

South Carolina School Climate Surveys: 2023 Factor Analysis Study

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Executive Summary

For nearly 15 years, the SC Educational Policy Center (SCEPC; now REM Center) has analyzed data from the South Carolina annual school climate surveys. Using factor analytic techniques, the SCEPC identified 14 school climate factors underlying responses from the teacher, student, and parent climate surveys (e.g., Gareau et al., 2010). These factors include: six factors from the teacher climate survey (*Working Conditions/Leadership, Home-School Relationship, Instructional Focus, Resources, Physical Environment, and Safety*); four factors from the student climate survey (*Learning Environment, Social-Physical Environment, Home-School Relationship, and Safety*); and four factors from the parent climate survey (*Learning Environment, Social-Physical Environment, Teacher Care and Support, and Home-School Relationship*). These factor definitions showed many similarities across the different respondent groups.

Although the school climate surveys remained fairly consistent over time, several changes have occurred over the last several years. These include changes to survey items, item response options, and survey administration. Examples of changes include: adding bullying items to all three of the school climate surveys with the 2015 administration, revising the parent survey items in 2021, and adding a “No Answer” response option for all surveys starting with the 2022 administration. Other changes include moving from paper-and-pencil to online administration of the parent survey in 2021, expanding the pool of survey participants to include parents of students in all grades (K-12th) in 2021 and students in grades 3-12 (in 2022), and administering school climate surveys through PowerSchool starting with the 2022 administration.

Given the changes to the school climate surveys in recent years, the purpose of this study was twofold: (1) to investigate the stability of the previously identified factor structures with 2023 teacher, student, and parent school climate data, and (2) to utilize both exploratory and confirmatory factor analysis (EFA/CFA) with all Likert-based items contained within each survey.

Key Findings and Recommendations

Using both exploratory and confirmatory factor analysis, the SCEPC/REM Center’s analysis of the 2023 teacher, student, and parent climate data resulted in the following findings:

- The previously identified 14 factor structure remained stable in the 2023 school climate data.
- “New” factor structures were identified via EFA; however, this did not result in identification of additional factors or in factors that changed in substantive meaning.
- “New” structures instead included the addition of several items to factors which previously did not load on a factor as well as the shifting of items between factors.

- Items designed to assess bullying within schools appear to be problematic from a methodological perspective. Specifically, items designed to address individual-level bullying incidents (e.g., “I have been bullied at school during the school day”) do not appear to be well aligned with assessing the broader school climate.
- Overall, given the substantive similarities between the previous and “new” teacher and student factor solutions, subsequent analyses utilizing these factor structures can proceed with either solution.

It is recommended that South Carolina could consider revising the items related to bullying to include a more targeted mixture of individual-level and school-level items. In general, more research is needed to fully assess the relationship between bullying and school climate within South Carolina. The report concludes with an example from the state of Delaware’s school climate surveys that include an assessment of bullying from varying perspectives.

Introduction

South Carolina School Climate Surveys

The assessment of school climate in South Carolina started in 1985 as a response to a requirement put forth by the South Carolina State Board of Education. These recommendations were made in part to address the development of district and school improvement plans of based upon educational reform legislation (Education Improvement Act of 1984) which was prompted by criticism arising from the 1983 report, “A Nation at Risk”. As part of the reform measures, the South Carolina State Board of Education mandated that each school undertake a comprehensive needs assessment to include surveys of parents, students, and teachers designed to assess six indicators of school effectiveness. These indicators included: 1) positive school climate, 2) instructional leadership of the principal, 3) emphasis on academics, 4) high expectations related to student achievement, 5) frequent monitoring of student progress and its utilization in curriculum planning, and 6) positive home-school relationship.

To assist schools in gathering and reporting this information, the South Carolina Department of Education (SCDE) developed school climate surveys for administration to parents, students, and teachers. In 1992, these surveys were reviewed by a statewide committee that provided recommendations for changes. Based on committee recommendations, survey item wording was changed to be parallel across the three respondent groups and items related to perceived school and faculty performance were added.

The current school climate surveys have been administered in SC public schools since 2002 to meet the requirements of the Education Accountability Act (EAA) of 1998. Section 59-18-900 of the EAA required the inclusion of “evaluations of the school by parents, teachers, and students” on the annual school report card. In response to this requirement, the South Carolina Department of Education developed and administered the parent, student, and teacher surveys in all public schools across the state. Each survey is a multi-item survey that asks the opinion and perceptions across multiple aspects of a school’s climate from the rater’s point of view, including evaluation of the learning environment, social and physical environment, and the home-school relationship. Since implementing the school climate surveys, three summative items from each survey have appeared on school report cards. These items describe the teacher, student, and parent perceptions of the school’s learning environment, social-physical environment, and home-school relations.

Beginning in 2022, school climate data collected from teachers and students was included as part of South Carolina’s school accountability model. Information is included from five factors identified as part of the SC Educational Policy Center’s (SCEPC) factor analysis (detailed below). This includes teacher responses to three school climate factors: teacher

perceptions of instructional focus, teacher perceptions of the working conditions, and teacher perceptions of safety; and two factors from the student survey: student perceptions of the social-physical environment and student perceptions of safety.

Previous Factor Analytic Work

For nearly 15 years, the SC Educational Policy Center (SCEPC; now REM Center) has analyzed the state’s climate survey database. Using factor analytic techniques, the SCEPC has identified and replicated 14 school climate factors measured across the teacher, student, and parent climate surveys (e.g., Gareau et al., 2010). This factor structure has remained stable across each survey across many survey administrations.

Table 1. Teacher, Student, and Parent School Climate Factors

Teacher Factors	Student Factors	Parent Factors
Working Conditions/Leadership	Learning Environment	Learning Environment
Home-School Relationship	Social-Physical Environment	Social-Physical Environment
Instructional Focus	Home-School Relationship	Teacher Care and Support
Resources	Safety	Home-School Relationship
Physical Environment		
Safety		

The identification of stable factors present in each survey has allowed the SCEPC/REM Center to compute meaningful factor scores. Factor scores show each school’s placement along each of the identified factors. In order to make comparisons between schools, the factors scores are standardized based on organizational level (i.e., elementary, middle, and high). Factor scores may be used in advanced analyses to gain understanding of important relationships with school climate. Subsequent analyses have indicated the school climate factors are highly related to various school, student, and teacher-based outcomes in South Carolina, in that higher climate scores are associated with more positive outcomes (e.g., higher student achievement; DiStefano et al., 2007; DiStefano et al., 2015; Monrad et al., 2008; Monrad et al., 2016a; 2016b). Such findings confirm the importance of measuring and assessing school climate in South Carolina.

Study Purpose

Although the teacher, student, and parent school climate surveys have remained mostly consistent since 2002, several changes to both the items contained in each survey, as well as survey administration procedures warrant a re-analysis of each survey’s factor structure. First, beginning in 2015, items related to bullying were added to each survey. This included three items on the teacher survey, eight items on the student survey, and two items on the

parent survey¹. Bullying items on the teacher and student survey ask teachers and students to respond to incidents of personal bullying (i.e., has an individual been bullied by another student/adult at the school), as well as more general acts of bullying and bullying behavior in the school (e.g., adults prevent bullying from happening in their school). To date, the SCEPC/REM Center has not considered the bullying items in factor analysis.

Second, numerous changes were made with the parent survey. Beginning with the 2021 survey administration, parents began completing the climate survey via an online administration. Concurrently, parents of students in all grades were asked to complete the survey. Prior to 2021, only parents of students in a school's highest grade, typically grades 5, 8, and 11, were asked to complete the parent climate survey. Additionally, the parent survey underwent a substantial revision in 2021, resulting in several changes to the survey items and response options. Examples of changes included deleting items, combining survey sections, adding new items, rewording items used in previous years, and adding/changing some item response options (for a complete discussion on the parent survey changes made in 2021, see Ene et al., 2022).

In addition to the expanded parent recipient pool in 2021, the students eligible to complete the student survey expanded in 2022. Prior to 2022, only students in a school's highest grade-level, typically grades 5, 8, and 11, were required to complete the survey. In 2022, the potential response pool expanded to all students in grades 3-12. Finally, all respondent groups (parents, teachers, and students) were asked to access and complete climate surveys via the internet.

Given the survey changes in recent years, the purpose of this study was twofold: (1) to investigate the stability of the previously identified factor structure on the 2023 teacher, student, and parent school climate data, and (2) to re-examine the data utilizing both exploratory and confirmatory factor analysis by including all Likert-based items contained within each survey.

Method

2023 School Climate Surveys

The **2023 School Climate Teacher Survey** was administered to all teachers, librarians, guidance counselors, ROTC instructors, and speech therapists at South Carolina schools through the PowerSchool Ecollect system. The survey consisted of 81 items, including

¹ The parent survey also includes an additional three items related to specific incidents of bullying involving their child.

questions from the areas of: Learning Environment (27 items), Social and Physical Environment (20 items, including 3 items related to bullying), Home and School Relations (11 items), Working Conditions (14 items), and Demographic-based items (9 items).

The **2023 School Climate Student Survey** was administered to all students in grades 3 through 12 in South Carolina schools through the PowerSchool Ecollect system. The survey consisted of 51 items, including questions from areas of: Learning Environment (18 items), Social and Physical Environment (17 items), Home and School Relations (8 items), and Bullying (8 items).

The **2023 School Climate Parent Survey** was administered to parents and guardians who have children in South Carolina schools through Qualtrics. Parents accessed the online survey through the parent portal in PowerSchool. The survey consisted of 41 items, including questions from areas of: Learning Environment (5 items), Social and Physical Environment (6 items), Home and School Relations (8 items), Individual Graduation Plan (IGP) Conference (3 items, only for parents of students in grades 9-12), Parent-School Experience/Participation (6 items), Bullying (3 items), and Demographics and Other background information (10 items).

Teachers, students, and parents responded to survey items by stating their level of agreement with statements using a four-point Likert scale ranging from: 1= “Disagree”, 2= “Mostly Disagree”, 3= “Mostly Agree”, and 4= “Agree”. A fifth option, 5= “No Answer”, was also provided. This option was recoded as missing for analyses.

Prior to data analysis, each dataset was examined for missing data. Cases having more than 25% of responses missing within each of the survey sections were removed. For cases with 25% or less missing data per section, missing item responses were imputed by replacing a missing response with the average of the individual’s responses for other items within the same survey section.

Following data cleaning, the number of cases were examined by school. Schools that failed to meet the following thresholds for total teacher, student, or parent data were removed from subsequent analyses: 10 teacher surveys, 20 student surveys, and 10 parent surveys. These guidelines follow survey thresholds set by the Education Oversight Committee (EOC) and the SC Department of Education (SCDE). In total, the final analyzed dataset contained 49,248 teacher surveys, 404,088 student surveys, and 55,550 parent surveys.

Data Analysis

Factor Analysis

To examine the factor structure of the teacher, student, and parent school climate surveys, exploratory factor analysis (EFA) was used to examine possible differing factor solutions, followed by confirmatory factor analysis (CFA) on the optimal solution. Previous factor analyses conducted by the SCEPC/REM Center used the SAS statistical programming package; however, advanced factor analytic procedures are limited in SAS. The *Mplus* (version 8.10) statistical program, a more specialized factor analytic software, was used for the current analysis to overcome shortcomings noted with SAS. This allowed us to examine how the clustered nature of school climate data (i.e., teachers and students clustered within schools) potentially impacts the results.

For EFA, a robust maximum likelihood (MLR) factor analysis with promax rotation was used for all three datasets. Rotation methods help to redistribute the relationships among factors mathematically, without altering the item-factor relationships to facilitate the interpretability of a factor solution (Comrey & Lee, 1992; Gorsuch, 1983). A scree plot was used to help determine a starting point for the number of factors needed to summarize the data sets. The plot illustrates the number of factors thought to represent the underlying dimensions of the data set through a graph of the percentage of variance extracted by successive numbers of factors (Gorsuch, 1983). The suggested number of dimensions underlying a data set can be identified at the point in which the graph begins to ‘level off’ signifying that an additional factor is not contributing much variance to the overall factor solution. Using suggestions from the scree plot, several different factor solutions were run and evaluated for the teacher, student, parent samples (Gorsuch, 1983).

Each EFA solution was individually evaluated based upon four criteria. First, the presence of a simple structure was considered. Simple structure refers to a solution where each item is strongly associated with only one factor. Items with a factor loading value of 0.30 or higher were kept in the solution. Cross-loadings were considered present if the items were within a difference of 0.10, or if loading values were above 0.30 on the secondary factor. Items were dropped if they did not meet the criteria for simple structure. Next, the absence of specific factors was assessed. Specific factors consist of one or two items and indicate that a data set may have been “over-factored.” Finally, the factor solution was reviewed for interpretability. In order for a factor solution to be informative, the factors should be explainable based on knowledge of the content area.

CFA procedures were used to evaluate both the stability of the SCEPC/REM Center’s previously identified factor structure, as well as the final EFA solution identified for the teacher, student, and parent analyses. CFA models were evaluated based on overall model fit using the following indices and recommended cut-off values: (1) Chi-square statistic (non-

significant value), (2) Comparative fit index (CFI; values exceeding 0.95; Hu & Bentler, 1999), (3) Tucker-Lewis index (TLI; values exceeding 0.95; Hu & Bentler, 1999), (4) root mean square error of approximation (RMSEA; values of 0.05 or less; Brown & Cudeck, 1993), and (5) standardized root mean square residual (SRMR; values of 0.08 or less; Hu & Bentler, 1999).

In addition to overall model fit, estimated factor loading values for all CFA models were inspected. A general CFA rule of thumb is that loading values should be at least 0.7, which would indicate that at least half of the variance (i.e., 0.7^2) in the observed variable is shared with the latent factor. However, in real world data, it is more reasonable to consider values of 0.6 as “high”, with loading values below 0.4 as “low” (e.g., Hair et al., 1998). Therefore, the expectation was that all loading values estimated in the CFA model would at least exceed 0.4.

Examining Clustered Data

Due to the nature of how schools are organized (e.g., students within classrooms, classrooms within a school, etc.), many educational settings produce nested or clustered data. For example, teachers (or students, parents) associated with a given school share similarities (e.g., administrative viewpoint, neighborhood characteristics, etc.). This similarity among cases can produce statistical dependency, which can lead to biased estimates of the relationships and attenuated standard errors of parameter estimates (i.e., factor loadings; O’Dwyer & Parker, 2014). Given that school climate surveys describe the climate at a particular school, we considered that stakeholders (i.e., parents, teachers, students) within a given school would share similarities due to their shared experiences.

The amount of variability at a higher level (i.e., school) may be considered of interest to model (e.g., multilevel CFA) or more of an effect that clouds a researcher’s view of the underlying structure. Our analyses considered the latter, including nesting variability as a design effect (Stapleton, 2013). Cluster variability at the school level was parsed from the factor analyses.

Results

Stability of the Previous Factor Structures

Our analysis began by examining the previously identified factor structures for the 2023 teacher, student, and parent data via CFA. This allowed us to examine the stability of the structure and assess if any model deviations are present in the 2023 data. As these factor structures were identified prior to the addition of the bullying items to each survey, this analysis did not include these items.

Analysis of South Carolina's school climate surveys includes analyzing all viable data from teachers, students, and parents associated with a "home" school(s) (i.e., elementary, middle, high school) across the state. This structure represents a situation in which the data is considered clustered or nested and ignoring the effect of nesting could lead to biased parameter estimates and poor model fit. Data corrections accommodating clustered data with EFA and CFA are available in the *Mplus* statistical program.

Prior to examining the previously identified factor structure on the 2023 teacher, student, and parent data, we evaluated the impact of clustering on the data. Specifically, we examined the item-level intraclass correlation coefficient (ICC). The ICC estimates the level of dependence and can be interpreted as the proportion of variance in an observed variable found at the cluster level rather than at the individual level (Muthén & Satorra, 1995). For the teacher, student, and parent data, the average size of the cluster (i.e., the average number of complete surveys obtained from each school) was 41.63, 354.77, and 53.57, respectively. For the teacher, student, and parent data, the average ICC across survey items was estimated as 0.13, 0.07, and 0.11, respectively.

A design effect is considered to provide a more accurate representation of the clustering effect, where values greater than 2.00 suggest that the clustering in the data should be taken into account during estimation (Muthén & Satorra, 1995; Stapleton, 2013). For the teacher, student, and parent data, the average design effect size was 6.31, 26.99, and 6.67 respectively. Consequently, when conducting factor analysis, the nested structure of the data was taken into consideration.

The previously identified factor structure for the teacher survey included six factors: *Working Conditions/Leadership*, *Home-School Relationship*, *Instructional Focus*, *Resources*, *Physical Environment*, and *Safety*. For the **2023 teacher school climate data**, the six-factor solution fit acceptably: $\chi^2(1524) = 126782.667$, $p < .001$; RMSEA = .041 (.041, .041); SRMR = .048; CFI = .880; TLI = .874. Table A2 in Appendix A displays the standardized factor loadings for the six factors.

The standardized factor loadings for all six factors in the teacher data were substantial, detailing a strong relationship between the items and their corresponding factor. The standardized loadings ranged from 0.62 to 0.87 for the *Working Conditions/Leadership* factor; from 0.64 to 0.84 for the *Home-School Relationship* factor; from 0.53 to 0.74 for the *Instructional Focus* factor; from 0.48 to 0.66 for the *Resources* factor; from 0.75 to 0.88 for the *Physical Environment* factor, and from 0.81 to 0.92 for the *Safety* factor. The correlation between factors ranged between 0.40 and 0.72, indicating moderate to strong relationships between the teacher climate factors.

The previously identified factor structure for the student survey included four factors: *Learning Environment*, *Social-Physical Environment*, *Home-School Relationship*, and *Safety*. For the **2023 student school climate data**, the four-factor solution fit well: χ^2 (521) = 339254.864, $p < .001$; RMSEA = .040 (.040, .040); SRMR = .043; CFI = .978; TLI = .977). Table A6 in Appendix A displays the standardized factor loadings across all student factors. In the student data, the standardized factor loadings for all four factors displayed a substantial relationship between the items and their corresponding factor. The standardized loadings ranged from 0.41 to 0.71 for the *Learning Environment* factor; from 0.61 to 0.71 for the *Social-Physical Environment* factor; from 0.54 to 0.66 for the *Home-School Relationship* factor; and from 0.74 to 0.87 for the *Safety* factor. The correlation between factors ranged between 0.60 and 0.74, indicating strong relationships between the student climate factors.

The previously identified factor structure for the parent survey included four factors: *Learning Environment*, *Social-Physical Environment*, *Teacher Care and Support*, and *Home-School Relationship*. For the **2023 parent school climate data**, the previous four-factor solution fit well: χ^2 (113) = 23628.213, $p < .001$; RMSEA = .061 (.061, .062); SRMR = .054; CFI = .945; TLI = .934). Table A10 in Appendix A displays the standardized factor loadings across all parent factors. The standardized loadings ranged from 0.69 to 0.85 for the *Learning Environment* factor; from 0.58 to 0.83 for the *Social-Physical Environment* factor; from 0.63 to 0.89 for the *Teacher Care and Support* factor; and from 0.58 to 0.86 for the *Home-School Relationship* factor. The correlation between factors ranged between 0.76 and 0.88, indicating strong relationships between the parent climate factors.

Identifying New Factor Structures

Exploratory Factor Analysis (EFA)

Our analysis continued by re-examining each dataset using exploratory factor analysis (EFA). To date, the SCEPC/REM Center has not considered the items related to bullying (first implemented in 2015) in factor analysis. The current EFA included the bullying items from each survey to examine potential new factor structures. Prior to conducting EFA, all bullying items that were “negatively worded” were reverse coded (e.g., “I have been bullied at school during the school day.”). Scree plots suggested that between three and six factors were underlying the teacher, student, and parent data sets. Each solution was run and evaluated using the aforementioned criteria. In a series of iterations, the Likert scaled items on each survey were factor analyzed. Following each round, cross-loading and low-loading items were identified and eliminated from the analyses.

From the initial EFA results of teacher and student survey data, we discovered that the tested factor solutions identified factors that were statistically appropriate, but the meaning of the factor solutions could not be interpreted on theoretical or substantive grounds from

the set of items grouped together. For instance, one bullying item (SPE11, “I have been bullied by a student at this school”) and a social-physical environment item (SPE02, “The hallways at my school are kept clean”) in the teacher data grouped together to produce a factor in the six-factor solution.

In an effort to identify the possible reason for these results we conducted a more in-depth item analysis. Specifically, we examined each item's relationship to an overall score (i.e., a total “school climate” score) using item-total correlation coefficients. A low item-total correlation provides empirical evidence that the item does not measure the same construct as the other items in the set. A correlation coefficient less than 0.3 suggests that an item does not correlate strongly with the scale overall and, thus, could be dropped (Zijlmans et al., 2018).

Upon investigation of the teacher survey data set, we found that the item-total correlation of the two bullying items asking about their personal bullying experiences (SPE11 and SPE12) were 0.27 and 0.29, respectively, while the remaining items' item-total correlation ranged from 0.37 and 0.81. Those two bullying items were therefore considered to be eliminated for further analysis. From the student data set, five bullying items asking about their personal bullying experiences (B01, B02, B03, B04, and B08) had item-total correlations ranging from 0.13 and 0.23, respectively, suggesting that they had poor correlations with the scale overall. They were therefore considered to be eliminated for further analysis as well.

In total, our EFA evaluation criteria resulted in the elimination of 11 items from the teacher surveys and 12 items from the student survey. No items were eliminated from the parent survey. Items not considered for use in CFA are listed in Tables B4 and B8 in Appendix B.

For the **2023 teacher school climate data**, a five-factor solution was determined to be the most interpretable. These five factors aligned with the SCEPC/REM Center’s previously identified factor solution. The five factors included: *Working Conditions/Leadership*, *Home-School Relationship*, *Instructional Focus*, *Physical Environment*, and *Safety*. These factors share substantive meaning with the previously identified six-factor solution for teachers.

For teachers, the first factor, *Working Conditions/Leadership* describes the administrative leadership, perceptions of inclusion of teachers, and enforcement of work-related policies. This factor included items such as: “I am satisfied with my current working conditions.” and “The school administration communicates clear instructional goals for the school.” *Home-school Relationship* describes the relationship between parents and their involvement with school activities. Example items include: “I am satisfied with home and school relations.” and “Parents attend school meetings and other school events.” The third factor, *Instructional Focus*, measures an understanding of instructional standards and high expectations for students to meet those standards. This factor included items such as:

“Teachers at my school focus instruction on understanding, not just memorizing facts.” and “Teachers at my school have high expectations for students' learning.” The fourth factor, *Physical Environment*, measures teachers' views of the physical environment of the schools and is closely associated with building cleanliness and maintenance (e.g., “The hallways at my school are kept clean.”). The final factor, *Safety*, expresses teachers' perceived safety during the school day and while going to and coming from school (e.g., “I feel safe going to or coming from my school.”).

The most significant change in the five-factor teacher solution was the elimination of the *Resources* factor. EFA results indicated six items that previously loaded on the *Resources* factor did not meet the minimum loading threshold to be considered and were therefore removed from analysis. Two items that previously loaded on *Resources* shifted to *Instructional Focus*. All other items that previously loaded on a stated factor loaded on the same factor under this new structure. Additionally, 10 items that did not load on any of the previous structure's factors were added to the new structure and loaded on one of five factors. This included four items on the *Working Conditions/Leadership* factor, two items on the *Home-School Relationship* factor, and four items on the *Instructional Focus* factor. See Table B2 in Appendix B for details on these items. Notably, the general school-level bullying item (SPE10) “My school or district provides me with training to assist in preventing and/or dealing with bullying.” did not show a strong relationship with any factor in the EFA factor solutions investigated.

For the **2023 student school climate data**, a four-factor solution was thought to be optimal for the overall data. These factors align with the previously identified structure and share substantive meaning: *Learning Environment*, *Social-Physical Environment*, *Home-School Relationship*, and *Safety*. The *Learning Environment* factor was defined by items such as: “My teachers expect students to learn” and “My teachers spend enough time helping me learn.” Positive student responses to these items suggest the existence of a nurturing learning environment in which the student feels supported by teachers and engaged in learning. The second factor, *Social-Physical Environment*, is similar to the Physical Environment factor for teachers, with items relating to building cleanliness and maintenance e.g., “The grounds around my school are kept clean.”). The third dimension, the *Home-School Relationship*, is primarily associated with parent involvement with the school and student learning (e.g., “My parent knows what I am expected to learn in school.”). The *Safety* factor for students is comparable to that outlined for teachers: the perception of security both at school and coming to and going from school (e.g., “I feel safe at my school before and after school hours.”).

In the “new” student factor structure, all items on each stated factor in the previous structure loaded on the same factor in the new structure, except for one *Learning Environment* item that was removed in the new structure. Additionally, six items that

previously did not load on a factor in the previous structure were added to the new structure, loading on the *Learning Environment* factor. This includes two items related to general school-level bullying: “Adults at my school prevent bullying from happening.” and “I can always go to adults at my school if I am being bullied.” See Table B6 in Appendix B for details regarding these items.

For the **2023 parent school climate data**, a one-factor solution was determined to be optimal for the overall data. A four-factor solution included a factor containing only two items, indicating the four-factor solution had been over-factored. Additionally, a two and three factor solution lacked interpretability and contained multiple items that cross-loaded across factors. Consequently, a one-factor solution was chosen for the parent survey to represent parents’ perceptions of school climate.

This shift from a four-factor solution to a one-factor solution is the most significant change in factor solutions among the three datasets. However, as noted earlier, the parent survey underwent the most significant revision, with several items being removed and/or reworded. The 2023 parent survey contained 19 Likert-based items used for factor analysis. Given the more limited number of items, compared to the teacher and student data, a one-factor solution is reasonable for consideration.

Confirmatory Factor Analysis (CFA)

For the series of CFAs, the final EFA solutions were tested for the teacher, student, and parent data sets. Since the survey data are clustered at the school level, we again looked at the intraclass correlation coefficient (ICC) before examining the fit of CFA models and considered the design effect associated with the clustered nature of the data. Given that the “new” factor structures contained only minor changes from the previous structures, item level ICCs and design effects were similar to those reported in examining the previous factor structure. The average ICCs for teachers, students, and parents were 0.14, 0.08, and 0.11 respectively, while the average design effect for teachers, students, and parents were 6.47, 27.82, and 6.80. Given the design effect for all surveys was greater than 2.00, the effect of clustering was corrected for in all CFAs.

For the **2023 teacher school climate data**, the five-factor solution showed acceptable fit: χ^2 (1759) = 155591.686, $p < .001$; RMSEA = .042 (.042, .042); SRMR = .052; CFI = .869; TLI = .864. Table B2 in Appendix B displays the standardized factor loadings for all identified teacher factors. The standardized factor loadings for all five factors were substantial, illustrating a strong relationship between the items and their corresponding factor in the teacher data. The standardized loadings ranged from 0.54 to 0.86 for the *Wording Conditions/Leadership* factor; from 0.58 to 0.84 for the *Home-School Relationship* factor; from 0.45 to 0.75 for the *Instructional Focus* factor; from 0.75 to 0.88 for the *Physical Environment* factor; and from 0.81 to 0.92 for the *Safety* factor. The correlation between

factors ranged between 0.40 and 0.78, indicating moderate to strong relationships between the teacher climate factors.

For the **2023 student school climate data**, the “new” four-factor solution showed good fit: $\chi^2(695) = 342745.989$, $p < .001$; RMSEA = .035 (.035, .035); SRMR = .041; CFI = .947; TLI = .944). Table B6 in Appendix B displays the standardized factor loadings for all identified student climate factors. In the student dataset, the standardized factor loadings for all four factors indicated a strong relationship between the items and their corresponding factor. The standardized loadings ranged from 0.43 to 0.72 for the *Learning Environment* factor, from 0.61 to 0.71 for the *Social-Physical Environment* factor, from 0.54 to 0.66 for the *Home-School Relationship* factor, and from 0.74 to 0.87 for the *Safety* factor. The correlation between factors ranged between 0.61 and 0.80, indicating strong relationships between the student climate factors.

For the **2023 parent school climate data**, the one-factor solution yielded an acceptable fit: $\chi^2(152) = 51093.134$, $p < .001$; RMSEA = .078 (.077, .078); SRMR = .052; CFI = .894; TLI = .881). Table B10 in Appendix B displays the standardized factor loadings with a for the one-factor parent solution. The standardized factor loadings indicated a strong relationship between the items and the *School Climate* factor in the parent data. The standardized loadings ranged from 0.54 to 0.83.

Key Findings and Conclusions

Selecting Factor Structures

The goal of the current study was to examine the underlying factor structures of the 2023 teacher, student, and parent school climate data. The purpose of this investigation was twofold: (1) to examine the stability of the factor structures previously identified by the SC Educational Policy Center (SCEPC)/REM Center, and (2) to identify potential new structures through both an exploratory and confirmatory factor analysis approach.

The previously identified six-factor teacher solution, four-factor student solution, and four-factor parent solution fit the 2023 teacher, student, and parent data well, indicating these structures remain stable. Subsequent exploratory factor analyses indicated some minor changes for the teacher and student factor structures. The “new” teacher factor structure included five identified factors, with the previous *Resources* factor falling out of the overall structure. The remaining five factors aligned with the previously identified factors: *Working Conditions/Leadership*, *Home-School Relationship*, *Instructional Focus*, *Physical Environment*, and *Safety*. The new EFA of the teacher data indicated some items that previously did not load on a factor now met the threshold for inclusion on a factor. The

Instructional Focus factor added six items, including four items that did not previously load on a factor, and two items that previously loaded on the *Resources* factor.

The “new” student factor structure aligned directly with the previously identified four-factor structure: *Learning Environment*, *Social Physical Environment*, *Home-School Relationship*, and *Safety*. Similar to the teacher data, items previously identified as not loading on a factor now met the threshold for inclusion. The student *Learning Environment* factor was most impacted by this item shift, as six items that previously did not load on a factor loaded on *Learning Environment*.

The re-analysis of the parent climate data resulted in the most significant potential change in factor structure. The EFA of the 2023 parent data indicated a possible “over-factoring” of a four-factor solution and lack of factor interpretability for a two or three-factor solution. Therefore, we examined the possibility of a one-factor solution. Better model fit, however, was obtained with the previously identified four-factor parent solution. Given the parent climate data is not included in South Carolina’s school accountability model, the choice in factor structure is of lesser consequence.

Model fit and item loading values between the previous and “new” teacher and student factor structures are mostly comparable, as were correlations between factors. Given the substantive similarities between the previous and “new” teacher and student factor solutions, subsequent analyses utilizing these factor structures can proceed with either solution.

Performance of Items Related to Bullying

One of the primary reasons for re-examining the factor structure of the teacher, student, and parent data was to examine how the inclusion of items related to bullying impacted the structure. Items designed to assess bullying in schools were first included on the school climate surveys in 2015. This included three items added to the teacher survey, eight items added to the student survey, and two items added to the parent survey². The items added to the teacher and student survey included items that ask teachers and students to reflect on incidents of individual acts of bullying (e.g., “I have been bullied by a student at this school.” – teacher survey item SPE11) as well as more general school-level items related to bullying (e.g., “Adults at my school prevent bullying from happening.” – student survey item B05). Results from this study indicated that the bullying related items targeted to individual incidents of bullying did not fit well (i.e., did not meet the minimum threshold for inclusion on a factor) and potentially provided poor measurement related to school climate (i.e., low item-

² The parent survey also includes an additional three items related to specific incidents of bullying involving their child.

total correlations). Inclusion of these items in the factor analysis, particularly with the student climate data resulted in factors that lacked interpretability.

The findings related to the individual-level bullying items prompted us to question the relationship between “bullying” and “school climate.” A brief look at the literature examining the relationship between bullying and school climate offers mixed results. Some researchers have reported significant relationships between a positive school climate and decreased instances of bullying (e.g., Petrie, 2014; Thapa et al., 2013). Other researchers have found that students reported a positive school climate while bullying was also found to be prevalent within a school (e.g., Nickerson et al., 2014).

Examining school climate and bullying measurement from other states

The 2016 Delaware School Surveys (Bear et al., 2016) represent an example of measuring school climate and bullying through student, teacher, and parent surveys administered across the state. Similar to South Carolina, these are comprehensive surveys that include multiple scales measuring student, teacher, and/or parent perceptions on various aspects related to their schools, including school climate, bullying, student engagement, social and emotional learning techniques, and/or social emotional competencies. The surveys are designed for students in grades 3-12, and for teachers/staff and parents of all grade levels.

All three school surveys have a school climate scale (i.e., Delaware School Climate Scale). This scale consists of five subscales (31 items) that are found on each of the school surveys and are related to 1) teacher-student relationship, 2) student-student relationship, 3) clarity of expectations, 4) fairness of rules, and 5) school safety. In addition, the student and teacher surveys have a bullying school-wide subscale (4 items) and a student engagement school-wide subscale (6 items). Other subscales include teacher-home communications (4 items on both teacher and parent surveys) and teacher-staff relations (4 items on the teacher survey).

As part of the school climate scale, the bullying school-wide subscale measures student and teacher perceptions of bullying at the school level. This subscale contains general items about school-level bullying such as “Students bully one another.” and “Bullying is a big problem in this school.” In addition, the student and parent surveys have a separate bullying scale (i.e., Delaware Bullying Victimization Scale). This scale measures respondents’ perceptions of bullying experienced at the individual student level, with students reporting their own experience and parents reporting on their child’s experience regarding bullying. The scale includes four subscales (4 items each) related to various types of bullying, including verbal bullying, physical bullying, social/relational bullying, and cyberbullying (only for students in grades 6-12; not included on the parent survey). Examples of student items on each individual bullying subscale include: “A student said mean things to me.” (Verbal), “I

was pushed or shoved on purpose.” (Physical), “Students left me out of things to make me feel badly” (Social/Relational), and “A student posted something mean or hurtful about me on a social media website such as Facebook, Twitter, or Instagram” (Cyberbullying). Similar items are included in the parent bullying subscales (e.g., “A student said mean things to my child.”).

All items on the school climate scale, including the bullying school-wide subscale, are measured on a four-point scale from “Disagree A Lot” to “Agree A Lot”. A total school climate score is derived for each of the three surveys by summing scores across all subscales. Correlations among scores on each of the school climate subscales showed lower correlations for the bullying school-wide subscale particularly for the student survey (.16-.41, absolute value), suggesting that this factor may not measure the construct of school climate as well as the other factors.

The individual bullying items are measured on a six-point scale from “Never” to “Every Day”. A separate score is computed for each subscale and a total score is computed by summing the scores of the subscales with/without the cyberbullying subscale. Therefore, two total scores are computed for students in grades 6-12 due to a debate among researchers as to whether cyberbullying should be viewed as a separate construct from the other three forms of bullying as it happens mostly outside of school (e.g., Olweus, 2012). Correlations among scores on each of the individual bullying student subscales showed lower correlations for the cyberbullying subscale (.55-.65) compared to the other bullying subscales (above .70).

Similar to Delaware, South Carolina could consider revising the items related to bullying to include a more targeted mixture of individual-level and school-level items. In general, more research is needed to fully assess the relationship between bullying and school climate within South Carolina.

References

- Bear, G., Yang, C., Harris, A., Mantz, L., Hearn, S., & Boyer, D. (2016). *Technical manual for the Delaware School Survey: Scales of School Climate; Bullying Victimization; Student Engagement; Positive, Punitive, and Social Emotional Learning Techniques; and Social and Emotional Competencies*. <https://www.delawarepbs.org/wp-content/uploads/2011/12/Delaware-School-Survey-Technical-Manual-Fall-2016.pdf>
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.
- Comrey, A. & Lee, H. (1992). *A first course in factor analysis*. Hillsdale, NJ: L. Erlbaum Associates.
- DiStefano, C., Monrad, D. M., May, R. J., McGuinness, P., & Dickenson, T. (2007, April). Using school climate surveys to categorize schools and examine relationships with school achievement. Paper presented at the meeting of the American Educational Research Association, Chicago, IL.
- DiStefano, C., Leighton, E., Ene, M., & Monrad, D. M. (2015). An examination of predictors and outcomes related to school climate using latent class. In L. Rivera (Ed.). *Structural Equation Modeling (SEM): Concepts, applications, and misconceptions*. Nova Science Publishers
- Ene, M., Leighton, E., Zhang, T., DiStefano, C., & Monrad, D.M. (2022). *2019-2021 Parent Survey Comparison*. Prepared for the South Carolina Education Oversight Committee. Columbia, SC: University of South Carolina, South Carolina Educational Policy Center.
- Gareau, S., May, R.J., Mindrila, D., Ishikawa, T., DiStefano, C., Monrad, D.M., & Price, K. (2010). The relationship between school climate and school performance. Paper Presented at the meeting of the American Educational Research Association, New York, NY.
- Gorsuch, R. (1983). *Factor analysis*. Hillsdale, NJ: L. Erlbaum Associates.
- Hair, J.F., Jr. Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis with readings, 5th ed.*. Englewood Cliffs, NJ: Prentice-Hall.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.

- Monrad, D. M., May, R. J., DiStefano, C., Smith, J., Gay, J., Mindrila, D., Gareau, S., & Rawls, A. (2008, April). Parent, student, and teacher perceptions of school climate: Investigations across organizational levels. Paper presented at the meeting of the American Educational Research Association, New York, NY.
- Monrad, D., Leighton, E., Ene, M., Guo, Z., McGrath, K., Ishikawa, T., & DiStefano, C. (2016a). *Assessing school climate: Perspectives across the Nation and within South Carolina*, Columbia, SC: University of South Carolina, South Carolina Educational Policy Center.
- Monrad, D.M., Ishikawa, T., DiStefano, C., Ene, M., Leighton, E., Huguley, S., Guo, Z., & McGrath, K. (2016b). *School climate and student achievement outcomes*, Columbia, SC: University of South Carolina, South Carolina Educational Policy Center.
- Muthén, B. O., & Satorra, A. (1995). Complex Sample Data in Structural Equation Modeling. *Sociological Methodology*, 25, 267–316.
<https://doi.org/10.2307/271070>
- Nickerson, A. B., Singleton, D., Schnurr, B., & Collen, M. H. (2014). Perceptions of school climate as a function of bullying involvement. *Psychology in the Schools*, 51(2), 157-181. <https://doi.org/10.1080/15377903.2014.888530>
- O'Dwyer, L. M., and Parker, C. E. (2014). A primer for analyzing nested data: multilevel modeling in SPSS using an example from a REL study (REL 2015–046). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Northeast & Islands. Retrieved from <http://ies.ed.gov/ncee/edlabs>.
- Petrie, K. (2014). The relationship between school climate and student bullying. *TEACH Journal of Christian Education*, 8(1), 26-34.
- Stapleton, L.M. (2013). Multilevel structural equation modeling with complex sample data. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (2nd ed., pp. 521–562). IAP Information Age Publishing.
- Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research*, 83(3), 357-385.
<https://doi.org/10.3102/0034654313483907>
- Zijlmans, E.A.O., Tijmstra, J., van der Ark, L. A., & Sijsma, K. (2018). Item-score reliability in empirical-data sets and its Relationship with other item indices. *Educational and Psychological Measurement*, 78(6), 998–1020.
<https://doi.org/10.1177/0013164417728358>

Appendix A: 2023 CFA Results Examining the Previous Factor Structures

Table A1. CFA Fit Information for the 2023 Teacher School Climate Data (Previous Factor Structure)

Chi-Square (<i>df</i>)	126782.667 (1524)
RMSEA (Root Mean Square Error of Approximation) (90% CI)	.041 (.041, .041)
SRMR (Standardized Root Mean Square Residual)	.048
CFI (Comparative Fit Index)	.880
TLI (Tucker-Lewis Index)	.874

Table A2. 2023 Teacher Climate Factors and Item Loading Values (Previous Factor Structure)

	Item Code	Loading
Working Conditions/Leadership		
The school leadership makes a substantial effort to address teacher concerns.	WC08	0.87
The school administration provides effective instructional leadership.	LE22	0.86
I feel supported by administration at my school.	WC04	0.84
I am satisfied with the learning environment in my school.	LE27	0.84
I am satisfied with my current working conditions.	WC14	0.83
The school administration communicates clear instructional goals for the school.	LE19	0.82
The faculty and staff at my school have a shared vision.	WC05	0.82
Teachers at my school are recognized and appreciated for good work.	LE12	0.79
The school administration sets high standards for students.	LE20	0.78
My decisions in areas such as instruction and student progress are supported.	WC09	0.78
I feel comfortable raising issues and concerns that are important to me.	WC11	0.78
The level of teacher and staff morale is high at my school.	LE10	0.78
Teacher evaluation at my school focuses on instructional improvement.	LE24	0.77
Teachers at my school are encouraged to develop innovative solutions to problems.	WC10	0.76
The rules for behavior are enforced at my school.	SPE13	0.74
The school administration arranges for collaborative planning and decision making.	LE26	0.72
Rules and consequences for behavior are clear to students.	SPE08	0.71
School administrators visit classrooms to observe instruction.	LE25	0.64
Teachers respect each other at my school.	LE11	0.62
Home-School Relationship		
I am satisfied with home and school relations.	HSR11	0.84
Parents at my school are interested in their children's schoolwork.	HSR04	0.80

Parents at my school support instructional decisions regarding their children.	HSR05	0.80
Parents attend school meetings and other school events.	HSR08	0.79
Parents at my school cooperate regarding discipline problems.	HSR07	0.77
Parents are involved in school decisions through advisory committees.	HSR10	0.76
Parents participate as volunteer helpers in the school or classroom.	HSR09	0.74
Parents attend conferences requested by teachers at my school.	HSR06	0.74
Parents at my school understand the school's instructional programs.	HSR03	0.73
Students at my school are motivated and interested in learning.	LE13	0.69
Students at my school behave well in the hallways, in the lunchroom, and on school grounds.	SPE06	0.69
Parents at my school are aware of school policies.	HSR01	0.67
Students at my school behave well in class.	SPE07	0.67
Parents at my school know about school activities.	HSR02	0.64

Instructional Focus

Teachers at my school focus instruction on understanding, not just memorizing facts.	LE03	0.74
Teachers at my school have high expectations for students' learning.	LE04	0.73
Effective instructional strategies are used to meet the needs of low achieving students.	LE07	0.73
Student assessment information is effectively used by teachers to plan instruction.	LE06	0.72
Teachers at my school effectively implement the state standards.	LE02	0.71
My school provides challenging instructional programs for students.	LE01	0.69
Instructional strategies are used to meet the needs of academically gifted students.	LE09	0.63
My school offers effective programs for students with disabilities.	LE08	0.55
There is a sufficient amount of classroom time allocated to instruction in essential skills.	LE05	0.53

Resources

There are sufficient materials and supplies available for classroom and instructional use.	LE14	0.66
Computers are used effectively for instruction at my school.	LE17	0.61
There is sufficient space for instructional programs at my school.	SPE05	0.59
I have sufficient space in my classroom to meet the educational needs of my students.	WC01	0.57
Our school has a good selection of library and media material.	LE15	0.54
Our school has sufficient computers for instructional use.	LE16	0.51
My class sizes allow me to meet the educational needs of my students.	WC13	0.51
I have access to reliable communication technology, including phone, fax, and e-mail.	WC03	0.48

Physical Environment

The hallways at my school are kept clean.	SPE02	0.88
The grounds around my school are kept clean.	SPE01	0.84

The bathrooms at my school are kept clean.	SPE03	0.83
The school building is maintained well and repaired when needed.	SPE04	0.75
Safety		
I feel safe at my school before and after school hours.	SPE14	0.92
I feel safe at my school during the school day.	SPE15	0.87
I feel safe going to or coming from my school.	SPE16	0.81

Note. WC = Working Conditions, LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

Table A3. 2023 Teacher Factor Correlations (Previous Factor Structure)

	Working Conditions /Leadership	Home-School Relationship	Instructional Focus	Resources	Physical Environment	Safety
Working Conditions/Leadership	1.00					
Home-School Relationship	0.70	1.00				
Instructional Focus	0.70	0.64	1.00			
Resources	0.72	0.67	0.72	1.00		
Physical Environment	0.48	0.46	0.43	0.55	1.00	
Safety	0.54	0.48	0.44	0.54	0.40	1.00

Table A4. Teacher Items Not Included in CFA (Previous Factor Structure)

	Item Code
There are relevant professional opportunities offered to teachers at my school.	LE18
The school administration has high expectations for teacher performance.	LE21
Student assessment information is used to set goals and plan programs for my school.	LE23
The rules about how students should behave in my school are fair.	SPE09
My school or district provides me with training to assist in preventing and/or dealing with bullying.	SPE10
I have been bullied by a student at this school.	SPE11
I have been bullied by an adult at this school.	SPE12
Students from different backgrounds get along well at my school.	SPE17
Teachers and students get along well with each other at my school.	SPE18
Teachers at my school collaborate for instructional planning.	SPE19
I am satisfied with the social and physical environment at my school.	SPE20
My non-instructional duties do not interfere with my essential role of educating students.	WC02
I am familiar with local, state, and national policies and how they affect teaching and learning.	WC06
Local, state, or national policies assist me in meeting the educational needs of my students.	WC07
Sufficient resources are available to allow teachers to take advantage of professional development activities.	WC12

Note. WC = Working Conditions, LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

Table A5. CFA Fit Information for the 2023 Student School Climate Data (Previous Factor Structure)

Chi-Square (<i>df</i>)	339254.864 (521)
RMSEA (Root Mean Square Error of Approximation) (90% CI)	.040 (.040, .040)
SRMR (Standardized Root Mean Square Residual)	.043
CFI (Comparative Fit Index)	.978
TLI (Tucker-Lewis Index)	.977

Table A6. 2023 Student Climate Factors and Item Loading Values (Previous Factor Structure)

	Item Code	Loading
Learning Environment		
Teachers work together to help students at my school.	SPE16	0.71
My teachers spend enough time helping me learn.	LE05	0.70
My teachers help students when they do not understand something.	LE06	0.69
My classes are interesting and fun.	LE11	0.62
My teachers praise students when they do good work.	LE13	0.61
My teachers want me to understand what I am learning, not just remember facts.	LE02	0.61
The textbooks and workbooks I use at my school really help me to learn.	LE15	0.59
My teachers do a good job teaching me mathematics.	LE07	0.57
My teachers give homework assignments that help me learn better.	LE10	0.56
My teachers do a good job teaching me English language arts.	LE08	0.52
My teachers expect students to learn.	LE03	0.51
My teachers give tests on what I learn in class.	LE09	0.49
My teachers expect students to behave.	LE04	0.41
Social-Physical Environment		
I am satisfied with the social and physical environment at my school.	SPE17	0.71
The grounds around my school are kept clean.	SPE01	0.69
Students at my school behave well in the hallways, in the lunchroom, and on school grounds.	SPE07	0.69
Teachers and students get along well with each other at my school.	SPE15	0.68
The hallways at my school are kept clean.	SPE02	0.67
Students at my school behave well in class.	SPE06	0.67
The bathrooms at my school are kept clean.	SPE03	0.65
Broken things at my school get fixed.	SPE04	0.65
Students from different backgrounds get along well at my school.	SPE14	0.64

Students at my school believe they can do good work.	LE12	0.61
Home-School Relationship		
I am satisfied with home and school relations.	HSR08	0.66
My school informs parents about school programs and activities.	HSR03	0.65
My parent knows what I am expected to learn in school.	HSR01	0.63
Parents at my school know their children's homework assignments.	HSR04	0.63
Parents are welcome at my school.	HSR06	0.61
My parent knows how well I am doing in school.	HSR02	0.60
My parent helps me with my homework when I need it.	HSR05	0.56
Parents volunteer and participate in activities at my school.	HSR07	0.54
Safety		
I feel safe at my school before and after school hours.	SPE11	0.87
I feel safe at my school during the school day.	SPE12	0.87
I feel safe going to or coming from my school.	SPE13	0.74

Note. LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

Table A7. 2023 Student Factor Correlations (Previous Factor Structure)

	Learning Environment	Social-Physical Environment	Home-School Relationship	Safety
Learning Environment	1.00			
Social-Physical Environment	0.74	1.00		
Home-School Relationship	0.74	0.63	1.00	
Safety	0.60	0.66	0.61	1.00

Table A8. Student Items Not Included in CFA (Previous Factor Structure)

	Item Code
My classes are challenging (not too easy, they make me think).	LE01
Work done by students can be seen on the walls of my school.	LE14
The media center at my school has a good selection of books.	LE16
I use computers and other technology at my school to help me learn.	LE17
I am satisfied with the learning environment in my school.	LE18
I have seen or know of another student getting bullied at my school.	B01
I have been bullied at school during a school day.	B02
I have been bullied while going to or from school.	B03
I have been bullied by someone from my school using a computer, the internet, a cellphone or another electronic device.	B04
Adults at my school prevent bullying from happening.	B05

I can always go to adults at my school if I am being bullied.	B06
An adult at my school has talked to me about bullying.	B07
I have bullied another student at my school.	B08
There is enough room for students to learn at my school.	SPE05
Students at my school know the rules and what happens when students break the rules.	SPE08
The rules about how students should behave in my school are fair.	SPE09
The rules for behavior are enforced at my school.	SPE10

Note. LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

Table A9. CFA Fit Information for the 2023 Parent School Climate Data (Previous Factor Structure)

Chi-Square (<i>df</i>)	23628.213 (113)
RMSEA (Root Mean Square Error of Approximation) (90% CI)	.061 (.061, .062)
SRMR (Standardized Root Mean Square Residual)	.054
CFI (Comparative Fit Index)	.945
TLI (Tucker-Lewis Index)	.934

Table A10. 2023 Parent Climate Factors and Item Loading Values (Previous Factor Structure)

	Item Code	Loading
Learning Environment		
I am satisfied with the learning environment at my child's school.	LE05	0.85
My child's teachers encourage my child to learn.	LE03	0.81
My child's teachers provide extra help when my child needs it.	LE04	0.78
My child's school has high expectations for student learning.	LE02	0.73
My child's teachers give homework that helps my child learn.	LE01	0.69
Social-Physical Environment		
I am satisfied with the social and physical environment at my child's school.	SPE06	0.83
My child's teachers care about my child.	SPE02	0.80
My child feels safe at school.	SPE03	0.79
My child's school is kept clean.	SPE01	0.58
Teacher Care and Support		
My child's teachers tell me how I can help my child learn.	HSR02	0.89
My child's teachers contact me to say good things about my child.	HSR01	0.83
I feel welcomed at my child's school.	HSR03	0.63
Home-School Relationship		
I am satisfied with home-school relations at my child's school.	HSR08	0.86
My child's school considers changes based on what parents say.	HSR06	0.81
My child's school gives me information about what my child should be learning in school.	HSR05	0.80
My child's school responds promptly when I have concerns.	HSR04	0.77
My child's school schedules activities at times that I can attend.	HSR07	0.58

Note. LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

Table A11. 2023 Parent Factor Correlations (Previous Factor Structure)

	Learning Environment	Social-Physical Environment	Teacher Care and Support	Home-School Relationship
Learning Environment	1.00			
Social Physical Environment	0.88	1.00		
Teacher Care and Support	0.77	0.76	1.00	
Home-School Relationship	0.86	0.87	0.88	1.00

Table A12. Parent Items Not Included in CFA (Previous Factor Structure)

	Item Code
My child's teachers and school staff prevent or stop bullying at school.	SPE04
My child's school has an anti-bullying program to prevent or deal with bullying.	SPE05

Note. LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

Appendix B: 2023 CFA Results Examining the New Factor Structures

Table B1. CFA Fit Information for the 2023 Teacher School Climate Data (New Factor Structure)

Chi-Square (<i>df</i>)	155591.686 (1759)
RMSEA (Root Mean Square Error of Approximation) (90% CI)	.042 (.042, .042)
SRMR (Standardized Root Mean Square Residual)	.052
CFI (Comparative Fit Index)	.869
TLI (Tucker-Lewis Index)	.864

Table B2. 2023 Teacher Climate Factors and Item Loading Values (New Factor Structure)

	Item Code	Loading
Working Conditions/Leadership		
The school leadership makes a substantial effort to address teacher concerns.	WC08	0.86
The school administration provides effective instructional leadership.	LE22	0.86
I am satisfied with the learning environment in my school.	LE27	0.84
I feel supported by administration at my school.	WC04	0.84
I am satisfied with my current working conditions.	WC14	0.83
The faculty and staff at my school have a shared vision.	WC05	0.82
The school administration communicates clear instructional goals for the school.	LE19	0.81
Teachers at my school are recognized and appreciated for good work.	LE12	0.79
The school administration sets high standards for students.	LE20	0.78
The level of teacher and staff morale is high at my school.	LE10	0.78
My decisions in areas such as instruction and student progress are supported.	WC09	0.78
I feel comfortable raising issues and concerns that are important to me.	WC11	0.78
Teacher evaluation at my school focuses on instructional improvement.	LE24	0.77
Teachers at my school are encouraged to develop innovative solutions to problems.	WC10	0.76
The rules for behavior are enforced at my school.	SPE13	0.75
I am satisfied with the social and physical environment at my school.*	SPE20	0.74
The school administration arranges for collaborative planning and decision making.	LE26	0.72
Rules and consequences for behavior are clear to students.	SPE08	0.72
School administrators visit classrooms to observe instruction.	LE25	0.63
Teachers respect each other at my school.	LE11	0.62
Sufficient resources are available to allow teachers to take advantage of professional development activities.*	WC12	0.60
The rules about how students should behave in my school are fair.*	SPE09	0.58

My non-instructional duties do not interfere with my essential role of educating students.*	WC02	0.54
Home-School Relationship		
I am satisfied with home and school relations.	HSR11	0.84
Parents at my school are interested in their children's schoolwork.	HSR04	0.80
Parents at my school support instructional decisions regarding their children.	HSR05	0.79
Parents attend school meetings and other school events.	HSR08	0.78
Parents at my school cooperate regarding discipline problems.	HSR07	0.77
Parents are involved in school decisions through advisory committees.	HSR10	0.75
Parents participate as volunteer helpers in the school or classroom.	HSR09	0.73
Parents at my school understand the school's instructional programs.	HSR03	0.73
Parents attend conferences requested by teachers at my school.	HSR06	0.73
Students at my school behave well in the hallways, in the lunchroom, and on school grounds.	SPE06	0.70
Students at my school are motivated and interested in learning.	LE13	0.70
Students at my school behave well in class.	SPE07	0.68
Parents at my school are aware of school policies.	HSR01	0.67
Parents at my school know about school activities.	HSR02	0.64
Teachers and students get along well with each other at my school.*	SPE18	0.62
Students from different backgrounds get along well at my school.*	SPE17	0.58
Instructional Focus		
Student assessment information is used to set goals and plan programs for my school.*	LE23	0.75
Student assessment information is effectively used by teachers to plan instruction.	LE06	0.72
Effective instructional strategies are used to meet the needs of low achieving students.	LE07	0.72
Teachers at my school have high expectations for students' learning.	LE04	0.71
Teachers at my school focus instruction on understanding, not just memorizing facts.	LE03	0.70
The school administration has high expectations for teacher performance.*	LE21	0.70
Teachers at my school effectively implement the state standards.	LE02	0.68
My school provides challenging instructional programs for students.	LE01	0.68
Instructional strategies are used to meet the needs of academically gifted students.	LE09	0.63
There are relevant professional opportunities offered to teachers at my school.*	LE18	0.62
Computers are used effectively for instruction at my school.	LE17	0.60
Teachers at my school collaborate for instructional planning.*	SPE19	0.60
My school offers effective programs for students with disabilities.	LE08	0.55
There is a sufficient amount of classroom time allocated to instruction in essential skills.	LE05	0.52
Our school has a good selection of library and media material.	LE15	0.45

Physical Environment

The hallways at my school are kept clean.	SPE02	0.88
The grounds around my school are kept clean.	SPE01	0.84
The bathrooms at my school are kept clean.	SPE03	0.83
The school building is maintained well and repaired when needed.	SPE04	0.75

Safety

I feel safe at my school before and after school hours.	SPE14	0.92
I feel safe at my school during the school day.	SPE15	0.87
I feel safe going to or coming from my school.	SPE16	0.81

Note. WC = Working Conditions, LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

*Items not included in the previous structure but added to the new structure.

Table B3. 2023 Teacher Factor Correlations (New Factor Structure)

	Working Conditions/Leadership	Home-School Relationship	Instructional Focus	Physical Environment	Safety
Working Conditions/Leadership	1.00				
Home-School Relationship	0.73	1.00			
Instructional Focus	0.78	0.68	1.00		
Physical Environment	0.49	0.47	0.47	1.00	
Safety	0.55	0.49	0.48	0.40	1.00

Table B4. Teacher Items Not Included in CFA (New Factor Structure)

	Item Code
There are sufficient materials and supplies available for classroom and instructional use.	LE14
Our school has sufficient computers for instructional use.	LE16
There is sufficient space for instructional programs at my school.	SPE05
My school or district provides me with training to assist in preventing and/or dealing with bullying.	SPE10
I have been bullied by a student at this school.	SPE11
I have been bullied by an adult at this school.	SPE12
I have sufficient space in my classroom to meet the educational needs of my students.	WC01
I have access to reliable communication technology, including phone, fax, and e-mail.	WC03
I am familiar with local, state, and national policies and how they affect teaching and learning.	WC06
Local, state, or national policies assist me in meeting the educational needs of my students.	WC07
My class sizes allow me to meet the educational needs of my students.	WC13

Note. WC = Working Conditions, LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

Table B5. CFA Fit Information for the 2023 Student School Climate Data (New Factor Structure)

Chi-Square (<i>df</i>)	342745.989 (695)
RMSEA (Root Mean Square Error of Approximation) (90% CI)	.035 (.035, .035)
SRMR (Standardized Root Mean Square Residual)	.041
CFI (Comparative Fit Index)	.947
TLI (Tucker-Lewis Index)	.944

Table B6. 2023 Student Climate Factors and Item Loading Values (New Factor Structure)

	Item Code	Loading
Learning Environment		
Teachers work together to help students at my school.	SPE16	0.72
I am satisfied with the learning environment in my school.*	LE18	0.72
My teachers spend enough time helping me learn.	LE05	0.67
My teachers help students when they do not understand something.	LE06	0.66
Adults at my school prevent bullying from happening.*	B05	0.65
I can always go to adults at my school if I am being bullied.*	B06	0.65
The rules about how students should behave at my school are fair.*	SPE09	0.63
My classes are interesting and fun.	LE11	0.63
My teachers praise students when they do good work.	LE13	0.61
The textbooks and workbooks I use at my school really help me to learn.	LE15	0.61
My teachers want me to understand what I am learning, not just remember facts.	LE02	0.58
My teachers give homework assignments that help me learn better.	LE10	0.56
My teachers do a good job teaching me mathematics.	LE07	0.55
The media center at my school has a good selection of books.*	LE16	0.50
My teachers do a good job teaching me English language arts.	LE08	0.49
My teachers expect students to learn.	LE03	0.47
My teachers give tests on what I learn in class.	LE09	0.46
Work done by students can be seen on the walls of my school.*	LE14	0.43
Social-Physical Environment		
I am satisfied with the social and physical environment at my school.	SPE17	0.71
The grounds around my school are kept clean.	SPE01	0.69
Teachers and students get along well with each other at my school.	SPE15	0.69
Students at my school behave well in the hallways, in the lunchroom, and on school grounds.	SPE07	0.68
The hallways at my school are kept clean.	SPE02	0.67
Students at my school behave well in class.	SPE06	0.66

The bathrooms at my school are kept clean.	SPE03	0.65
Broken things at my school get fixed.	SPE04	0.65
Students from different backgrounds get along well at my school.	SPE14	0.64
Students at my school believe they can do good work.	LE12	0.61
Home-School Relationship		
I am satisfied with home and school relations.	HSR08	0.66
My school informs parents about school programs and activities.	HSR03	0.65
My parent knows what I am expected to learn in school.	HSR01	0.63
Parents at my school know their children’s homework assignments.	HSR04	0.63
Parents are welcome at my school.	HSR06	0.61
My parent knows how well I am doing in school.	HSR02	0.59
My parent helps me with my homework when I need it.	HSR05	0.56
Parents volunteer and participate in activities at my school.	HSR07	0.54
Safety		
I feel safe at my school before and after school hours.	SPE11	0.87
I feel safe at my school during the school day.	SPE12	0.87
I feel safe going to or coming from my school.	SPE13	0.74

Note. LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment
 *Items not included in the previous structure but added to the new structure.

Table B7. 2023 Student Factor Correlations (New Factor Structure)

	Learning Environment	Social-Physical Environment	Home-School Relationship	Safety
Learning Environment	1.00			
Social-Physical Environment	0.80	1.00		
Home-School Relationship	0.76	0.63	1.00	
Safety	0.65	0.67	0.61	1.00

Table B8. Student Items Not Included in CFA (New Factor Structure)

	Item Code
I have seen or know of another student getting bullied at my school.	B01
I have been bullied at school during a school day.	B02
I have been bullied while going to or from school.	B03
I have been bullied by someone from my school using a computer, the internet, a cellphone or another electronic device.	B04
An adult at my school has talked to me about bullying.	B07
I have bullied another student at my school.	B08

My classes are challenging (not too easy, they make me think).	LE01
My teachers expect students to behave.	LE04
I use computers and other technology at my school to help me learn.	LE17
There is enough room for students to learn at my school.	SPE05
Students at my school know the rules and what happens when students break the rules.	SPE08
The rules for behavior are enforced at my school.	SPE10

Note. LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment

Table B9. CFA Fit Information for the 2023 Parent School Climate Data (New Factor Structure)

Chi-Square (<i>df</i>)	51093.134 (152)
RMSEA (Root Mean Square Error of Approximation) (90% CI)	.078 (.077, .078)
SRMR (Standardized Root Mean Square Residual)	.052
CFI (Comparative Fit Index)	.894
TLI (Tucker-Lewis Index)	.881

Table B10. 2023 Parent Climate Factors and Item Loading Values (New Factor Structure)

	Item Code	Loading
School Climate		
I am satisfied with home-school relations at my child's school.	HSR08	0.83
I am satisfied with the learning environment at my child's school.	LE05	0.81
I am satisfied with the social and physical environment at my child's school.	SPE06	0.80
My child's teachers care about my child.	SPE02	0.78
My child's school considers changes based on what parents say.	HSR06	0.78
My child's school gives me information about what my child should be learning in school.	HSR05	0.77
My child's school responds promptly when I have concerns.	HSR04	0.76
My child's school is kept clean.	SPE01	0.76
My child's teachers and school staff prevent or stop bullying at school.	SPE04	0.74
My child's teachers tell me how I can help my child learn.	HSR02	0.73
My child's teachers encourage my child to learn.	LE03	0.73
My child feels safe at school.	SPE03	0.73
My child's teachers provide extra help when my child needs it.	LE04	0.72
I feel welcomed at my child's school.	HSR03	0.69
My child's school has an anti-bullying program to prevent or deal with bullying.	SPE05	0.68
My child's teachers contact me to say good things about my child.	HSR01	0.67
My child's school has high expectations for student learning.	LE02	0.64
My child's teachers give homework that helps my child learn.	LE01	0.57
Parents volunteer and participate in activities at my school.	HSR07	0.54

Note. LE = Learning Environment, HSR = Home and School Relations, and SPE = Social and Physical Environment