Not Too Young to Notice: The Early Emergence of Racial Disparities in Elementary Students' School Climate Perceptions

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Not Too Young to Notice: The Early Emergence of Racial Disparities in Elementary

Students' School Climate Perceptions

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Jerome Graham is an Assistant Professor of K-12 Educational Administration at Michigan State University. His research evaluates the implementation and effects of educational policies and practices that have the potential to make schools more humanizing for Black children. Jerome's work explores the question, **"How would schooling look differently if it were structured in a way that equitably facilitated the social and emotional learning (SEL) and wellbeing of all—and especially Black—students?"** He anchors this work through interdisciplinary, mixed-method scholarship that highlights three areas that would look radically different if policies and practices nurtured students' wellbeing: school climate, school discipline, and mental health. His research draws attention to these areas by: (1) problematizing, analyzing, and documenting the disparities that often make school a 'site of suffering' for Black students and (2) investigating the implementation and effects of policies and practices offering alternatives to current schooling approaches that would center, improve, and affirm wellbeing.

Abstract

Scholarship on school climate often fails to explore the perspectives of elementary-school students. To fill this gap, we use survey-data from Georgia to examine racial disparities in elementary-school students' school climate perceptions, how they vary over time, and the factors that associate with them. We find that Black and "Other Race" students report worse school climate perceptions than their peers, that these disparities have worsened with time, and remain present among students attending the same school. Further, bullying and disciplinary incidents predict worse climate perceptions, while increases in teaching experience improve them. These results suggest that efforts to improve school climate should center elementary-schools students, and that racial disparities, bullying, teaching experience, and discipline should be considered in these efforts.

Key words: School Climate, Racial School Climate Gap, Students' Perceptions, Equity, and Educational Disparities

Introduction

School climate, a multidimensional construct assessing students', educators', and parents' perceptions of the "quality and character of school life" (Espelage & Hong, 2019; Thapa et al., 2013), is associated with a range of student outcomes, including school discipline (Rodriguez et al., 2024; Welsh et al., 2024), chronic absenteeism (Graham et al., 2026; Hamlin, 2021), and academic achievement (Berkowitz et al., 2017; Thapa et al., 2013). As school climate has increasingly been positioned as both an accountability indicator and a lever for school improvement in the Every Student Succeeds Act (ESSA) era (Darling-Hammond et al., 2016; Jordan & Hamilton, 2020; Temkin & Harper, 2017), understanding whose experiences are reflected in aggregate measures of climate has taken on heightened importance.

At the same time, a substantial body of research documents how racialized schooling policies, practices, and interactions shape students' perceived and actual school experiences (Golden et al., 2025; Golden et al., 2018; Griffin et al., 2017), such that students of color often experience schooling differently than their White peers (Duncan & Murnane, 2011; Smolkowski et al., 2016). These differences are reflected in well-documented disparities in disciplinary, academic, and socioemotional outcomes (Amemiya et al., 2020; Bottiani et al., 2017; Welsh & Little, 2018), contributing to the "racial school climate gap," or systematic differences in students' perceptions of school climate by race (Voight et al., 2015; Graham, 2022; Konold et al., 2017). Because school climate is measured through surveys that gauge perceptions, documenting racial disparities in those perceptions is consequential, as students' understanding of safety, belonging, and fairness are influenced by inequitable and discriminatory school experiences (Byrd, 2015; Byrd & Carter Andrews, 2016). As states increasingly incorporate school climate measures into ESSA accountability systems and use them to inform resource

allocation and improvement strategies, racial disparities in climate perceptions raise important

questions about whose experiences are reflected in these policy instruments. To the extent that

school-level climate indicators are reported in aggregate form, without attention to disparities

across student groups, such measures may obscure meaningful inequities and inadvertently

undermine efforts to position school climate as an equity-centered lever for improvement.

While researchers increasingly document the benefits of positive school climate and its

growing prominence within accountability systems (Berkowitz et al., 2017; Jordan & Hamilton,

2020), it is unlikely to function as an equity-oriented school improvement lever without attention

to whether racial disparities in climate perceptions exist, when they begin, and how they evolve.

Existing evidence documents such disparities, though it draws overwhelmingly from middle- and

high-school samples (Bottiani et al., 2016; Konold et al., 2017; Voight et al., 2015). Elementary-

school students' voices are rarely centered, as climate in the early grades is often assessed

through adult-reported surveys (Thapa et al., 2013; Wang & Degol, 2016). This sidelining of

student voice is consequential given evidence that younger students can reliably report on their

school experiences (Koth et al., 2008; La Salle et al., 2016). As a result, we know little about

whether racial climate disparities emerge during elementary-school, intensify over time, or

reflect differing experiences between-schools or persist within-school.

Evidence from other domains suggests that schooling disparities appear as early as pre-

and elementary-school (Gilliam et al., 2016; Fryer & Levitt, 2004), raising the possibility that

racial school climate gaps may also take shape during these formative years. If so, efforts to

improve school climate as a strategy for advancing equity and school improvement may need to

begin earlier than is often assumed. To contribute to the limited knowledge base in this area, this

study examines school climate perceptions among 3rd–5th grade students in Georgia, exploring

both their magnitudes and correlates. Specifically, we address the following questions:

1. To what extent do racial disparities exist in elementary students' school climate

   perceptions, and how have they varied over time?

2. To what extent do school climate perceptions differ by race when adjusting for district-,

   school-, and school-by-grade-level factors?

3. In what ways do individual and school factors relate to perceptions of school climate and

   the magnitude of racial disparities therein?

To answer these questions, we leverage data from 2016–17 through 2023–24 to examine

longitudinal trends in school climate disparities, assess whether they remain after accounting for

district-, school-, and school-by-grade-level factors, and how they are shaped by individual- and

school-level factors. In doing so, we consider whether observed differences are driven primarily

by differential sorting patterns across districts and schools or whether they persist even among

students in the same institutional contexts. To the extent that differences persist over time and

within schools, our findings show that the disparities we observe are not solely attributable to

school sorting and may reflect objective and racialized differences in students' lived experiences.

The remainder of the paper proceeds as follows. We first provide a brief overview of

prior studies on disparities in school climate. Next, we summarize the data and methods

employed in this study before discussing the results. We conclude with policy implications and

directions for future research.

Literature Review

Racial Differences in Students' Perceptions of School Climate

Research consistently demonstrates that students' perceptions of school climate are associated with a range of academic, behavioral, and socioemotional outcomes (Cohen et al., 2009; Gage et al., 2016; McCoy et al., 2013). School climate is typically conceptualized as a multidimensional construct encompassing perceptions of safety, relationships with adults and peers, fairness, and support (Aldridge et al., 2018; Berkowitz et al., 2017; Thapa et al., 2013). Despite broad agreement on the importance of these domains, empirical evidence regarding racial differences in students' climate perceptions is inconsistent.

Several cross-sectional studies report weak or nonsignificant racial differences after accounting for individual- and school-level characteristics. Early analyses of middle- and high-school samples found limited racial variation across climate measures (Kuperminc et al., 1997; Way et al., 2007), a pattern echoed in later studies reporting null race effects (Bradshaw et al., 2009). Using nationally representative data from the Educational Longitudinal Study of 2002, Fan et al. (2011) similarly find that mobility, socioeconomic status, and problem behaviors explain substantially more variation in perceptions of order, safety, fairness, and teacher–student relationships than race, which was not a significant predictor.

In contrast, other studies document persistent racial disparities in climate perceptions. Using Maryland survey data, Bottiani et al. (2016) find that Black students report significantly lower perceptions of teacher support than White students, even after accounting for socioeconomic background. Voight et al. (2015), analyzing within-school variation in California middle-schools, show that Black and Hispanic students report less favorable perceptions of safety and connectedness than White students, and that the magnitude of these disparities varies across schools. Extending this work, Graham (2022) documents persistent within-school Black–

White and "Other" race–White disparities across Georgia middle- and high-schools, particularly

in perceptions of adult and peer support.

These divergent findings may reflect variability in how school climate is operationalized,

the populations studied, and analytic approaches used. Disparities appear more consistently in

relational and support-oriented constructs than in composite measures (Bottiani et al., 2016;

Voight et al., 2015). Most existing analyses are cross-sectional, limiting insight into whether

disparities are stable or vary across times (Voight et al., 2015), and few studies offer insights into

disparities in climate perceptions since the COVID-19 pandemic (Graham et al., 2026). Third,

studies differ on which subgroups they include in their analyses, meaning gaps may emerge for

some minoritized groups and not others, highlighting the need to further disaggregate groups like

"students of color" (Graham, 2022). Finally, only a small number of studies distinguish between

between-school and within-school disparities (Graham, 2022; Voight et al., 2015). This

distinction is critical for understanding whether racial climate gaps reflect racialized sorting

patterns across schools or differential experiences within shared institutional environments.

Taken together, prior research documents the possibility of racial disparities among

secondary-school students' climate perceptions but, with few exceptions (Koth et al., 2008; La

Salle et al., 2016) offers little insights into whether such disparities emerge in elementary-school,

persist or intensify over time, and/or reflect differences in between- or within-school

experiences. We address these gaps by examining racial disparities in climate perceptions among

elementary-school students in Georgia. By centering these students' voices and exploring both

between-school and within-school disparities, we provide evidence on the early emergence and

persistence of racial climate gaps and the contextual factors associated with their magnitude.

Methods and Sample

To offer these contributions, we use a 7-year panel of data for 3rd through 5th grade

students who took the Georgia Elementary School Climate Survey (GESCS) from 2016–17

through 2023–24 (data for year 2020-2021 not available as it was not collected due to the Covid-

19 pandemic). During this time frame, roughly 1.7 million surveys were completed, with an

average number of respondents of 265,570 students pre-COVID and 174,513 since. As shown in

Table 1, we find that Black and White students tend to be overrepresented among survey takers,

making up ~38% of 3rd-5th grade students but ~42% of survey respondents. These figures are

generally consistent pre- and post-pandemic. Alternatively, Hispanic students are

underrepresented among survey takers, with a 7-9 percentage point difference between their

student body and survey sample composition. For Asian students, the gap was 2 percentage

points pre-pandemic and 3 percentage points post-pandemic. The average student response rate

is relatively high for students in grades 3–5, at 70% pre-pandemic, but dips noticeably to 60%

post-pandemic. Additionally, the number of non-participating schools increased sharply from an

average of 75 per year pre-pandemic to 693 per year post-pandemic, suggesting the post-

pandemic sample size drop is driven substantively by schools no longer administering the survey

rather than only declining within-school response rates alone.

To explore the extent to which our findings might be biased by this differential

participation across the pandemic periods, we begin by comparing schools participating and non-

participating schools by before and since the pandemic. As shown in Appendix Table A1, which

compares participating and non-participating schools across key characteristics, on most

dimensions, the two groups are broadly similar. However, there are a few meaningful

differences. Non-participating schools pre-pandemic had notably higher shares of White students

(47.89% vs. 37.68%) and lower shares of Black and Hispanic students, suggesting that survey

non-participation was patterned by race before the pandemic. This gap largely closes post-pandemic, where racial composition across participating and non-participating schools converges considerably. Non-participating schools also had higher poverty rates pre-pandemic (70.93% vs. 64.93%) and higher shares of students with disabilities (19.08% vs. 11.57%). To the extent that these schools — serving more White, higher-poverty, and higher-SWD populations — systematically perceive school climate differently, our pre-pandemic estimates may not fully capture the range of school climate experiences across Georgia.

We note this as a limitation and, in light of it, replicate our key models restricting the analytic sample to schools with survey data in at least one pre- and one post-pandemic year. Results are substantively unchanged — coefficients differ by no more than 0.002 across all specifications — and the post-pandemic convergence in school characteristics shown in Appendix Table A1 further suggests that differential participation is unlikely to meaningfully bias our findings.

Measures

School Climate. Students' school climate perceptions serve as the primary outcome variable for this study. The Georgia Department of Education (GaDOE) until 2023-2024 annually administered the GESCS, which is a self-report scale that was adapted from the Georgia Brief School Climate Inventory (White et al., 2014) and has been used to measure elementary students' school climate perceptions since 2013-14 (La Salle et al., 2016). Schools use passive consent procedures when administering the survey, and data were collected anonymously, and thus, is not linkable to students over time.

Participants respond to 11 school climate questions (see Appendix Table A2 for a list of the survey items) using a 4-point Likert Scale with response options ranging from "Always" to

"Never." Before computing school climate scores, we first conducted an exploratory factor

analysis (EFA) on the 11 items each year separately to confirm the factor structure of the scale.

The EFA returned a single factor with an eigenvalue above 1, suggesting a unidimensional

measure of climate. Of the 11 items, our final measure used 8, as three items were removed for

having small factor loadings (<.4), similar to what La Salle et al. (2016) found in a 2013-14

sample of this data. For supplementary analyses, however, we fit all our models using all 11

items and find that our results are qualitatively similar (available upon request). We then created

our school climate index by standardizing the average of the eight items (i.e., $M = 0$, $SD = 1$)

within each year and relative to all elementary students in the state.

Race. Students self-report their race on the GESCS and we use those responses to

construct binary variables for race. The GESCS included race options of Black, Hispanic, White,

Asian, and "Other" until 2017-2018, but expanded its categorization to include Native American,

Mixed Race, and "I prefer not to answer" from 2018-19 onward. To make the panel comparable

across years, we recode the three new categories as "Other" race for our primary analyses. We

fully acknowledge that using an "Other" category is problematic and does not fully capture the

schooling experiences of non-Black-, White-, Asian-, and Hispanic students. In doing so, we do

not intend to erase students' voices and recognize the limited inferences policymakers can draw

from this type of categorization. At the same time, using these additional categories would

impede us from using the longer panel and from meaningfully determining whether disparities in

elementary schooling experiences for students are changing with time. Further, we find that

Black, Hispanic, White, and Asian students make up 96 percent of the student-body composition

in Georgia, leaving few students identifying in other student groups. Accordingly, changes in

disparities over time might primarily be an artifact of small changes in enrollment for those

groups. See Appendix Table A3 for a descriptive table indicating the year-wise percentage composition of Native American, Mixed Race, and students who respond saying "I prefer not to answer" for year 2018-2019 onward.

Bullying. The GESCS also asks students to respond to 4 items that assess their experiences with bullying in school (experiences being hit, having rumors spread about them, being threatened, and being excluded), which might confound the relationship between race and school climate (Espelage & Hong, 2019; Fu et al., 2023). Students respond to these items using a 5-point Likert scale, with higher responses indicating more negative bullying experiences. Using these items, we create a standardized bullying index and include it as a covariate in our models.

School Characteristics. We complement the GESCS data with administrative data from GaDOE, which allows us to explore whether and how several school contextual characteristics relate to school climate disparities. We extract school demographic information from GaDOE, including percentages of Black, Hispanic and low-income students, students with disabilities, and English language learners. We include data on school discipline because of evidence accentuating that students of color, and Black students specifically, are disproportionately subjected to punitive and exclusionary discipline (Dhaliwal et al., 2024; Graham et al., 2025; Wang et al., 2023; Welsh & Little, 2018) and their effects on school climate (Rodriguez et al., 2024; Welsh et al., 2025). Data on the percentage of Black and Hispanic teachers is also included considering research documenting the positive effect these educators have on climate perceptions (Cohen et al., 2009). Given the evidence on the inequitable sorting of educators across schools (Goldhaber et al., 2015; Graham & Flamini, 2021), we also include data on the percentage of new teachers, average teacher experience, student-teacher ratios, and student-counsellor ratios. Finally, we include NCES indicators for geographic locale.

Empirical Strategy

Research question (RQ) 1 examines racial disparities in school climate perceptions among elementary-school students and how they have varied over time. First, we descriptively plot the means of the overall school climate scale by race and year, providing a graphical analysis of how trends vary over time. Second, to understand the magnitude and statistical significance of disparities in climate perceptions and their variation over time, we measure gaps for Black, Hispanic, Asian and "Other" race students compared to White students for the 2016-17 academic year (baseline). Next, we interact each binary race variable with each year, leaving out White and the baseline year, which captures changes in school climate disparities compared to 2016-17. We use OLS models for this analysis as expressed Equation 1:

$$Climate_{it} = \beta_0 + \beta_1 Race_{ig} + B_2 Year_t + \beta_3 Race_{ig} * Year_t + r_{it} \qquad (1)$$

, where *Climate*$_{it}$ captures the school climate perceptions for student *i* in year *t*. For each racial group *g*, we estimate a separate model that includes a binary indicator $Race_{ig}$, which equals 1 if student *i* belongs to group *g* and 0 if they are White. β_2 indicates the year in which the school climate gap is observed. The main effect of $Race_{ig}$ captures the racial school climate gap between the focal group (i.e., Black students) and White students in the baseline year (2016-17), and the interaction term β_3 ($Race_{ig} \times Year_t$) shows how these gap change in subsequent years relative to that baseline. All models include robust standard errors clustered at the school-level.

RQ2 examines whether school climate disparities primarily reflect differences in the schools and districts students attend, rather than differences in students' experiences within the same educational contexts. Given that racial segregation in Georgia remains high, any gaps documented in RQ1 may reflect the fact that students of color and White students systematically attend different contexts, pointing away from the idea that objective differences in treatment

form disparate perceptions. To assess this possibility, we estimate several fixed-effects models

that progressively restrict comparisons to students within the same district, school, and same

school and grade. Although these models cannot directly identify the mechanisms that shape

students' climate perceptions, they allow us to assess how much of the racial climate gap remains

after accounting for students' proximity to one another. The model is specified as:

$$Climate_i = \beta_0 + \beta_1 Black_i + \beta_2 Hispanic_i + \beta_3 Asian_i + \beta_4 Other_i + \lambda + \theta_i + r_i \quad (2)$$

, where $Climate_i$ still represents the standardized climate score for student i and λ represents

year fixed effects. The fixed-effect term θ_i varies across model specifications. We first estimate a

district fixed-effects model ($\theta_i = \alpha_d$), which compares students of different racial groups across

schools within the same district while absorbing all time-invariant district characteristics (i.e.,

policies, administrative capacity, and demographic composition). Next, because meaningful

segregation may still occur across schools within districts, we next estimate a school fixed-

effects model ($\theta_i = \alpha_s$), restricting comparisons to students attending the same school. This

specification tests whether students of color and White students experience school climate

differently within the same school context. Finally, to assess whether racial school climate gaps

persist among students in the same grade within the same school, we estimate a school–grade

fixed-effects model ($\theta_i = \alpha_{sg}$).

     Finally, RQ3 examines how individual- and school-level factors associate with racial

disparities in school climate perceptions and whether such disparities attenuate with the inclusion

of contextual covariates. To address this question, we estimate ordinary least squares (OLS)

models that progressively introduce covariates to assess how racial climate gaps change across

specifications. All models include year fixed effects and robust standard errors clustered at the

school level. All continuous variables are standardized (M = 0, SD = 1). The full model is

specified as follows:

$$Climate_{ist} = \beta_0 + \beta_1 Black_i + \beta_2 Hispanic_i + \beta_3 Asian_i + \beta_4 Other_i + \beta_5 IndCov_i + \beta_6 SchCov_{st} + \lambda_t + \varepsilon_{ist}$$

(3)

, where terms mostly mirror Equation 2. In Model 1, we include a binary race variable; in Model

2, we add a vector of individual-level covariates, $IndCov_{ist}$, including student i's gender, grade,

and bullying index. In Model 3, we add a vector of school-level covariates, $SchCov_{st}$, including

the share of Black, Hispanic, and economically disadvantaged students; the percentage of

students with disciplinary incidents; and teacher- and staff-level characteristics such as the share

of Black and Hispanic teachers, the share of novice teachers, average years of teacher

experience, student–teacher ratio, and student–counselor ratio. Finally, we include indicators for

geographic locale, with suburban schools as the reference category. We also fit the fully

specified model for each race group to explore how the individual- and school-level factors

predict climate scores by race.

To assess the sensitivity of our findings to alternative model specifications, we conduct

two supplementary analyses. First, we estimate multilevel models, beginning with an

unconditional model to assess how much variation in school climate perceptions is attributable to

differences between schools. We report an intraclass correlation coefficient (ICC) of .095,

indicating that schools account for less than 10 percent of the variation in students' climate

perceptions. Although this ICC is modest, since students are nested within schools, we still

estimate multilevel models using the full specification as our first robustness check. We also fit

school and year fixed-effects models as an additional robustness check. This specification further

restricts comparisons to students attending the same school in the same academic year,

accounting for any time-varying school-level factors.

Findings

In answering RQ1, we find that school climate perceptions among students in Georgia

exhibit persistent racial disparities. As shown in Figure 1, White and Asian students consistently

report more favorable perceptions of school climate than Black or "Other" race students. Across

groups, average climate perceptions declined between 2017 and 2018, increased through 2020,

and then fall sharply following the onset of the COVID-19 pandemic between 2022 and 2023.

Although perceptions begin to rebound in 2024 for most groups, Black students remain well

below their pre-pandemic levels. Appendix Table A4 quantifies the standard deviation (SD)

magnitude of these statewide racial school climate gaps. In the baseline year, Black students

reported school climate scores that were .384 SDs lower than White students' ($p < .01$),

representing the largest observed gap across groups. Relative to 2017, this gap widens in several

subsequent years, with statistically significant increases in 2018, 2019, 2022, and most notably in

2023. These coefficients range from 0.55 SDs to 0.96 SDs. Students identifying as "Other" race

also report significantly lower climate perceptions than White students in 2017 ($\beta = -.201$, $p <$

.01), and this gap widens significantly in 2018 ($\beta = .095$, $p < .01$) and 2019 ($\beta = .081$, $p < .05$).

Hispanic and Asian students did not have statistically significant baseline differences in climate

perceptions than White students, though the year coefficients suggest the gap might be widening

with time.

RQ2 examines the extent to which racial differences in school climate perceptions persist

after accounting for district-, school-, and school–grade-level factors. Column 1 of Table 2

presents statewide estimates pooled across all districts and years. Consistent with Figure 1, Black

($\beta = -.429$, p < .01) and "Other" race ($\beta = -.233$, p < .01) students report substantially worse

climate perceptions than White students. Hispanic students also report slightly lower perceptions

($\beta = -.067$, p < .01), while Asian students' are similar. Column 2 introduces district fixed effects,

restricting comparisons to students attending schools within the same district. The magnitude of

the climate gap narrows but remains significant for Black ($\beta = -.350$, p < .01) and "Other" race

students ($\beta = -.176$, p < .01). In contrast, Asian students report significantly more favorable

climate perceptions than their same-district attending White peers ($\beta = .094$, p < .01), while the

Hispanic–White gap is no longer significant.

Column 3 further restricts comparisons to students attending the same school, and we still

find evidence of racial disparities. Under this specification, the magnitude of the climate gap

continues to attenuate for Black ($\beta = -.198$, p < .01) and "Other" race students ($\beta = -.128$, p <

.01), though both remain statistically significant. Notably, the coefficient for Hispanic students

becomes positive and statistically significant ($\beta = .053$, p < .01), indicating that within the same-

school, Hispanic students report more favorable perceptions than White students. Finally,

Column 4 presents results from the school–grade fixed-effects model. The Black–White climate

gap remains similar to the school fixed-effects model ($\beta = -.195$, p < .01), while the gap for

"Other" race students increases in magnitude ($\beta = -.172$, p < .01). The positive Hispanic–White

difference further strengthens in this specification ($\beta = .078$, p < .01) and Asian students report

slightly more favorable perceptions than White students ($\beta = .035$, p < .10).

Results from the balanced-panel specification, which restricts the sample to schools

observed in both the pre- and post-pandemic periods, are substantively indistinguishable from

those obtained using the full sample. Coefficients differ by no more than 0.002 across all

specifications and those in the restricted sample do not change in direction or statistical

significance, providing strong evidence that differential school participation does not

meaningfully bias our estimates. These estimates are shown in Appendix Table A5.

Next, we investigate RQ3, which assesses how school climate perceptions and racial

disparities therein are associated with individual- and school-level factors. Table 3 presents

baseline estimates of racial school climate gaps across the panel. In this specification, Black

students report school climate perceptions that are .419 (p < .01) standard deviations lower than

those of White students. Hispanic students report slightly less favorable perceptions than White

students (β = -.042, p < .05), while "Other race" students report substantially lower perceptions

(β = .226, p < .01). When we control for gender, bullying, and grade level, the Black–White

school climate gap decreases by .062 standard deviations (from −.419 to −.357) but remains

substantively and statistically significant (p < .01). In contrast, the gaps for Hispanic and "Other

race" students increase in magnitude, indicating that individual characteristics such as bullying

experiences and grade composition partially account for baseline differences. Consistent with

this pattern, bullying is strongly associated with less favorable climate perceptions (β = −.332, p

< .01) and 4th and 5th grade students report significantly less favorable perceptions (−.198 and

−.355, respectively; p < .01) that their 3rd grade peers, while female students report more

favorable perceptions than male students (β = .131, p < .01).

In the fully specified model, which adds school-level contextual variables, the Black–

White school climate gap further attenuates to −.200 (p < .01) but remains significant. The gap

between "Other race" and White students also declines relative to Model 2, reaching −.181 (p <

.01). Notably, once school-level factors are included, Hispanic students report slightly more

favorable perceptions than White students (.050, p < .01). These results are qualitatively similar

when using the restricted sample (results available upon request).

Although the inclusion of school-level controls does not meaningfully alter the

coefficients on individual-level variables, several school characteristics are associated with

climate perceptions. Higher shares of Black and Hispanic student enrollment are associated with

less favorable climate perceptions, possibly reflecting compositional reporting differences for

these students. In addition, higher student–counselor ratios ($\beta = -.008$, $p < .10$) and greater

shares of students with disciplinary incidents ($\beta = -.034$, $p < .01$) are associated with less

favorable perceptions. In contrast, attending an urban school ($\beta = .059$, $p < .01$) and having more

experienced teachers ($\beta = .023$, $p < .01$) are associated with more favorable climate perceptions.

These patterns are generally consistent across alternative specifications, including school-year

fixed-effects models and multilevel models that account for the nested structure of the data (see

Appendix Tables A6 and A7).

We conclude by examining heterogeneous associations between individual- and school-

level factors and school climate perceptions by race (Table 4). Across all racial groups, female

students report more favorable perceptions than males, with SDs ranging from .072 (Black

students) to .192 (White students). Experiences of bullying are associated with substantial

declines in school climate perceptions for all groups, as a one SD increase in the bullying index

corresponds to reductions ranging from .265 (Black students) to .367 (White students). Grade-

level patterns are similarly consistent across racial groups, with declines becoming larger at

higher grade levels. Together, these findings suggest that individual experiences—particularly

bullying and grade progression—are among the most consistent predictors of students' climate

perceptions across racial groups.

Most demographic student- and teacher-level variables show limited or inconsistent

associations across races. An exception appears for "Other" race students, for whom higher

shares of Black (β = .168, p < .01) and Hispanic teachers (β = .024, p < .10) are associated with

more favorable perceptions. Teacher experience is positively associated with climate perceptions

among Black (β = .021, p < .01) and White (β = .023, p < .01) students. In contrast, higher

student–teacher ratios predict significant declines in climate perceptions for Hispanic (β = −.033,

p < .05), White (β = −.019, p < .05), and "Other" race students (β = −.051, p < .05). Finally,

higher shares of students with disciplinary incidents are associated with less favorable climate

perceptions across all racial groups, with predicted declines ranging from −.022 SDs for White

students (p < .05) to −.136 SDs for Asian students (p < .10).

Discussion

The study examines the extent of, trends in, and correlates of racial school climate

disparities among elementary students in Georgia. Consistent with prior research in middle- and

high-school settings (Bottiani et al., 2016; Graham, 2022; Voight et al., 2015), we find that Black

and "Other" race students report significantly less favorable school climate perceptions than

White students, and that these disparities widen over time. Hispanic students do not differ from

White students at baseline, though modest gaps emerge in later years, while Asian students'

perceptions are largely comparable to or slightly better than those of White students. Extending

prior scholarship that has largely focused on secondary grades (Bottiani et al., 2016; Konold et

al., 2017), our findings suggest that racial climate disparities are already present in elementary

school and, for some groups, intensify across cohorts and time.

Importantly, racial school climate gaps for Black and "Other" race students persist when

analyses are restricted to within-district, within-school, and within school-grade comparisons.

This pattern aligns with prior within-school evidence in secondary contexts (Graham, 2022;

Voight et al., 2015) and narrows the extent to which disparities can be attributed solely to racial

sorting across schools. Further, when paired with broader research documenting racialized

patterns in discipline (Welsh & Little, 2018), teacher expectations (Cherng, 2017; Papageorge et

al., 2020), and school interactions (Griffin et al., 2017), our results provide suggestive evidence

that disparate trends we observed are not likely explained by subjective differences in survey

responses. The negative school climate perceptions non-Black, Hispanic, or Asian students of

color should be highlighted in any discussion or policy working towards reducing school climate

disparities. Particularly considering research documenting that Native American students report

facing discrimination and microaggressions at school (Johnston-Goodstar & Roholt, 2017).

Taken together, these findings suggest that disparities in perceived school climate may reflect

differential experiences within schools, rather than merely differences in school assignment.

For Hispanic students, the pattern is more nuanced and contributes to the mixed evidence

in the literature (Konold et al., 2017; Voight et al., 2015). When analyses are restricted to within-

district models, disparities attenuate, and in within-school and within-grade models, coefficients

become positive. These results suggest that between-district and between-school compositional

differences may account for a portion of observed disparities in pooled models. That said, more

work is needed to further nuance these findings in light of persistent evidence of racialized

schooling and societal experiences that likely detrimentally affect Hispanic students' climate

experiences such as racial incantations in schools (Horton, 2021) and radicalized immigration

enforcement (Dee & Murphy, 2020; Kirksey et al., 2021; Kirksey et al., 2026).

Implications and Directions for Future Research

Because school climate is measured through student-reported perceptions, the distinction

between perceived and objective conditions warrants consideration. While perceptions are not

equivalent to observable treatment, they are likely highly correlated with it. A substantial body of

research demonstrates that students' perceived safety, belonging, and fairness shape engagement, attendance, and academic outcomes (Berkowitz et al., 2017; Cohen et al., 2009; McCoy et al., 2013). Moreover, perceptions often reflect patterned experiences embedded in institutional contexts. Thus, while our analyses cannot adjudicate specific mechanisms, persistent within-school disparities in perceptions are difficult to dismiss as merely subjective differences detached from structural realities.

The developmental timing of these disparities is particularly noteworthy. Elementary school represents a formative period in which students construct foundational beliefs about belonging, institutional trust, and academic competence. Research documenting early-emerging racial disparities in discipline and achievement (Fryer & Levitt, 2004; Gilliam et al., 2016) raises the possibility that school climate disparities may operate alongside and reinforce these patterns. The presence and widening of racial climate gaps in elementary grades suggest that inequitable experiences may accumulate earlier in students' schooling trajectories than often assumed.

These findings carry important implications for policy, particularly considering the ESSA, under which many states incorporate school climate indicators into accountability systems (Darling-Hammond et al., 2016; Jordan & Hamilton, 2020). If climate measures are reported and acted upon in aggregate form without attention to subgroup disparities, they may obscure meaningful inequities within schools. Our results suggest that equity-centered implementation of ESSA requires disaggregation of climate data and deliberate attention to persistent racial gaps, especially in elementary settings where disparities are often overlooked. Investments in teacher retention, reductions in exclusionary discipline, and targeted anti-bullying initiatives may represent promising avenues for strengthening climate perceptions in ways that are responsive to subgroup differences.

Future research should continue to examine the mechanisms linking institutional

practices to racial disparities in perceived school climate. While the present study leverages

longitudinal student-level data and within-school comparisons, qualitative and mixed-methods

approaches may further illuminate how students interpret and experience climate in their daily

interactions. Advancing school climate as an equity lever for improvement will require not only

measuring aggregate perceptions but also interrogating whose experiences are reflected—and

whose are marginalized—within those measures.

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Table 1. Descriptive Statistics for School Sample and Survey Respondents

	Pre-Pandemic		Post-Pandemic	
Variables	Mean	SD	Mean	SD
Panel A: School-Level Socio-Compositional and Staffing Averages				
% Black	38.42	0.25	38.97	1.54
% Hispanic	15.57	0.10	15.91	1.27
% White	37.86	0.60	37.71	2.22
% Asian	4.10	0.22	4.34	2.25
% Other	3.95	0.13	5.12	0.69
% ED	65.45	0.91	62.94	6.99
% SWD	11.51	0.18	12.20	0.47
% ESOL	9.00	0.72	10.50	1.99
% Gifted	8.45	0.21	10.07	1.39
Student-Teacher Ratio	16.07	0.21	14.98	0.33
Student-Counsellor Ratio	596.12	8.89	536.24	25.33
Teacher Experience	13.30	0.09	13.47	0.26
% Students with incidents	7.21	0.13	6.98	1.21
Panel B: Student-Level Characteristics of Survey Respondents				
% Black	42.07	0.75	43.11	2.82
% Hispanic	8.84	0.57	7.35	1.40
% White	42.60	3.22	38.83	3.06
% Asian	1.69	0.12	1.36	1.32
% Other	4.80	4.54	9.36	3.13
Female	0.50	0.00	0.51	0.00
Survey Response	69.50	5.60	59.53	3.46

Panel A presents school-level averages and standard deviations calculated across all Georgia elementary schools, drawn from administrative records, for pre-pandemic (prior to 2020) and post-pandemic (2020 and later) periods. Panel B presents individual student-level descriptive statistics for the sample of students who completed the survey. We combined multiracial and Native students into the 'Other' category for the survey sample.

Table 2. Differences in School Climate by Level

VARIABLES	(1) State	(2) District FE	(3) School FE	(4) School-Grade FE
Black	-0.429***	-0.350***	-0.198***	-0.195***
	(0.014)	(0.012)	(0.006)	(0.006)
Hispanic	-0.067***	-0.002	0.053***	0.078***
	(0.018)	(0.019)	(0.009)	(0.009)
Asian	0.045	0.094***	0.029	0.035*
	(0.046)	(0.036)	(0.019)	(0.018)
Other	-0.233***	-0.176***	-0.128***	-0.172***
	(0.016)	(0.012)	(0.009)	(0.009)
2018	-0.032***	-0.031***	-0.033***	-0.029***
	(0.008)	(0.008)	(0.008)	(0.008)
2019	0.012	0.007	0.001	0.012
	(0.010)	(0.010)	(0.010)	(0.010)
2020	0.051***	0.045***	0.037***	0.048***
	(0.012)	(0.012)	(0.012)	(0.012)
2022	-0.018	-0.022*	-0.034***	-0.027**
	(0.012)	(0.012)	(0.012)	(0.012)
2023	-0.104***	-0.117***	-0.133***	-0.123***
	(0.014)	(0.013)	(0.013)	(0.013)
2024	-0.095***	-0.103***	-0.113***	-0.103***
	(0.012)	(0.011)	(0.011)	(0.011)
Observations	1,412,669	1,412,669	1,412,669	1,412,669

Note. This table shows the differences in school climate perceptions among elementary school students in Georgia at different levels- the state, district, school and school-grade. This is done by using appropriate fixed levels. Robust standard errors at the school level are in parentheses. Year 2017 refers to academic year 2016-2017, other years follow the same pattern. For example, the year 2024 refers to the academic year 2023-2024.

*** p<0.01, ** p<0.05, * p<0.10

Table 3. Racial School Climate Gaps

VARIABLES	(1)	(2)	(3)
Black	-0.419***	-0.357***	-0.200***
	(0.012)	(0.010)	(0.007)
Hispanic	-0.042**	-0.061***	0.050***
	(0.017)	(0.014)	(0.011)
Asian	0.049	0.026	0.060*
	(0.045)	(0.035)	(0.033)
Other Race	-0.226***	-0.240***	-0.181***
	(0.015)	(0.013)	(0.011)
Female		0.131***	0.131***
		(0.003)	(0.003)
Bullying		-0.332***	-0.329***
		(0.003)	(0.003)
Grade 4		-0.198***	-0.196***
		(0.004)	(0.004)
Grade 5		-0.355***	-0.351***
		(0.005)	(0.005)
Black- Enrollment %			-0.106***
			(0.014)
Hispanic- Enrollment %			-0.034***
			(0.007)
Black teacher %			-0.006
			(0.012)
Hispanic teacher %			-0.011**
			(0.004)
New Teachers %			-0.005
			(0.004)
Average Experience of teachers			0.023***
			(0.006)
Student-Teacher Ratio			-0.004
			(0.005)
Urban School			0.059***
			(0.015)
Rural School			0.017
			(0.014)
Direct Certificate %			0.055***
			(0.009)
Student-Counsellor Ratio			-0.008*
			(0.004)
Students with incidents %			-0.034***
			(0.007)
Observations	1,692,707	1,692,155	1,655,877

Note. This table represents the racial school climate gaps using three OLS models that increasingly add controls. Standard errors are clustered at the school level.

*** p<0.01, ** p<0.05, * p<0.10

Table 4. Relationship between covariates and school climate by race

VARIABLES	Black	Hispanic	White	Asian	Others
Female	0.072***	0.112***	0.192***	0.117***	0.148***
	-0.004	-0.006	-0.003	-0.01	-0.007
Bullying	-0.265***	-0.344***	-0.367***	-0.360***	-0.334***
	-0.003	-0.005	-0.002	-0.011	-0.005
Grade 4	-0.268***	-0.108***	-0.144***	-0.108***	-0.141***
	-0.006	-0.011	-0.005	-0.017	-0.01
Grade 5	-0.446***	-0.224***	-0.276***	-0.201***	-0.291***
	-0.006	-0.011	-0.005	-0.017	-0.014
Black- Enrollment %	-0.055	-0.047	-0.073	-0.048	0.042
	-0.05	-0.128	-0.048	-0.293	-0.093
Hispanic- Enrollment %	0.025	-0.021	-0.035	-0.129	-0.025
	-0.048	-0.056	-0.035	-0.16	-0.057
Black teacher %	0.02	0.073	0.048	-0.071	0.168***
	-0.025	-0.059	-0.033	-0.133	-0.051
Hispanic teacher %	-0.007	-0.006	0.007	-0.004	0.024*
	-0.009	-0.008	-0.008	-0.026	-0.013
New Teachers %	-0.005	0.008	0.002	0.012	-0.009
	-0.005	-0.012	-0.005	-0.021	-0.011
Teaching Experience	0.021***	0.008	0.023***	-0.001	0.011
	-0.007	-0.022	-0.009	-0.051	-0.016
Student-Teacher Ratio	-0.003	-0.033**	-0.019**	-0.023	-0.051**
	-0.008	-0.015	-0.009	-0.039	-0.022
Direct Certificate %	0.091***	0.015	-0.009	0.08	-0.005
	-0.031	-0.03	-0.022	-0.071	(0.035)
Student-Counsellor Ratio	0.003	0.007	-0.002	-0.02	-0.005
	-0.007	-0.009	-0.006	-0.022	-0.01
Students with incidents %	-0.060***	-0.065***	-0.022**	-0.136*	-0.087***
	-0.009	-0.018	-0.01	-0.071	-0.026
Observations	695,101	142,334	689,569	27,475	101,398

Note. This table presents associations between the different covariates used in the study and school climate perceptions disaggregated by race, using school-year fixed effects. The "Other" race category is composed for Native American and mixed-race students. Standard errors are clustered at the school level. Direct Certification is an automatic process to provide free and reduced-price meals to eligible children; it is a proxy measure of student poverty.

*** p<0.01, ** p<0.05, * p<0.10

Figure 1. Racial disparities in school climate perceptions over time.
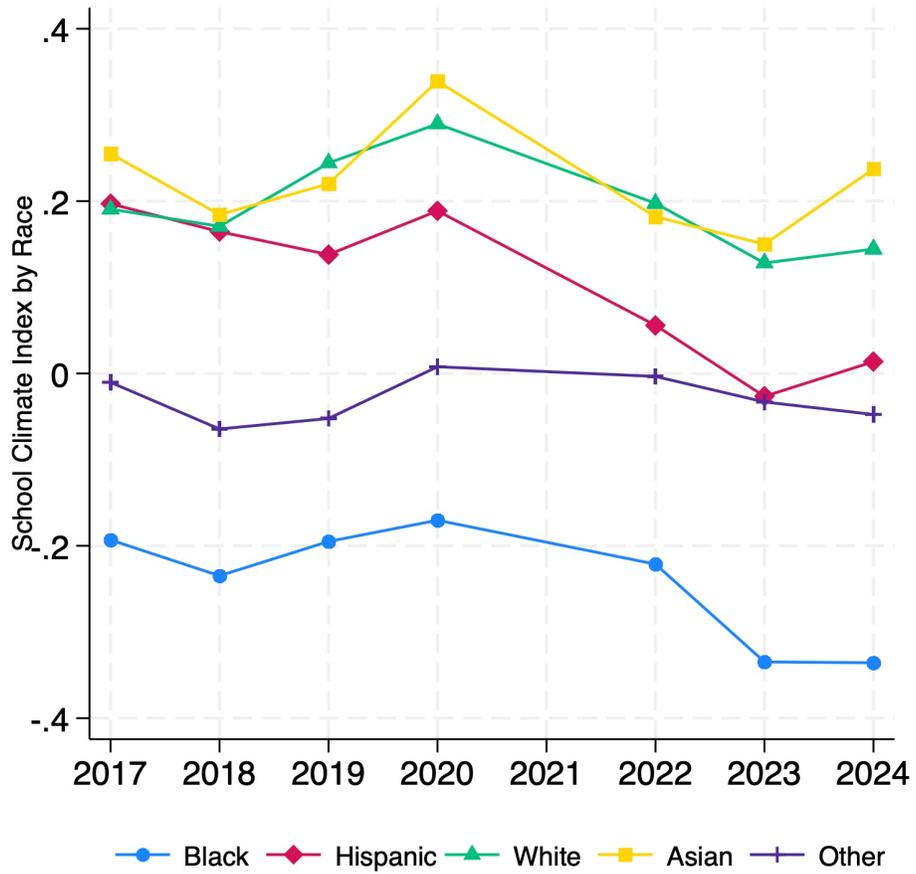
Note. Figure 1 plots students' reported school climate perception on eight items in the survey. The school climate scale is standardized (i.e., M=0, SD=1) for each year. Year corresponds to the Spring term (i.e., 2024= the 2023-24 school year). The figure shows the differences in school climate perceptions overtime for elementary school students in Georgia, disaggregated by race.

Appendices

Table A1. Conditional Descriptive Statistics - Survey Participation

Variables	Pre-Pandemic, Not Participating		Pre-Pandemic, Participating		Post-Pandemic, Not Participating		Post-Pandemic, Participating	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
% Black Students	34.72	24.73	38.24	31.27	37.17	28.27	39.04	30.67
% Hispanic Students	10.74	10.40	15.74	17.90	16.97	16.03	16.34	17.34
% White Students	47.89	25.09	37.68	29.55	36.72	26.91	37.31	28.78
% Asian Students	1.96	4.29	4.22	8.73	6.18	11.06	4.80	9.09
% Other Students	4.58	3.05	4.02	2.13	5.58	2.82	5.42	2.40
% Native Students	0.13	0.59	0.10	0.30	0.31	0.53	0.34	0.49
% Multi-Racial Students	4.46	3.03	3.92	2.12	5.28	2.80	5.02	2.41
% Poverty	70.93	26.90	64.93	30.16	59.24	32.27	63.60	30.32
% SWD	19.08	22.16	11.57	3.46	13.77	11.97	12.35	3.79
% ELLs	5.88	9.37	9.29	13.68	12.15	13.81	11.05	14.64
% Gifted Students	6.22	6.27	8.58	6.56	9.97	7.17	10.48	7.47
Student-Teacher Ratio	15.40	23.61	15.93	2.20	14.16	5.33	14.80	2.25
Student-Counsellor Ratio	454.38	186.19	590.99	175.04	466.95	176.07	522.47	163.28
Teaching Experience	13.92	3.50	13.36	2.58	13.05	3.95	13.48	3.10
% Students with Incidents	7.35	9.22	6.68	6.34	5.72	5.68	7.11	6.37
Female	N/A	N/A	0.50	0.50	N/A	N/A	0.51	0.50
Response Rate Overall	8.64	20.28	68.50	16.39	0.49	0.56	58.37	20.04
Response Rate Black	--	--	41.59	40.60	--	--	43.88	42.46
Response Rate Hispanic	--	--	8.71	21.70	--	--	7.58	21.82
Response Rate White	--	--	41.43	39.70	--	--	38.64	39.84
Response Rate Asian	--	--	1.74	8.78	--	--	1.61	8.90
Response Rate Other	--	--	6.53	13.86	--	--	8.30	15.79
N(schools) =	1,676		4,849		2,771		3,780	

Note. All descriptive statistics represent school-level means and standard deviations for elementary schools in Georgia during academic years prior to 2020 (pre-pandemic) and 2020 onward (post-pandemic). N reflects the number of unique schools observed in each period, regardless of the number of years a school appears. Response rate statistics and gender composition are only available for participating schools. We combined multiracial and Native students into the 'Other' category.

Table A2. Survey Items for Georgia Elementary School Climate Survey 2017-2024

Item	Average Inter-item Covariance	Alpha
I like school	0.15	0.76
I feel like I do well in school	0.16	0.78
My school wants me to do well *	0.17	0.78
My school has clear rules for behavior *	0.17	0.77
I feel safe at school *	0.14	0.75
Teachers treat me with respect	0.15	0.76
Good behavior is noticed at my school	0.15	0.76
Students in my class behave so that teachers can teach	0.15	0.76
I get along with other students	0.15	0.76
Students treat each other well	0.14	0.75
There is an adult at my school who will help me if I need it	0.16	0.76
Test Scale	0.15	0.78

Note. Appendix Table 2 presents inter-item covariances and Alpha coefficients for the school climate scale pooled across the 2016-2017 to 2023-2024 academic years. The questions were answered on a Likert scale of often, always, sometimes and never. * These three items were not included in the main analysis.

Table A3. Year-wise percentage composition of Native American, Mixed Race, and students who respond saying "I prefer not to answer"

Race/Year	2018-19	2019-20	2021-22	2022-23	2023-24
Native American	0.01	0.01	0.01	-	0.01
Mixed Race	1.02	1.18	0.61	0.92	1.56
Response: "I prefer not to answer"	8.96	12.48	6.19	6.39	8.08

Table A4. Statewide Racial School Climate Gaps Over Time

Racial School Climate Gap	(1) Black	(2) Hispanic	(3) Asian	(4) Other
Racial School Climate Gap at Baseline				
Racial School Climate Gap in 2017	-0.384***	0.006	0.064	-0.201***
	(0.016)	(0.018)	(0.052)	(0.034)
School Climate Gap relative to baseline				
2018	-0.022	-0.012	-0.051*	-0.034
	(0.014)	(0.021)	(0.028)	(0.032)
2019	-0.055***	-0.112***	-0.089***	-0.095***
	(0.019)	(0.031)	(0.030)	(0.035)
2020	-0.076***	-0.107***	-0.015	-0.081**
	(0.023)	(0.037)	(0.049)	(0.038)
2022	-0.035	-0.148***	-0.080	0.000
	(0.023)	(0.033)	(0.066)	(0.042)
2023	-0.079***	-0.161***	-0.043	0.040
	(0.026)	(0.048)	(0.142)	(0.048)
2024	-0.096***	-0.137***	0.029	0.009
	(0.022)	(0.041)	(0.044)	(0.038)
Observations	1,171,586	693,331	598,901	674,112

Note. This table presents mean differences in racial and ethnic minoritized students' school climate perceptions relative to their White peers for elementary schools in Georgia from the 2017 academic year through 2024. The coefficient for 'Other' represents Native American and mixed-race students. Coefficients representing the mean differences on the overall school climate scale between Black, Hispanic, Asian, and 'Other race' students compared to White students are presented for the baseline year- 2017, and additional coefficients depict the variation in these gaps relative to baseline. All models include robust standard errors clustered to the school level.

*** p<0.01, ** p<0.05, * p<0.10

Appendix Table A5. Differences in School Climate by Level (restricted sample

VARIABLES	(1) State	(2) District FE	(3) School FE	(4) School-Grade FE
Black	-0.430***	-0.351***	-0.198***	-0.195***
	(0.014)	(0.012)	(0.006)	(0.006)
Hispanic	-0.067***	-0.001	0.055***	0.079***
	(0.019)	(0.019)	(0.009)	(0.009)
Asian	0.045	0.094***	0.029	0.035*
	(0.046)	(0.036)	(0.019)	(0.018)
Other	-0.233***	-0.176***	-0.128***	-0.172***
	(0.016)	(0.013)	(0.009)	(0.009)
2018	-0.031***	-0.031***	-0.033***	-0.029***
	(0.008)	(0.008)	(0.008)	(0.008)
2019	0.013	0.008	0.001	0.013
	(0.010)	(0.010)	(0.010)	(0.010)
2020	0.050***	0.044***	0.036***	0.047***
	(0.012)	(0.012)	(0.012)	(0.012)
2022	-0.017	-0.022*	-0.034***	-0.027**
	(0.013)	(0.012)	(0.012)	(0.012)
2023	-0.101***	-0.115***	-0.131***	-0.121***
	(0.014)	(0.013)	(0.013)	(0.013)
2024	-0.093***	-0.102***	-0.112***	-0.102***
	(0.012)	(0.012)	(0.011)	(0.011)
Observations	1,403,538	1,403,538	1,403,538	1,403,538

Note. This table shows the differences in school climate perceptions among elementary school students in Georgia at different levels- the state, district, school and school-grade. This is done by using appropriate fixed levels. Robust standard errors at the school level are in parentheses. This sample is restricted to only schools appear in both the pre- and post-Covid periods. Year 2017 refers to academic year 2016-2017, other years follow the same pattern. For example, the year 2024 refers to the academic year 2023-2024.

*** p<0.01, ** p<0.05, * p<0.10

Table A6. Racial School Climate Gaps- OLS, Fixed Effects and HLM

VARIABLES	OLS	FEs	HLM
Black	-0.200***	-0.173***	-0.168***
	(0.007)	(0.005)	(0.005)
Hispanic	0.050***	0.034***	0.026***
	(0.011)	(0.008)	(0.009)
Asian	0.060*	0.025	0.035
	(0.033)	(0.015)	(0.036)
Other Race	-0.181***	-0.150***	-0.153***
	(0.011)	(0.007)	(0.006)
Female	0.131***	0.132***	0.129***
	(0.003)	(0.003)	(0.003)
Bullying	-0.329***	-0.311***	-0.311***
	(0.003)	(0.002)	(0.002)
Grade 4	-0.196***	-0.195***	-0.193***
	(0.004)	(0.004)	(0.004)
Grade 5	-0.351***	-0.345***	-0.342***
	(0.005)	(0.005)	(0.004)
Black- Enrollment %	-0.106***	-0.033	-0.037**
	(0.014)	(0.035)	(0.016)
Hispanic- Enrollment %	-0.034***	-0.006	-0.024**
	(0.007)	(0.026)	(0.012)
Black teacher %	-0.006	-0.012	-0.014
	(0.012)	(0.020)	(0.014)
Hispanic teacher %	-0.011**	-0.004	-0.016*
	(0.004)	(0.005)	(0.009)
New Teachers %	-0.005	-0.001	-0.005
	(0.004)	(0.004)	(0.005)
Average Experience of teachers	0.023***	0.019***	0.009
	(0.006)	(0.006)	(0.008)
Student-Teacher Ratio	-0.004	-0.006	-0.017**
	(0.005)	(0.006)	(0.007)
Urban School	0.059***		-0.024
	(0.015)		(0.029)
Rural School	0.017		0.023
	(0.014)		(0.024)
Direct Certificate %	0.055***	0.021	0.029***
	(0.009)	(0.017)	(0.011)
Student-Counsellor Ratio	-0.008*	0.002	-0.002
	(0.004)	(0.004)	(0.007)
Students with incidents %	-0.034***	-0.048***	-0.056***
	(0.007)	(0.008)	(0.008)
Observations	1,655,877	1,655,877	1,655,877

Note. This table represents the racial gaps between Black, Hispanic, Asian and "other" race students and White students including all covariates using OLS, school-year fixed effects, and hierarchical linear models. Standard errors are clustered at the school level. *** p<0.01, ** p<0.05, * p<0.10

Appendix A7

Across OLS, fixed-effects, and hierarchical linear models, Black students and students in the "Other" race category report less favorable school climate perceptions than White students, with comparable magnitudes across approaches. Individual-level associations—particularly bullying experiences, gender differences, and grade-level patterns—are remarkably stable across specifications. The coefficients for these variables are nearly identical whether using OLS, fixed effects, or multilevel models, increasing confidence that these disparities reflect robust individual-level differences rather than artifacts of model choice.

More substantial differences across specifications emerge for school-level covariates, particularly school racial composition. In the OLS model, higher shares of Black and Hispanic enrollment are associated with significantly lower climate perceptions ($-.106^{***}$ and $-.034^{***}$, respectively). These associations attenuate substantially and become statistically insignificant in the fixed-effects model ($-.033$ and $-.006$) and remain small in the hierarchical model ($-.037^{**}$ and $-.024^{**}$). This pattern suggests that cross-sectional associations between school racial composition and climate perceptions largely reflect stable between-school differences rather than within-school changes attributable to composition itself. A similar pattern appears for school location. While students attending urban schools report more favorable climate perceptions in OLS ($.059^{***}$), this association becomes negative and statistically insignificant in the hierarchical model ($-.024$), underscoring how cross-sectional comparisons may obscure underlying contextual differences. Teacher experience is positively associated with climate perceptions in OLS ($.023^{***}$) and fixed-effects models ($.019^{***}$), but this relationship weakens and becomes statistically insignificant in the hierarchical specification ($.009$). In contrast, the percentage of students with disciplinary incidents consistently predicts lower school climate perceptions across all models, with the magnitude increasing in fixed-effects and hierarchical models (from $-.034^{***}$ in OLS to $-.056^{***}$ in HLM).