

A Multinational Study Exploring Adolescent Perception of School Climate and Mental Health

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School climate is a topic of increasing importance internationally. The current study investigated the established measurement invariance of an eight-factor school climate scale using a multinational sample of secondary students. School climate factor means across 14 international groups were compared and findings on the association between school climate factors and mental health were also investigated. Findings, from this study, illustrate several cross-national similarities regarding the ways in which secondary students perceive school climate and the influence of school climate on student mental health. These findings can support school psychologists' efforts to identify strategies and supports that improve the school environment in areas that are most consistently related to student experiences, such as school safety and school connectedness. Implications, limitations, and future directions are discussed.






Impact and Implications Statement

This study contributes insights regarding cross-national perceptions of school climate and mental health. The findings from the current study inform school personnel efforts to develop and implement school improvement strategies that data shows have a notable impact on student experiences. Such information can be established and applied globally while also recognizing the additional influence of localized norms when implementing strategies or interventions.

Keywords: school climate, cross-cultural, mental health, international

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School climate is a multidimensional construct that represents perceptions of various aspects of the educational environment. School climate refers to the beliefs, values, and attitudes that shape interactions between and among students, teachers, and administrators within a school (Cohen et al., 2009; Kuperminc et al., 1997). A positive school climate is associated with increased academic achievement (Koth et al., 2008), school completion, and positive social, emotional, and behavioral outcomes (Hough et al., 2017; Lester & Cross, 2015). Conversely, a negative school climate has been correlated with an increased likelihood of youth engaging in risky behaviors and peer victimization (Bear et al., 2011; Koth et al., 2008).

There has been increasing interest in improving school environments and enhancing student outcomes in countries around the world. The European Commission called for a shift in policy in 2018 to promote a balanced system of school assessment. For example, the Serbian Ministry of Education, Science, and Technological Development has integrated a “School Report Card” assessment tool that, in addition to achievement scores and school demographic data, includes evaluations of the educational environment (European Commission, 2018). In Spain, a national State Observatory of School Climate was created to support educational environments in which students can thrive through the exchange of practices and research via conferences and websites (Office of Equity and Quality in Education, 2012). In the United States, the Every Student Succeeds Act (ESSA) has shifted how school accountability is both conceptualized and evaluated (U.S. Department of Education, 2016). As a requirement of ESSA, states must include at least one nonacademic measure (e.g., school climate and attendance) as part of annual accountability data; this requirement acknowledges the importance of the interrelationship between educational environments and student outcomes. School climate assessment is an effective mechanism for accountability, a viable source of information for documenting and measuring students’ needs in the learning context, and an initial step in school improvement planning.

Although the above efforts reflect an educational interest in enhancing school climate research, accountability measures, and support for interventions, multinational studies examining student perceptions have been limited. The 2018 edition of the worldwide Program for International Students Assessment (PISA), which included representation from 79 countries and economies, found a positive school climate to be associated with academic resilience. School absenteeism was significantly associated with the quality of student–teacher relationships, an aspect of school climate (Monseur & Baye, 2017; OECD, 2019). In another example, the Second Regional Comparative and Explanatory Study (SERCE for its name in Spanish) is a longitudinal, large-scale study focused on identifying school and societal factors associated with Latin American and Caribbean students’ educational outcomes (United Nations Educational, Scientific, and Cultural Organization, 2019). SERCE has been one of the largest education studies ever implemented in Latin America and the Caribbean, assessing learning and achievement across 16 countries and more than 195,000 students. One of the key takeaways from SERCE was the significance of a positive educational environment that promotes respect for students and learning. In fact, the authors assert that such environments can have an overshadowing effect on barriers related to social disparities, potentially reducing learning inequities among students (United Nations Educational, Scientific, and Cultural Organization, 2008).

Hatzichristou et al. (2018) explicitly examined the ways social, political, and economic factors related to student experiences of school climate and mental health in a sample of 746 middle school students. The authors situated their investigation in the ongoing economic recession in Greece to explore protective factors against adversity in the national financial crisis. Results indicated a significant relationship between the effects of the Greek economic recession, students’ subjective well-being, and school climate (Hatzichristou et al., 2018). Across contexts, school climate represents a shared and important construct; as such, this study sought to investigate cross-national similarities and differences in student perceptions and examine the degree to which aspects of school climate relate to student mental health across cultures.

Conceptual Foundations

The most commonly recognized areas of school climate include perceptions of physical and emotional safety, interpersonal relationships among peers and adults, and perceptions of the learning environment, including teachers’ expectations and material school resources (Thapa et al., 2013). Appropriating knowledge from the field of cultural psychology as a theoretical conceptualization for the purpose of the current study, the multinational study of students’ school climate perceptions does not “necessitate the blanket denial of universals because . . . [universals are] a form of pluralism and pluralism is a special form of universalism” (Shewder & Sullivan, 1993, p. 508). Shewder and Sullivan (1993) utilize the phrase “universalism without uniformity” (p. 508) to describe a concept and process of multicultural explorations that serve to identify divergences in experiences, as well as collective or universal experiences—in this case, perceptions of school climate among students across different countries.

Students are nested within schools that are nested within larger systems. Thus, school improvement efforts should include both large scale and localized, targeted strategies to foster school improvement. Here, we use the terms “context” and “contextually relevant” to refer to the physical and local context of each region within the study. While we have not expanded beyond the overarching regional context for the purpose of this initial study, we do recognize the significance of examining localized culturally specific variables per country (e.g., school size, school demographics, etc.) in future studies. We appreciate that a one-size-fits-all approach to school improvement fails to meet the differential needs of students across contexts. However, we intended to explore the group-level trends across educational settings using a multinational sample. Findings from the current study will inform large-scale practices for school improvement efforts that can be applied cross-nationally to improve student school climate.

Cross-National Examination of School Climate Perspectives

Previous studies have examined cross-cultural similarities and differences in the relationships between gender, age, culture, and school climate across settings. Jia et al. (2009) conducted a study of school climate perceptions among seventh-grade students from New York City and China. They found that the dimensions of school climate (e.g., teacher support) were significantly associated with outcomes for both groups. The effect of peer support on students’

psychological well-being, above and beyond that of parent or teacher support, was also evidenced (Jia et al., 2009). However, Chinese students reported significantly more positive perceptions of school climate than the U.S. sample. Situated within a cultural context, results may reflect differences in perceptions of teachers in China and the United States. In mainstream Chinese culture, for example, families emphasize education and hierarchical obedience, thus encouraging children to readily embrace schooling and teacher authority (Yau et al., 2009). Additionally, students in the United States perceived more emotional support from their parents than Chinese students.

Sandal et al. (1998) found that, for students across Finland, Latvia, Norway, and Slovakia, the most significant predictors of school satisfaction were a sense of fairness, safety, and support. Khoury-Kassabri, Benbenishty and Astor (2005) explored how perceptions of school climate differentially related to peer victimization across 162 Jewish and Arab community schools in Israel. Though school climate was negatively associated with peer victimization for all secondary students ($N = 10,400$), school climate accounted for 27% of the variance in physical victimization in Jewish schools and only 16% of the variance in physical victimization in Arab schools. Researchers posited that cultural differences between Jewish and Arab students, particularly related to perceived social responsibility in school, might partially account for this disparity (Khoury-Kassabri et al., 2005).

The aforementioned studies demonstrate cross-national perspectives comparing psychological attitudes related to school climate but constituted as latent variables that cannot be measured directly. As such, school climate measures function as indicators of the latent construct. Van de Vijver and Leung (2000) assert that given that most cross-cultural research focuses on the comparisons of psychological constructs across cultural groups, employing statistical methodology establishing equivalence of measures is essential (Milfont & Fischer, 2010). To our knowledge, the current study is the first study of this scale that examined the factor structure of a school climate survey using a large cross-national sample and also conducted measurement invariance analyses at the subscale level. Measurement invariance assesses the psychometric equivalence of constructs across groups. Scalar invariance is one type of measurement invariance and is required to meaningfully compare latent variable means (i.e., school climate subscales). More specifically it must first be established that each observed indicator (i.e., subscale items) relates to the latent construct (i.e., school climate subscale) in the same way across groups (e.g., country). When scalar invariance is established, it is presumed that regardless of group membership (i.e., country) students who have the same subscale scores also have the same scores on the subscale items (Milfont & Fischer, 2010) and therefore, meaningful comparisons can be drawn.

School Climate and Mental Health

A sustained positive school climate supports students' social, emotional, and behavioral adjustment. This is perhaps particularly elucidated among adolescents since the transition to secondary school can be one of the most challenging times for students (Kuperminc et al., 1997). The change in school structure may result in feelings of isolation, loneliness, and victimization at a particularly vulnerable time for adolescents, who are at risk for onset of depressive or anxiety disorders (Lester et al., 2017). In a study of

3,459 adolescents in Western Australia, researchers examined the relationship between school climate and mental health as measured by the Depression Anxiety Stress Scale. Results indicated that during the first year of secondary school, negative perceptions of school connectedness were associated with increased feelings of depression and anxiety from the start to end of the year. Feelings of connectedness also declined over the course of the first year (Lester et al., 2013). In a subsequent study, Lester and Cross (2015) found school climate served as a protective factor against depression, with school connectedness and peer social support identified as the most important protective factors for first- and second-year students, respectively. Lester et al.'s study findings illustrate a bidirectional relationship between student well-being and perceived belonging and connectedness.

As a result of several studies establishing connections between school climate and student mental health outcomes (Khoury-Kassabri et al., 2005; Lester et al., 2017), there is a growing emphasis on data-driven school improvement efforts that facilitate a physically and emotionally safe and supportive learning environment for all students. The World Health Organization (WHO) conducted the Global Burden of Disease Study among 17 countries, and found evidence of these "enormous burdens worldwide, due to the combination of high prevalence and high disability" (Kessler et al., 2007, p. 168). With widespread efforts focused on creating safe and supportive learning environments for *all* students, we are admonished to increase our understanding of (a) the multinational aspects of the school environment that are most related to student perceptions of school climate and mental health, (b) the interrelationships among school climate and mental health, and (c) targeted strategies and interventions to improve outcomes given culture-specific considerations.

Purpose

The purpose of the current study was to examine perceptions of school climate and mental health among adolescents across 14 countries or territories. Data from this study were collected as part of a multinational project initiated by members of the International School Psychology Association (ISPA) Research Committee. Findings from the study can guide universal as well as targeted, culturally relevant school improvement strategies to support positive school climate and mental health outcomes for adolescents. For school psychologists, understanding the relationship between mental health and various school climate factors can support more targeted advocacy, resources, and strategies to increase educational outcomes and mental well-being. The following research questions were examined:

1. Is there scalar measurement invariance for the school climate subscales across groups?
2. Are there mean differences in perceptions of school climate, as measured by eight collective subscales?
 - a. It was hypothesized that, among a multinational sample, there would not be significant differences in perceptions of overall school climate.
3. What is the relationship between perceptions of school climate and self-reported mental health problems?

- a. It was hypothesized that, among a multinational sample, there would be a significant association between school climate and student mental health problems. Higher levels of mental health problems were expected to be related to more negative perceptions of school climate.

Methods

Participants

The targeted developmental level of this study was early to late adolescence (e.g., age 11–17). The sample accounts for differences in the way that grade level is defined across groups. Specifically, in Germany, Latvia, and Russia, fifth grade is the equivalent of sixth grade in the remaining sample given student age and stage in the schooling trajectory. Participants included 34,923 fifth- through twelfth-grade secondary students from 298 schools across 14 countries, regions, and territories: Belgium—French-speaking community ($N = 339$), Germany ($N = 1,301$), Greece ($N = 390$), Hungary ($N = 342$), Italy ($N = 134$), Jamaica ($N = 1,705$), Latvia—Latvian speaking community ($N = 4,645$), Latvia—Russian-speaking community ($N = 1,173$), Lithuania ($N = 330$), Malta ($N = 304$), Puerto Rico ($N = 420$), Russia ($N = 6,439$), Slovakia ($N = 384$), and the United States ($N = 18,042$). Participants were representative across gender categories for boys ($N = 17,318$, 48.2%) and girls ($N = 18,401$, 51.2%). Participant demographics are summarized in Table S1 (see supplemental materials).

Procedures

Recruiting

This International School Climate Collaborative (ISCC) was initiated through conversations and communications among members of the Research Committee of the ISPA. Convenience sampling (Connelly, 2008) was used by recruiting international research collaborators through a listserv invitation sent to members and affiliates of the ISPA. Leadership was provided by the primary investigator and colleagues, and a country lead representing respective research teams was identified for each participating country. Country leads were responsible for recruiting schools via context-specific professional education organizations, providing study information and parent opt-out forms, administering online or paper surveys, and monitoring data collection at school sites in their respective countries. All international collaborators completed human subjects research training online through the Collaborative Institutional Training Institute (CITI) or through a web-based training provided by the principal investigator to ensure consistency in ethical research standards and practices. In addition to the respective Institutional Review Boards (IRBs) internationally, all human subjects training and research study procedures were approved by the IRB at the University of Connecticut.

Survey Translation

Translation of study materials (i.e., consent, notification, and information forms) was completed for each site by a bilingual translator identified by the site's lead researcher. School climate surveys were translated using a staged process of translation, review,

and back-translation recommended by Beaton et al. (2000) for adaptation of surveys for expanded cultural and linguistic settings (see Table S2 in supplemental materials). The comprehensive translation process emphasizes semantic and conceptual equivalence across survey adaptations, rather than a literal translation that does not account for subtle differences in word connotations (see Beaton et al. for full review).

Each site determined the target language(s) of the translations based on the primary language(s) spoken in participating schools. Given that this study investigates multinational perceptions of school climate, Puerto Rico is referred to separately from the United States to highlight geographic, linguistic, and cultural distinctness. Similarly, surveys in Latvia were administered in both Latvian (Latvia-L) and Russian (Latvia-R); these translations are referred to separately to account for linguistic differences across the country. As an English-speaking country, Jamaica created adapted survey versions with minor changes (e.g., spelling) reviewed by the primary research team. Participants from Malta also opted to use an English version of the survey and underwent similar adaptation procedures as Jamaica.

Survey Administration

School climate surveys were available to participants through a secure online portal (Qualtrics) hosted by the PI's institution, and in paper format based on preference and to accommodate sites with limited access to technology (i.e., computers and internet). The country leads ensured that school personnel obtained parental consent for students to participate in the survey, as defined by each country's standards (e.g., signed parental consent process and parental opt-out form).

Students completed the surveys independently under the supervision of school personnel during school hours. School personnel were not permitted to view students' responses during or after the survey. No personal identifying data were collected. Students were notified that they could skip questions or discontinue the survey at any time. The survey took approximately 10–15 min to complete.

Measures

School Climate

The Georgia School Climate Survey (GSCS) is a validated measure of middle and high school student perceptions of school climate within the eight dimensions of school connectedness, character, physical environment, adult social support, peer social support, cultural acceptance, order and discipline, and safety (GSHS 2.0; Georgia Department of Education et al., 2016). Participants' responses were on a Likert scale with response options ranging from 1 (strongly disagree) to 4 (strongly agree), where higher scores represent more positive perceptions of school climate. The scale includes a higher-order school climate factor that explains the variance, in part, among eight lower-order factors that assess the aforementioned dimensions of school climate. The factor structure of this model has demonstrated good data fit with middle school respondents ($\chi^2(17) = 27, 825.18, p < .001, CFI = .966, TLI = .944, RMSEA = .074, SRMR = .030, N = 301,520$) and high school respondents ($\chi^2(16) = 18,762.23, p < .001, CFI = .979, TLI = .963, RMSEA = .060, SRMR = .022, N = 327,864$).

Reliability analyses yielded a Cronbach's alpha of .92 for secondary students (La Salle, 2017).

Mental Health

The mental health scale, a component of the larger Georgia Student Health Survey 2.0, includes eight items assessing how often a student has experienced psychological and somatic symptoms within a 30-day period. More specifically, the items ask if in the past 30 days students have experienced symptoms of depression or emotional dysregulation. Students responded to these questions on a scale ranging from 1 = not at all to 7 = 30 days. Lower scores represent more positive mental health. Confirmatory factor analysis resulted in good data fit for the model in the present study ($\chi^2(20, N = 34,923) = 478.37, p < .001, CFI = .99, TLI = .99, RMSEA = .03, SRMR = .04$). Reliability analyses in previous studies resulted in a high scale reliability coefficient for the mental health scale (.86–.88) (Wang et al., 2019).

Demographics

Data on the following demographic variables were collected: Country, school, grade, and gender. However, participating countries or regions had the autonomy to modify the demographic questions to ensure that they represented the local context (e.g., salient racial, ethnic, and socioeconomic groups).

Data Analysis

Initial analyses were conducted in SPSS v.24 to evaluate the demographic characteristics of the sample. Mplus v. 7.3 (Muthén & Muthén, 1998–2015) was used to answer RQ1, RQ2, and RQ3. Structural equation modeling procedures were utilized; specifically, multigroup confirmatory factor analysis (CFA) was used to establish measurement invariance across groups and examine mean differences in perceptions of school climate (RQ1 and RQ2). The country was the grouping command in the model to account for the nested nature of the data (e.g., students and schools nested within countries), using weighted least square parameter estimates with a diagonal weight matrix and standard errors with mean- and variance-adjusted chi-square test statistics (WLSMV estimator; Muthén & Muthén, 1998–2015) due to the categorical nature of the school climate data (4-point Likert scale). Theta parameterization was used to estimate models. Item and factor thresholds for categorical indicators were estimated rather than factor intercepts (used for continuous variables) for the measurement models.

Establishing measurement invariance (RQ1) was a necessary precursor to comparing means across groups (RQ2). Measurement invariance was conducted for the following factors: School Connectedness, Character, Environment, Adult Support, Peer Support, Cultural Acceptance, Order & Discipline, and Safety. First, individual confirmatory factor analyses were conducted for each group model of the proposed factor structure. Model fit indices were examined in cases of misspecification, and modifications were applied with caution only for cases consistent with the theoretical framework of the underlying model. Chi-square is sensitive to sample size, so the goodness of fit was assessed through three commonly used metrics including root-mean-square error of approximation (RMSEA) $\leq .08$, comparative fit index (CFI) and

Tucker–Lewis index (TLI) $\geq .90$, and standardized root-mean-square residual (SRMR) $\leq .08$ (Hu & Bentler, 1999; Pendergast et al., 2017).

Following the identification of the model for each group, invariance across groups was assessed using the multigroup measurement invariance approach (Wu & Estabrook, 2016). Specifically, when analyzing ordered categorical variables, Wu and Estabrook (2016) advocate for a multigroup measurement invariance approach in which each of the invariance models (i.e., configural and scalar) is identified separately. Based on the recommendations for data with more than two categories, the first model estimated was the configural model followed by the scalar model (Wu & Estabrook, 2016).

A goal of this study was to establish equality of thresholds (i.e., scalar invariance) so that average ratings could be meaningfully compared across groups (RQ1). Statistically, a model demonstrating threshold invariance (i.e., scalar model) is equivalent to a configural model. Conceptually, establishing threshold invariance assumes that people across multiple groups have an equal probability of shifting across response categories (or thresholds) on the latent construct (Pendergast et al., 2017). If threshold invariance is established, invariance across intercepts can be assumed, and support for the meaningful comparison of means across groups would be established (Pendergast et al., 2017). Authors in this study predetermined that if full invariance was not established, partial measurement invariance was examined and specified parameters were allowed to differ between groups based on modifications with the highest indices. Authors also predetermined that in order to establish partial invariance, at least five of the eight thresholds had to be invariant across groups (Bieda et al., 2017). According to Wu and Estabrook (2016), there are often identification issues among categorical variables that prevent the testing of loading invariance across groups, especially in the case of varying residual variances.

Finally, once full or partial scalar invariance was established, latent means were compared (RQ2). Given established research evidence of the factor structure of the English School Climate Survey, the U.S. sample was designated as the reference group for the models. The pooled standard deviation, a weighted average of standard deviation for two or more groups, was calculated using the weighted average of each group's standard deviation. This results in an averaged standard deviation with more weight given to larger sample sizes (Svetina et al., 2020; Wu & Estabrook, 2016). In Mplus, standard errors for the parameter estimates are computed using the observed information matrix to account for missing data (Muthén & Muthén, 1998–2015).

Linear regression analyses were used to examine the relationship between school climate and mental health ratings while controlling for grade and gender (RQ3). The present study investigated a regression model with the eight school climate subscales as predictors instead of the overall school climate factor. Thus, the variance explained by the regression model (R^2) and model regression coefficients (β) for subscales were compared between the English and translated surveys.

Results

Research Question 1—Is there scalar measurement invariance for the school climate subscales across groups?

The fit indices and model specifications for each group are displayed in Table 1. The eight-factor model resulted in acceptable

Table 1
Confirmatory Factor Analysis Results for Translated Surveys

Survey version	Model fit indices				
	χ^2	<i>df</i>	CFI	TLI	RMSEA
The United States					
English	18185.74*	586	.96	.96	.04
Belgium					
French	1028.43*	586	.88	.87	.05
Germany					
German	1424.56*	586	.97	.96	.03
Greece					
Greek	792.98*	586	.91	.90	.03
Hungary					
Hungarian	914.72*	586	.96	.96	.04
Italy					
Italian	765.38*	586	.84	.83	.05
Jamaica					
English	956.44*	586	.95	.94	.02
Latvia					
Latvian	2332.06*	586	.92	.91	.03
Lithuania					
Lithuanian	1121.73*	586	.93	.92	.06
Malta					
Maltese	906.78*	586	.96	.96	.04
Puerto Rico					
Spanish	1018.80*	586	.99	.99	.04
Russia					
Russian	984.75*	586	.97	.96	.02
Russia					
Russian	2557.54*	586	.91	.90	.02
Slovakia					
Slovakian	1792.11*	586	.84	.83	.07

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean-square error approximation.

* $p < .001$.

CFI, TLI, SRMR, and RMSEA fit indices. Fit indices supported a good data model, $\chi^2(14,748, N = 34,923) = 80850.41, p < .001$, RMSEA = .042 (.042-.042), CFI = .96, TLI = .96) and SRMR = .05.

Configural Invariance

Configural invariance was assessed across all groups and a good fit to the data was established: $\chi^2(7,452, N = 34,923) = 62278.8, p < .001$; RMSEA = .054 (.054-.06); CFI = .97, TLI = .97; SRMR = .05, supporting invariance across the underlying factor structure across all groups.

Scalar Invariance

To assess for equality of thresholds, partial scalar invariance was examined and the data were found to have acceptable fit to the model: $\chi^2(7,452, N = 34,923) = 62278.8, p < .001$; RMSEA = .054 (.054-.06); CFI = .97, TLI = .97; SRMR = .05, supporting equality of thresholds across groups. Though the overall model fit was good, we considered the model to be partially invariant because results indicated linear dependency among two or more variables or negative variance/residual variance, specifically in relation to the Culture and Peer Support subscales. Because of failure to establish

threshold invariance across all groups for these subscales, Culture and Peer Support were not utilized in subsequent analyses.

Research Question 2—Are there mean differences in perceptions of school climate?

Table 2 contains the overall means, standard deviations, and correlations for student-level study variables; Table 3 contains the school climate and mental health means and standard deviations for each participating site. Table 4 displays differences in Adult Support ($M_{AS\Delta}$), Character ($M_{C\Delta}$), School Connectedness ($M_{SC\Delta}$), Order and Discipline ($M_{OD\Delta}$), Physical Environment ($M_{PE\Delta}$), and School Safety ($M_{SS\Delta}$) between respective countries and territories. As mentioned, latent means for Culture and Peer Support were not compared across groups because preconditions were not met. The overall mean climate for the total sample was 3.01 (range = 2.77–3.2). The group pooled standard deviation for the groups was .39.

Mean comparisons to the reference group (English survey) yielded several significant findings. In the following section, we focus on reporting outcomes that meet the following two criteria: Have significant quotients and have an effect size of .95 or higher, representing a mean difference of at least one standard deviation.

Adult Support

Italy ($M_{AS\Delta} = .63, d = 1.62$), Latvia-L ($M_{AS\Delta} = .41, d = 1.05$), Puerto Rico ($M_{AS\Delta} = .84, d = 2.15$), Russia ($M_{AS\Delta} = .43, d = 1.10$), and Greece ($M_{AS\Delta} = .37, d = .95$) had mean scores at or above one standard deviation from the comparison mean.

Character

Significantly lower ratings were observed for Character in Belgium ($M_{C\Delta} = -.59, d = 1.51$), Lithuania ($M_{C\Delta} = -.41, d = 1.05$), and Slovakia ($M_{C\Delta} = -.39, d = 1.00$). Conversely, Malta ($M_{C\Delta} = .57, d = 1.46$) and Puerto Rico ($M_{C\Delta} = .46, d = 1.18$) had significantly higher ratings on the Character scale.

School Connectedness

Jamaica ($M_{SC\Delta} = 1.00, d = 2.56$) and Russia ($M_{SC\Delta} = .43, d = 1.10$) reported higher perceptions of School Connectedness, with Jamaica's mean being two and a half standard deviations above that of the reference mean. In contrast, Belgium ($M_{SC\Delta} = -.21, d = 1.49$) reported more negative perceptions of school connectedness than the comparison sample.

Table 2
Means, Standard Deviations, and Correlations Among Study Variables

Variable	M (SD)	Correlation			
		1	2	3	4
1. Grade	9.10 (1.97)	—	.01*	-.10**	-.06**
2. Gender	—	—	—	-.11*	.12**
3. School climate	3.01 (.492)			—	-.29**
4. Mental health	1.75 (1.08)				—

Note. Gender: Boys = 1, Girls = 2 Grades: 5–12.

* $p < .05$. ** $p < .001$.

Table 3
Means and Standard Deviations of School Climate Subscale and Mental Health Ratings

Country	School climate subscale								
	Adult support	Character	Cultural acceptance	School connectedness	Order and discipline	Peer support	Physical environment	School Safety	Mental health
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Full sample	2.94 (.81)	3.43 (.57)	2.74 (.78)	2.94 (.66)	3.01 (.70)	3.23 (.65)	2.80 (.76)	2.99 (.80)	1.75 (1.08)
Belgium	2.93 (.60)	3.08 (.54)	2.82 (.63)	2.71 (.63)	2.69 (.63)	3.29 (.60)	2.41 (.68)	2.72 (.69)	2.04 (1.19)
Germany	2.99 (.70)	3.48 (.46)	2.73 (.59)	2.97 (.60)	2.96 (.53)	3.38 (.49)	2.19 (.68)	3.15 (.76)	1.69 (.842)
Greece	2.67 (.76)	3.54 (.42)	2.65 (.67)	2.71 (.62)	2.69 (.63)	3.35 (.53)	2.61 (.69)	3.22 (.67)	1.77 (.76)
Hungary	2.89 (.77)	3.45 (.45)	2.80 (.67)	2.95 (.53)	3.16 (.50)	3.38 (.49)	2.85 (.66)	3.05 (.77)	1.74 (.77)
Italy	3.33 (.68)	3.54 (.44)	2.96 (.64)	2.97 (.53)	2.81 (.56)	3.42 (.51)	2.86 (.58)	3.38 (.63)	1.93 (1.01)
Jamaica	2.71 (.86)	3.48 (.54)	2.36 (.78)	3.23 (.66)	3.07 (.66)	3.05 (.75)	2.61 (.76)	2.52 (.84)	2.44 (1.40)
Latvia-Latvian	3.17 (.72)	3.55 (.56)	2.80 (.69)	2.91 (.60)	2.92 (.61)	3.31 (.63)	3.07 (.67)	2.90 (.79)	1.95 (1.10)
Latvia-Russian	2.95 (.78)	3.34 (.54)	2.86 (.68)	2.91 (.63)	2.90 (.64)	3.28 (.62)	2.99 (.67)	2.95 (.79)	2.25 (1.81)
Lithuania	2.85 (.60)	3.29 (.43)	2.93 (.55)	2.81 (.59)	2.78 (.47)	3.18 (.52)	2.84 (.58)	3.41 (.62)	2.22 (1.12)
Malta	3.07 (.83)	3.64 (.52)	2.92 (.74)	2.98 (.71)	3.19 (.61)	3.48 (.54)	2.89 (.70)	2.92 (.78)	2.17 (1.27)
Puerto Rico	3.34 (.73)	3.55 (.54)	2.75 (.82)	2.97 (.72)	2.91 (.79)	3.27 (.68)	2.77 (.78)	2.31 (.75)	1.56 (.94)
Russia	3.14 (.79)	3.39 (.61)	3.11 (.75)	3.10 (.71)	3.17 (.66)	3.36 (.68)	3.13 (.74)	3.13 (.83)	1.90 (1.11)
Slovakia	2.78 (.75)	3.20 (.64)	2.59 (.68)	2.78 (.59)	2.62 (.57)	3.09 (.69)	2.64 (.67)	2.81 (.83)	2.10 (1.17)
The United States	2.84 (.82)	3.47 (.57)	2.62 (.79)	2.89 (.66)	3.02 (.74)	3.17 (.65)	2.70 (.75)	3.01 (.77)	1.55 (.99)

Order and Discipline

In the area of Order and Discipline, Greece ($M_{OD\Delta} = -.39$, $d = 1$), and Slovakia ($M_{OD\Delta} = -.41$, $d = 1.05$) reported lower perceptions in comparison to the reference group.

Physical Environment

Germany reported lower perceptions of the physical environment ($M_{PE\Delta} = -.58$, $d = 1.49$), while Latvia-L ($M_{PE\Delta} = .5$, $d = 1.28$), Latvia-R ($M_{PE\Delta} = .39$, $d = 1$), and Russia reported more favorable perceptions ($M_{PE\Delta} = .67$, $d = 1.72$).

School Safety

Groups Jamaica ($M_{SS\Delta} = -.53$, $d = 1.36$) and Puerto Rico ($M_{SS\Delta} = -.79$, $d = 2.03$) reported feeling less safe than the reference group. In fact, the average rating for Puerto Rico was two standard deviations below the comparison mean. In contrast, Greece ($M_{SS\Delta} = .65$, $d = 1.67$), Italy ($M_{SS\Delta} = .74$, $d = 1.90$), Lithuania ($M_{SS\Delta} = .48$, $d = 1.23$), and Russia ($M_{SS\Delta} = .43$, $d = 1.10$) reported feeling safer than the reference group.

Research Question 3—What is the relationship between perceptions of school climate and self-reported mental health problems?

The regression model examined the extent to which the eight school climate subscales, combined, accounted for variance in student mental health. Regression analysis revealed that, controlling for the effects of gender and grade, the school climate subscales collectively accounted for a significant portion of the variance in mental health ratings for nine countries and territories: The United States, Belgium, Germany, Italy, Jamaica, Latvia-L, Latvia-R, Russia, and Slovakia (Table 5). The strongest association between school climate and mental health was observed for Italy ($r^2 = .59$, $p < .01$) and Belgium ($r^2 = .52$, $p < .01$), where ratings of school climate significantly accounted for 59% and 52% of the variance in mental health ratings, respectively.

For countries where school climate was significantly associated with mental health, regression coefficients were further examined to identify the subscales with the most significant connection to student mental health. In the reference sample (the United States), all subscales were significantly associated with mental health ratings. School Connectedness was most frequently associated with mental health ratings across samples, with lower perceptions of School Connectedness being significantly associated with greater mental health problems in five additional cultures: Belgium, Germany, Jamaica, Latvia-L, and Russia (see Table S3 in supplemental materials). Similarly, lower ratings of perceived School Safety were significantly associated with more mental health problems in four additional cultures: Germany, Jamaica, Latvia-L, Russia, and the United States.

Discussion

The purpose of the current study was to examine school climate perceptions and the relationship between school climate and mental health among a cross-national sample with 14 participating countries or territories. The GSCS was adapted and administered to adolescents in secondary school to assess cross-cultural student perceptions of school climate and mental health, as well as the influence of school climate perceptions on student mental health. There were several key findings in the study. Partial scalar invariance was established for the translated surveys, supporting invariance among factor thresholds across groups in using a 4-point Likert response scale. Scalar invariance allows for the meaningful cross-national examination of mean differences across groups. Scalar invariance was not established for two of the eight subscales, Cultural Acceptance and Peer Support, and as such those subscales were not included in subsequent analyses. We posit that invariance was not established for Cultural Acceptance for two reasons. First, the level of cultural diversity across the multinational study varies greatly, some being mostly homogenous (i.e., Russia) and others with large heterogeneity (i.e., the United States), so this latent construct is likely interpreted differently across groups. For example, the question “students at this school are treated fairly

Table 4
Comparisons of Mean School Climate Subscale Ratings by Country

Country	School climate subscale											
	Adult support		Character		School connectedness		Order and discipline		Physical environment		School safety	
	ΔM (σ^2)	Effect size	ΔM (σ^2)	Effect size	ΔM (σ^2)	Effect size	ΔM (σ^2)	Effect size	ΔM (σ^2)	Effect size	ΔM (σ^2)	Effect size
Belgium	.15** (.55)	.38	-.59** (.46)	1.51	-.21** (.58)	1.49	-.27** (.45)	.69	-.25** (.84)	.64	-.25** (.56)	.64
Germany	.14** (.51)	.36	-.00 (.45)	.00	.10** (.53)	.26	-.07** (.23)	.18	-.58** (.55)	1.49	.34** (.12)	.87
Greece	.37** (.59)	.95	.09* (.40)	.23	-.21** (.64)	.54	-.39** (.37)	1.00	-.08 (.59)	.21	.65** (.65)	1.67
Hungary	.06 (.67)	.15	-.11* (.39)	.28	.11* (.50)	.28	.16** (.27)	.41	.19** (.46)	.49	.16* (.104)	.41
Italy	.63** (.75)	1.62	.14 (.47)	.36	.11 (.47)	.28	-.25** (.25)	.64	.21** (.39)	.54	.74** (.93)	1.90
Jamaica	-.09** (1.00)	.23	.34** (.93)	.87	1.00** (1.72)	2.56	.26** (.73)	.67	-.07** (.90)	.18	-.53** (.96)	1.36
Latvia-Latvian	.41** (.72)	1.05	-.19** (.55)	.49	.02 (.50)	.05	-.11** (.33)	.28	.50** (.62)	1.28	-.10** (.73)	.03
Latvia-Russian	.16** (.75)	.41	-.20** (.52)	.51	.07* (.63)	.18	-.11** (.42)	.28	.39** (.57)	1.00	.11 (.98)	.28
Lithuania	-.05 (.31)	.13	-.41** (.27)	1.05	-.13** (.48)	.33	-.33** (.13)	.85	.12** (.34)	.31	.48** (.83)	1.23
Malta	.32** (.99)	.82	.57** (1.16)	1.46	.18** (.96)	.46	.30** (.57)	.77	.24** (.61)	.62	-.05 (.75)	.13
Puerto Rico	.84** (1.20)	2.15	.46** (1.11)	1.18	.29** (1.12)	.74	.08 (1.19)	.21	.16** (.93)	.41	-.79** (.64)	2.03
Russia	.43** (.98)	1.10	-.02 (.84)	.05	.43** (1.14)	1.10	.29** (.67)	.74	.67** (1.02)	1.72	.43** (1.56)	1.10
Slovakia	-.08 (.57)	.21	-.39** (.60)	1.00	-.12** (.48)	.31	-.41** (.29)	1.05	-.12** (.49)	.31	-.16** (.96)	.41

* Significant at the .05 level.

** Significant at the .05 level.

regardless of race, ethnicity, or culture” could result in significant variance in heterogeneous cultures, while in more homogenous cultures, distinguishing difference in treatment based on race is not as apparent. The Peer Support subscale has limited items ($N = 3$) and perhaps does not fully capture the construct on a multinational level. Findings from these analyses support the use of a six-factor School Climate Survey that can be used cross-nationally to examine student perceptions of school climate. The School Climate Survey, available in 10 languages (2 countries used English, 2 used Russian) contributes to the availability of use both intra- and internationally as schools globally have become increasingly multilingual.

The findings from the study also illustrate cross-national similarities and differences in student perceptions across several aspects of the school environment. On average, we observed that for any given school climate factor, approximately 30% of nations (Table 4) met the criteria of being both significantly different (in either a positive or negative direction) and having an effect size that was approaching or larger than 1 standard deviation from the reference mean. That is, students from different sites varied significantly in school climate perceptions across domains, but it is still evident that school climate is a cross-national construct. These data support a degree of universalism in both the underlying constructs of school climate and in student experiences at school, supporting cross-national collaboration that recognizes some of the shared global experiences of students, and uses such information to research and implement large-scale practices that can contribute to school improvement efforts. Globally, students spend approximately 1,000 hr (out of 6,000 waking hours) per year in school. Schools are the breeding grounds for developing environments where students are academically successful, engaged, and feel safe. These are universal goals, regardless of where in the world the school is. That is cause for creating educational environments that work for everyone, everywhere. For example, response styles differ based on cultural values and context, and this is crucial to acknowledge in cross-national survey administration and interpretation of results (Vieluf et al., 2019); some of the differences observed may be related to school norms and social expectations rather than vast differences in student experiences at school. To illustrate, general trends from the present study show more positive and statistically significant subscale ratings with large effect sizes for Southern region countries in Europe (Greece, Hungary, and Italy) more often than for countries in the northern region of Europe (Belgium, Slovakia, and Germany) (Table 4). These results are consistent with a previous study on rater acquiescence, or the tendency to select ratings on one side of a rating scale, in which Yang et al. (2012) found that in Western Europe, southern regions show greater positive acquiescence when compared to northern regions (Yang et al., 2012). Understanding cultural norms clarifies the intersection between school experiences and response style. In Italy, teachers place greater importance on interpersonal relationships than on rule-following and the physical environment. Thus, Italian students may both enjoy more positive relationships with others at school compared to students from other nations and be inclined toward agreeable responses on a measure administered in a school context. In another example, for School Connectedness, two groups (i.e., Jamaica and Russia) reported significantly more positive perceptions while Belgium reported significantly more negative perceptions, and in 9 of the 11 remaining groups mean differences were significant with effect sizes ranging from .18 to 2.56. Findings within this domain highlight that efforts

Table 5
Regression: School Climate Subscales as Predictors of Mental Health

Country	Variance (R^2)	Standard error (SE)
Belgium	.52**	.15
Germany	.26**	.03
Greece	.31	.33
Hungary	.64	.35
Italy	.59**	.22
Jamaica	.24**	.03
Latvia-Latvian	.27**	.02
Latvia-Russian	.35**	.12
Lithuania	.36	.19
Malta	.29	.33
Puerto Rico	.18	.35
Russia	.41**	.03
Slovakia	.29**	.08
The United States	.15**	.00

** Significant at the .01 level.

to promote the degree to which students feel connected to and a part of the school environment are fundamental in building the cornerstones for students to be able to grow academically, socially, and emotionally (Lester & Cross, 2015). School Safety also emerged as a common theme, with significant mean differences observed in 12 of the 14 groups and effect sizes ranging from .03 to 2.03. Students need to feel safe—both physically and emotionally—in order to learn and thrive. Recognizing this shared value among students allows for school psychologists and other educators to intently create school environments where students feel safe, secure, and connected. Recommendations for universal supports include establishing school-wide programs where students are able to connect with peers and adults; specifically, research has shown that if students are able to identify even one adult they can talk to if they need support, this can have lasting effects on long-term outcomes. Building a culture of trust and community increases school safety by reducing incidents of victimization and increasing bystander reporting.

Findings also supported a relationship between student-reported symptoms of mental health problems and perceptions of school climate in the majority of the investigated groups (the United States, Belgium, Germany, Italy, Jamaica, Latvia-L, Latvia-R, Russia, and Slovakia). This is in accordance with conclusions from other studies emphasizing the universal importance of the environment in students' behavior and mental health (Weist et al., 2014). Consistent with findings from mean comparisons, school safety emerged as an important variable in student mental health for several groups, indicating that stakeholders may learn from one another through commonalities in the ways school safety affects their students, and also provide additional considerations for support by addressing unique regional circumstances and challenges. For example, in Jamaica, student reports of school safety were 1.36 standard deviations below the comparison mean, and school safety showed one of the strongest effects on student mental health, with students demonstrating nearly a half-point increase in ratings of mental health problems for every point decrease in perceptions of school safety. In recent years, Jamaican researchers have drawn attention to limited progress in antibullying intervention and research compared to other nations, making it a priority in education legislation and school intervention (Elledge et al., 2019). Educators in the Jamaica setting

may look to other countries that are struggling with antibullying measures to implement interventions that promote student well-being. Current findings make it possible to identify common educational issues like school safety, among others that cultures face, creating an opportunity for intellectual exchange that influences practice.

Even so, groups differed in terms of the extent to which areas of school climate were associated with mental health problems. Previous international studies have emphasized increasing connectedness and belonging as protective factors to promote student mental health and overall student outcomes (Lester & Cross, 2015; Riekie et al., 2017). Lower perceptions of school connectedness were associated with more mental health problems in several—but not all—groups, and effect sizes larger than one emerged for only 3 of the 13 reference groups. Though it is important to focus on issues of connectedness at school to improve student mental health universally, present findings also encourage the exploration of additional interventions that meet local needs to address student mental health specifically. Particularly highlighting the importance of local influences, school connectedness, and cultural acceptance were significant variables in Latvian-community schools in Latvia, but not in Russian-community schools in Latvia. Based on previous work and cultural relations within Latvia, this may be related to Russian speakers in Latvia already experiencing a degree of “Russian-speaking nationality” that makes belongingness an inherent part of their school environment (Austers, 2002; Cheskin, 2013). In contrast, Latvian schools are less reliant on language as a cultural unifier, making students more aware of whether they feel accepted culturally and like a collective community at school. Results indicate the importance of whole-school or universal school improvement efforts that also recognize the influence of local norms and cultural influences, particularly to ensure effectiveness in efforts to maintain positive perceptions of school climate and reduce mental health problems.

Limitations and Future Directions

The current study contributes to cross-national efforts to advance understanding of school climate and symptoms of mental health problems. While there are several strengths, there are also notable limitations to the study. Although we had a robust international sample, convenience sampling limits the generalization of results beyond the cultural contexts explored. Further, data were collected cross-sectionally, so results summarizing the association between school climate and mental health should be interpreted with caution and without the assumption of causality. A future study may replicate these results with an expanded population in novel cultural settings.

Data collected for this study were obtained via self-report from participants; including additional measures of the school environment (e.g., observations, interviews, and school outcome data) can provide a more comprehensive understanding of universal as well as contextually specific needs. Multiple informants on perceptions of school climate, including school personnel and families, should also be considered alongside students to identify similarities and differences in educational perceptions and experiences. Such data can inform efforts supporting educational environments where teachers are able to teach, students are able to learn and develop, and families are able to meaningfully contribute to supporting student success.

As a preliminary investigation, the current study focused on examining perceptions of school climate and its subdomains,

particularly as they relate to symptoms of mental health. The mental health survey was developed by the department of education responsible for administering the GSHS on an annual basis. The authors recognize the limitation of assessing mental health as a one-dimensional construct; as such, results related to reported symptoms of mental health should be interpreted with some caution because of the limitation of a one-dimensional measure of mental health limiting the ability to identify targeted supports and interventions to support struggling students. Future research studies should consider parsing out the dimensions of mental health (e.g., positive affect, life satisfaction, anxiety, and depression; Headey et al., 1993) and examining them in relation to perceptions of school climate. Future studies should also focus on the examination of universal and local social, political, and economic factors that may be more proximally related to students' school experiences and well-being. Such analyses, examined from a universalism without uniformity lens (Shewder & Sullivan, 1993), will enhance broad strategies that relate to student experiences in consistent and predictable ways, as well as targeted strategies that address the nonuniform aspects that differentially affect students' experiences. To illustrate, in the present study, data collection for Puerto Rico took place in the aftermath of Hurricane Maria, an event that significantly disrupted and restructured schooling in subsequent months and years. Student-reported feelings of safety in this region were low, suggesting responses to trauma such as the increased perceived threat of risk to self and family (Orengo-Aguayo et al., 2019). Despite this, students reported more positive experiences of school climate in several areas when compared to the reference sample—especially in the domains of adult support, connectedness, and character. The paradox illuminates the capacity for students to have positive school experiences in spite of extenuating circumstances with the provision of educational supports. For example, Puerto Rican students have recognized increased community cohesion and solidarity in personal narratives about the hurricane (Muñoz, 2007). Therefore, fostering a cohesive school culture with quality staff–student relationships is crucial in the aftermath of societal crises.

At the same time, not all regions can point to a significant cultural event that recently defined schooling experiences. Jamaican students in the present study reported feeling less safe than most other groups despite the absence of major sociopolitical changes. Students also felt the most connected at school in Jamaica, indicating that interventions to promote connectedness may not support feelings of safety in the same way that other international studies have demonstrated (Lester & Cross, 2015). Like several other samples in the present study, further investigation is warranted to identify factors affecting students' attitudes toward school climate to develop interventions. Beyond events out of our control, stakeholders must focus on malleable variables of interest to promote the capacity to modify and intervene. Targeted interventions may be better informed by how specific domains of school climate can be leveraged as a protective factor against negative outcomes for students.

Conclusion

Globally, promoting a positive school environment for all students is an increasing priority for educational stakeholders and leaders, as demonstrated by efforts to evaluate and promote school climate (United Nations Educational, Scientific, and Cultural Organization, 2019). In this changing educational landscape, the

availability of tools that can be used to assess school climate cross-nationally is central to widespread school improvement efforts. Cross-cultural adaptations of the GSCS facilitate the assessment of school climate across nations, as well as within nations that are educating increasingly diverse student populations.

Finally, cross-national adaptations of school climate measures facilitate the examination of school climate perceptions and additional variables across a range of cultures to inform universal and targeted intervention. School psychologists all over have long been held to the standard of supporting both teachers (as consultants) and students to enhance academic and social–emotional outcomes (Oakland & Cunningham, 1997). Yet, the practice has evolved to encourage a simultaneous understanding of variables at the systems level (e.g., national identities, norms, and values) and the individual level (intersectional identities of ethnicity, language, etc.) in this pursuit (Begeny, 2018). Cross-national resources support school psychologists to promote quality school environments by targeting universal variables of interest (e.g., school climate and subjective well-being) in a manner that meets context-specific school needs. Ultimately, safe and positive environments lead to thriving students and thriving adults—everywhere!

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