Contextualizing the association between school climate and student well-being: The moderating role of rurality

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ABSTRACT

BACKGROUND: In rural communities, understanding and improving school climate may benefit youth facing unique contextual challenges to well-being. As education research rarely focuses on rural schools, we aimed to examine school climate and student well-being with a particular focus on rural schools, compared to suburban schools.

METHODS: Cross-sectional survey data were collected from 62,265 students in 22 rural and 78 suburban Maryland middle and high schools. Student self-report data were collected on school climate (safety, engagement, and environment) as well as internalizing problems, behavior problems, stress, substance abuse, and future orientation. Multiple-group, multi-level models were fit to compare between rural and suburban schools.

RESULTS: On average, rural students reported significantly lower perceptions of safety and engagement than suburban students. Safety and engagement were generally associated with higher youth well-being. A number of moderated effects were observed, which generally suggested stronger associations between school-level climate – particularly engagement – and more positive outcomes for rural compared to suburban students.

CONCLUSIONS: Students' perceptions of safety and engagement were associated with student well-being, in some cases with stronger associations for rural students. These findings suggest that efforts to improve school climate may be particularly impactful for rural students.

Keywords: rural, school climate, mental health, behavioral health, substance use

Contextualizing the association between school climate and student well-being:

The moderating role of rurality

School climate is conceptualized as "the quality and character of school life" (p5), reflecting norms and values, relationships, practices, and organizational structures that contribute to school experiences.[1] The United States Department of Education's (USDOE) Safe and Supportive Schools model presents positive school climate including three core domains: safety, engagement, and environment.[2] Research has shown consistent associations between these aspects of school climate and students' mental, behavioral, and academic outcomes,[3–7] highlighting the importance of fostering positive school climate for student well-being. Yet less is known about how broader context may moderate the experience and potential impact of school climate. In particular, little work has specifically examined school climate in rural schools, where the rural context positions schools to play a central role in student well-being while presenting unique contextual challenges that require additional consideration.

The Rural School Context

In the United States, nearly 20% of all students live in rural areas, many of which face high levels of poverty and unemployment, under-resourced schools, and limited access to specialized health and behavioral health services.[8,9] These circumstances have serious implications for student health and well-being, with rural students less likely to complete high school or go on to college than students elsewhere, and an achievement gap that is widening even as outcomes are improving nationwide.[9] In addition, rural communities and schools have been disproportionately impacted by the opioid crisis[10–13] and its related consequences, including poor academic outcomes, unemployment, and physical and mental health problems.[14,15] Rates of youth suicide are also rising disproportionately in rural areas,[16] highlighting the importance of

efforts to improve modifiable factors, like school climate, which contribute to these disparities in youth well-being. In fact, schools play a central role in rural communities, making substantial contributions to the community by promoting community identity and serving as a critical driver to the local economy.[17,18] Yet schools in rural locations face a number of challenges such as funding disparities, school consolidation, technology gaps, higher teacher turnover, and limited access to professional development,[18,19] all of which may negatively impact school climate in rural schools.[20] However, the experiences and needs of rural youth are often overlooked in education and health research.[19]

Current Study

The current study aimed to identify supportive resources and outcomes for rural youth, with a focus on the link with school climate. Using data from a statewide collaborative called the Maryland Safe and Supportive Schools Project, we sought to address the following three aims: 1) compare students' perceptions of school climate and well-being across rural and suburban schools; 2) evaluate the associations between school climate and student well-being; and 3) determine the extent to which locality moderates these associations. These findings may shed light on potential targets for improving school climate and well-being in rural schools.

METHODS

Participants

Data for this project come from 100 public schools across 13 school districts. This study reports data from 62,265 students in 22 rural (N = 14,356) and 78 suburban (N = 47,909) middle and high schools; see Tables 1-2 for descriptive statistics.

Instruments

School climate. The Maryland Safe and Supportive Schools (MDS3) Climate Survey measures 13 subscales mapping onto the 3 domains of the USDOE school climate model.[21] Students responded to each item on a scale from 1 (strongly disagree) to 4 (strongly agree). Scale scores were calculated by taking the mean of each of the contributing subscale scores, with recoding where necessary such that higher scores indicated more positive school climate. The climate survey has demonstrated excellent psychometric properties, including consistent measurement across student sex, grade level, school level, and ethnicity.[21,22]

Safety is comprised of measures of perceived safety (4 items), perceived bullying and aggression (4 items), and perceived substance use (3 items). In the current sample, reliability for the full scale was α = .82.

Engagement assessed connection to teachers (6 items), student connectedness (5 items), academic engagement (4 items), whole-school school connectedness (4 items), a culture of equity (4 items), and parent engagement (5 items). Reliability for the full scale was α = 95.

Environment included rules and consequences (5 items), physical comfort (4 items), availability of emotional support (3 items), and disorder (5 items). Reliability for the full scale was α = 79.

Student well-being. Five indicators of student well-being were assessed. Substance use responses were based on the number of days in the last 30 days, and were recalculated on an ordinal scale of 0 (no days) to 3 (6-30 days). For the other four measures, responses were rated on a scale of 1 (never) to 4 (almost always). All scale scores were calculated by taking the mean, with scores coded as missing if more than 40% of the contributing items were missing.

Behavior problems were measured by four items assessing self-reported 1) trouble controlling temper; 2) having threatened to hit or hurt someone; 3) doing things without thinking; and 4) being easily angered ($\alpha = .81$).

Internalizing problems included five items assessing self-reported feelings of being 1) lonely; 2) sad; 3) worried that something bad will happen; 4) depressed; and 5) nervous or anxious ($\alpha = .85$).

Stress included four items evaluating experiences in the past 30 days of 1) trouble falling asleep; 2) not getting enough sleep; 3) feeling stressed; and 4) feeling that difficulties were piling up so high that you could not overcome them ($\alpha = .81$).

Substance use included 7 items assessing experiences of 1) having at least 1 drink of alcohol; 2) smoking cigarettes; 3) using marijuana; 3) using prescription drugs or other medications not for medicinal purposes; 5) having 5 or more drinks in a row; 6) smoking cigars; and 7) using any other substances to get high ($\alpha = .90$).

Future orientation included 4 items endorsing the following beliefs: 1) I will go to college after I graduate; 2) I am excited about my future; 3) I have goals in my life; and 4) I can find lots of ways around any problem ($\alpha = .79$).

Student-level demographics. Students self-reported on their *sex*, *grade*, and *race*, and *mother's highest level of education* (a proxy for students' socio-economic status). Response categories for these variables are included in Table 1; for analysis, race was recoded as a binary indicator.

School-level demographics. Indices of school-level student body demographics included student *enrollment*, *percentage of students identifying as a minority race*, *percentage of students*

receiving free and reduced prices meals (FARMS), and *percentage of students who had received out of school suspensions* in the past year.

Locality for each school was obtained from the National Center for Education Statistics, which included city, suburban, town, and rural, and was based on relative proximity to an urban center.[23] As there were not a sufficient number of participating project schools located in urban (N = 7) or town (N = 4) locales to support inferences in this analysis, only schools coded as rural or suburban were included in this study.

Procedure

Recruitment was led by the Maryland State Department of Education in conjunction with the local school systems.[24] Participating schools administered the web-based MDS3 School Climate Survey during the 2014-2015 school year. Within the participating schools, informational letters were sent to students' parents and guardians about their student's possible participation in the survey. As student data were collected anonymously and voluntarily, active parental consent was not required by the state or Institutional Review Board (IRB). Student response rate was approximately 76%.[25] All student data were collected via student self-report, with survey administration overseen by school staff. These procedures were approved by the researchers' IRB.

Data Analysis

To test whether students' perceptions of school climate and well-being differed by locality (Aim 1), the association between school climate and well-being (Aim 2), and whether these associations differed by locality (Aim 3), a series of multiple-group (by locality) three-level models were fit to the data in M*plus* (Version 8) to allow for comparisons between rural and suburban schools. Robust full-information maximum likelihood was utilized to account for

missing data and multivariate non-normality.[26,27] In each set of multiple-group models, students comprised level one (N_{rural} = 14,356; $N_{suburban}$ = 47,909) and were nested within classrooms at level two (J_{rural} = 717; $J_{suburban}$ = 2,226) and schools at level three (K_{rural} = 22; $K_{suburban}$ = 78). For each outcome model, standard indices were used to assess good model-data fit (CFI ≥ .95, RMSEA ≤ .06, SRMR ≤ .08)[28]. In multilevel models, the SRMR is calculated at each level, however, when the number of clusters is less than 200 at a given level, the SRMR ≤ .08 may be too strict,[29] thus, the level three SRMR was interpreted with caution.

Our first aim examined differences in school climate and well-being by locality. Level one predictors included student sex (0 = *boys*; 1 = *girls*), grade (centered at Grade 9), race (0 = *White*, 1 = *non-White*), and mother's highest level of education (centered at the lowest level). Level two was modeled to account for the nesting of the outcomes at the classroom level, but with no predictors included. School-level demographic variables were included as level 3 predictors (standardized as z-scores due to large differences in variance across variables). Models were grouped by locality (rural, suburban). For each school climate outcome, the intercept parameter was constrained and a Wald test was conducted to determine significant differences by locality.[30] A similar set of models was run for the 5 well-being outcomes, retaining the same predictors as above. However, these models also controlled for school climate by including safety, engagement, and environment at both level 1 (student report; group mean centered by school), and level 3 (aggregating responses for all students within a school; grand mean centered). Again, the intercept parameter was constrained and Wald tests were used to determine if well-being differed by locality. The intercept may be interpreted as the average level of the outcome, controlling for covariates. These results also provided insight regarding our second aim, which was to examine the associations between school climate and student well-

being; we focused here on the main effects of student-level and school-level school climate on well-being.

For Aims 3 and 4, we explored the moderating role of locality in the association between school climate and student well-being. Building from the models assessing the prior two aims, parameter constraints and Wald tests were used to determine if the associations between school climate and student well-being differed by locality.[30] For each model, six model constraints and Wald tests were conducted, testing whether student-level and school-level safety, engagement, and environment differentially impacted the respective outcome.

RESULTS

Model parameter estimates, fit statistics, and Wald test results are presented in Tables 3-5. For most models, the RMSEA and CFI indicated good model-data fit, as did the SRMR at level-one and level-two. The SRMR at level-three exceed the recommended cutoffs, however, given the methodological limitations of the SRMR-between with few clusters discussed above, we proceeded with model interpretation.

With regard to Aim 1 and the differences by locality, the results of the Wald test of the school climate intercepts indicated a significant difference in perceptions of safety between students in suburban schools and rural schools, $\chi^2 = 4.61$, $p = .03$, with students in suburban schools perceiving their schools to be safer ($\gamma_{000} = 2.78$, SE = .02, $p < .01$) than students in rural schools ($\gamma_{000} = 2.55$, SE = .10, $p < .01$). There was also a significant difference in perceptions of engagement between groups, $\chi^2 = 4.88$, $p = .03$, with suburban students perceiving greater engagement ($\gamma_{000} = 2.83$, SE = .02, $p < .01$) than rural students ($\gamma_{000} = 2.66$, SE = .08, $p < .01$). There was no significant difference in perceptions of environment between groups, $\chi^2 = .88$, $p = .35$. For full model results, see Table 3.

In terms of the five well-being outcomes, there were no significant differences between students in rural and suburban schools in the intercepts for substance use ($\chi^2 = 1.52$, $p = .22$), behavior problems ($\chi^2 = 2.55$, $p = .11$), stress ($\chi^2 = 3.28$, $p = .07$), or future orientation ($\chi^2 = 2.34$, $p = .13$). There was a significant difference in internalizing problems ($\chi^2 = 21.37$, $p < .01$), with suburban students ($\gamma_{000} = 1.92$, $SE = .02$, $p < .001$) reporting higher levels of internalizing problems than rural students ($\gamma_{000} = 1.78$, $SE = .03$, $p < .01$).

Regarding our second and third aims, the parameter estimates for each of the well-being outcomes by locality are reported in Table 4, with results of the Wald test comparisons reported in Table 5. For brevity, below we describe only the main effects for rural schools followed by moderation by locality.

Behavior Problems

At level one, each school climate variable, safety ($b_{rural} = -.20$, $SE = .01$, $p < .01$), engagement ($b_{rural} = -.33$, $SE = .02$, $p < .01$), and environment ($b_{rural} = -.11$, $SE = .02$, $p < .01$), was associated with a significant decrease in rural students' behavior problems. At level three, only school-level safety was associated with a significant decrease in student behavior problems ($b_{rural} = -.26$, $SE = .10$, $p < .01$).

Rural vs. suburban schools. Locality did not moderate the relationships between student-level school climate and behavior problems but did moderate two of the relationships between school-level school climate and student behavior problems. Locality moderated the relationship between school-level safety and problem behaviors ($\chi^2 = 15.80$, $p < .01$), with greater school-level safety associated with greater problem behavior in suburban schools ($b_{suburban} = .22$, $SE = .07$, $p < .01$) and less problem behavior in rural schools ($b_{rural} = -.26$, $SE = .10$, $p = .01$). Locality also moderated the relationship between school-level engagement and problem behavior ($\chi^2 =$

13.39, $p < .01$) such that greater school-level engagement was associated with significantly lower problem behavior in suburban schools ($b_{suburban} = -1.01$, SE = .12, $p < .01$) but not in rural schools ($b_{rural} = -.27$, SE = .16, $p = .08$).

Internalizing Problems

Higher student-level safety ($b_{rural} = -.29$, SE = .02, $p < .01$) and engagement ($b_{rural} = -.32$, SE = .02, $p < .01$) were significantly associated with lower levels of rural students' internalizing problems. At the school level, higher engagement was associated with lower levels of internalizing problems ($b_{rural} = -.69$, SE = .15, $p < .01$), while higher ratings of the school environment were associated with higher levels of internalizing problems ($b_{rural} = .44$, SE = .13, $p < .01$).

Rural vs. suburban schools. Locality did not moderate any associations between student-level school climate and internalizing problems. At the school level, locality moderated the relationship between engagement and internalizing problems ($\chi^2 = 7.03$, $p < .01$), such that in suburban schools there was no significant association between school-level engagement and internalizing difficulties ($b_{suburban} = -.20$, SE = .11, $p = .06$), while in rural schools increased school-level engagement was associated with significantly lower levels of internalizing problems ($b_{rural} = -.69$, SE = .15, $p < .01$). Additionally, locality moderated the relationship between school-level environment and internalizing problems ($\chi^2 = 6.13$, $p = .01$), such that environment did not significantly predict internalizing problems in suburban schools ($b_{suburban} = .07$, SE = .08, $p = .41$), however in rural schools, higher school-level perceptions of the environment were associated with higher internalizing problems ($b_{rural} = .44$, SE = .13, $p < .01$).

Stress

Higher student-level reports of student safety (b_{rural} = -.23, SE = .02, p < .01), engagement (b_{rural} = -.18, SE = .03, p < .01), and environment (b_{rural} = -.21, SE = .03, p < .01) were all associated with lower levels of student stress. Additionally, higher school-level engagement was associated with lower levels of student stress (b_{rural} = -.80, SE = .23, p < .01), while higher perceptions of the school-level environment were associated with increased student stress (b_{rural} = .46, SE = .18, p = .01).

Rural vs. suburban schools. Locality significantly moderated the impact of school-level engagement on student stress (χ^2 = 4.26, p = .04). In suburban schools, school-level engagement was not statistically related to student stress ($b_{suburban}$ = -.25, SE = .13, p = .06); however, in rural schools, higher levels of school-level engagement were associated with decreased student stress (b_{rural} = -.80, SE = .23, p < .01).

Substance Use

Higher student-level safety (b_{rural} = -.14, SE = .01, p < .01) and engagement (b_{rural} = -.46, SE = .03, p < .01) were associated with lower levels of student substance use. Alternatively, higher student-level environment was associated with greater student substance use (b_{rural} = .16, SE = .03, p < .01). At the school-level, only school-level safety was significantly associated with substance use (b_{rural} = -.28, SE = .13, p = .04), such that higher levels of school-level safety were associated with lower levels of student substance use.

Rural vs. suburban schools. Locality significantly moderated the relationship between student-level engagement and substance use (χ^2 = 17.05, p < .01). In suburban schools, higher student-level engagement was associated with lower levels of student substance use ($b_{suburban}$ = -.31, SE = .02, p < .01). In rural schools, student-level engagement was also similarly related to substance use, but the relationship was significantly stronger (b_{rural} = -.46, SE = .03, p < .01).

Future Orientation

Greater student-level reported safety (b_{rural} = -.06, SE = .01, p < .01) and environment (b_{rural} = -.08, SE = .04, p = .03) were associated with lower levels of positive future orientation among rural students. Alternatively, higher student-reported engagement (b_{rural} = .57, SE = .03, p < .01) was associated with a more positive future orientation. At the school-level, only engagement significantly predicted rural students' future orientation (b_{rural} = .70, SE = .24, p < .01), with greater levels of engagement associated with more positive student future orientation.

Rural vs. suburban schools. Locality did not significantly moderate any of the relationships between student- or school-level school climate and future orientation.

DISCUSSION

This study sought to compare rural and suburban students' perceptions of school climate and well-being, evaluate the associations between school climate and well-being with a particular focus on students in rural schools, and determine the extent to which these relationships differ from those observed in suburban schools. Results indicated that students in rural schools perceive their schools to be less safe and engaging than their suburban counterparts, reflecting similar findings of low school connectedness in rural schools.[31] However, students in rural and suburban settings reported similar levels of well-being with the exception of internalizing difficulties, which were higher among suburban students. In rural schools, at both the student- and school-levels, safety and engagement were predominantly associated with higher student well-being across outcomes, as expected. The pattern regarding environment was less clear, such that there was an unexpected association between higher substance use and higher student-level environment ratings, and behavior problems negatively associated with student-level environment but positively associated with school-level environment in rural

schools. While it is unclear exactly what is driving these associations, when observing similar findings between substance use and environment, Bottiani et al.[32] posited that a positive environment may be associated with neighborhood wealth, such that schools in wealthier neighborhoods are likely to have a more positive appearance yet also students at higher risk of using certain substances.

With regard to the question of locality, the findings suggested there were few rural vs. suburban differences in how students' perceptions of school climate predict well-being. However, there were some notable differences in how school-level climate bolsters student outcomes, at times suggesting that school climate was a stronger predictor in rural schools. This pattern was present in several instances for engagement, with greater student engagement at the student- or school-level associated with more positive outcomes for students in rural schools. For example, at the student-level, engagement was more strongly associated with less substance use in rural schools, while at the school-level, higher engagement was associated with less internalizing problems and less stress for rural students, but not significantly associated with these issues for suburban students (behavior problems was an exception to this pattern, with engagement associated with less behavior problems in suburban settings and unassociated in rural settings). We also saw some indication of a similar pattern with safety, which was associated with fewer behavior problems for rural students and more behavior problems for suburban students.

While previous school climate measurement research aligns with the USDOE three-domain school climate model,[21] the breadth of the construct of school climate remains an ongoing discussion amongst researchers. A current debate is the extent to which the construct should retain a broader definition or rather be defined with a narrower focus on interpersonal

interactions.[33] In this narrower model, safety and environment are not irrelevant, but are conceptualized as precursors or outcomes of positive engagement.[34] Given the cross-sectional data, we could not examine the temporal relationships among the school climate variables. However, our pattern of results supports the prominent role of engagement in student well-being, with suggestions that engagement may be particularly impactful for rural students' well-being, as compared to suburban students.

In terms of measurement, it is notable that many of the predictive differences in school climate were found in school-level measures of climate, rather than student-level climate. Moreover, main effects of these school-level climate variables were sometimes in the unexpected direction - a finding also noted by others.[35] Given that much of the previous literature on school climate has focused on student-level perceptions,[36] and where studied, school-level effects do not seem intuitive, these findings suggest that more research investigating the effects of school-level school climate for students is needed.[37,38]

Limitations and Conclusions

While a strength of this study is its focus on contextualizing the role of school climate in student well-being, we encountered a number of limitations. First, this research was conducted within a single state. The proportion of rural school districts varies widely across states, which can impact the extent to which their needs are reflected in education policy.[19] Rural contexts themselves also vary widely, both in terms of geography and access to resources. We had initially sought to embrace a more granular approach by examining variations in rural (fringe, distant, remote) settings, however, we were unable to do so due to sample limitations, as most rural schools were located within communities considered to be fringe or distant. There is increasing recognition of the need to look beyond the rural/urban divide, and it should be noted

that our discussion of "rural" overlooks important variations within this context. As such, the findings may not generalize to other states or rural schools. Even within this rather large study, there were a relatively small number of rural schools for the school-level comparisons, perhaps resulting in lack of power to detect suburban-rural differences at the school-level. Future research using national data with a richer school-level data set would be helpful to replicate and deepen this analysis.

IMPLICATIONS FOR SCHOOL HEALTH

Findings suggest that a safer and more engaging school climate is associated with well-being for rural students, yet rural students view their schools as less safe and engaging than their suburban peers. Student engagement may be particularly critical for promoting rural student well-being, highlighting the importance of allocating resources to efforts that promote engagement, such as supporting teachers' ability to connect with and engage with students and families (including families from different backgrounds), promoting school identity, and facilitating positive connections among students. Based on these findings, we conclude by highlighting key practice implications for schools.

Implication 1: Whole-School Approaches to Promote School Climate

Promising whole-school approaches to improving school climate include Positive Behavioral Interventions and Supports[39] and the Whole School, Whole Community, Whole Child model.[40] With fewer human resources available in rural schools, comprehensive implementation of these types of programs may be challenging, but user-oriented toolkits offer helpful steps and actions to support implementation.[41] Rural schools are particularly resourceful at overcoming human resource constraints through enlisting school personnel and community members in multiple, boundary crossing roles; identifying and supporting these critical

individuals will be helpful to effectively leverage existing resources while promoting school-community engagement.[42]

Implication 2: Comprehensive Health Centers

With limited community resources to promote student health and well-being, school-based services such as comprehensive health centers for students and families are not only an effective approach for overcoming access barriers,[18,43] but also contribute to improved perceptions of school connectedness, particularly for low SES students.[44] Further, comprehensive school health center services may reduce time spent away from school and provide an opportunity for behavioral risk assessment and prevention efforts for at-risk students.[45] Although less prevalent in rural schools, when they are available these health services are accessed at similar or higher rates than in urban schools, highlighting the promise of this approach for supporting student health and well-being.[46]

Implication 3: Bolster Supports for Teachers

Rural schools have been noted to have less experienced teachers, higher teacher turnover, and limited access to professional development.[18,19] Recognizing the multiple roles played by teachers in rural contexts, including instrumental roles in promoting positive classroom and school climates,[32,47] efforts to build staff capacity and attend to staff well-being is critical.[48] Indeed, the relationship between teacher burnout and school climate is likely bidirectional, with teachers serving a core role in engaging students and families but teacher burnout also predicted by poorer school climate.[49] In the face of new challenges brought about by the COVID-19 pandemic, which have likely decreased student engagement and increased teacher stress,[50,51] appropriately supporting educators' own well-being will be critical in both ensuring a healthy

and supportive school climate, and in combating personnel challenges experienced in rural schools.

Implication 4: Responses Must Be Tailored to the Particular Rural Context

Finally, because many interventions and policies have not been developed or tested for rural schools,[19] rural school climate improvement efforts should consider contextual factors that may promote or hinder their feasibility, acceptability, and efficacy in the rural context. With rural contexts varying widely, effective interventions may differ both across and within rural schools as compared to suburban schools.[52] For example, whereas promising engagement strategies may include home visits, in-class parental involvement, and use of school facilities for community activities,[53] these strategies may not be feasible in some rural school settings, where many students live a substantial distance from school and may spend up to two hours a day riding a bus. Further, to understand youth and family needs and develop policies that are responsive to unique contextual demands, planning efforts should authentically engage not only parents but also young people themselves.[54]

Human Subjects Approval Statement

The University of Virginia Institutional Review Board for Social & Behavioral Sciences has reviewed and approved this project as exempt (IRB-SBS #2254).

Conflict of Interest Disclosure Statement

All authors of this article declare they have no conflicts of interest.

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TABLES

Table 1. Descriptive Statistics for Student- and School-Level Demographics

	Full Sample	Rural	Suburban
Student-Level			
Students (N)	62,265	14,356	47,909
Sex			
Boys	47%	48%	47%
Girls	46%	48%	46%
Missing	7%	5%	8%
Race			
White	46%	62%	41%
Persons of Color	47%	33%	52%
Missing	7%	5%	8%
Grade			
Grade 6	16%	6%	19%
Grade 7	15%	6%	17%
Grade 8	13%	5%	15%
Grade 9	14%	22%	12%
Grade 10	14%	20%	12%
Grade 11	12%	20%	10%
Grade 12	10%	16%	8%
Missing	7%	5%	8%
Mother's Education			
Did not complete High school	7%	6%	7%
High school graduate	17%	22%	16%
Some College	13%	16%	12%
College Graduate	38%	40%	37%
Missing	25%	15%	28%
School-Level			
Schools (N)	100	22	78
Enrollment (Mean)	1132.54	974.19	1190.88
Percent Minority	55%	38%	60%
Percent Farms	39%	34%	41%
Percent Suspensions	12%	15%	11%

Table 2. Descriptive Statistics for Student-Level School Climate and Well-Being and School-Level School Climate

	Range	Full Sample			Rural			Suburban		
		M	SD	Missing	M	SD	Missing	M	SD	Missing
Student-Level										
School Climate										
Safety	1-4	2.83	0.64	9%	2.73	0.62	6%	2.85	0.64	10%
Engagement	1-4	2.87	0.56	13%	2.82	0.55	9%	2.89	0.56	14%
Environment	1-4	2.58	0.48	17%	2.57	0.46	11%	2.58	0.49	19%
Well-Being										
Behavior Problems	1-4	1.95	0.77	15%	1.97	0.78	10%	1.94	0.77	16%
Internalizing Problems	1-4	1.88	0.74	15%	1.89	0.76	10%	1.88	0.73	16%
Stress	1-4	2.37	0.84	20%	2.46	0.84	12%	2.34	0.84	22%
Substance Use	0-3	0.20	0.53	11%	0.31	0.64	8%	0.17	0.49	12%
Future Orientation	1-4	3.46	0.58	16%	3.44	0.61	11%	3.47	0.58	18%
School-Level										
School Climate										
Safety	1-4	2.81	0.26	0%	2.75	0.22	0%	2.83	0.27	0%
Engagement	1-4	2.86	0.19	0%	2.82	0.16	0%	2.87	0.19	0%
Environment	1-4	2.57	0.17	0%	2.57	0.14	0%	2.56	0.18	0%

Table 3. Main Effects of Locality on Students' Perceptions of School Climate

	Safety		Engagement		Environment	
	Rural	**Suburban**	**Rural**	**Suburban**	**Rural**	**Suburban**
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
Intercept	2.55 (.10)*	2.78 (.02)*	2.66 (.08)*	2.83 (.02)*	2.48 (.08)*	2.55 (.02)*
Student-Level						
Girls	-0.09 (.01)*	-0.08 (.01)*	-0.05 (.01)*	-0.05 (.01)*	-0.03 (.01)*	-0.03 (01)*
Grade (Centered at 9th)	0.00 (.01)	-0.04 (.01)*	-0.02 (.01)*	-0.05 (.01)*	-0.01 (.01)	-0.05 (.01)*
Racial Minority	0.01 (.03)	0.03 (.01)*	-0.10 (.01)*	-0.03 (.01)*	-0.04 (.01)*	0.02 (.01)
Mother's Education	0.02 (.01)*	0.02 (.00)*	0.05 (.01)*	0.03 (.00)*	0.02 (.01)*	0.00 (.00)
School-Level						
Enrollment	-0.22 (.06)*	-0.12 (.02)*	-0.09 (.03)*	-0.03 (.02)	-0.10 (.04)*	-0.04 (.02)
Percent Racial Minority	0.00 (.07)	0.02 (.02)	-0.08 (.06)	-0.05 (.02)*	-0.03 (.06)	-0.05 (.03)
Percent FARMS	-0.26 (.06)*	-0.14 (.02)*	-0.11 (.04)*	-0.02 (.02)	-0.10 (.06)	-0.03 (.04)
Percent Suspensions	0.11 (.07)	-0.05 (.02)*	0.06 (.06)	-0.06 (.02)*	0.03 (.06)	-0.05 (.02)*
Model Fit						
RMSEA	0.01		0.01		0.01	
CFI	0.51		0.58		0.47	
SRMR: Within	0.03		0.03		0.03	
SRMR: Between 2-L	0.00		0.00		0.00	
SRMR: Between 3-L	0.14		0.14		0.14	
Model Fit χ^2	$\chi^2(24) = 133.32$, $p < .001$		$\chi^2(24) = 133.10$, $p < .001$		$\chi^2(24) = 133.70$, $p < .001$	
Wald Test χ^2	$\chi^2(1) = 4.61$, $p = .03$		$\chi^2(1) = 4.88$, $p = .03$		$\chi^2(1) = .88$, $p = .35$	

Note. * $p < .05$

Table 4. Contribution of School Climate on Student Well-Being

	Behavior Problems		Internalizing Problems		Stress		Substance Use		Future Orientation	
	Rural	**Suburban**	**Rural**	**Suburban**	**Rural**	**Suburban**	**Rural**	**Suburban**	**Rural**	**Suburban**
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
Intercept	2.13 (.03)*	2.08 (.02)*	1.78 (.03)*	1.92 (.02)*	2.23 (.05)*	2.33 (.02)*	0.37 (.04)*	0.31 (.02)*	3.22 (.03)*	3.27 (.01)*
Student-Level										
Covariates										
Girls	-0.04 (.02)*	0.00 (.01)	0.17 (.02)*	0.19 (.01)*	0.32 (.02)*	0.28 (.01)*	-0.15 (.02)*	-0.08 (.01)*	0.12 (.01)*	0.08 (.01)*
Grade (Centered at 9th)	-0.02 (.01)*	-0.01 (.01)	-0.02 (.01)*	-0.01 (.00)*	0.03 (.01)*	0.03 (.01)*	0.06 (.01)*	0.04 (.00)*	0.01 (.00)*	0.01 (.00)*
Racial Minority	0.14 (.02)*	0.09 (.01)*	-0.03 (.01)*	-0.09 (.01)*	-0.11 (.01)*	-0.10 (.01)*	0.03 (02)	0.00 (.01)	0.04 (.01)*	0.03 (.01)*
Mother's Education	-0.09 (.01)*	-0.07 (.01)*	-0.04 (.01)*	-0.04 (.01)*	-0.03 (.01)*	-0.03 (.00)*	-0.05 (.01)*	-0.03 (.00)*	0.08 (.01)*	0.06 (.00)*
School Climate										
Safety	-0.20 (.01)*	-0.19 (.01)*	-0.29 (.02)*	-0.27 (.01)*	-0.23 (.02)*	-0.21 (.01)*	-0.14 (.01)*	-0.11 (.01)*	-0.06 (.01)*	-0.06 (.01)*
Engagement	-0.33 (.02)*	-0.32 (.01)*	-0.32 (.02)*	-0.28 (.02)*	-0.18 (.03)*	-0.19 (.02)*	-0.46 (.03)*	-0.31 (.02)*	0.57 (.03)*	0.57 (.01)*
Environment	-0.11 (.02)*	-0.09 (.01)*	0.00 (.02)	0.01 (.02)	-0.21 (.03)*	-0.23 (.02)*	0.16 (.03)*	0.16 (.01)*	-0.08 (.04)*	-0.13 (.01)*
School-Level										
Covariates										
Enrollment	-0.01 (.01)	0.00 (.01)	0.00 (.02)	0.01 (.01)	0.06 (.03)*	0.04 (.01)*	-0.02 (.03)	0.01 (.01)	0.00 (.01)	-0.03 (.01)*
Percent Racial Minority	-0.01 (.01)	-0.05 (.01)*	-0.05 (.02)*	0.01 (.01)	-0.06 (.03)*	0.02 (.01)*	-0.03 (.02)	-0.03 (.01)*	0.00 (.02)	0.05 (.01)*
Percent FARMS	0.02 (.02)	0.04 (.01)*	-0.05 (.03)	0.00 (.01)	-0.04 (.05)	-0.03 (.01)*	-0.04 (.04)	-0.01 (.01)*	0.01 (.02)	-0.04 (.01)*
Percent Suspensions	0.01 (.01)	0.02 (.01)*	0.01 (.02)	-0.04 (.01)*	0.00 (.03)	-0.06 (.01)*	0.03 (.03)	0.00 (.01)	0.02 (.01)	0.01 (.01)
School Climate										
Safety	-0.26 (.10)*	0.22 (.07)*	-0.16 (.09)	-0.21 (.06)*	-0.01 (.19)	-0.23 (.08)*	-0.28 (.13)*	-0.10 (.05)*	-0.05 (.13)	-0.11 (.07)
Engagement	-0.27 (.16)	-1.01 (.12)*	-0.69 (.15)*	-0.20 (.11)	-0.80 (.23)*	-0.25 (.13)	0.01 (.20)	-0.22 (.08)*	0.70 (.24)*	0.59 (.10)*
Environment	0.01 (.13)	0.19 (.08)*	0.44 (13)*	0.07 (.08)	0.46 (.18)*	0.13 (.10)	-0.03 (.15)	0.10 (.07)	-0.12 (.15)	-0.11 (.10)
Model Fit										
RMSEA	0.02		0.02		0.02		0.02		0.02	
CFI	0.97		0.97		0.97		0.97		0.97	
SRMR Within	0.03		0.03		0.03		0.03		0.03	
SRMR Between 2-L	0.01		0.00		0.01		0.00		0.00	
SRMR Between 3-L	0.18		0.18		0.17		0.17		0.18	
Model Fit χ^2	$\chi^2(72) = 557.83, p < .001$		$\chi^2(72) = 565.48, p < .001$		$\chi^2(72) = 573.228, p < .001$		$\chi^2(72) = 578.43, p < .001$		$\chi^2(72) = 569.918, p < .001$	

Note. * $p < .05$

Table 5. Wald Tests of Parameter Differences in Intercepts and Associations Between School Climate and Student Well-Being by Locality

	Behavior Problems			Internalizing			Stress			Substance Use			Future Orientation		
	χ^2	DF	sig	χ^2	DF	sig	χ^2	DF	sig	χ^2	DF	sig	χ^2	DF	sig
Intercept	2.55	1		21.37	1	*	3.28	1		1.52	1		2.34	1	
Student-Level															
Safety	0.18	1		0.78	1		0.97	1		2.71	1		0.22	1	
Engagement	0.24	1		1.97	1		0.22	1		17.05	1	*	0.04	1	
Environment	0.67	1		0.06	1		0.51	1		0.00	1		2.30	1	
School-Level															
Safety	15.80	1	*	0.23	1		1.17	1		1.60	1		0.20	1	
Engagement	13.39	1	*	7.03	1	*	4.26	1	*	1.14	1		0.18	1	
Environment	1.34	1		6.13	1	*	2.75	1		0.61	1		0.00	1	

Note. * $p < .05$