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School Climate in Rural and Urban Schools and the Impact of SWPBIS

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Abstract

Positive school climate is associated with myriad positive student, staff, and school outcomes, including increased achievement and decreased problem behavior. Hence, universal evidence-based practices are necessary to increase school climate. One universal approach with evidence of effects on school climate is School-Wide Positive Behavior Interventions and Supports (SWPBIS). However, little research exists evaluating the effects of SWPBIS on school climate focus on student perceptions. Furthermore, researchers have rarely examined differences in students' perceptions of school climate in rural and urban schools and differences of SWPBIS effectiveness in rural and urban schools. Therefore, we used state-wide school climate data for elementary students in the U.S. state of Georgia and examined differences between rural and urban locale and SWPBIS implementation. Using multilevel structural equation modeling, we found that rural schools implementing SWPBIS with high levels of fidelity had significantly higher positive school climate than urban schools. Implications and limitations are discussed.

Keywords

school climate, school-wide positive behavior interventions and supports, rural schools, fidelity of implementation

Improving school climate is associated with increased achievement and decreased problem behavior (Thapa et al., 2013) and has become a primary goal of schools, state departments of education, and the U.S. Department of Education (J. Cohen et al., 2009). School climate is a multidimensional construct that, in essence, represents the patterns of student and school staff experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures (National School Climate Council, 2012). Myriad measures have been developed and used to evaluate school climate (U.S. Department of Education's Office of Safe and Healthy Students, 2018), and a growing evidence base continues to examine the role school climate plays in student success and school-wide intervention programs that can meaningfully improve school climate (Berkowitz et al., 2017; Thapa et al., 2013; Wang & Degol, 2016).

A few universal, school-wide prevention and intervention models have evidence of positive effects of school climate (Charlton et al., 2020), the most effective being School-Wide Positive Behavior Interventions and Supports (SWPBIS). However, to date, little research has examined the effects of SWPBIS on students' perceptions of school climate as compared to adults' perceptions, and no published research has examined differences by rural setting in schools implementing SWPBIS. Given the demographic and geographic differences between rural and urban schools (Pew Research Center, May 2018) and the unique challenges associated with recruiting and retaining school staff in rural schools (Berry et al., 2011), there is a need to explore unique differences in both school climate and SWPBIS implementation. Therefore, this study was designed to address these two gaps in literature by modeling the effect of SWPBIS implemented with fidelity in rural and urban schools on students' perceptions of school climate. First, we define school climate and measurement of school climate. Then we describe the relation between SWPBIS and school climate broadly. Finally, we focus on differences between rural and urban schools' school climate and SWPBIS implementation.

School Climate

School climate encompasses a multitude of factors that predict critical school outcomes and reflects perceptions of

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school engagement, environment, and safety (Charlton et al., 2020). The U.S. Department of Education's National Center on Safe Supportive Learning Environments (n.d.) suggest that a positive school climate is the product of a school's attention to fostering safety; promoting a supportive academic, disciplinary, and physical environment; and encouraging and maintaining respectful, trusting, and caring relationships throughout the school community. Wang and Degol (2016) reviewed 327 school climate documents, 91% of which were empirical studies. Across the school climate literature, they identified four broad domains: (a) academic climate, defined as the ways in which learning and teaching are promoted in a school; (b) community climate, defined as the quality of interactions between and among members of a school; (c) safety, defined as the physical and emotional security provided by a school and the degree of order and discipline present; and (d) institutional environment, defined as the adequacy of the school setting, the maintenance and infrastructure of the building, and the accessibility and allocation of educational resources. Collectively, these four domains broadly represent the key features of school climate. Yet, not all domains are covered in all measures and for each target population. For example, the elementary version (grades 3–5) of the Georgia Student Health Survey (GSHS), a state-developed measure of students' perceptions of school climate, does not ask students about the institutional environment, while the secondary version (grades 6–12) does ask about the institutional environment. Although the elementary version of the GSHS does not include institutional environment, research has found that the measure is a valid assessment of school climate (La Salle et al., 2016).

Although there are many different measures of school climate, each including different items and covering different domains, the association between school climate, student, and school outcomes is clear. Thapa et al. (2013) reviewed 206 records and found positive associations between school climate and student outcomes, including increased academic achievement, student self-concept, and psychological well-being, as well as decreased absenteeism, drug-use, and suspensions from school. These findings were confirmed and extended by Wang and Degol's (2016) review that incorporated behavioral impact, finding positive school climates associated with lower rates of aggression in school, less-disruptive behavior, and less bullying. Berkowitz et al. (2017) examined the associations between school climate, inequality, and academic achievement. The authors identified 78 studies and found consistent evidence that increased perceptions of school climate were associated with increased achievement, even in schools with high proportions of students from low socioeconomic status (SES) backgrounds. Overall, there is no doubt that school climate is associated with positive student, teacher, and school outcomes.

SWPBIS and School Climate

Given the association between positive student, teacher, and school outcomes and positive school climates, there is a need for identifying evidence-based, school-wide intervention models to increase positive school climate. One such school-wide model is SWPBIS, a multitiered framework for preventing problem behavior in school and implementing evidence-based interventions when problem behavior does occur (Sugai & Horner, 2020). Schools begin by teaching, reinforcing, and monitoring behavioral expectations to all students (i.e., universal prevention). Students who are not responsive to universal prevention are provided with more intensive behavioral instruction and intervention, termed Tier-2 supports, which are often delivered to small groups of students or via a mentoring-based approach. Students unresponsive to Tier-2 support are provided more intensive, one-on-one interventions. These Tier-3 supports should be based on a functional behavior assessment and target the specific needs of the student. SWPBIS implementation is contingent upon regular review of student data and team-based decision-making based on student data. Furthermore, teachers focus on positive reinforcement of desired behaviors and using proactive evidence-based teaching and classroom management strategies, promoting positive student–teacher interactions. Those same procedures are then replicated throughout the school to prevent problem behaviors in all settings, including hallways and cafeterias, encouraging consistent behavioral expectations and delivering regular positive reinforcement. As such, SWPBIS leads to increases in perceptions of school safety and school climate by clearly communicating the expectations to everyone and focusing on positive reinforcement for engaging in the desired behaviors and positive teacher–student interactions (Gage et al., 2020).

An expanding research-base continues to document positive and meaningful impacts on student and school outcomes resulting from SWPBIS implementation. Lee and Gage (2020) conducted a meta-analysis of experimental and quasi-experimental SWPBIS research. The authors identified 29 studies, including seven randomized-control trials (RCTs), evaluating the effects of SWPBIS across academic, organizational, and behavior outcomes. Overall, they found that SWPBIS has a positive and statistically significant effect of school-level academic achievement ($d = 0.11$), behavior, including reducing out-of-school suspensions (OSSs: $d = -0.26$), and increasing school staff perceptions of organizational health, a domain aligned with school climate, ($d = 0.37$). These findings are corroborated by other evidence reviews (e.g., B. S. Mitchell et al., 2018) and more recent studies (Lee et al., 2021), supporting the evidence of effectiveness of SWPBIS on academic and behavioral outcomes.

A key component of effectiveness of SWPBIS is implementation with fidelity, defined as carrying out SWPBIS practices as prescribed (Sanetti et al., 2021). Fidelity has been a critical feature of SWPBIS since its inception (Horner et al., 2004) and is directly related to effectiveness (Gage et al., 2019). There are a number of measures developed to evaluate implementation fidelity of SWPBIS with most focusing on universal, Tier 1, implementation (McIntosh et al., 2017). For example, the Benchmarks of Quality (BoQ; R. Cohen et al., 2007) is a widely used measure of universal SWPBIS fidelity. Schools implementing 70% or more of the critical features of SWPBIS as measured by the BoQ are considered implementing with fidelity. Research has consistently found that schools implementing the critical features of SWPBIS at or above 70% fidelity, as measured by the BoQ, have fewer office discipline referrals and suspensions, and higher academic achievement (Childs et al., 2016; Gage et al., 2017, 2019)

Researchers also have specifically examined the relation between SWPBIS and school climate. Charlton et al. (2020) reviewed experimental research evaluating the effects of universal intervention programs on school climate. Among the 28 studies identified, eight implemented SWPBIS. The authors report that among all of the reviewed school-wide approaches, SWPBIS had the largest effects on school climate ($d = 0.61$) and were the most methodologically rigorous. Bradshaw and colleagues (2009) evaluated the impact of universal SWPBIS on teacher perceptions of school climate from an RCT. Teachers completed *The Organizational Health Inventory for Elementary Schools* (OHI; Hoy & Feldman, 1987). The authors examined data across 4 years of SWPBIS implementation and found a statistically significant increase in overall organizational health in schools implementing SWPBIS compared to schools in the business-as-usual control group when comparing baseline OHI to OHI at year 4 ($d = 0.29$).

However, of the eight SWPBIS studies, only one included in Charlton et al.'s review measured students' perceptions of school climate (Converse & Lignugaris/Kraft, 2009), while the rest measured school staff perceptions. Researchers have found that student and school staff perceptions of school climate may not be correlated (M. M. Mitchell et al., 2010). For example, Ramsey et al. (2016) compared student and teacher perceptions of school climate, finding that students consistently rated the domains of *connectedness* and *safety* significantly lower than teachers. The authors suggest these differences are due to differences in how adults and children perceive violence. Teachers are more likely to downplay school violence compared to students, who are more likely to highlight concerns (Wienke Totura et al., 2009). Thus, universal programs designed to increase school climate for both students and staff, such as SWPBIS, should measure both student and staff perceptions. As noted, very few SWPBIS research studies have targeted student perceptions. Converse and Lignugaris/Kraft (2009) examined the effects of a mentoring program on students' perceptions of school climate in a single middle school implementing SWPBIS; however, no comparison was done between schools implementing and not implementing SWPBIS. Outside of Charlton's review, we identified one dissertation study that examined student perceptions of school climate and SWPBIS (Betters-Bubon, 2012), analyzing student perceptions of school climate using student data from two elementary schools comparing an implementing school to a school not implementing SWPBIS. Using data across four consecutive years, Betters-Bubon (2012) found no statistically significant difference in perceptions of school climate between the two schools. Overall, there is a robust evidence base supporting the efficacy of SWPBIS, but very little research focused on students' perceptions of school climate in schools implementing SWPBIS.

School Climate, SWPBIS, and Rural Settings

Although there is a large body of evidence evaluating school climate generally (Thapa et al., 2013), very little has explicitly compared school climate in rural and urban schools. A recent Pew Research Center (2018) study found growing demographic and cultural differences between rural and urban communities. People living in rural settings tend to be less racially/ethnically diverse, are less likely to be college educated, and earn less than those living in urban settings. Furthermore, those in rural settings are more likely to be politically conservative and perceive those living in urban settings to be very different from themselves. The same study also found that people in urban settings are more concerned about crime and the quality of K-12 public schools in their communities than those in rural settings. Taken together, there appear to be clear social and cultural differences between rural and urban settings, yet little research has examined student perceptions, particularly perceptions of school climate.

A handful of studies have examined school staff perceptions of school climate and compared responses in rural or urban schools. Jain et al. (2015) evaluated 82,000 school staff members in almost 4,500 schools on their perceptions of school climate and then compared differences by urban and rural locale. Results suggest that school staff in rural elementary schools reported more positive school climates than school staff in urban schools. The largest difference between rural and urban school staff was for perceptions of staff and student safety ($d = 0.17$). Abel and Sewell (1999) surveyed 97 teachers in urban and rural schools, finding that urban teachers reported significantly worse working conditions and staff relations than teachers in rural schools. Overall, the literature is sparse and based on the few studies,

it is unclear if there are differences in student perceptions of school climate by location.

Purpose

Given that there is limited research on differences in students' perceptions of school climate in rural and urban schools and that studies including student perceptions of school climate report no SWPBIS effects, we used data from a state-wide school climate assessment and SWPBIS implementation to explore the effects of SWPBIS on school climate in rural and urban schools. Each year, students in Grades 3–12 in Georgia are asked to complete the GSHS. SWPBIS, which is supported by the Georgia Department of Education (GDOE), is only reported for elementary schools; therefore, in this study, we only used data from elementary schools (Grades 3–5). We conducted a post hoc quasi-experimental design (QED) study to explore both differences in perceptions of school climate in rural and urban schools and differential effects on school climate in schools implementing SWPBIS. Our study was guided by the following research questions:

Research Question 1: Are there differences between students' perceptions of school climate in rural and urban public elementary schools?
Research Question 2: Are there differences between students' perceptions of school climate in public elementary schools implementing SWPBIS and those not implementing SWPBIS?
Research Question 3: Are there differences between students' perceptions of school climate in rural and urban public elementary schools implementing SWPBIS?

Method

Sample

We used school climate data from all third- to fifth-grade students attending public elementary schools in Georgia who completed the GSHS in the spring of 2016. We then merged the student-level data (e.g., student grade level that was included as part of the survey) with school-level demographic data from the U.S. Department of Education's National Center for Educational Statistics (NCES) and discipline data from the GDOE by school name. The NCES data include a locale variable, based on U.S. Census criteria, which define locales as (a) urban, (b) suburban, (c) town, and (d) rural (Geverdt, 2015). To address our research questions, we reduced the sample to only schools located in either urban or rural locales (i.e., we removed all schools coded as suburban or town). We added an indicator for implementation of SWPBIS from the GDOE that facilitates district-level planning and provides school team training, technical assistance, and ongoing coaching to SWPBIS district coordinators to build capacity and support the SWPBIS process. The implementation data also were from the spring of 2016.

Table 1. Demographic Characteristics for Schools in Study.

	All schools		Urban schools		Rural schools	
Demographic	*M*	*SD*	*M*	*SD*	*M*	*SD*
Enroll	599.0	202.7	592.8	201.5	602.8	203.3
% Black	36.8	31.0	56.6	31.7	24.7	23.4
% White	45.3	29.6	21.8	22.2	59.6	23.9
% Hispanic	12.1	14.9	15.0	19.4	10.3	10.9
% FRL	70.4	26.8	77.7	29.7	66.0	23.8
% SWD	11.2	3.7	9.6	3.5	12.1	3.4
% LEP	8.1	12.4	10.8	15.8	6.4	9.5
% Read	33.8	16.9	30.3	21.3	36.0	13.1
% Math	37.0	17.7	31.7	20.4	40.2	14.9
% ODR	132.6		134.6	150.0	131.4	167.0
% ISS	42.0	86.5	27.1	62.8	51.1	97.1
% OSS	41.4	60.5	59.1	81.1	30.5	39.5

Note. FRL = free and reduced-price lunch; SWD = students with a disabilities; LEP = limited English proficient; Read = % at or above grade level in reading; Math = % at or above grade level in mathematics; ODR = office discipline referrals; ISS = in-school suspensions, and OSS = out-of-school suspensions.

Table 1 provides the descriptive statistics for all schools and schools by locale. The final analytic sample included 164,303 students in 643 schools, with 385 rural schools and 258 urban schools with an average enrollment of 599 students (SD = 202.7) across all schools. On average, there were slightly more students in rural elementary schools than urban elementary schools. There were more White students and fewer Black and Hispanic students in rural schools compared to urban schools. Rural schools had fewer students receiving limited English proficiency services but more students with disabilities. Rural schools had more students on grade level in reading and mathematics. Rural schools reported more in-school suspension (ISS) than urban schools, while urban schools reported more OSS.

Measures

School climate. The Georgia Student Health Survey: Elementary Survey (GSHS) is an 11-item measure of school climate. The GSHS was developed by the GDOE, the Georgia Department of Public Health, and Georgia State University to measure student perceptions of school climate. The 11 items are rated on a 4-point Likert-type scale from *Never* to *Always* and include items such as "I feel safe at school," "My school wants me to do well," and "Teachers treat me with respect" (see Table 2). The GDOE uses a

Table 2. Descriptive Statistics for All School Climate Items.

	All		Urban		Rural		No SWPBIS		Initiating		Emerging		Operational	
School climate items	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1	3.0	1.0	3.1	1.0	3.0	1.0	3.0	1.0	3.1	1.0	3.0	1.0	3.0	1.0
2	3.1	0.9	3.1	0.9	3.1	0.9	3.1	0.9	3.1	0.9	3.1	0.9	3.1	0.8
3	3.9	0.5	3.8	0.5	3.9	0.4	3.9	0.5	3.9	0.5	3.9	0.5	3.9	0.5
4	3.8	0.6	3.7	0.7	3.8	0.6	3.8	0.6	3.8	0.6	3.8	0.6	3.8	0.6
5	3.6	0.7	3.6	0.8	3.6	0.7	3.6	0.7	3.6	0.8	3.5	0.8	3.6	0.7
6	3.2	0.9	3.1	0.9	3.2	0.9	3.2	0.9	3.2	0.9	3.1	0.9	3.2	0.8
7	3.1	0.9	3.0	0.9	3.2	0.9	3.1	0.9	3.1	0.9	3.0	0.9	3.2	0.8
8	3.4	0.9	3.3	0.9	3.4	0.9	3.4	0.9	3.4	0.9	3.3	1.0	3.4	0.9
9	2.8	0.9	2.6	0.9	2.8	0.9	2.8	0.9	2.7	0.9	2.6	0.9	2.9	0.9
10	3.6	0.8	3.6	0.8	3.6	0.7	3.6	0.8	3.6	0.8	3.6	0.8	3.7	0.7
11	2.5	0.8	2.5	0.9	2.5	0.8	2.5	0.8	2.5	0.9	2.4	0.8	2.6	0.8

Note. All items included in the Georgia Student Health Survey-Elementary Schools. SWPBIS = School-Wide Positive Behavior Interventions and Supports.

total score to represent school climate in their state accountability system; therefore, the measure is interpretated as a single latent construct. Prior research has established evidence of both reliability ($\alpha > .80$) and construct validity (La Salle et al., 2016) for the GSHS. We calculated Cronbach's alpha for all 11 items using our sample in hand and found $\alpha = .78$. The GSHS is not associated with SWPBIS.

School-wide positive behavior support. All schools working with the GDOE to implement SWPBIS complete the BoQ (Kincaid et al., 2010) to measure fidelity of implementation. The BoQ is a 53-item rating scale completed by a school's SWPBIS team in consultation with an external SWPBIS coach to measure Tier 1 implementation fidelity with items organized into 10 SWPBIS critical elements: (1) the SWPBIS team; (2) faculty commitment; (3) effective procedures for dealing with discipline; (4) data entry and analysis plan established; (5) expectations and rules developed; (6) reward/recognition program established; (7) lesson plans for teaching expectations/rules; (8) implementation plan; (9) classroom systems; and (10) evaluation. The 53 items are scored between 0 and 3 points, with 12 items allowing a score of 3 for fully-in-place and 43 items using a 2 as fully-in-place. The scores are then summed and divided by the total number of points possible ($n = 107$) and scaled as a percentage. Fidelity is defined as a score of 70% or above (R. Cohen et al., 2007). Prior research has established the psychometric properties of the BoQ, finding adequate total score internal consistency ($\alpha = .96$), test–retest reliability ($r = .94$, $p < .01$), and inter-rater reliability ($r = .87$, $p < .01$; R. Cohen et al., 2007).

In Georgia, schools are categorized into levels of implementation based on three categories tied to BoQ scores: *Installing*, defined primarily as fidelity below 70% on the BoQ; *Emerging*, defined as fidelity between 70% and 85% on the BoQ; and *Operational*, defined as BoQ above 85%. Of the 643 schools in the final analytic sample, 179 schools (28%) were implementing SWPBIS. Of those, 118 were *Installing*, 18 were *Emerging*, and 43 were *Operational*.

Rural setting indicator. As noted, we used the NCES locale designation to create the rural and urban indicators. The NCES provides two codes for each local. The first number is a primary category, and the second number is a secondary category. The specific definitions for urban and rural are as follows: Urban–Large (11): Territory inside an Urbanized Area and inside a Principal City with population of 250,000 or more; Urban–Midsize (12): Territory inside an Urbanized Area and inside a Principal City with population less than 250,000 and greater than or equal to 100,000; Urban–Small (13): Territory inside an Urbanized Area and inside a Principal City with population less than 100,000; Rural–Fringe (41): Census-defined rural territory that is less than or equal to 5 miles from an Urbanized Area, as well as rural territory that is less than or equal to 2.5 miles from an Urban Cluster. Rural–Distant (42); Census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an Urbanized Area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an Urban Cluster; Rural–Remote (43): Census-defined rural territory that is more than 25 miles from an urbanized area and also more than 10 miles from an urban cluster (pp. 2–3; Geverdt, 2015). We combined all urban settings into a single urban category and all rural settings into a single category. We combined the categories because the number of schools within some categories (e.g., Rural–Remote) had very few

schools and it would have been difficult to facilitate interpretation of analyses described below.

Covariates. Our primary interest in this study was the interaction between rural setting and SWPBIS implementation. However, to increase the accuracy of the models, we included a series of student- and school-level covariates. At the student level, we included grade level as it was the only student-level demographic available from the school climate survey. At the school level, we included 22 covariates, such as school enrollment, percentage of students by race/ethnicity, percentage of students receiving free or reduced-price lunch, limited English proficient, and special education services, and all available school-level discipline outcomes (see Table 3 for complete list). We included all discipline outcomes to control for all possible differences correlated with the primary dependent measure (e.g., school climate).

Table 3. Multilevel Structural Equation Model School-level Covariates.

Total enrollment	Corporal punishment incidents
Percentage White	Expulsions
Percentage Black	Detentions
Percentage Hispanic	Bus suspensions (10 or fewer days)
Percentage Asian	In-school suspensions
Percentage Native American	Out-of-school suspensions
Percentage Multiracial	Office discipline referrals
Percentage migrant	Percentage at or above grade level: Reading
Percentage gifted	Percentage at or above grade level: Math
Percentage limited English proficient	Regional Education Service Area (17 areas)
Percentage students with disabilities	
Percentage free and reduced-price lunch	

Data Analysis

First, we examined the descriptive statistics for each of the individual school climate items. Descriptive statistics were calculated for the full analytic sample, by locale (e.g., rural or urban), and by SWPBIS implementation level. Next, we used a multilevel structural equation model (ML-SEM) approach to evaluate our primary research questions (Marsh et al., 2009). ML-SEM is ideal for exploring contextual effects, defined as group-level variables (e.g., school characteristics) to explain individual-level latent constructs (e.g., perceptions of school climate). The advantage of using ML-SEM instead of a multilevel, or mixed-effects, model is that the ML-SEM approach can control for both measurement error and sampling error of the latent construct at the student-level (Lüdtke et al., 2011). Essentially, we used the ML-SEM-based latent construct as the dependent variable to estimate the contextual effects of school-level urban locale and SWPBIS implementation, controlling for the 22 covariates (see Table 3). We included the covariates to control for any potential demographic, behavioral, or achievement confounds on the relation between school climate, urban or rural settings, and SWPBIS.

We entered the student grade level at the within level of the model and the 22 school-level covariates at the between-level part of the model. The goal of the study was to evaluate the contextual effect of locale (e.g., rural and urban), SWPBIS, and the interaction between locale and SWPBIS. The interaction effects explore differences in student perceptions of school climate in rural and urban schools implementing different level of SWPBIS fidelity. Figure 1 provides a reduced ML-SEM plot of the final model and describes each of the primary substantive contextual effect in this study. The interaction terms are presented as the three primary comparisons. Urban setting and no SWPBIS are the reference categories; therefore, the interaction effects are rural-installing, rural-emerging, and rural-operational. We examined the root mean square error of approximation (RMSEA) for model fit. RMSEA values less than 0.05 indicate adequate model fit (Browne & Cudeck, 1993). All ML-SEM modeling was conducted using the *lavaan* package (Rosseel, 2012) in *R* (R Core Team, 2013).

Results

Descriptive statistics for the school climate items are presented in Table 2. For interpretation, the higher the score, the more positive the perceptions of each item. On average, students rated each school climate item positively. The highest rated item was "My school wants me to do well" while the lowest rated item was "Students in my class behave so that teachers can teach." Given the means and standard deviations, there were very few differences between the rural and urban schools or schools not implementing SWPBIS and the different implementation fidelity levels.

We fit an ML-SEM to assess the school-level contextual effects on students' perceptions of school climate, while also adjusting for school-level clustering and school-level covariates (see Table 3 for a list of model covariates). First, we examined the intra-class correlation coefficient (ICC) for each school climate item. The ICC describes the proportion of the total variance in each item that is accounted for by the clustering. The average ICC was 0.04, suggesting that 4% of the variance is between schools and 96% of the variance was at the student-level. The highest ICC was "Students treat each other well" (0.10), while the lowest ICC was "My school wants me to do well" (0.02). The model that we fit had no convergence issues. The full-model RMSEA was 0.02, suggesting evidence of model fit.

The parameter estimates for the structural model are presented in Table 4. To answer the first research question,

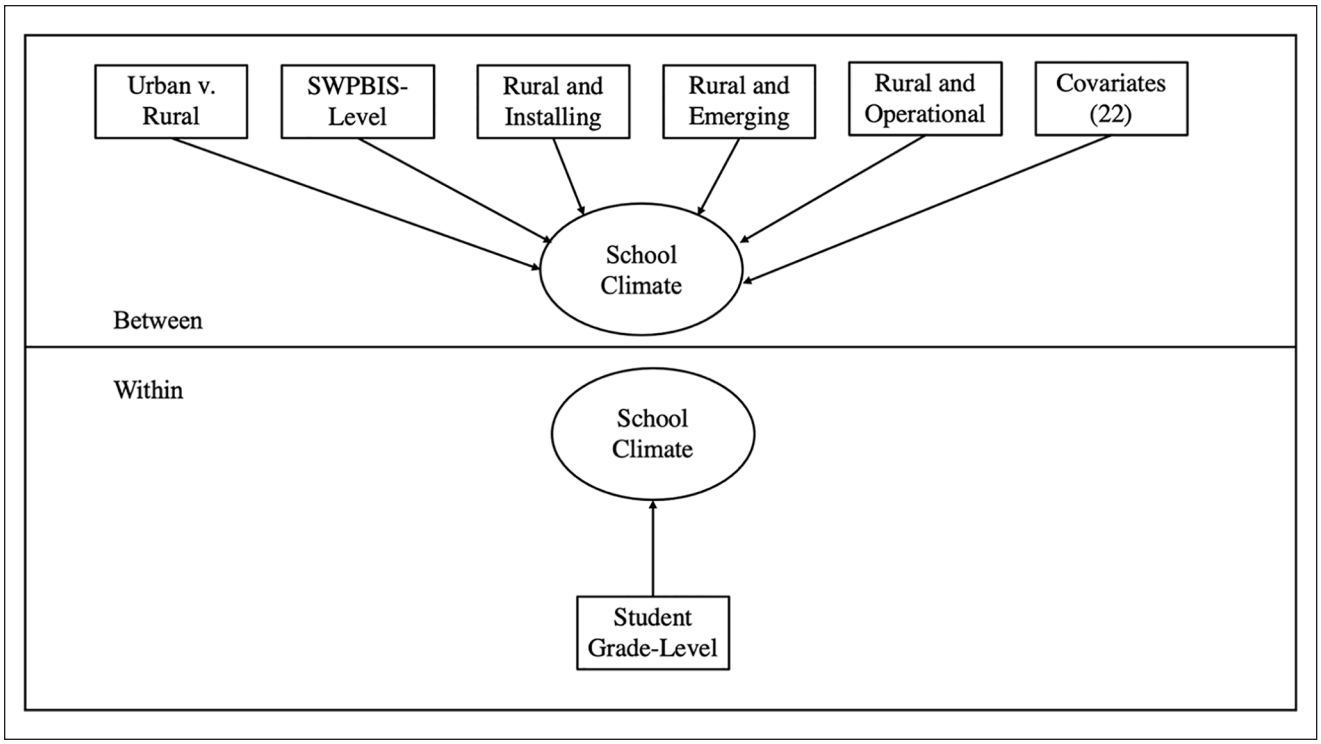

Figure 1. Reduced multilevel structural equation model.

Table 4. Standardized Parameter Estimates for the Multilevel Structural Equation Model.

Level	Parameter	Estimate	*SE*	*z* value	*p* value
Within					
	Grade level	−0.076***	0.002	−43.027	.000
Between					
	Rural	−0.007	0.008	−0.833	.405
	SWPBIS: Emerging	0.009	0.010	0.879	.380
	SWPBIS: Initiating	−0.002	0.033	−0.048	.962
	SWPBIS: Operational	−0.041	0.022	−1.910	.056
	Rural × Emerging	0.001	0.013	0.076	.939
	Rural × Initiating	−0.006	0.038	−0.170	.865
	Rural × Operational	0.066**	0.025	2.648	.008

Note. We do not report the parameter estimates for the 22 school-level covariates. Full tables available from first author. SWPBIS = School-Wide Positive Behavior Interventions and Supports.
**$p < .01$. ***$p < .001$.

we found no statistically significant difference between students' perceptions of school climate in rural and urban schools, controlling for all covariates. As a robustness check, we estimated the same model without the SWPBIS indicators and found the same result. The same was true for SWPBIS; there was no statistically significant difference in students' perceptions of school climate in schools implementing or not implementing SWPBIS. We again ran a robustness check without locale included and again found the same result. We then examined the interaction effects for rural schools implementing four different SWPBIS implementation levels: no SWPBIS (reference group), emerging, initiating, and operational. We found no significant effects for rural schools with emerging or initiating SWPBIS-levels. We did find a statistically significant interaction effect for rural schools implementing SWPBIS at the operational level. The coefficient was positive, suggesting that students in rural schools implementing SWPBIS with high fidelity have significantly higher perceptions of school climate than students in the

other interactions, including students in urban schools implementing with high fidelity.

Discussion

This study was designed to fill three gaps in the literature. First, we conducted an explicit analysis comparing students' perceptions of school climate in rural and urban schools. Second, we examined the effects of SWPBIS implementation on students' perceptions of school climate in a Southeastern U.S. state. Third, we explored differences of SWPBIS effects on school climate by locale (rural or urban). In addition, we were able to extend the literature by modeling school climate in a novel, rigorous way to increase the accuracy and precision of the global "school climate" construct by using latent variable modeling. Furthermore, the modeling approach also controlled for the nesting of students within schools and a series of demographic, discipline, and academic achievement school-level covariates. Taken together, we believe that the results provide insights described below.

We found no statistically significant differences for students' perceptions of school climate in rural and urban schools. Jain et al. (2015) and Abel and Sewell (1999) both found significant differences for school staff perceptions, particularly for school safety. The results in Table 4 suggest that students in urban schools reported feeling less safe at school than students in rural schools, but the raw standardized mean difference was only $d = 0.11$.

Regardless, there are often assumptions about rural and urban schools that can be assuaged by the results here. Based on the results, students do not appear to feel more or less unsafe or more or less connected to their teachers in rural or urban schools when controlling for all school-level differences (e.g., percentage of White students). The data include students attending schools in Atlanta, a major metropolitan area, and students attending very rural schools many miles from the nearest large city. Therefore, we believe that the results can generalize to other states similar to Georgia, such as North Carolina, Louisiana, and Kansas (i.e., one large urban metro and many rural towns). That being said, a state-wide analysis such as this does not capture nuances experienced by some students in either rural or urban schools. For example, Kosciw et al. (2015) found that lesbian, gay, bi-sexual, transgender, and queer (LGBTQ) youth in rural schools are significantly more likely to be harassed and less likely to receive support from adults in their school than members not in the LGBTQ community. These nuances are not captured in our data, given the very large sample size we modeled. Put differently, small subgroups of students with very negative perceptions of school climate in rural schools are unlikely to significantly impact the overall mean. Therefore, more studies and different analyses are needed. For example, latent profile analyses or quantile regression modeling could be used to evaluate differences by urban locale at the margins of the school climate measure.

Charlton and colleagues (2020) identified eight studies evaluating the effects of SWPBIS on school climate and found significant and medium effect sizes. However, of those, only one used a student measure and, after review of the study, the focus of the study did not provide any insight about SWPBIS effects on student perceptions of school climate. The only other study we could locate was a dissertation that found no overall effects of SWPBIS on student perceptions of school climate (Betters-Bubon, 2012). Our results confirm those findings with a much larger data set. Thus, although SWPBIS has an effect on school staff perceptions, it does not appear that implementation of SWPBIS, regardless of implementation fidelity level, has a significant effect on students' perceptions of school climate broadly. Notably, however, we did find a difference for student perceptions of student climate in rural schools implementing with higher fidelity.

Yet, we contend there is still much work to be done to confirm this finding. First, as noted, there was very little variance between schools on the school climate measures. Students appeared to rate their elementary schools similarly overall, indicating that there may be few moderators that do predict differences, particularly at the school level. Furthermore, as noted above, more nuanced analyses are needed. SWPBIS is designed to prevent problems, but importantly, directly impact students demonstrating problem behaviors. These students are a subgroup of the larger population, and there may be significant effects for those particular students. Future studies should include more student-level characteristics, particularly indicators of behavioral performance in school and history of intervention receipt via SWPBIS implementation.

As noted, we were not sure about differential effects of SWPBIS in rural schools given that no prior research had explored this topic. We found that students in schools implementing with the highest levels of fidelity (i.e., doing SWPBIS as prescribed) in rural schools reported statistically significantly higher perceptions of school climate. Although more research is needed, we have a few ideas as to why SWPBIS appears to be more effective in rural schools with high fidelity of implementation. First, rural schools tend to be smaller, with fewer students, perhaps allowing for more opportunity to build positive peer and adult relationships that promotes stronger school environment. Schools implementing SWPBIS with high levels of fidelity are providing regular positive reinforcement throughout the school, increasing positive interactions and connections and enhancing a student's sense of belonging and feelings of safety. Furthermore, the smaller class sizes may provide more opportunities to teach and reinforce behavioral expectations as there are fewer students and

more chances to focus on providing regular positive feedback. It might be that students know each other in the school and know who to ask for help if they are not feeling safe. We should note that the models do statistically control for the size of the schools but do not capture the potential effects of enrollment.

Overall, the finding prompts more research questions than it answers. As such, research should be conducted to determine whether or not there are differences in how SWPBIS is enacted in rural schools versus urban schools to ascertain what might explain the significant and positive effect SWPBIS can have on rural schools and the impact of fidelity of implementation to student perceptions of school climate in these settings.

Implications for Practice

Rural schools experiencing high rates of behavior problems and poor school climate should consider training and support to implement SWPBIS. As noted, simply "doing" SWPBIS is not enough because effects only actualize after implementing with fidelity. This can take time, as research suggests schools often need at least 3 to 5 years before they reach operational levels of implementation (Technical Assistance Center on Positive Behavior Interventions and Supports, 2015). It is important that practitioners realize the length of time it takes to operate at this level. According to our findings, no statistically significant effects were found in schools implementing SWPBIS with emerging or initiating implementation levels. School-based teams need to remain patient and continue to implement SWPBIS with fidelity so they can see desired outcomes. Given that fidelity is critical, school teams should conduct implementation fidelity checks using reliable fidelity measures (e.g., PBIS Tiered Fidelity Inventory; McIntosh et al., 2017) to assess whether the extent core features of SWPBIS are being consistently implemented, no matter the operational level. The critical features of the BoQ (subitems) can also be examined to determine what areas might need to be a focus. Fidelity outcome data can be reviewed quarterly to monitor progress and make informed decisions. The key is that schools identify training opportunities within their state, commit to long-term implementation, and monitor fidelity.

Rural schools implementing SWPBIS should also consider using school climate data as another data source for decision-making. VanLone et al. (2019) describe an eight-step process for schools to consider when implementing SWPBIS and explicitly highlight regular collection and review of school climate data. Although many school climate measures are anonymous, reducing the ability to target individualized interventions to specific students, school-teams can review school climate data school-wide by climate domain (e.g., safety) multiple times a year (e.g., beginning and end of the school year). Furthermore, if student demographics are included (e.g., race/ethnicity), reviews of differences by subgroups can inform school-wide practices. For example, if data suggest that Black students feel less safe than White students, schools should consider targeting efforts to reduce disproportionate discipline and consider culturally responsive approaches to instruction and disciplinary practices (Aceves & Orosco, 2014).

Limitations

A number of limitations necessitate mention. First, no student-level characteristics were available beyond grade level. Future studies should collect student race/ethnicity, gender, socio-economic status, and disability status to both explore student-level moderators of school climate and control for them as student characteristics may confound the results. Second, we only examined data for students in Grades 3–5. School climate data in Georgia is not collected for students below third grade due to concern about reading level and understanding the questions. It is possible that younger students may have different perceptions than older students. Third, the school climate measure was designed as a global measure and does not provide subdomain scores. We did not conduct an exploratory factor analysis to confirm the factor structure since the measure, as designed and reported, is used to evaluate schools in Georgia. Future research should consider looking at the items of the survey, as well as conducting exploratory analyses to identify multidimensionality of the measure and whether the measure includes all domains of school climate. Fourth, we used the state's SWPBIS system to identify SWPBIS implementation levels. Future studies should consider using the direct fidelity scores instead of broad, categorical fidelity levels to evaluate more nuanced differences. For example, the BoQ lists several critical areas, such as teaming. It would be interesting to look at the critical elements of the BoQ more deeply to test out differences between rural and urban schools. Relatedly, we focused exclusively on SWPBIS implementation and do not have information about other initiatives active at either intervention or comparison schools. Fifth, data on receipt of targeted or intensive intervention was not available at the student level; therefore, we cannot ascertain whether or not SWPBIS may have more effect on students receiving additional interventions relative to students only receiving universal (Tier 1) prevention supports. Sixth, all data were extant; the authors did not collect the data. Therefore, the accuracy of the data may be compromised by data entry errors. That being said, all data are what is reported by the GDOE for all accountability purposes, increasing the likelihood of data accuracy. Last, we did not explore differences between the rural and urban subcategories, including Rural-Remote. We used the broader categories, which is the approach used in most U.S. Department of Education reporting (see Geverdt, 2015).

Future research should explore more nuanced differences between the locale subcategories.

Conclusion

Research suggests that students in schools with positive school climates experience fewer behavior problems and have higher academic achievement. Thus, efforts to improve school climate should be primary targets of research, policy, and practice. Data suggest that SWPBIS is among the most effective approaches for increasing school staff perceptions of school climate, but little research had focused on students' perceptions of school climate. We leverage a statewide data set and found that rural schools implementing SWPBIS with high levels of fidelity have significantly more positive school climates. These findings are encouraging and suggest that if the mechanisms leading to the positive impacts in rural schools can be identified, then those mechanisms can be implemented in all schools to actualize the positive effects on school climate.

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