index | Environmental conditions index | Health and recreational facilities index |
|---|---|---|---|---|
| **Summary** | | | | |
| Mostly white | 0.8005** | 0.8977** | 0.8507** | 0.6532** |
| | (0.0031) | (0.0047) | (0.0044) | (0.0051) |
| Mostly non-white | 0.7175** | 0.8092** | 0.7904** | 0.5529** |
| | (0.0057) | (0.0096) | (0.0068) | (0.0079) |
| Difference | 0.0830** | 0.0885** | 0.0602** | 0.1002** |
| | (0.0065) | (0.0107) | (0.0081) | (0.0094) |
| Endowments | 0.0282* | 0.0370 | 0.0158 | 0.0319 |
| | (0.0133) | (0.0248) | (0.0148) | (0.0224) |
| Coefficients | 0.0570** | 0.0833** | 0.0447** | 0.0431** |
| | (0.0156) | (0.0268) | (0.0161) | (0.0156) |
| Interactions | -0.0023 | -0.0317 | -0.0003 | 0.0252 |
| | (0.0194) | (0.0347) | (0.0204) | (0.0262) |
| **Endowments** | | | | |
| Middle school | -0.0004 | 0.0001 | 0.0002 | -0.0015 |
| | (0.0006) | (0.0004) | (0.0004) | (0.0020) |
| High school | -0.0033+ | -0.0011 | -0.0009 | -0.0077* |
| | (0.0018) | (0.0026) | (0.0017) | (0.0033) |
| Other grades | -0.0028 | -0.0007 | 0.0033 | -0.0110** |
| | (0.0022) | (0.0039) | (0.0032) | (0.0040) |
| City | -0.0054 | -0.0130+ | -0.0231** | 0.0198** |
| | (0.0041) | (0.0072) | (0.0055) | (0.0060) |
| Town | -0.0009 | 0.0044 | -0.0113+ | 0.0042 |
| | (0.0041) | (0.0071) | (0.0063) | (0.0063) |
| Rural | 0.0069 | -0.0111 | 0.0276* | 0.0040 |
| | (0.0108) | (0.0210) | (0.0117) | (0.0195) |
| Enrollment | 0.0012 | 0.0150** | 0.0021 | -0.0136** |
| | (0.0023) | (0.0047) | (0.0024) | (0.0040) |
| Building year | 0.0040** | 0.0056* | 0.0065** | -0.0000 |
| | (0.0015) | (0.0023) | (0.0021) | (0.0016) |
| Property taxes (pp) | 0.0417** | 0.0572** | 0.0242** | 0.0437** |
| | (0.0073) | (0.0109) | (0.0075) | (0.0082) |
| State building aid (pp) | -0.0114** | -0.0267** | -0.0112* | 0.0036 |
| | (0.0044) | (0.0078) | (0.0051) | (0.0058) |
| Federal building aid (pp) | -0.0024 | 0.0075 | -0.0015 | -0.0132** |
| | (0.0030) | (0.0050) | (0.0034) | (0.0046) |
| Bond revenues (pp) | -0.0009 | -0.0017 | -0.0004 | -0.0006 |
| | (0.0013) | (0.0020) | (0.0017) | (0.0019) |
| Donations (pp) | 0.0020 | 0.0014 | 0.0005 | 0.0043+ |
| | (0.0013) | (0.0013) | (0.0009) | (0.0024) |
| **Coefficients** | | | | |
| Middle school | -0.0004 | -0.0007 | -0.0008 | 0.0002 |
| | (0.0023) | (0.0041) | (0.0028) | (0.0037) |
| High school | 0.0051 | 0.0031 | 0.0044 | 0.0078 |
| | (0.0032) | (0.0051) | (0.0034) | (0.0052) |

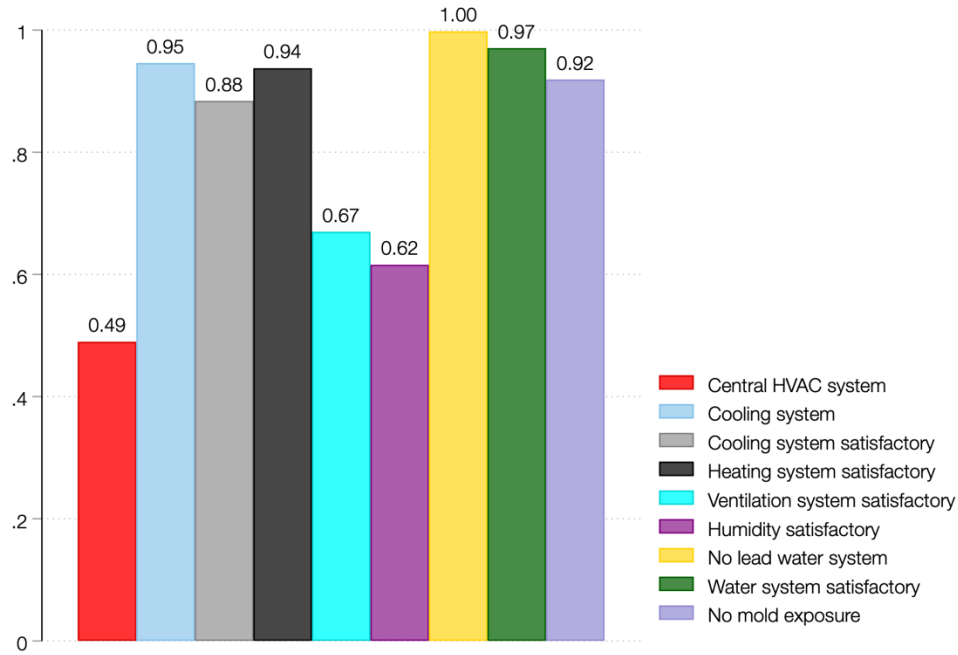
| | | | | |
|---|---|---|---|---|
| Other grades | 0.0012 | -0.0001 | -0.0020 | 0.0056** |
| | (0.0010) | (0.0017) | (0.0015) | (0.0021) |
| City | -0.0386* | -0.0427 | -0.0775** | 0.0045 |
| | (0.0189) | (0.0334) | (0.0213) | (0.0134) |
| Town | 0.0001 | -0.0012 | 0.0021 | -0.0007 |
| | (0.0011) | (0.0018) | (0.0017) | (0.0016) |
| Rural | -0.0001 | 0.0003 | -0.0012+ | 0.0005 |
| | (0.0005) | (0.0009) | (0.0007) | (0.0009) |
| Enrollment | 0.0024 | 0.0063* | 0.0005 | 0.0005 |
| | (0.0015) | (0.0029) | (0.0015) | (0.0019) |
| Building year | 0.0017 | 0.0024 | 0.0041* | -0.0012 |
| | (0.0013) | (0.0021) | (0.0018) | (0.0021) |
| Property taxes (pp) | 0.0144** | 0.0261** | 0.0060 | 0.0112* |
| | (0.0042) | (0.0067) | (0.0046) | (0.0052) |
| State building aid (pp) | 0.0089 | 0.0072 | 0.0280* | -0.0085 |
| | (0.0104) | (0.0174) | (0.0115) | (0.0108) |
| Federal building aid (pp) | -0.0031 | 0.0012 | -0.0004 | -0.0102** |
| | (0.0023) | (0.0036) | (0.0024) | (0.0040) |
| Bond revenues (pp) | -0.0039* | -0.0056+ | -0.0016 | -0.0045 |
| | (0.0019) | (0.0031) | (0.0023) | (0.0029) |
| Donations (pp) | 0.0058** | 0.0034 | 0.0015 | 0.0126** |
| | (0.0021) | (0.0033) | (0.0026) | (0.0028) |
| Interactions | | | | |
| Middle school | -0.0001 | -0.0001 | -0.0001 | 0.0000 |
| | (0.0003) | (0.0005) | (0.0003) | (0.0004) |
| High school | 0.0028 | 0.0017 | 0.0025 | 0.0043 |
| | (0.0019) | (0.0028) | (0.0020) | (0.0030) |
| Other grades | 0.0027 | -0.0002 | -0.0048 | 0.0133** |
| | (0.0024) | (0.0041) | (0.0035) | (0.0045) |
| City | 0.0374* | 0.0414 | 0.0751** | -0.0044 |
| | (0.0183) | (0.0323) | (0.0207) | (0.0130) |
| Town | 0.0002 | -0.0051 | 0.0086 | -0.0028 |
| | (0.0044) | (0.0075) | (0.0066) | (0.0067) |
| Rural | -0.0031 | 0.0076 | -0.0292* | 0.0123 |
| | (0.0114) | (0.0216) | (0.0126) | (0.0204) |
| Enrollment | -0.0049+ | -0.0126** | -0.0009 | -0.0011 |
| | (0.0028) | (0.0049) | (0.0029) | (0.0038) |
| Building year | -0.0018 | -0.0024 | -0.0042* | 0.0012 |
| | (0.0014) | (0.0021) | (0.0020) | (0.0021) |
| Property taxes (pp) | -0.0314** | -0.0566** | -0.0131 | -0.0244* |
| | (0.0084) | (0.0131) | (0.0099) | (0.0110) |
| State building aid (pp) | -0.0115 | -0.0093 | -0.0362* | 0.0109 |
| | (0.0133) | (0.0225) | (0.0144) | (0.0140) |
| Federal building aid (pp) | 0.0045 | -0.0017 | 0.0005 | 0.0147** |
| | (0.0033) | (0.0052) | (0.0035) | (0.0052) |
| Bond revenues (pp) | 0.0049* | 0.0070+ | 0.0020 | 0.0056 |
| | (0.0023) | (0.0038) | (0.0029) | (0.0035) |
| Donations (pp) | -0.0021 | -0.0012 | -0.0005 | -0.0045+ |
| | (0.0013) | (0.0013) | (0.0010) | (0.0026) |
| Observations | 1440 | 1440 | 1440 | 1440 |

Figure 1. Average Building Conditions of New York State Public Schools

(a) Building aesthetics




(b) Environmental conditions



(c) Health and recreational facilities

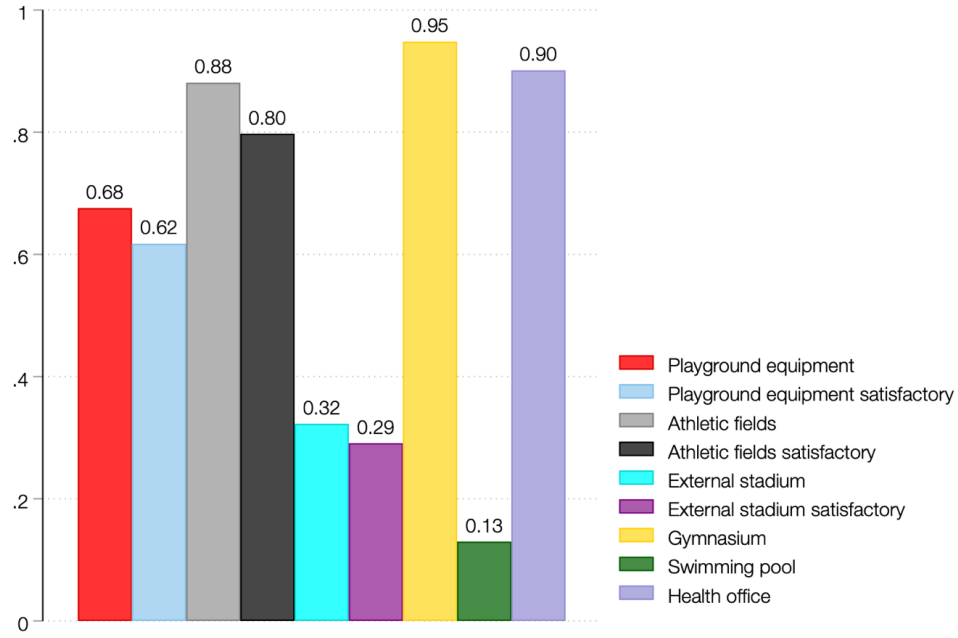
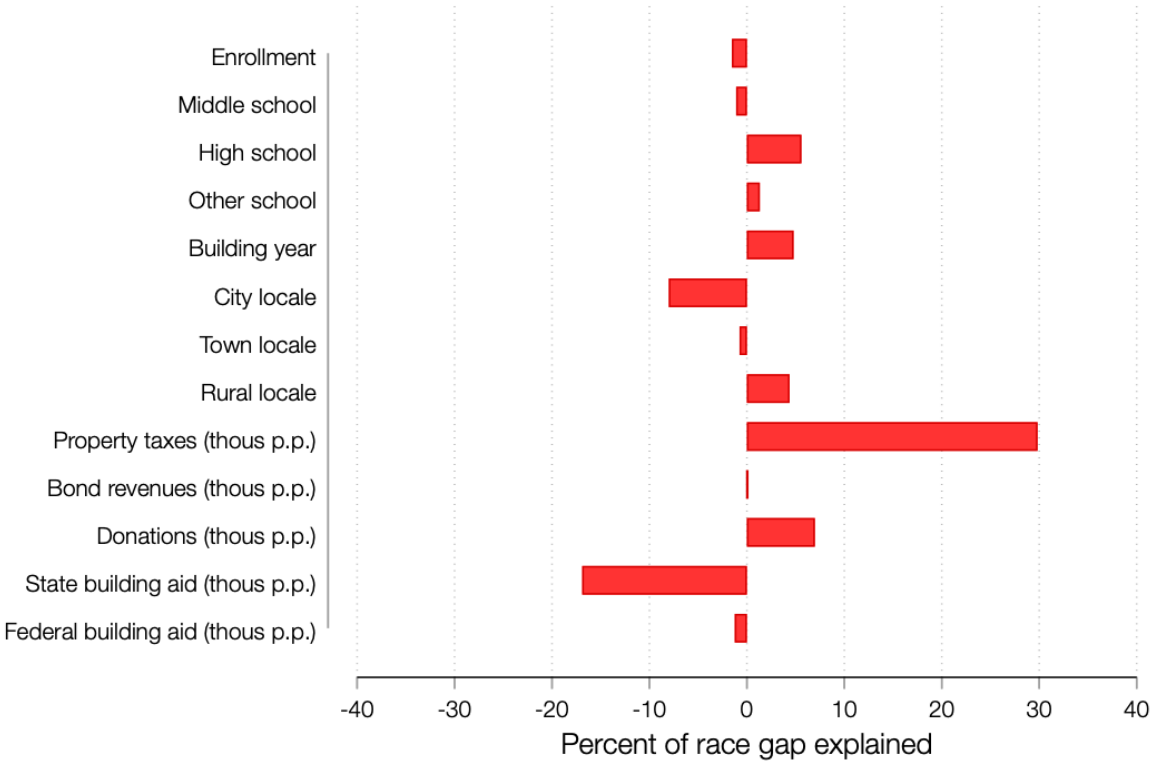


Figure 2. Percent of Racial Gap in Overall School Building Conditions Explained by Contributing Factors



## Appendix Tables and Figures

Appendix Table A1. Questions from the School Building Condition Survey (2015)

| Variables | Questions | Answer Options |
|---|---|---|
| ***Building aesthetics*** | | |
| Overall building condition satisfactory | Q29. Overall building rating | Excellent, Satisfactory, Unsatisfactory, and Poor |
| Appearance rating good | Q104a. General Appearance – Overall Rating | Good, Fair, and Poor |
| Lighting quality good | Q108c. Lighting Quality- Overall Rating | Good, Fair, and Poor |
| Cleanliness rating good | Q105a. Cleanliness – Overall Rating | Good, Fair, and Poor |
| Noise in classrooms | Q107. Is there noise in classrooms from HVAC units, traffic, etc. that may impact education? | Yes/No |
| Vermin (rodents, insects, cockroaches) | Q109a. Is there evidence of active infestations of ... (check all that apply)? | Rodents, Wood-boring or wood-eating insects, Cockroaches, Other Vermin, Other |
| ***Environmental conditions*** | | |
| Central HVAC system | Q88a. Does this building have a central HVAC system? | Yes/No |
| Cooling system | Q91. Cooling / Air-Conditioning Generating Systems? | Yes/No |
| Heating system satisfactory | Q89b. Overall condition of heat generating systems? | Excellent, Satisfactory, Unsatisfactory, Non-functioning, and Critical Failure |
| Cooling system satisfactory | Q91. Overall condition of piped heating and cooling distribution systems? | Excellent, Satisfactory, Unsatisfactory, Non-functioning, and Critical Failure |
| Ventilation system satisfactory | Q92a. Overall condition of air handling and ventilation systems? | Excellent, Satisfactory, Unsatisfactory, Non-functioning, and Critical Failure |
| Humidity condition satisfactory | Q111a. Overall rating of humidity/moisture condition in building: | Good, Fair, and Poor |
| Lead water system | Q84a. Water Distribution System – Types of Pipes? | Iron, Galvanized, Copper, Lead, PVC, Other |
| Water system condition satisfactory | Q84b. Overall condition of water distribution system? | Excellent, Satisfactory, Unsatisfactory, Non-functioning, and Critical Failure |
| Mold | Q110a. Is there visible mold or moldy odors? | Yes/No |
| ***Health and recreational facilities*** | | |
| Playground equipment | Q55. Playgrounds and Playground Equipment | Yes/No |
| Playground condition satisfactory | Q55b. Playgrounds and Equipment Condition | Excellent, Satisfactory, Unsatisfactory, and Poor |
| Athletic fields | Q56. Athletic Fields and Play Fields | Yes/No |

| | | |
|---|---|---|
| Athletic fields condition satisfactory | Q56b. Athletic Fields Condition | Excellent, Satisfactory, Unsatisfactory, and Poor |
| External stadium | Q57. Exterior Bleachers / Stadiums | Yes/No |
| Stadium condition satisfactory | Q57b. Exterior Bleachers/Stadiums Condition | Excellent, Satisfactory, Unsatisfactory, and Poor |
| Gymnasium | Q26. Spaces provided – Tick all that applies | Yes/No |
| Swimming pool | Q26. Spaces provided – Tick all that applies | Yes/No |
| Health offices | Q26. Spaces provided – Tick all that applies | Yes/No |

Appendix Table A2. Elementary School Building Conditions by Student Racial Composition

| | Mostly white (1) | Mixed (2) | Mostly non-white (3) | Difference (3-1) |
|---|---|---|---|---|
| **Building aesthetics** | | | | |
| Overall building condition satisfactory | 0.869 | 0.847 | 0.783 | -0.086** |
| Appearance rating good | 0.888 | 0.882 | 0.739 | -0.149** |
| Lighting quality good | 0.786 | 0.762 | 0.667 | -0.119** |
| Cleanliness rating good | 0.971 | 0.952 | 0.839 | -0.132** |
| Noise in classrooms | 0.067 | 0.048 | 0.053 | -0.014 |
| Vermin (rodents, insects, cockroaches) | 0.050 | 0.026 | 0.075 | 0.025 |
| *Building aesthetics average* | *0.605* | *0.586* | *0.526* | *-0.079* |
| | | | | |
| **Environmental conditions** | | | | |
| Central HVAC system | 0.503 | 0.403 | 0.458 | -0.045 |
| Cooling system | 0.936 | 0.926 | 0.944 | 0.009 |
| Heating system satisfactory | 0.946 | 0.952 | 0.925 | -0.021 |
| Cooling system satisfactory | 0.854 | 0.880 | 0.900 | 0.046* |
| Ventilation system satisfactory | 0.755 | 0.662 | 0.503 | -0.252** |
| Humidity condition satisfactory | 0.694 | 0.620 | 0.492 | -0.203** |
| Lead water system | 0.002 | 0.005 | 0.000 | -0.002 |
| Water system condition satisfactory | 0.971 | 0.970 | 0.964 | -0.007 |
| Mold | 0.037 | 0.072 | 0.122 | 0.085** |
| *Environmental conditions average* | *0.633* | *0.61* | *0.590* | *-0.043* |
| | | | | |
| **Health and recreational facilities** | | | | |
| Playground equipment | 0.975 | 0.977 | 0.936 | -0.039** |
| Playground condition satisfactory | 0.863 | 0.921 | 0.878 | 0.015 |
| Athletic fields | 0.909 | 0.908 | 0.697 | -0.211** |
| Athletic fields condition satisfactory | 0.817 | 0.854 | 0.650 | -0.167** |
| External stadium | 0.227 | 0.111 | 0.064 | -0.163** |
| Stadium condition satisfactory | 0.198 | 0.092 | 0.053 | -0.145** |
| Gymnasium | 0.944 | 0.947 | 0.933 | -0.011 |
| Swimming pool | 0.056 | 0.023 | 0.053 | -0.003 |
| Health offices | 0.919 | 0.905 | 0.797 | -0.122** |
| *Health and recreational facilities average* | *0.656* | *0.638* | *0.562* | *-0.094* |
| | | | | |
| *Schools* | *481* | *568* | *360* | |

*+p<0.1; *p<0.05; **p<0.01.*

*Note*. Means or proportions of each variable by group presented in columns 1-3. Column 4 presents a comparison of group means t-test between mostly white and mostly non-white schools.

Appendix Table A3. Middle and High School Building Conditions by Student Racial Composition

| | Mostly white (1) | Mixed (2) | Mostly non-white (3) | Difference (3-1) |
|---|---|---|---|---|
| **Building aesthetics** | | | | |
| Overall building condition satisfactory | 0.868 | 0.868 | 0.763 | -0.105** |
| Appearance rating good | 0.909 | 0.877 | 0.676 | -0.233** |
| Lighting quality good | 0.776 | 0.785 | 0.640 | -0.136** |
| Cleanliness rating good | 0.962 | 0.936 | 0.763 | -0.199** |
| Noise in classrooms | 0.079 | 0.043 | 0.072 | -0.007 |
| Vermin (rodents, insects, cockroaches) | 0.056 | 0.028 | 0.079 | 0.023 |
| *Building aesthetics average* | *0.608* | *0.590* | *0.499* | *-0.109* |
| **Environmental conditions** | | | | |
| Central HVAC system | 0.576 | 0.503 | 0.576 | -0.001 |
| Cooling system | 0.968 | 0.951 | 0.978 | 0.011 |
| Heating system satisfactory | 0.941 | 0.948 | 0.899 | -0.042 |
| Cooling system satisfactory | 0.885 | 0.896 | 0.928 | 0.043 |
| Ventilation system satisfactory | 0.812 | 0.666 | 0.489 | -0.323** |
| Humidity condition satisfactory | 0.676 | 0.620 | 0.439 | -0.238** |
| Lead water system | 0.000 | 0.003 | 0.000 | 0.000 |
| Water system condition satisfactory | 0.974 | 0.988 | 0.964 | -0.010 |
| Mold | 0.091 | 0.083 | 0.165 | 0.074* |
| *Environmental conditions average* | *0.658* | *0.629* | *0.604* | *-0.054* |
| **Health and recreational facilities** | | | | |
| Playground equipment | 0.191 | 0.199 | 0.101 | -0.090* |
| Playground condition satisfactory | 0.153 | 0.178 | 0.079 | -0.074* |
| Athletic fields | 0.944 | 0.960 | 0.842 | -0.102** |
| Athletic fields condition satisfactory | 0.847 | 0.847 | 0.741 | -0.106** |
| External stadium | 0.656 | 0.604 | 0.496 | -0.159** |
| Stadium condition satisfactory | 0.591 | 0.558 | 0.453 | -0.138** |
| Gymnasium | 0.968 | 0.948 | 0.950 | -0.018 |
| Swimming pool | 0.297 | 0.261 | 0.273 | -0.024 |
| Health offices | 0.956 | 0.945 | 0.871 | -0.085** |
| *Health and recreational facilities average* | *0.623* | *0.611* | *0.534* | *-0.089* |
| *Schools* | *340* | *326* | *139* | |

*+p<0.1; *p<0.05; **p<0.01.*

*Note*. Means or proportions of each variable by group presented in columns 1-3. Column 4 presents a comparison of group means t-test between mostly white and mostly non-white schools.

Appendix Table A4. Elementary School Building Conditions by Geographic Locale

| | City | Town | Rural | Suburb |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| **Building aesthetics** | | | | |
| Overall building condition satisfactory | 0.833 | 0.826 | 0.912 | 0.819 |
| Appearance rating good | 0.858 | 0.888 | 0.869 | 0.830 |
| Lighting quality good | 0.772 | 0.770 | 0.785 | 0.725 |
| Cleanliness rating good | 0.907 | 0.963 | 0.946 | 0.922 |
| Noise in classrooms | 0.049 | 0.062 | 0.073 | 0.050 |
| Vermin (rodents, insects, cockroaches) | 0.043 | 0.019 | 0.050 | 0.052 |
| *Building aesthetics average* | *0.577* | *0.588* | *0.610* | *0.566* |
| **Environmental conditions** | | | | |
| Central HVAC system | 0.562 | 0.453 | 0.442 | 0.432 |
| Cooling system | 0.951 | 0.901 | 0.919 | 0.943 |
| Heating system satisfactory | 0.926 | 0.938 | 0.946 | 0.946 |
| Cooling system satisfactory | 0.914 | 0.839 | 0.854 | 0.884 |
| Ventilation system satisfactory | 0.698 | 0.696 | 0.765 | 0.599 |
| Humidity condition satisfactory | 0.716 | 0.652 | 0.673 | 0.567 |
| Lead water system | 0.000 | 0.000 | 0.004 | 0.004 |
| Water system condition satisfactory | 0.975 | 0.975 | 0.965 | 0.967 |
| Mold | 0.074 | 0.118 | 0.042 | 0.074 |
| *Environmental conditions average* | *0.646* | *0.619* | *0.623* | *0.602* |
| **Health and recreational facilities** | | | | |
| Playground equipment | 0.914 | 0.963 | 0.973 | 0.977 |
| Playground condition satisfactory | 0.864 | 0.826 | 0.858 | 0.920 |
| Athletic fields | 0.586 | 0.857 | 0.896 | 0.893 |
| Athletic fields condition satisfactory | 0.556 | 0.801 | 0.804 | 0.828 |
| External stadium | 0.080 | 0.199 | 0.262 | 0.099 |
| Stadium condition satisfactory | 0.074 | 0.186 | 0.227 | 0.078 |
| Gymnasium | 0.951 | 0.975 | 0.923 | 0.942 |
| Swimming pool | 0.105 | 0.031 | 0.092 | 0.015 |
| Health offices | 0.827 | 0.932 | 0.865 | 0.888 |
| *Health and recreational facilities average* | *0.551* | *0.641* | *0.656* | *0.627* |
| *Schools* | *162* | *161* | *260* | *822* |

*Note*. Means or proportions of each variable by group presented.

Appendix Table A5. Middle and High School Building Conditions by Geographic Locale

| | City (1) | Town (2) | Rural (3) | Suburb (4) |
|---|---|---|---|---|
| **Building aesthetics** | | | | |
| Overall building condition satisfactory | 0.800 | 0.901 | 0.876 | 0.834 |
| Appearance rating good | 0.764 | 0.851 | 0.896 | 0.850 |
| Lighting quality good | 0.836 | 0.762 | 0.756 | 0.743 |
| Cleanliness rating good | 0.818 | 0.921 | 0.948 | 0.914 |
| Noise in classrooms | 0.109 | 0.089 | 0.078 | 0.046 |
| Vermin (rodents, insects, cockroaches) | 0.109 | 0.020 | 0.041 | 0.051 |
| *Building aesthetics average* | *0.573* | *0.591* | *0.599* | *0.573* |
| **Environmental conditions** | | | | |
| Central HVAC system | 0.745 | 0.564 | 0.508 | 0.533 |
| Cooling system | 1.000 | 0.960 | 0.959 | 0.960 |
| Heating system satisfactory | 0.891 | 0.941 | 0.943 | 0.938 |
| Cooling system satisfactory | 0.909 | 0.911 | 0.891 | 0.896 |
| Ventilation system satisfactory | 0.691 | 0.723 | 0.788 | 0.650 |
| Humidity condition satisfactory | 0.600 | 0.644 | 0.637 | 0.595 |
| Lead water system | 0.000 | 0.000 | 0.000 | 0.002 |
| Water system condition satisfactory | 0.909 | 1.000 | 0.984 | 0.978 |
| Mold | 0.127 | 0.139 | 0.073 | 0.097 |
| *Environmental conditions average* | *0.652* | *0.654* | *0.643* | *0.628* |
| **Health and recreational facilities** | | | | |
| Playground equipment | 0.073 | 0.168 | 0.228 | 0.173 |
| Playground condition satisfactory | 0.073 | 0.149 | 0.192 | 0.142 |
| Athletic fields | 0.800 | 0.901 | 0.959 | 0.945 |
| Athletic fields condition satisfactory | 0.655 | 0.782 | 0.839 | 0.856 |
| External stadium | 0.527 | 0.614 | 0.689 | 0.580 |
| Stadium condition satisfactory | 0.509 | 0.554 | 0.627 | 0.527 |
| Gymnasium | 0.927 | 0.970 | 0.943 | 0.962 |
| Swimming pool | 0.600 | 0.347 | 0.244 | 0.237 |
| Health offices | 0.818 | 0.960 | 0.938 | 0.945 |
| *Health and recreational facilities average* | *0.554* | *0.605* | *0.629* | *0.596* |
| *Schools* | *55* | *101* | *193* | *452* |

*Note*. Means or proportions of each variable by group presented.

Appendix Table A6. Elementary School Building Conditions by Student Poverty Concentration

| | Low (1) | Medium (2) | High (3) | Difference (3-1) |
|---|---|---|---|---|
| **Building aesthetics** | | | | |
| Overall building condition satisfactory | 0.867 | 0.853 | 0.792 | -0.075** |
| Appearance rating good | 0.888 | 0.814 | 0.834 | -0.055* |
| Lighting quality good | 0.734 | 0.757 | 0.748 | 0.015 |
| Cleanliness rating good | 0.965 | 0.914 | 0.906 | -0.059** |
| Noise in classrooms | 0.053 | 0.059 | 0.055 | 0.002 |
| Vermin (rodents, insects, cockroaches) | 0.031 | 0.052 | 0.059 | 0.028* |
| *Building aesthetics average* | *0.590* | *0.575* | *0.566* | *-0.024* |
| **Environmental conditions** | | | | |
| Central HVAC system | 0.391 | 0.449 | 0.521 | 0.129** |
| Cooling system | 0.953 | 0.912 | 0.934 | -0.019 |
| Heating system satisfactory | 0.957 | 0.948 | 0.923 | -0.034* |
| Cooling system satisfactory | 0.910 | 0.839 | 0.875 | -0.035+ |
| Ventilation system satisfactory | 0.636 | 0.673 | 0.652 | 0.016 |
| Humidity condition satisfactory | 0.616 | 0.590 | 0.630 | 0.014 |
| Lead water system | 0.006 | 0.002 | 0.000 | -0.006 |
| Water system condition satisfactory | 0.971 | 0.975 | 0.961 | -0.010 |
| Mold | 0.063 | 0.057 | 0.101 | 0.038* |
| *Environmental conditions average* | *0.611* | *0.605* | *0.622* | *0.011* |
| **Health and recreational facilities** | | | | |
| Playground equipment | 0.990 | 0.977 | 0.928 | -0.062** |
| Playground condition satisfactory | 0.928 | 0.896 | 0.842 | -0.085** |
| Athletic fields | 0.943 | 0.884 | 0.726 | -0.217** |
| Athletic fields condition satisfactory | 0.904 | 0.807 | 0.643 | -0.261** |
| External stadium | 0.092 | 0.168 | 0.162 | 0.070** |
| Stadium condition satisfactory | 0.076 | 0.143 | 0.140 | 0.064** |
| Gymnasium | 0.941 | 0.943 | 0.943 | 0.002 |
| Swimming pool | 0.014 | 0.027 | 0.088 | 0.074** |
| Health offices | 0.892 | 0.896 | 0.858 | -0.035 |
| *Health and recreational facilities average* | *0.642* | *0.638* | *0.592* | *-0.05* |
| *Schools* | *511* | *441* | *457* | |

*+p<0.1; *p<0.05; **p<0.01.*

*Note*. Means or proportions of each variable by group presented in columns 1-3. Column 4 presents a comparison of group means t-test between high poverty and low poverty schools.

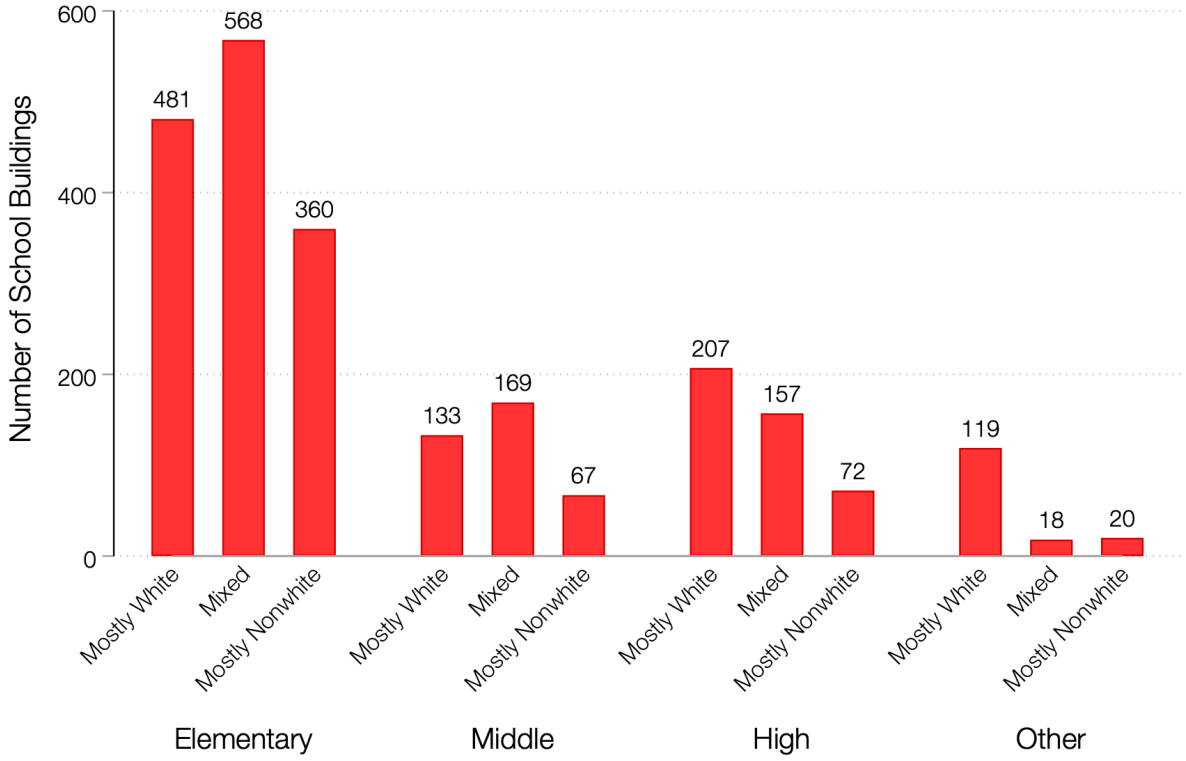
Appendix Table A7. Middle and High School Building Conditions by Student Poverty Concentration

| | Low (1) | Medium (2) | High (3) | Difference (3-1) |
|---|---|---|---|---|
| **Building aesthetics** | | | | |
| Overall building condition satisfactory | 0.862 | 0.835 | 0.837 | -0.025 |
| Appearance rating good | 0.911 | 0.818 | 0.771 | -0.140** |
| Lighting quality good | 0.766 | 0.736 | 0.759 | -0.007 |
| Cleanliness rating good | 0.958 | 0.892 | 0.849 | -0.109** |
| Noise in classrooms | 0.062 | 0.061 | 0.072 | 0.011 |
| Vermin (rodents, insects, cockroaches) | 0.052 | 0.030 | 0.066 | 0.015 |
| *Building aesthetics average* | *0.602* | *0.562* | *0.559* | *-0.043* |
| **Environmental conditions** | | | | |
| Central HVAC system | 0.505 | 0.571 | 0.620 | 0.116* |
| Cooling system | 0.958 | 0.965 | 0.976 | 0.018 |
| Heating system satisfactory | 0.936 | 0.965 | 0.898 | -0.038 |
| Cooling system satisfactory | 0.897 | 0.887 | 0.922 | 0.025 |
| Ventilation system satisfactory | 0.695 | 0.697 | 0.699 | 0.004 |
| Humidity condition satisfactory | 0.623 | 0.584 | 0.620 | -0.003 |
| Lead water system | 0.002 | 0.000 | 0.000 | -0.002 |
| Water system condition satisfactory | 0.980 | 0.978 | 0.970 | -0.010 |
| Mold | 0.094 | 0.095 | 0.127 | 0.033 |
| *Environmental conditions average* | *0.632* | *0.638* | *0.648* | *0.016* |
| **Health and recreational facilities** | | | | |
| Playground equipment | 0.158 | 0.216 | 0.181 | 0.023 |
| Playground condition satisfactory | 0.133 | 0.182 | 0.151 | 0.018 |
| Athletic fields | 0.966 | 0.931 | 0.855 | -0.110** |
| Athletic fields condition satisfactory | 0.887 | 0.814 | 0.705 | -0.182** |
| External stadium | 0.628 | 0.597 | 0.566 | -0.062 |
| Stadium condition satisfactory | 0.569 | 0.550 | 0.518 | -0.051 |
| Gymnasium | 0.963 | 0.952 | 0.946 | -0.017 |
| Swimming pool | 0.249 | 0.251 | 0.392 | 0.143** |
| Health offices | 0.946 | 0.957 | 0.886 | -0.060* |
| *Health and recreational facilities average* | *0.611* | *0.606* | *0.578* | *-0.033* |
| *Schools* | *406* | *231* | *166* | |

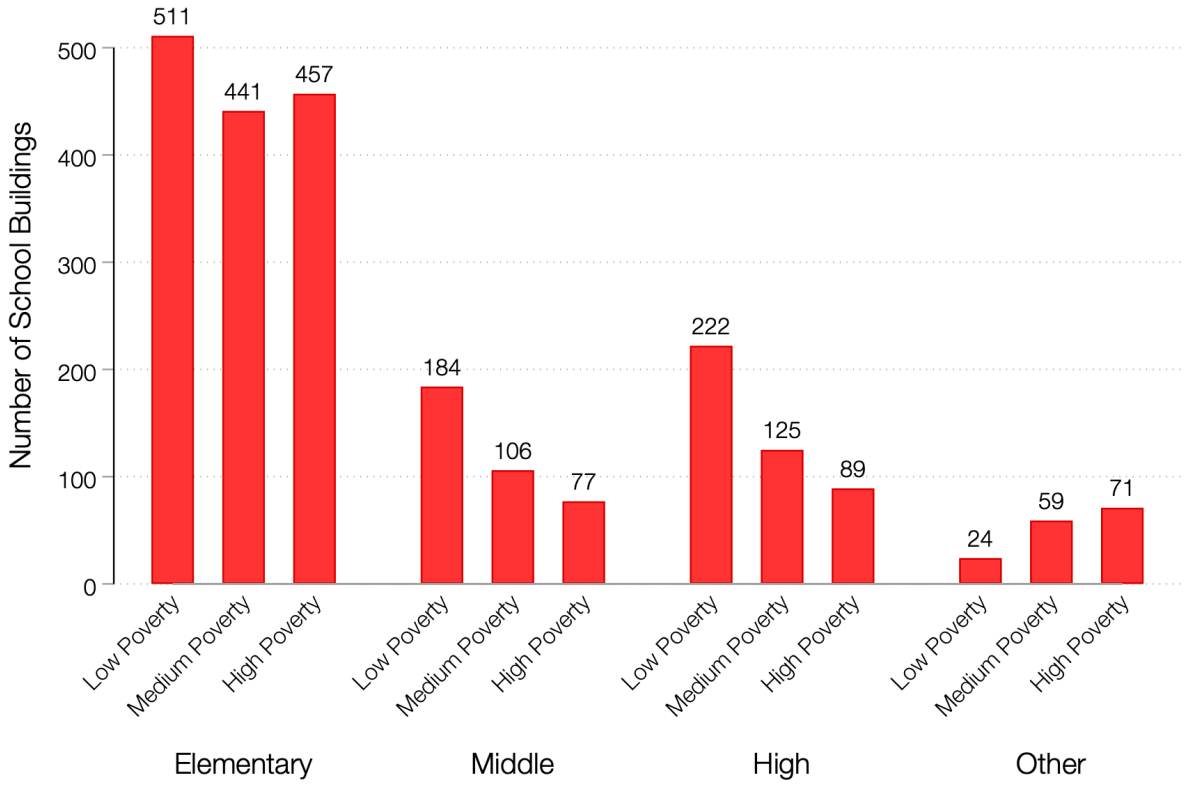
*+p<0.1; *p<0.05; **p<0.01.*

*Note*. Means or proportions of each variable by group presented in columns 1-3. Column 4 presents a comparison of group means t-test between high poverty and low poverty schools.

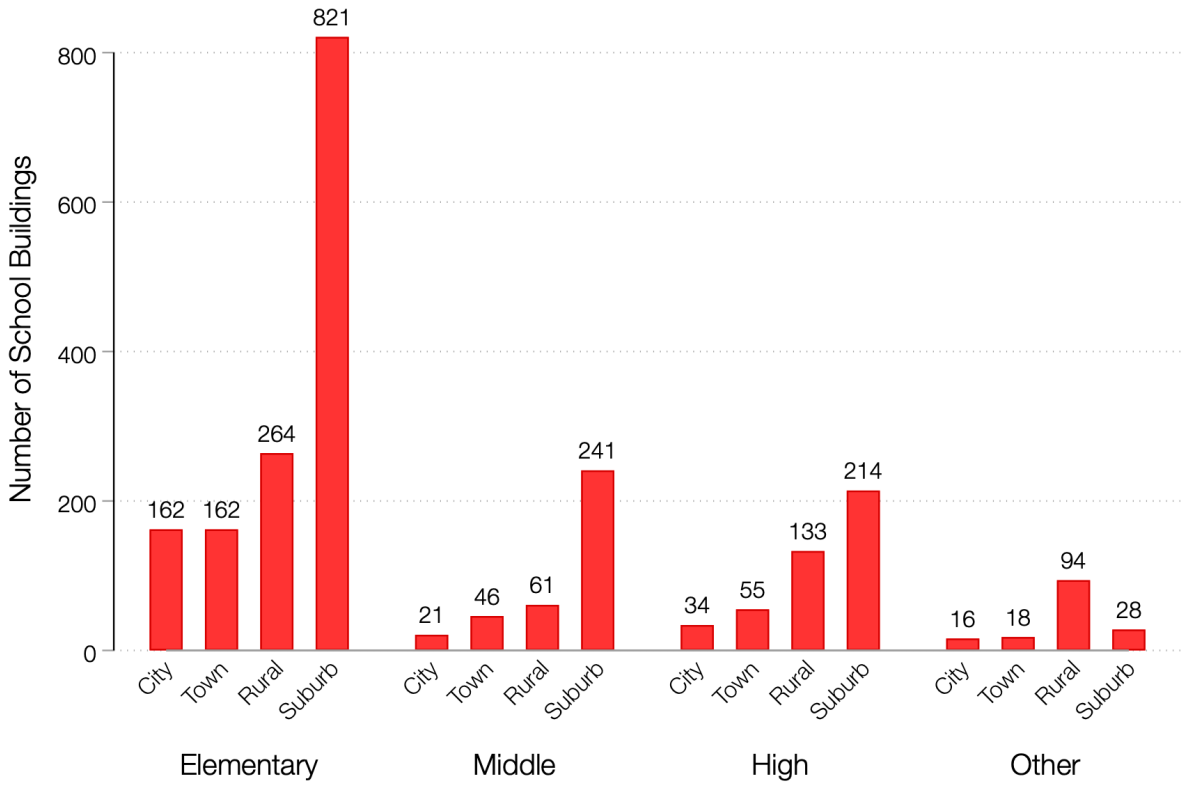
Appendix Figure A1. Number of Schools by School Racial Composition and Level



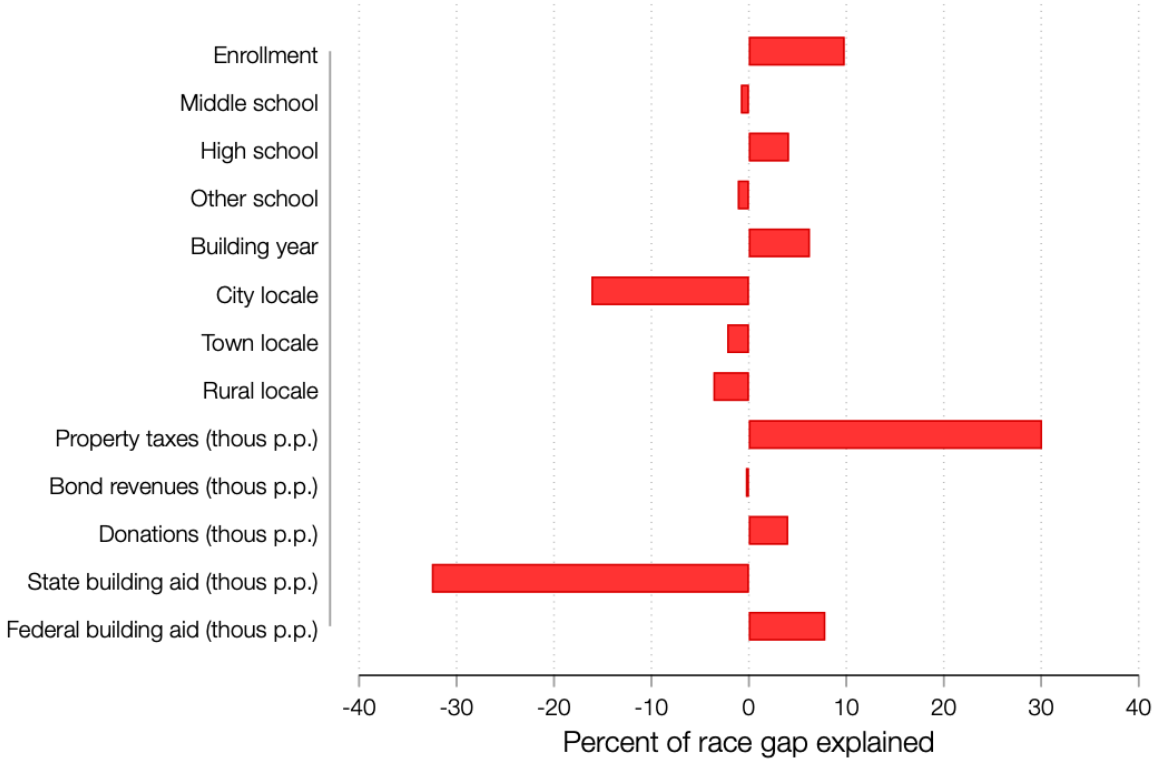
Appendix Figure A2. Number of Schools by Student Poverty Concentration and Level



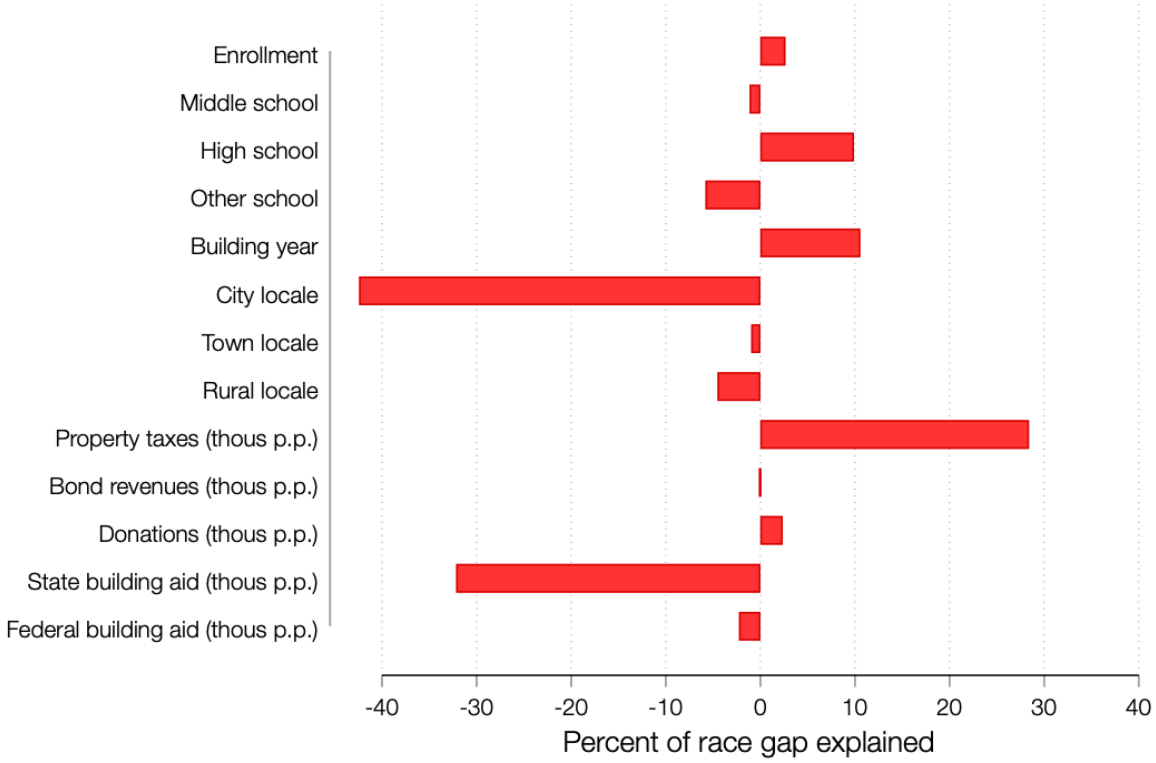
Appendix Figure A3. Number of Schools by Geographic Locale and School Level



Appendix Figure A4. Percent of Racial Gap in Building Aesthetics Index Explained by Contributing Factors



Appendix Figure A5. Percent of Racial Gap in Environmental Conditions Index Explained by Contributing Factors



Appendix Figure A6. Percent of Racial Gap in Health and Recreational Facilities Index Explained by Contributing Factors