Development of Pennsylvania Department of Education School Climate Index Summary

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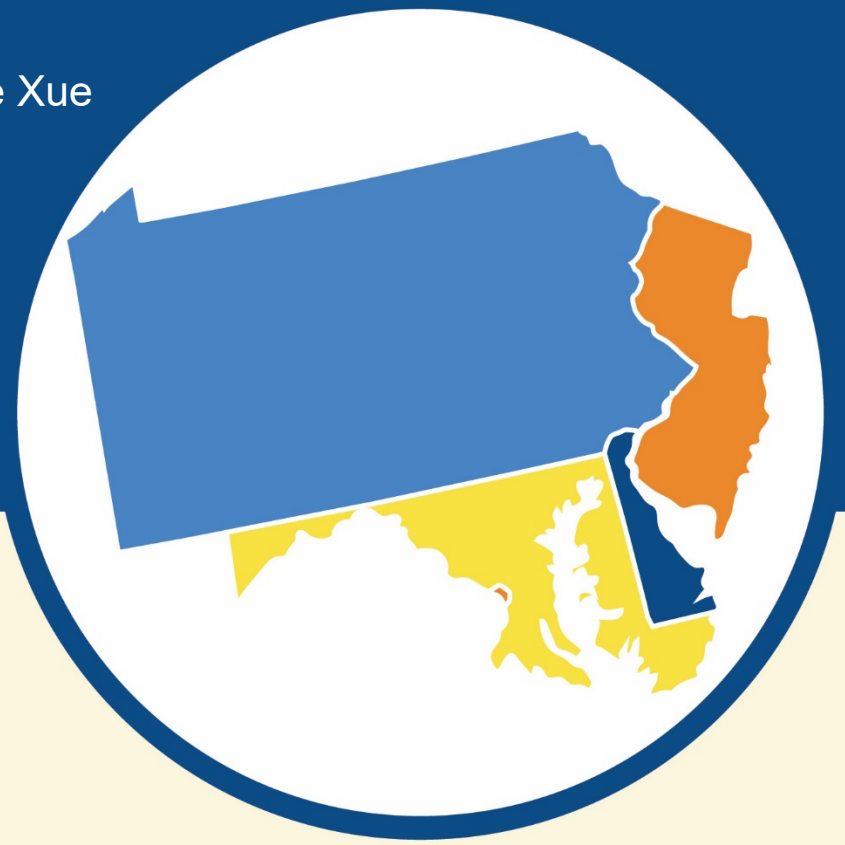

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To: Office for Safe Schools, Pennsylvania Department Education

From: Lauren Amos and Yange Xue

Date: 6/30/2021

Subject: Development of Pennsylvania Department of Education School Climate Index Summary

This project explores the properties of Pennsylvania Department of Education (PDE) school climate surveys with the aim of developing a summary index of school climate that could be calculated for each school using the surveys. Data to develop measures of school climate were gathered from surveys of students, teachers, other staff, parents, and community members. Survey results are intended to provide Pennsylvania schools and educators with information that can be used for needs assessments, program development, and short- and long-term improvement planning. The measures of school climate resulting from surveys can also be used to compare schools in the state.

The survey data used for our analysis come from 76 schools involved in PDE's School Climate Leadership Initiative (SCLI), a five-stage strategic planning process that is based on a technical assistance model developed by the National School Climate Center. These schools previously agreed to implement climate surveys and make their data available. PDE conducted a small pilot in 2015 and then made the surveys available to SCLI schools for administration during the 2016/17 and 2017/18 school years. The surveys were not mandatory and were administered by SCLI schools with the support of their local education agencies (LEAs) and intermediate units (IUs).

The SCLI was established to produce a yearly action plan that reflects long-term school climate improvement goals. For schools that have self-assessed as having adequate readiness to implement changes to improve school climate and have established shared leadership practices, action plans will focus on strategies to improve one or more of the school climate domains reflected in the surveys. Readiness is defined as the school's capacity, commitment, and competence to carry out comprehensive school climate improvement. Assessing readiness involves reflecting on the school's leadership capacity, vision for school climate, and relevant standards. Action plans for other schools will prioritize readiness and community engagement goals, followed by climate-targeted practices.

Schools involved in the SCLI are using the school climate surveys as part of the improvement process. The survey results will be triangulated with other data to identify needs and priorities for action planning. PDE would like support in examining and improving measures of school climate based on the climate surveys to improve the quality of data available to LEAs for improvement. PDE envisions LEAs using the data to identify schools with lower ratings in particular areas of climate in order to target assistance to these schools. To achieve that objective, the Regional Educational Laboratory (REL) Mid-Atlantic worked with PDE staff in two phases of the project.

The first phase involved calculating survey response rates and assessing the validity and reliability of the survey instruments. The results of these analyses were summarized in memos shared with PDE on July 24, 2019, and December 13, 2019. The second phase built on these initial analyses to develop a school climate index and domain-level sub-indices that are interpretable. This memo summarizes work from the second phase, explaining how the project team and PDE developed the school climate index and sub-indices by domain based on the PDE school climate survey and presents the results for the 2016/17 and 2017/18 surveys.

Using a Rasch model[1], the project team developed benchmarks for each of the survey domains that indicate whether a respondent's perceptions of school climate fall into one of four categories, ranging from "unfavorable" to "most favorable." The survey domains include:

- Social-Emotional Learning
- Student Support and Academic Engagement
- Safe and Respectful School Climate

Based on these benchmarks, the team translated each individual's survey responses to a 100-point scaled score for each domain in the survey. Finally, the team combined respondents' scaled scores into a sub-index in each domain and an overall index of school climate for each school. We found that overall school climate index and sub-indices successfully differentiated among schools, suggesting that they can be used to identify domains and schools that merit attention. Below we highlight key findings from the second phase that suggest which schools and in what domains schools might have benefited from technical support. We describe the findings in the second half of the memo.

[1] A Rasch model is a one-parameter item response theory (IRT) model that explains the relationship between item responses or behaviors and what the test designer is trying to measure.

Box 1. Key study findings

Our analyses found that with appropriate adjustments to school climate domains and high response rates, PDE's school climate surveys of students and staff can produce valid and reliable data with two areas for improvement:

- Response options for the elementary student survey might need to be refined to improve its reliability.
- Parent and community survey respondents are unlikely to participate in high enough numbers for those surveys to be useful for incorporating into a school climate index or to inform school-level decisions.

Importantly, we found that overall school climate index and domain scores can successfully differentiate among schools, suggesting that LEAs can reasonably and accurately use these data to identify schools that merit attention and provide or seek guidance on what actions might be taken to support schools with low scores.

Although pilot study data are too dated to be actionable in the present, future survey administrations can help LEAs make at least three types of evidence-based decisions to inform annual action planning under the School Climate Leadership Initiative. For example:

1. **Areas for improvement:** In what school climate domains and for which members of Pennsylvania's public school communities (e.g., racial/ethnic groups, grade level, students with disabilities) do we need to improve?
   - Approximately half of the participating schools earned "unfavorable"[2] scores for the *Social-Emotional Learning* domain.
   - Overall school climate scores for students were lower than for classroom teachers and non-instructional staff. Student and staff perceptions differed the most for the *Student Support and Academic Engagement* domain, which was rated much lower by students than by staff.
   - *High school students* were more likely than middle school students, classroom teachers, and non-instructional staff to rate their school climate unfavorably.
2. **School identification:** Which schools might benefit from targeted supports or intervention?
   - In school year 2017-18:
     - Four schools (8 percent) earned "unfavorable" overall school index scores.
     - Twenty-six schools (52 percent) earned "unfavorable" scores for the Social-Emotional Learning domain.
     - Three schools (6 percent) earned "unfavorable" Safe and Respectful School climate index scores.
     - Two schools (3 percent) fell into the "unfavorable" category for classroom teachers and four schools (6 percent) fell into this category for non-instructional staff.
   - Across domains and respondents, schools earning "unfavorable" ratings were not concentrated in specific LEAs but reside in many different local education agencies. This suggests that LEAs might prioritize providing targeted assistance for these schools over implementing new or scaling existing district-wide interventions.
3. **Monitoring progress:** Are school climate reforms and initiatives moving the needle? How are perceptions of school climate changing over time?
   - Overall school climate index scores did not change substantially for most schools between survey years; however, two years of data are insufficient to discern a trend or the impact of a specific school climate intervention.

In the sections that follow, we first give an overview of the PDE school climate survey and the findings from the first (previous) phase of the analysis. We then briefly describe our approach to benchmark the survey (detailed descriptions of benchmark analysis and relevant results are in Appendix B). Next, we describe our approach for creating the school climate index scores and share results for the Pennsylvania

[2] Refer to Exhibit 1 below for a definition and interpretation of an "unfavorable" score.

public schools that participated in the survey. We conclude the memo with a summary and lessons learned for future school climate survey administration.

A. Survey description

PDE developed the school climate survey instruments drawing largely from the American Institutes for Research Conditions for Learning Survey[3] and an instrument from the Alaska Department of Education.[4] PDE offered web-based school climate surveys to school staff (classroom teachers and non-instructional staff), students (grades 3–12, including three versions: one for elementary school [grade 3–5], one for middle school [grade 6–8], and one for high school [grade 9–12]), parents, and community members in the 2016/17 and 2017/18 school years. The surveys asked questions in four main domains of school climate:

1. Social-Emotional Learning
2. Student Support
3. High Expectations/Academic Rigor & Challenge
4. Safe and Respectful School Climate

Results from our first phase analysis, which we reported in our July 2019 memo (Appendix F), suggest that some items and the domain structure of the surveys did not perform well in the context of Pennsylvania public schools. Based on these results, we reorganized the domains by combining the Student Support and High Expectations/Academic Rigor & Challenge domains into one domain called Student Support and Academic Engagement for all the surveys except for the parent survey. The parent survey ended up with only one domain that combined all the original domains. We also removed items that did not improve the measurement of the domains (we include the memo summarizing the results from these analyses in Appendix G). In Appendix A and as discussed in the previous memo, we present the items for each survey that we recommend be included and excluded as well as the new domains.

With the exception of the elementary school student survey, all items have four response categories, typically: strongly disagree, disagree, agree, and strongly agree. Responses for the elementary school student survey items include three categories: no, sometimes, and yes. Fewer response categories for the elementary school student survey could have contributed to limited variation in student responses and lower reliability estimates. The text box includes an overview of key findings from the preceding (first) phase of the analysis.

[3] https://safesupportivelearning.ed.gov/survey/american-institutes-research-conditions-learning-survey

[4] https://eric.ed.gov/?id=ED577047

Box 2. Key findings from the first (preceding) phase of the analysis

Survey response rates

- Overall response rates ranged from 61 to 71 percent for student and staff surveys. These rates fell below the response rate target of 85 percent or greater established by the National Center for Education Statistics to ensure credible and generalizable survey data for the relevant population. However, a number of LEAs and schools met the 85 percent standard for student and classroom teacher participation in both survey years.
- Although low response rates can affect survey reliability and validity when respondents do not accurately reflect the true composition of a school's or LEA's population, our validity estimates can still help: (1) indicate whether the survey domains adequately capture the underlying school climate construct associated with each, (2) determine whether a specific survey item fits in a particular domain or should be removed from a survey entirely, and (3) create population-based statistics for use as benchmarks to support LEA efforts to compare school survey results.
- It is critical to obtain sound and representative school climate data for future survey administrations. Due to low response rates and data quality challenges discussed in Appendix G, we were unable to: (1) determine if the respondent pool was representative of participating schools' actual demographic profile, and (2) conduct a nonresponse analysis. Consequently, the 2016/17 and 2017/18 school climate survey results could be at risk of nonresponse bias. To obtain an accurate picture of school climate, it is important to improve survey response rates in future survey administrations to avoid or reduce the potential for nonresponse bias.

Survey validity

- The surveys from which PDE developed its surveys were originally developed and validated using data from Chicago, Illinois and Alaska public schools. The validity estimates based on our confirmatory factor analyses for each of the PDE surveys' four domains of school climate suggest that some items and the domain structure of the surveys do not fit the context of Pennsylvania public schools as well as they do in other jurisdictions.
- To improve survey validity, we recommended:
    - Excluding items with low validity; and
    - Combining the Student Support and High Expectations/Academic Rigor & Challenge domains into one domain called Student Support and Academic Engagement because we found that these two domains are highly correlated and likely capture theoretically similar concepts. As we discuss in Appendix G, other school climate studies have suggested that school engagement is a complex construct of interrelated behavioral, emotional, and cognitive factors that are difficult to disentangle.

Survey reliability

- With the exception of the elementary school student survey, we found all other surveys to be reliable measures of school climate, in each domain, after we excluded items with low validity.
- To improve the reliability of the elementary school student survey, we recommended changing the rating scales for the elementary school student survey and adding items to the Social-Emotional Learning domain for future survey administration.

Our analysis in the second phase aimed to develop sub-indices that combine responses from different types of respondents within each climate domain and to develop an overall index that combines responses across different climate domains and different respondent types.

In discussion with PDE, we decided not to exclude the community and parent surveys in the school climate index score calculations. Because schools and districts did not report the number of community members they invited to participate in the community survey, it was not possible to define a potential respondent

pool for the community survey to assess the response rates. We did not have the information about who the respondents are, how well they know the schools, and how useful their perspectives might have been to inform efforts for improving school climate. For the parent survey, the response rates were very low (less than 10 percent), and the psychometric analyses pointed to issues with responses. We therefore exclude the community survey and parent survey analyses below.

B. Benchmarking the survey

To create an interpretable school climate index and sub-indices, the project team used Rasch modeling to conduct a benchmarking analysis. This analysis yielded cut points that divide the scores on the survey into interpretable ranges.

We conducted the benchmarking analyses in three steps:

- First, we estimated an initial Rasch model and modified the model after assessing the fit for each survey in each year.
- Second, we used the estimates of the step values from the Rasch model to determine interpretable cut points that represented different ranges of school climate scores.
- Third, we estimated Rasch scores and used the benchmarks to convert the Rasch scores for each domain into a 1–99 scale that is easier to interpret. The cut points on the scaled scores that aligned with the Rasch cut points are 20, 50, and 80. In addition to Rasch scores, we also calculated a simple average across items within a domain and converted it into a scale score based on the mapping between the raw total scores and Rasch scores in Rasch estimates.

These analyses resulted in interpretable scales (with a possible range of 1–99, categorized into different levels) that reflect perceptions of school climate and can be used directly in the calculation of the school climate index. Exhibit 1 shows four different levels of school climate, separated by three cut points identified based on the Rasch model. In Appendix B, we provide more technical details about the benchmarking analyses.

Exhibit 1. Definition and interpretation of benchmarks

Description	Interpretation	Rescaled index score
Level 4 (Most favorable)	Most likely to respond "strongly agree" to a positively valenced question	Index score > 80
Level 3 (More favorable)	Most likely to respond "agree" but more likely to select "strongly agree" than "disagree/strongly disagree" to a positively valenced question	50 <Index score ≤ 80
Level 2 (Favorable)	Most likely to respond "agree" but more likely to select "disagree/strongly disagree" than "strongly agree" to a positively valenced question	20 < Index score ≤ 50
Level 1 (Unfavorable)	Most likely to respond "disagree/strongly disagree" to a positively valenced question	Index score ≤ 20

We conducted these analyses separately for each of the surveys for each year. When estimating the scores for the surveys in 2017/18, we anchored item difficulty estimates on the estimates for the 2016/17

surveys (that is, we put the item difficulties on the same scale) so that the scores are comparable across years.

C. Creating a school climate index

We constructed domain scores that combined responses from different types of respondents (students, classroom teachers, and non-instructional staff) within each climate domain, which LEAs can use to identify schools in need of technical support. We also constructed an overall index that combined responses across different climate domains. Because different respondent types might have different perceptions of a school's climate, indices that combine all types of respondents intend to capture a more complete picture of school climate but may also obscure important subgroup differences.

1. Creating the school climate index

We first calculated each respondent's score for each domain and then created the school climate index within and across domains based on the scaled scores. We provide more details about the formulas for calculating the index scores and how the scores were weighted in Appendix B. The analyses included the following steps:

1. For each respondent type—students, classroom teachers, and non-instructional staff—we calculated:
    - *Each individual respondent's score for each school climate domain.* For every respondent that has a valid score for a domain, we calculated a scale score on the domain, applying the steps outlined above.
    - *School-level scores for each school climate domain for each respondent type*. We took the average across individuals within a respondent type and domain for a given school to calculate school-level scores on each domain for each respondent type.
    - *A school climate index for each respondent type.* To create a simple summary of positive or negative perceptions of school climate, we then created a summary cross-domain score by averaging across the domains for each respondent type.[5] PDE elected to weight all domains equally.
2. Combined scores across the three respondent types to calculate:
    - An overall school climate index across respondent types to provide a high-level picture of how students, classroom teachers, and non-instructional staff view their school climate in the participating schools. Specifically, we calculated the weighted average of the respondent-specific school-level index across the respondent types. These analyses only include schools for which all respondent types—students, classroom teachers, and non-instructional staff—participated in the survey. With input from PDE, we weighted the respondent types by the proportions of students and staff in the school's population, allowing weights to vary in different schools.[6] The combined school-level index scores are overwhelmingly driven by

[5] The elementary school survey items have fewer response categories and cannot be rescaled the same way as other surveys. Therefore, elementary schools are excluded from the overall index calculation in this round, but they can be included in the index for future surveys because of the planned revision to the elementary school survey.

[6] We calculated the proportions of students and staff in each school using PDE administrative enrollment data.

student scores (that is, the index scores primarily reflect the student scores), given PDE's decision that the weight for each respondent type would reflect the number of that respondent type in the school's population. In Exhibit 2, we show the averages of weights used in calculating the index scores by respondent type in 2016/17 and 2017/18.[7]

Exhibit 2. Average weights by respondent type and year of survey

		Average weights by respondent type		
Year of survey	Number of schools	Students	Classroom teachers	Non-instructional staff
2016/17	36	0.897	0.079	0.024
2017/18	50	0.895	0.089	0.016

Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18 and Pennsylvania Department of Education administrative enrollment data. Elementary schools were excluded.

- A score for each domain to identify areas in need of support. Specifically, we calculated a school-level score for each domain. To do this, we calculated averages for the school-level domain scores across respondent types weighted by the proportions of students and staff in the school population.

2. Types of respondents within schools

The score for each domain and the overall index across domains combined responses from different types of respondents (students, classroom teachers, and non-instructional staff) within schools. Before proceeding with calculating the index scores, we examined the patterns of responses within schools. We excluded students who are court- or agency-placed[8] (for example, those participating in Adult Affidavit Programs or placed in a special education or cyber course outside of their parent/guardian district of residence) from the analyses. The elementary school student survey items had response categories that were different from other surveys, and the levels of scores were not comparable to other surveys. Therefore, we did not include the elementary school student survey in the calculation of the overall index scores and the sub-index scores by domain. Instead, we reported the school level scores for the elementary school survey separately from other school climate survey findings.

In Exhibit 3, we show the pattern of responses for schools with all respondent types in 2016/17 and 2017/18 (excluding elementary school students). There were 43 schools in 2016/17 and 60 schools in 2017/18 that had survey responses from students, classroom teachers, and non-instructional teachers. We developed the overall school climate index scores and scores for the domains for these schools.

The remaining schools did not have responses from all three types (for example, some had only students or only staff responding). In 2016/17, more than half of the schools that participated in the survey did not have surveys completed by both the students and staff (classroom teachers and non-instructional staff),

[7] In Phase 1 of the project, we used anonymized school climate survey data, where the information about schools was not clean and accurate. In Phase 2 of the project, we obtained de-anonymized data from PDE that included accurate information about schools so that we can accurately calculate the school level index scores. Therefore, there are some discrepancies in the number of schools reported in the two phases of the analyses.

[8] These students have a special school identifier of 9,999 in the survey data.

but the response patterns improved in 2017/18. We included these schools in the results for school index scores by respondent type.

Exhibit 3. Response patterns for respondent types within (non-elementary) schools in 2016/17 and 2017/18

Respondent type within schools	Number of schools	Number of students	Number of classroom teachers	Number of non-instructional staff
2016/17				
Students, classroom teachers, and non-instructional staff	43	15,432	1,317	493
2017/18				
Students, classroom teachers, and non-instructional staff	60	22,092	1,807	691

Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18.
Note: Elementary school students were excluded from this table.

We also examined student respondent types within schools and compared those to the grade levels reported in the classroom teachers survey and the grade level information in the Common Core of Data (CCD). There were three schools in 2016 and one school in 2017 that had students who responded to a version of the student survey out of the grade range that schools were reported as having (Exhibit 4a). We excluded these students from the index score calculation.

Exhibit 4a. Surveys excluded from the analysis due to atypical student survey respondent types

School	CCD grade range	Teacher-reported grade range	Number of elementary school survey responses	Number of middle school survey responses	Number of high school survey responses
A (2016)	5–8	5–8	87	225	3
B (2016)	PK–6	0–6	166	0	2
C (2016)	7–12	7–12	12	0	250
D (2017)	1–3	0–5	357	0	1

Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18.
Note: Numbers highlighted in red are atypical responses; these students were excluded from the analysis.
CCD = Common Core of Data. PK = Pre-kindergarten.

When reporting the index scores, we set a minimum threshold of sample size for number of respondents within schools for each respondent type: at least 5 classroom teachers or non-instructional staff and at least 10 students. Schools with number of respondents below the thresholds were excluded from reporting. In Exhibit 4b, we show the number of schools excluded from the overall school climate and the school climate indices by respondent type calculations.

Exhibit 4b. Number of schools excluded from analyses due to small sample sizes

Analysis	Number of schools excluded out of the total number of participating schools	
	2016/17	2017/18
Overall school climate index		
All respondent types [b]	7 out of 43	10 out of 60
School climate index by respondent type		
Elementary school student survey	out of 8	out of 20
Middle school student survey	out of 54	out of 34
High school student survey	out of 68	out of 50
Classroom teacher survey	out of 50	out of 81
Non-instructional staff survey	out of 47	out of 80

Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18.

[a] We excluded schools with fewer than 5 classroom teachers or non-instructional staff or fewer than 10 students from schools that had survey responses when reporting the school index scores.

[b] Analysis limited to the subset of schools for which all three respondent types (students, classroom teachers, and non-instructional staff) participated in the survey.

3. Results of the school climate index scores

Using the Rasch score and mean score approaches (see Appendix B for detailed description of the two approaches), we calculated the overall school climate index scores by domain and respondent type for each school in each year. As a reminder, we only calculated the overall index scores and scores for each domain for schools that had survey responses from students, classroom teachers, and non-instructional teachers, and we did not include the elementary school student survey in calculating these scores because of different response option categories. The school climate index scores based on the Rasch score and mean score approaches are highly correlated (Exhibit 5), suggesting that these two approaches are interchangeable. The percentages of schools that fell into different levels of school climate are comparable. Appendix D includes the distributions of the school climate scores by the different levels for the two approaches. Compared to the simple mean score approach, the Rasch score approach accounts for the fact that different items within a domain provide different amounts of information in terms of measuring school climate. Therefore, we focus on the results based on the Rasch scores in the main text, and include the results based on the mean scores in Appendix C.

The cut points identified using the 2016-2017 and 2017-2018 PDE School Climate Survey are not appropriate to be used for future surveys because the number of schools participating in the survey was small, and not necessarily representative of schools statewide. Moreover, PDE is updating the elementary school student survey to make it more comparable to the other student surveys. In future administrations, PDE can benchmark the surveys using Rasch modeling in the first year and then use either the Rasch score approach or the mean score approach with the same cut points in later years to calculate school climate index scores.

Exhibit 5. Correlations between the school climate index scores based on Rasch and mean scale score approaches, by year

Index/domain score	2016/17	2017/18
Overall school climate index		
Domain score for Student Support and Academic Engagement		
Domain score for Safe and Respectful School Climate		
Domain score for Social-Emotional Learning		
Number of schools		

Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18, excluding elementary schools.

Overall school climate index scores. Our calculations of overall school-level index scores (in the subset of schools in which all respondent types participated in the survey and with elementary school scores excluded) indicate the following:

- Students and staff held different perceptions of their school climate.
  - Students held less favorable perceptions than classroom teachers and/or non-instructional staff as suggested by lower overall index scores across domains[9] and by lower scores for the Student Support and Academic Engagement domain.[10]
  - Students had lower scores than non-instructional staff for Safe and Respectful School Climate domains.[11]
  - Middle school students held more favorable perceptions (higher scores) than classroom teachers for the Social-Emotional Learning domain.[12]
- Classroom teachers and non-instructional staff had different perceptions.
  - Classroom teachers had less favorable perceptions (lower scores) than non-instructional staff for the Social-Emotional Learning domain, but more favorable (higher scores) in the Student Support and Academic Engagement domain. (Overall index scores were similar between classroom teachers and non-instructional staff.) (Exhibit 6).

[9] ANOVA tests demonstrate significant differences across respondent groups [$F(3, 110) = 5.0$, $p < .01$ for 2016/17; $F(3, 154) = 5.0$, $p < .01$ for 2017/18]; post hoc tests show that high school students had significantly lower scores than staff in both years ($p < .05$), and middle school students had significantly lower scores than non-instructional staff in 2016/17 ($p < .05$).

[10] ANOVA tests demonstrate significant differences across respondent groups [$F(3, 110) = 32.2$, $p < .001$ for 2016/17; $F(3, 154) = 52.9$, $p < .001$ for 2017/18]; post hoc tests show that all the groups are significantly different from each other ($p < .01$) except between high school and middle school students in both years.

[11] ANOVA tests demonstrate significant differences across respondent groups [$F(3, 110) = 6.0$, $p < .001$ for 2016/17; $F(3, 154) = 5.1$, $p < .01$ for 2017/18]; post hoc tests show that students had significantly lower scores than non-instructional staff in both years ($p < .05$).

[12] ANOVA tests demonstrate significant differences across respondent groups [$F(3, 110) = 3.4$, $p < .05$ for 2016/17; $F(3, 154) = 5.4$, $p < .01$ for 2017/18]; post hoc tests show that middle school students had significantly lower scores than classroom staff in both years ($p < .05$), and classroom teachers had lower scores than non-instructional staff in both years ($p < .05$).

Exhibit 6. Average index scores at the school level by respondent type (based on Rasch scores)

School climate index score	Classroom teachers Mean (SD)	Non-instructional staff Mean (SD)	High school students Mean (SD)	Middle school students Mean (SD)
2016/17 (n = 36 schools)				
Overall index score across domains for each respondent type	()	()	()	()
Social-Emotional Learning	()	()	()	()
Safe and Respectful School Climate	()	()	()	()
Student Support and Academic Engagement	()	()	()	()
2017/18 (n = 50 schools)				
Overall index score across domains for each respondent type	()	()	()	()
Social-Emotional Learning	()	()	()	()
Safe and Respectful School Climate	()	()	()	()
Student Support and Academic Engagement	()	()	()	()

Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18, excluding elementary schools.
SD = standard deviation.

The correlations of the index scores across respondent types also suggest that students and staff did not have high agreement about school climate (Exhibit 7). For Student Support and Academic Engagement, the correlations between student and non-instructional staff reports were close to zero (-0.05 and 0.12 for 2016/17 and 2017/18 surveys, respectively); the correlations between student and classroom teacher reports were 0.18 to 0.39. For the remaining index scores, the correlations between student and non-instructional staff reports were in the 0.38 to 0.70 range, with most correlations less than 0.50; the correlations between student and classroom teacher reports were in the 0.57 to 0.70 range. The correlations between classroom teacher and non-instructional staff reports were higher, in the range of 0.62 to 0.85. Conventionally, correlation coefficients less than 0.50 (in absolute value) are considered low, those between 0.50 and 0.70 are considered moderate, and those greater than 0.70 are considered high in terms of magnitude (Hinkle, Wiersma, & Jurs, 2003). The correlations between students and staff reports are mostly in the low-to-moderate range.

Exhibit 7. Correlations of index scores across respondent types (based on Rasch scores)

	2016/17 (n = 36 schools)		2017/18 (n = 50 schools)	
	Students	Classroom teachers	Students	Classroom teachers
Overall index score cross domains				
Students	--	--	--	--
Classroom teachers		--		--
Non-instructional staff				
Social-Emotional Learning				
Students	--	--	--	--
Classroom teachers		--		--
Non-instructional staff				
Student Support and Academic Engagement				
Students	--	--	--	--
Classroom teachers		--		--
Non-instructional staff				
Safe and Respectful School Climate				
Students	--	--	--	--
Classroom teachers		--		--
Non-instructional staff				

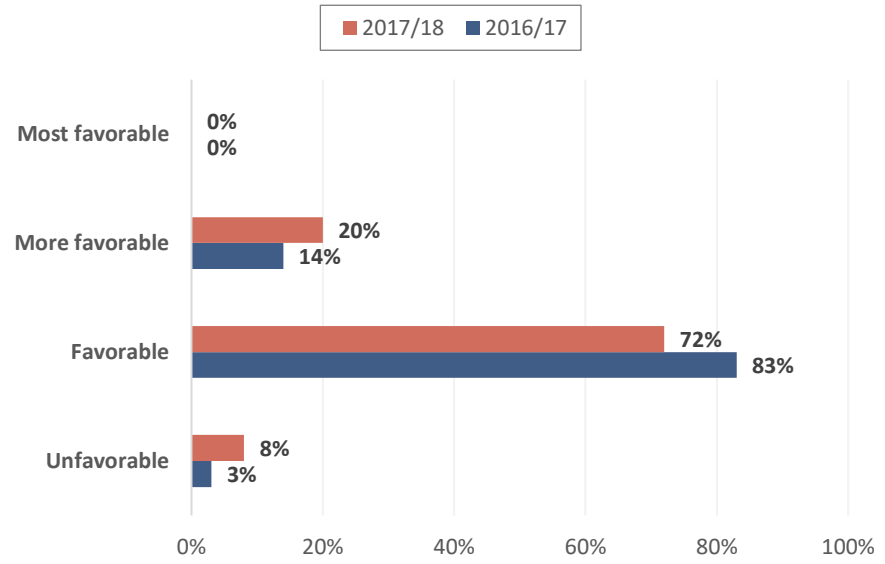
Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18, excluding elementary schools.
Note: *Correlation is statistically significant at the 0.05 level, two-tailed test. **Correlation is statistically significant at the 0.01 level, two-tailed test. ***Correlation is statistically significant at the 0.001 level, two-tailed test.

School climate index scores across respondent types in schools that had all respondent types. Index scores can divide schools into four classifications: unfavorable, favorable, more favorable, and most favorable. In Exhibit 8, we show the distributions of the overall index scores based on the Rasch scores[13] for 2016/17 and 2017/18 in schools that had all respondent types.

- No schools fell into the "most favorable" category.
- Between 14 percent and 20 percent of schools fell into the "more favorable" category.
- The majority of schools (72 percent to 83 percent) fell into the "favorable" category.
- One school in 2016/17 and four schools in 2017/18 earned scores placing them in the "unfavorable" category.

[13] See Exhibit C.1 in Appendix C for distributions of the overall index scores based on the mean scores.

Exhibit 8. Percentage of schools that fall into each overall school climate index category by school year (based on Rasch scores)



Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18, excluding elementary schools.
Note: The overall school climate index scores are based on 36 schools in 2016/17 and 50 schools in 2017/18.

Based on the scores by school climate domain, LEAs may want to focus on the Social-Emotional Learning domain, as more than half of schools fell into the "unfavorable" category.

In Exhibit 9, we summarize the number and percentage of schools that scored within the score category by school climate domain. The distributions of the scores for each domain based on the Rasch scores[14] for 2016/17 and 2017/18 are illustrated in Exhibit 10. Then, in Exhibit 11, we provide an example of the histogram for the distribution of the scores for the Social-Emotional Learning domain for 2017/18 that shows more than half of schools falling into the "unfavorable" category.

To view histograms for the distributions of the overall index scores and scores by domain for each survey year, please see Exhibits D.1 through D.8 in Appendix D. These scores are for schools that have all three types of respondents.

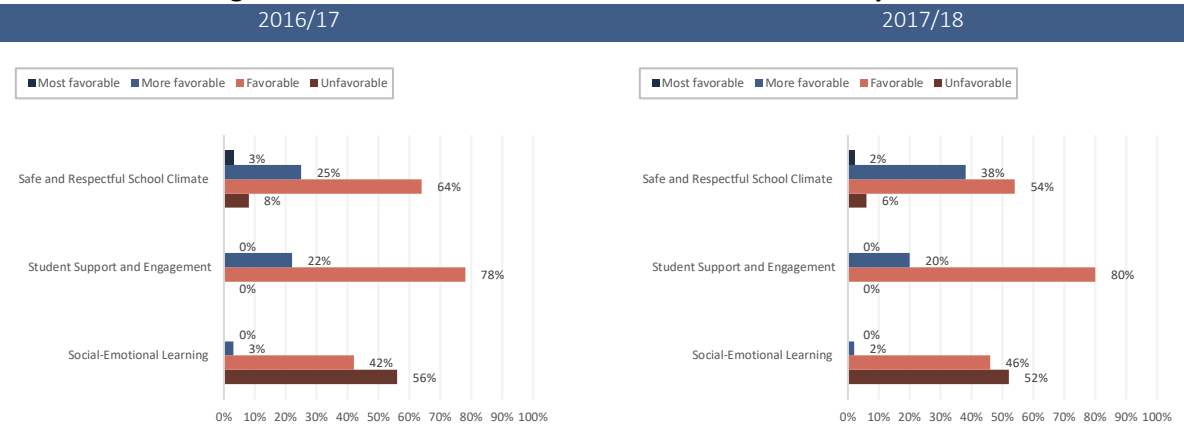
[14] See Exhibit C.2 in Appendix C for distributions of the scores based on the mean scores.

Exhibit 9. Summary of domain scores (based on Rasch scores), 2016/17 and 2017/18

Domain	Results
Social-Emotional Learning	• No schools fell into the "most favorable" category. • Three percent of schools in 2016/17 and 2 percent of schools in 2017/18 (one school in both cases) fell into the "more favorable" category. • Forty-two percent of schools in 2016/17 and 46 percent of schools in 2017/18 fell into the "favorable" category. • Fifty-six percent of schools in 2016/17 and 52 percent of schools in 2017/18 fell into the "unfavorable" category.
Student Support and Academic Engagement	• No schools fell into the "most favorable" or "unfavorable" categories. • Twenty-two percent of schools in 2016/17 and 20 percent of schools in 2017/18 fell into the "more favorable" category. • Seventy-eight percent of schools in 2016/17 and 80 percent of schools in 2017/18 fell into the "favorable" category.
Safe and Respectful School Climate	• One school in each year fell into the "most favorable" category. • Twenty-five percent of schools and 38 percent of schools in 2017/18 fell into the "more favorable" category. • The majority of schools fell into the "favorable" category each survey year (54 percent in 2016/17 and 64 percent in 2017/18). • Three schools earned "unfavorable" scores in each year; one of those schools fell into the "unfavorable" category for both survey years.

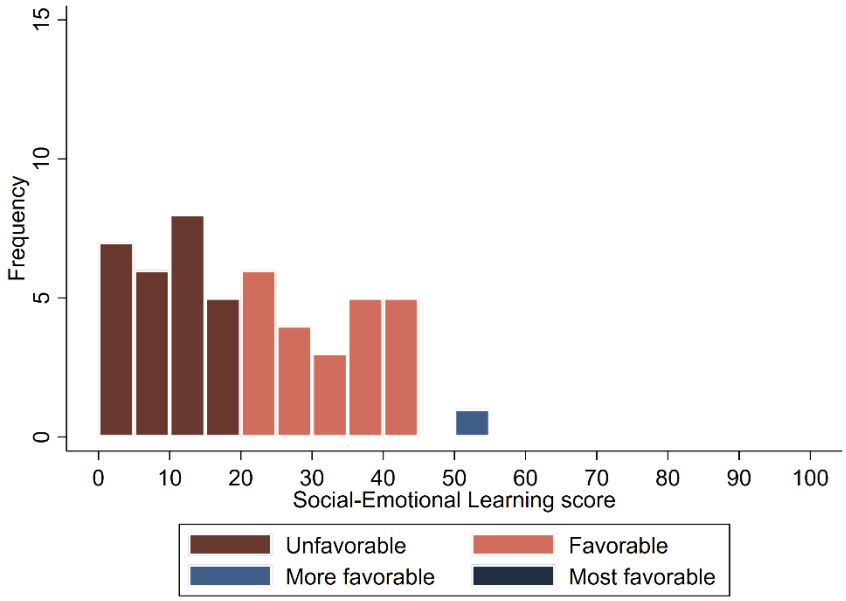
Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18, excluding elementary schools.

Exhibit 10. Percentage of schools that fell into different levels of scores by domain



Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18, excluding elementary schools.
Note: The domain scores are based on 36 schools in 2016/17 and 50 schools in 2017/18.

Exhibit 11. Distribution across schools of the Social-Emotional Learning scores for the 2017/18 survey



Source: Pennsylvania Department of Education School Climate Survey 2017/18, excluding elementary schools.
Note: Domain scores are based on Rasch scores.

Change in school climate scores. We examined the means and standard deviations of the overall school climate index scores and domain scores based on the Rasch scores for 27 schools that have data in both years (Exhibit 12).[15] The scores for the 2017/18 survey were slightly lower than those for the 2016/17 survey but apparent differences were not statistically significantly.

Exhibit 12. Mean school climate index scores based on Rasch scores, by year

Index/domain score	2016/17 Mean (SD)	2017/18 Mean (SD)
Overall school climate index	()	()
Domain score for Student Support and Academic Engagement	()	()
Domain score for Safe and Respectful School Climate	()	()
Domain score for Social-Emotional Learning	()	()

Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18, excluding elementary schools.
Note: Table includes schools that have data for both years (n =).
SD = standard deviation.

When looking at changes within schools in the four levels of school climate between the two years, most schools stayed with the same levels (Exhibit 13). Eighty-two to 93 percent of schools had no change in the levels of school climate; 0 to 7 percent of schools had positive change in levels, and 7 to 15 percent of schools had negative change in levels.

[15] See Exhibit C.3 in Appendix C for the results based on the mean scores.

Exhibit 13. Number of schools with different changes in the levels of school climate

Index/domain score	Number of schools[a]		
	Positive change	No change	Negative change
Overall school climate index	2	23	2
Domain score for Student Support and Academic Engagement		25	2
Domain score for Safe and Respectful School Climate	2	23	2
Domain score for Social-Emotional Learning	1	22	4

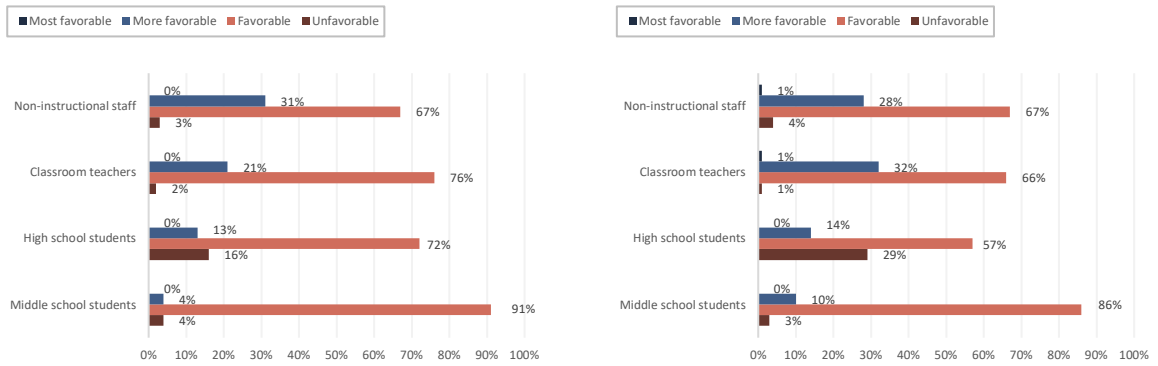
Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18, excluding elementary schools.
Note: Table includes schools that have data for both years (n =).
[a] Based on Rasch scores.

School climate index scores by respondent type. In addition to examining school index scores for schools in which all respondent types participated in the survey, we also calculated school-level index and scores for each respondent type. These analyses draw on a larger sample of schools because the calculations do not require us to exclude schools for which all respondent types did not participate in the survey. As a result, the sample sizes of schools included in these calculations varied by respondent type.

In Exhibit 14, we show the distributions of the school climate index levels by respondent group based on the Rasch scores[16] for 2016/17 and 2017/18. Chi-square tests demonstrate significant differences in the percentages of schools falling into different levels of index scores between different respondent groups in both 2016/17 (X^2 = [6, 136] = 14.3, p < .05) and 2017/18 (X^2 = [9, 216] = 38.1, p < .001). High school students rated 16 percent of schools in 2016/17 and 29 percent of schools in 2017/18 as "unfavorable" on the overall index; 4 percent of schools in 2016/17 and 3 percent of schools in 2017/18 fell into the "unfavorable" category for middle school students. One school in each year fell into the "unfavorable" category for classroom teachers; 3 to 4 percent of schools had overall school climate index scores (a total of 4 schools) that fell into the "unfavorable" category for non-instructional staff. See Exhibits E.1 and E.2 in Appendix E for the percentages of schools that fell into different levels of index scores by respondent type, including the elementary school student survey. Histograms for the distributions of index scores by respondent type are available in Exhibits E.3 to E.12 in Appendix E.

[16] See Exhibit C.4 in Appendix C for distributions of the school climate index levels by respondent type based on the mean scores.

Exhibit 14. Percentage of schools that fell into different levels of index scores, by respondent type



Source: Pennsylvania Department of Education School Climate Survey 2016/17 and 2017/18.

Note: Sample sizes in 2016/17: 23 schools for middle school student survey, 32 schools for high school student survey, 42 schools for classroom teacher survey, and 39 schools for non-instructional staff survey. Sample sizes in 2017/18: 29 schools for middle school student survey, 42 schools for high school student survey, 76 schools for classroom teacher survey, and 69 schools for non-instructional staff survey.

Chi-square tests show significant differences in the percentages of schools falling into different levels of index scores by respondent type for both 2016/17 ($p < .05$) and 2017/18 ($p < .001$).

D. Implications and lessons learned for future survey administration

Although pilot study data are too dated to be actionable in the present, future survey administrations can help LEAs make at least three types of evidence-based decisions to inform annual action planning under the School Climate Leadership Initiative.

1. **Areas for improvement:** In what school climate domains and for which members of our school communities (e.g., racial/ethnic groups, grade level, students with disabilities) do we need to improve?
2. **School identification:** Which schools might benefit from targeted supports or intervention?
3. **Monitoring progress:** Are school climate reforms and initiatives moving the needle? How are perceptions of school climate changing over time?

We use these categories to organize the study implications presented below.

Index purpose	Summary of findings and potential next steps
School improvement	• Improving Social-Emotional Learning programming is an area of need. In both survey years, approximately half of the participating schools earned "unfavorable" scores for the Social-Emotional Learning domain. • Middle and high school students' overall school climate scores were lower than those of classroom teachers and non-instructional staff. Students' scores for the Student Support and Academic Engagement domain were substantially lower than school staff's scores, suggesting that staff may be overestimating the rigor of academic work, that they may need to raise their expectations for students, that students and staff do not share the same expectations of rigor or use the same language to describe it. • High school students were more likely than other respondent types to rate their overall school climate as "unfavorable," suggesting a need for high schools to strengthen student supports. This finding is consistent with other state school climate survey results such as the California School Climate Survey (Jain et al., 2015).

Evidence-based identification of school needs	On a 4-point scale from "unfavorable" (Level 1) to "most favorable" (Level 4), most schools fell into the "favorable" (Level 2) category. No schools fell into the "most favorable" category, suggesting general room for improvement in the participating schools. However, results also indicate that some schools might benefit from targeted support. For example:
	• One school in 2016/17 and four schools in 2017/18 earned "unfavorable" overall school index scores.[17] These schools also earned "unfavorable" scores for the Social-Emotional Learning domain.
	• Twenty schools earned "unfavorable" Social-Emotional Learning index scores in 2016/17 and 26 schools in 2017/18. Of those schools, 13 fell into the "unfavorable" category for both survey years.
	• Three schools in 2016/17 and three schools in 2017/18 earned "unfavorable" Safe and Respectful School climate index scores. One of those schools earned an "unfavorable" score for both survey years.[18]
	• Results suggest that students and school staff hold different perceptions of the overall school climate:
	  ○ Two schools fell into the "unfavorable" category for middle school students.
	  ○ Five schools in 2016/17 and 12 schools in 2017/18 fell into the "unfavorable" category for high school students. Four of those schools earned "unfavorable" scores in both 2016/17 and 2017/18.
	  ○ Of these schools, none fell into the "unfavorable" category for classroom teachers or non-instructional staff, with one exception.[19]
	• Results also suggest that classroom teachers and non-instructional staff hold different perceptions of school.
	  ○ Two schools fell into the "unfavorable" category for classroom teachers.
	  ○ Four schools' overall school climate index scores fell into the "unfavorable" category for non-instructional staff.
	Across domains and respondents, schools earning "unfavorable" ratings were not concentrated in specific LEAs but reside in many different local education agencies, often just one or two schools per district. This suggests that LEAs, particularly those with limited resources, might prioritize providing targeted assistance for these schools over implementing new or scaling existing district-wide interventions.

Index purpose	Summary of findings and potential next steps
Progress	Overall, the results do not suggest that perceptions of school climate changed substantially in most schools between survey years, suggesting the measures are relatively stable. • A small percentage of schools experienced a negative change in school climate. • However, generally speaking two years of data are insufficient to discern a trend or the effectiveness of a specific school climate intervention.

To ensure that school climate index scores can help educators answer questions like these and provide guidance on next steps, sound and representative survey data are needed. Our analysis suggests a number of considerations for future administrations of the school climate survey:

- **Improve survey response rates.** Low response rates in some schools suggest that the school climate results might be at risk of nonresponse bias. It is important to improve survey response rates in future survey administrations to avoid or reduce nonresponse bias.
    - **Incentivize high participation among students and staff.** In some participating schools, one respondent group completed the survey while another did not. To capture a more accurate and representative picture of the diversity and magnitude of student and staff perceptions of their school climate, it is important that schools systematically recruit and encourage all respondent types to participate. To do so, it is critical for LEAs and schools to both communicate the importance of and incentivize participation. Although a response rate of 100 percent may not be feasible when administering a voluntary survey, we encourage LEAs and schools to minimally aim for an 85 percent response rate to obtain valid results
    - **Distribute age-appropriate surveys to students.** Our analysis indicates that a few schools administered the wrong version of the survey to students. To ensure reliable and valid survey results, students should complete a survey that was developed, pilot tested, and/or validated for their grade level.
- **Administer surveys with unique respondent IDs for student and staff respondents.** Assigning a unique respondent ID for all potential student and staff respondents, that could be matched to administrative datasets, would reduce, if not eliminate, the occurrence of duplicative survey responses and enable LEAs to disaggregate survey results by a wider range of demographic characteristics such as disability status. It would also allow LEAs to better understand and address survey non-response.
- **Develop population-based estimates of how LEAs and schools compare to each other.** The ability to contextualize scale scores against comparable schools nationwide can help LEAs understand how schools "typically" perform, the extent to which Pennsylvania schools meet those expectations relative to peer schools, and potentially, identify LEAs or schools from which they might learn school climate improvement strategies that are both effective and replicable. In the absence of developing these benchmarks, LEAs might consider reviewing the results of a

[17] School ID: 8304, 8348, 4442, 8093, and 1566

[18] School ID: 8291

[19] School ID 8348 earned an "unfavorable" score for non-instructional staff.

national survey (such as the U.S. Department of Education School Climate Surveys) or other state school climate surveys (such as the California School Climate, Health and Learning Surveys) the to understand how other schools perform by school level, grade level, respondent type, domain, and demographic group.

Understanding differential perceptions of school climate is important to ensure that schools adopt reforms, interventions and practices that can effect positive change for the schools and individuals in greatest need. With higher quality school climate survey data, LEAs can obtain more information to inform action planning by, for example:

1. Identifying low domain scores overall and disaggregated by school level, respondent type, grade level, and demographic characteristics to explore the extent to which and for whom perceptions of a school climate vary. Take, for instance, a predominantly white school in which black students only account for 10% of enrollment. An overall favorable index score might obscure the perceptions of black students who might hold a less favorable view of the school. Both (1) comparing scores across subgroups, and (2) examining the distribution of scores within a school is essential to determine whether and to what degree there is a substantial group of students or staff who are dissatisfied with their school climate and therefore, critical to an evidence-based action planning process.
2. Investigating average responses, question-by-question within each domain, to better understand what specific aspects of a school's climate may be contributing to low domain scores.

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APPENDIX A. Final recommendations of items to include and exclude from the surveys

Below, we denoted items that we recommend dropping, revising, or adding to a survey with italics and shading. These recommendations were included in the memo submitted to Pennsylvania Department of Education on December 13, 2019.

A. Parent survey items

Keep all original items.

Exhibit A.1. One School Climate factor (all original items)

Variable name	Item
	Please indicate how strongly you agree or disagree
Pq88sppd	At this school there are good supports for all children, including children with learning problems.
Pq92tchi	Teachers at my child's school are interested in what I have to say.
Pq84tchc	I am satisfied with communication with my child's teacher(s).
Pq87chdl	My child likes his/her teachers.
Pq94prnr	I would recommend my child's school to others.
Pq85gded	My child is getting a good education at this school.
Pq91hiex	Adults at this school have high expectations for all children.
Pq93prni	I feel like I am actively involved in my child's education.
Pq81spps	My child's school is a supportive and inviting place for students.
Pq82chds	My child is safe at school.
Pq83prnw	I feel welcome at this school.
Pq86chdf	My child is treated fairly at this school.
Pq89sptp	This is a supportive and inviting place for parents/guardians.
Pq90adtd	Adults at this school respect cultural diversity.

Note: All parent survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

B. Staff survey items

Drop 3 items for classroom teachers and 1 item for non-instructional staff.

Exhibit A.2. Social-Emotional Learning (all original items)

Variable name	Item
	How much do you agree with the following statements about students in your school? *Students in my school…*
Sq27stpt	Stop and think before doing anything when they get angry.
Sq28grpp	Do their share of the work when doing group projects.
Sq29givu	Give up when they can't solve a problem easily.
Sq30argu	Get into arguments when they disagree with people.
Sq31dbst	Do their best, even when their school work is difficult.
Sq32okfg	Think it's OK to fight if someone insults them.
Sq33dohw	Do all their homework.
Sq34symn	Say mean things to other students when they think the other students deserve it.
Sq35wkot	Try to work out their disagreements with other students by talking to them.
Sq36okch	Think it's OK to cheat if other students are cheating.
Sq37dogd	Try to do a good job on school work even when it is not interesting.

Note: Items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Exhibit A.3. Student Support (all original items; combined with High Expectations, Academic Rigor, and Challenge items)

Variable name	Item	Note
	How much do you agree with the following statements about your teaching? *I…*	
Sq43care	Really care about my students.	Classroom teacher only
Sq44mkup	Help my students make up work after an excused absence.	Classroom teacher only
Sq45fdbk	Give my students feedback on class assignments that helps improve their work.	Classroom teacher only
Sq46acom	Provide accommodations to students who need them.	Classroom teacher only
	How much do you agree with the following?	
Sq70asks	The principal asks students about their ideas.	
Sq71effc	Students and parents receive effective communication about academic progress.	
Sq72frtr	When students break rules, they are treated fairly.	

Note: Items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Exhibit A.4. High Expectations, Academic Rigor, and Challenge (combined with Student Support items; drop three items for classroom teachers and one item for non-instructional staff)

Variable name	Item	Note
	How much do you agree with the following statements about your teaching? *I…*	
Sq38cnct	*Work to connect what I am teaching to life outside the classroom.*	*Classroom teacher only, drop*
Sq40shid	Encourage students to share their ideas about things we are studying in class.	Classroom teacher only
Sq41expa	*Require my students to explain their answers.*	*Classroom teacher only, drop*
Sq42prep	Prepare all students for success in the next grade, in college, or in a job.	Classroom teacher only
Sq48chwk	Believe all students can do challenging school work.	Classroom teacher only
	How much do you agree with the following?	
Sq73hpwk	I am happy working at this school.	
Sq74schp	This school is making steady progress implementing rigorous academic standards.	
Sq54advw	When students in this school already know the material that is being taught, they are given more advanced assignments.	
Sq76stfa	In this school, staff members have a "can do" attitude.	
Sq77cmpt	*Students have adequate access to computers at this school.*	*Low factor loading for classroom teacher, drop from other classroom teacher and non-instructional staff for consistency*
Sq78hnra	Students in this school are encouraged to take advanced classes, such as honors, Advanced Placement (AP), or International Baccalaureate (IB), or classes that lead to professional certification.	
Sq79poss	This school provides positive experiences for students.	

Note: Items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Exhibit A.5. Safe and Respectful School Climate (all original items)

Variable name	Item
	Please indicate how strongly you agree or disagree
Sq7crime	This school is badly affected by crime and violence in the community.
Sq8posp	This school provides positive experiences for parents.
Sq9welcm	This school provides a welcoming environment.
Sq14thrn	Students at this school are often threatened.
Sq16blyc	Students at this school are often bullied because of certain characteristics (for example, their race, religion, weight, or sexual orientation)
Sq17sfen	This school provides a safe environment for teaching and learning.
	How safe do you feel
Sq19sfos	Outside around the school?[a]
Sq20sfhl	In the hallways and bathrooms of the school?[a]
Sq21sfcs	In your classroom or work area?[a]
	How much do you agree with the following statements about students in your school? *Students in this school…*
Sq22dntc	Don't really care about each other.
Sq23ptth	Like to put others down.
Sq24dntg	Don't get along together very well.
Sq25lkot	Just look out for themselves.
Sq26trtr	Treat each other with respect.
	How much do you agree with the following?
Sq75stfi	School staff members have a lot of informal opportunities to influence what happens here.
Sq80stfs	School staff members are supported by administration.

Note: All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the staff survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe.

C. *Elementary school student survey items (Grade 3 to 5)*

Drop 2 items, rephrase or reword some items, and/or add 1–3 new items.

Exhibit A.6. Social-Emotional Learning (all original items plus potential items)

Variable name	Item
	Please mark whether you agree with these statements about students in your school.
Eq27stpt	Most students in my school stop and think before they get too angry.
Eq28grpp	ORIGINAL: Most of the students in my school do their part when we work together on a group project. *POTENTIAL REVISION: Most students in my school get along well when we need to work together as a group or team.*
Eq31dbst	Most students in my school do their best, even when their school work is hard. *POTENTIAL REVISION: Most students in my school feel it is important to try to do their best, even when their school work is hard or not interesting.*
Eq30argu	Most students in my school get mad when they disagree with people.
Eq35wkot	ORIGINAL: Most students in my school try to talk to other students if they are having a problem with them. *POTENTIAL REVISION: Most students in my school try to work out their problems with other students by talking to them.*
POTENTIAL ITEM A	*In my school, we talk about how our actions make others feel*[6]
POTENTIAL ITEM B	*In my school, we talk about ways to be a good person*[6]
POTENTIAL ITEM C	*In my school, adults teach me how to show feelings in proper ways*[6]
POTENTIAL ITEM D	*Adults in my school are good examples of how to behave*[20]
POTENTIAL ITEM E	*Most students in my school will try to stop other students from saying mean things to others*[6]

Note: All items have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

[20] Based on items in the National School Climate Center Comprehensive School Climate Inventory (Elementary Version)

Exhibit A.7. Student Support (all original items; combined with High Expectations, Academic Rigor, and Challenge items)

Variable name	Item
	Please mark whether you agree with these statements about your school
Eq10fair	Teachers and other staff in this school are fair to all students.
Eq11givh	Teachers and other staff in this school are willing to give students help.
Eq51difs	I wish I went to a different school.
	Please mark whether you agree with these statements about your teachers.
Eq43care	My teachers really care about me.
Eq66trtd	My teachers treat some students better than others.
Eq64ntct	My teachers notice if I have trouble learning something.
Eq65hlpi	My teachers help me do better on my school work.

Note: All items have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

Exhibit A.8. High Expectations, Academic Rigor, and Challenge (combined with Student Support items; drop two items)

Variable name	Item	Note
	Please mark whether you agree with these statements about your school	
Eq69ubrd	I am bored in school.	
	Please mark whether you agree with these statements about your teachers.	
Eq39tlko	*My teachers want us to talk with others about things we are studying.*	*Drop*
Eq41expa	*My teachers ask me to explain my answers.*	*Drop*
Eq47hmwk	The homework I get from my teachers helps me learn.	
Eq67topc	My teachers give me work that is interesting.	

Note: All items have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

Exhibit A.9. Safe and Respectful School Climate (all original items)

Variable name	Item
	Please mark whether you agree with these statements about your school
Eq19sfos	I feel safe outside around the school.
Eq20sfhl	I feel safe in the hallways and bathrooms of the school.
Eq21sfcs	I feel safe in my classroom.
	Please mark whether you agree with these statements about students in your school.
Eq26trtr	Most students in my school treat each other with respect.
Eq13blly	Students at my school are bullied.
Eq15tsed	Students at my school are teased, picked on, made fun of, or called names.

Note: All items have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

D. Middle school student survey items (Grade 6 to 8)

Exhibit A.10. Social-Emotional Learning (all original items)

Variable name	Item
	How much do you agree with the following statements about students in your school? ***Students in my school…***
Mq27stpt	Stop and think before doing anything when they get angry.
Mq28grpp	Do their share of the work when we have group projects.
Mq29givu	Give up when they can't solve a problem easily.
Mq30argu	Get into arguments when they disagree with people.
Mq31dbst	Do their best, even when their school work is difficult.
Mq32okfg	Think it's OK to fight if someone insults them.
Mq33dohw	Do all their homework.
Mq34symn	Say mean things to other students when they think the other students deserve it.
Mq35wkot	Try to work out their disagreements with other students by talking to them.
Mq36okch	Think it's OK to cheat if other students are cheating.
Mq37dogd	Try to do a good job on school work even when it is not interesting.

Note: All items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Exhibit A.11. Student Support (combined with High Expectations, Academic Rigor, and Challenge items; drop three items)

Variable name	Item	Note
	How much do you agree with the following statements about your teachers? ***My teachers…***	
Mq43care	Really care about me.	
Mq44mkup	Help me make up work after an excused absence.	
	How much do you agree with the following?	
Mq49adtb	Adults in this school are often too busy to give students extra help.	
Mq50ruls	Adults in this school apply the same rules to all students equally.	
Mq51difs	I wish I went to a different school.	
Mq52exth	I can get extra help at school outside of my regular classes.	
Mq53cnsl	A counselor at this school has helped me plan for life after high school.	
Mq55extra	Adults in this school are usually willing to take the time to give students extra help.	
	Please indicate how often you have done the following this school year:	
Mq60tlkt	*Talked to a teacher about a problem you were having in class.*[a]	*Drop*
Mq61tlka	*Talked to an adult at school about something that was bothering you*[a]	*Drop*
Mq62tkou	*Talked to an adult at school about something outside of school that is important to you.*[a]	*Drop*
	How much do you agree with the following statements about your teachers? ***My teachers…***	
Mq64ntct	Notice if I have trouble learning something.	
Mq65hlpi	Will help me improve my work if I do poorly on an assignment.	
Mq66trtd	Treats some students better than others.	

Note: All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

Exhibit A.12. High Expectations, Academic Rigor, and Challenge (combined with Student Support items; drop seven items)

Variable name	Item	Note
	How much do you agree with the following statements about your teachers? *My teachers…*	
Mq38cnct	Often connect what I am learning to life outside the classroom.	
Mq40shid	Encourage students to share their ideas about things we are studying in class.	
Mq41expa	*Often require me to explain my answers.*	*Drop*
Mq47hmwk	Often assign homework that helps me learn.	
Mq48chwk	*Think all students can do challenging school work.*	*Drop*
	How much do you agree with the following?	
Mq54advw	*When students in this school already know the material that is being taught, the teacher gives them more advanced assignments.*	*Drop*
Mq56chma	*Students at this school are expected to learn challenging math material to get them ready for high school.*	*Drop*
	Please indicate how often you have done the following this school year:	
Mq57rsch	*Wrote a research paper of two or more pages.*[a]	*Drop*
Mq58defn	*Wrote a paper in which you defended your own point of view or ideas.*[a]	*Drop*
Mq59fmpr	*Made a formal presentation to a class about something you read or researched.*[a]	*Drop*
	How much do you agree with the following statements about your classes?	
Mq67topc	The topics we are studying are interesting and challenging.	
Mq68mkth	This class really makes me think.	
Mq69ubrd	I am usually bored in this class.	

Note: All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

Exhibit A.13. Safe and Respectful School Climate (drop one item)

Variable name	Item	Note
	How much do you agree with the following statements about your school?	
Mq12wory	*I worry about crime and violence in school.*	*Drop*
Mq13blly	Students at this school are often bullied.	
Mq14thrn	Students at this school are often threatened.	
Mq15tsed	Students at this school are often teased or picked on.	
Mq16blyc	Students at this school are often bullied because of certain characteristics (ex: race, religion, or weight)?	
Mq18sthm	I sometimes stay home because I don't feel safe at school.	
	How safe do you feel?	
Mq19sfos	Outside around the school?[a]	
Mq20sfhl	In the hallways and bathrooms of the school?[a]	
Mq21sfcs	In your classes?[a]	
	How much do you agree with the following statements about students in your school? *Students in my school…*	
Mq22dntc	Don't really care about each other.	
Mq23ptth	Like to put others down.	
Mq24dntg	Don't get along together well.	
Mq25lkot	Just look out for themselves.	
Mq26trtr	Treat each other with respect.	

Note: All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the middle school student survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe.

E. High school student survey items (Grade 9 to 12)

Exhibit A.14. Social-Emotional Learning (all original items)

Variable name	Item
	How much do you agree with the following statements about students in your school? ***Students in my school…***
Hq27stpt	Stop and think before doing anything when they get angry.
Hq28grpp	Do their share of the work when we have group projects.
Hq29givu	Give up when they can't solve a problem easily.
Hq30argu	Get into arguments when they disagree with people.
Hq31dbst	Do their best, even when their school work is difficult.
Hq32okfg	Think it's OK to fight if someone insults them.
Hq33dohw	Do all their homework.
Hq34symn	Say mean things to other students when they think the other students deserve it.
Hq35wkot	Try to work out their disagreements with other students by talking to them.
Hq36okch	Think it's OK to cheat if other students are cheating.
Hq37dogd	Try to do a good job on school work even when it is not interesting.

Note: All the items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Exhibit A.15. Student Support (combined with High Expectations, Academic Rigor, and Challenge items; drop four items)

Variable name	Item	Note
	How much do you agree with the following statements about your teachers? *My teachers…*	
Hq43care	Really care about me.	
Hq44mkup	Help me make up work after an excused absence.	
	How much do you agree with the following?	
Hq49adtb	Adults in this school are often too busy to give students extra help.	
Hq50ruls	Adults in this school apply the same rules to all students equally.	
Hq51difs	I wish I went to a different school.	
Hq52exth	I can get extra help at school outside of my regular classes.	
Hq53cnsl	A counselor at this school has helped me plan for life after high school.	
Hq55extra	Adults in this school are usually willing to take the time to give students extra help.	
	Please indicate how often you have done the following this school year:	
Hq60tlkt	*Talked to a teacher about a problem you were having in class.*[a]	*Drop*
Hq61tlka	*Talked to an adult at school about something that was bothering you.*[a]	*Drop*
Hq62tkou	*Talked to an adult at school about something outside of school that is important to you.*[a]	*Drop*
Hq63tkcn	*Talked to a counselor at school in depth about planning for college.*[a]	*Drop*
	How much do you agree with the following statements about your teachers? *My teachers…*	
Hq64ntct	Notice if I have trouble learning something.	
Hq65hlpi	Will help me improve my work if I do poorly on an assignment.	

Note: All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

Exhibit A.16. High Expectations, Academic Rigor, and Challenge (combined with Student Support items; drop six items)

Variable name	Item	Note
	How much do you agree with the following statements about your teachers? ***My teachers…***	
Hq38cnct	Often connect what I am learning to life outside the classroom.	
Hq40shid	Encourage students to share their ideas about things we are studying in class.	
Hq41expa	*Often require me to explain my answers.*	*Drop*
Hq47hmwk	Often assign homework that helps me learn.	
Hq48chwk	*Think all students can do challenging school work.*	*Drop*
	How much do you agree with the following?	
Hq54advw	When students in this school already know the material that is being taught, the teacher gives them more advanced assignments.	
Hq56chma	*Students at this school are expected to learn challenging math material to get them ready for graduation.*	*Drop*
	Please indicate how often you have done the following this school year:	
Hq57rsch	*Write a research paper of 5 or more pages.*[a]	*Drop*
Hq58defn	*Write a paper in which you defended your own point of view or ideas.*[a]	*Drop*
Hq59fmpr	*Make a formal presentation to a class about something you read or researched.*[a]	*Drop*
	How much do you agree with the following statements about your classes?	
Hq67topc	The topics we are studying are interesting and challenging.	
Hq68mkth	This class really makes me think.	
Hq69ubrd	I am usually bored in this class.	

Note: All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

Exhibit A.17. Safe and Respectful School Climate (drop one item)

Variable name	Item	Note
	How much do you agree with the following statements about your school?	
Hq12wory	*I worry about crime and violence in school.*	*Drop*
Hq13blly	Students at this school are often bullied.	
Hq14thrn	Students at this school are often threatened.	
Hq15tsed	Students at this school are often teased or picked on.	
Hq16blyc	Students at this school are often bullied because of certain characteristics (ex: race, religion, or weight)?	
Hq18sthm	I sometimes stay home because I don't feel safe at school.	
	How safe do you feel?	
Hq19sfos	Outside around the school?[a]	
Hq20sfhl	In the hallways and bathrooms of the school?[a]	
Hq21sfcs	In your classes?[a]	
	How much do you agree with the following statements about students in your school? *Students in my school…*	
Hq22dntc	Don't really care about each other.	
Hq23ptth	Like to put others down.	
Hq24dntg	Don't get along together well.	
Hq25lkot	Just look out for themselves.	
Hq26trtr	Treat each other with respect.	

Note: All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the high school student survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe.

F. *Community survey items*

Exhibit A.18. Social-Emotional Learning (all original items)

Variable name	Item	Note
	How much do you agree with the following statements about students in your community? *Students in my community…*	
Cq97comh	Help others in the community in times of need.	
Cq98comp	Respect community property.	
	How much do you agree with the following?	
Cq99volw	Community volunteers are welcome in this district.	
Cq100inp	Input from community members is welcomed by our district.	
Cq102sts	Students in this school are encouraged to be successful.	
Cq79poss	This district provides positive experiences for students.	
	How much do you agree with the following statements about students in your community? *Students in my community…*	
Cq96comc	*Care about others in the community.*	*This item was moved from the Safe and Respectful School Climate to the Social-Emotional Learning domain.*

Note: All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Exhibit A.19. Student Support (combined with High Expectations, Academic Rigor, and Challenge items)

Variable name	Item
	How much do you agree with the following statements about educators in your district? *Educators in my district…*
Cq43care	Care about their students.
	How much do you agree with the following?
Cq71effc	Parents and community members receive effective communication about progress in our schools.
Cq72frtr	All students in our district are treated fairly.

Note: All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Exhibit A.20. High Expectations, Academic Rigor, and Challenge (combined with Student Support items)

Variable name	Item
	How much do you agree with the following statements about educators in your district? *Educators in my district…*
Cq48chwk	Believe all students can do challenging school work.
Cq42prep	Prepare all students for success in the next grade, in college, or in a job.
	How much do you agree with the following?
Cq74schp	This district is making steady academic progress.
Cq101acs	Students have adequate access to technology in this district.

Note: All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Exhibit A.21. Safe and Respectful School Climate (drop one item)

Variable name	Item	Note
	Please indicate how strongly you agree or disagree	
Cq8posp	The schools provide positive experiences for parents and community members.	
Cq9welcm	The schools provide a welcoming environment.	
Cq95comr	The schools have a good relationship with the community.	
Cq17sfen	The schools provide a safe environment for teaching and learning.	
	How much do you agree with the following statements about students in your community? *Students in my community…*	
Cq22dntc	*Don't really care about each other.*	*Drop*
Cq26trtr	Treat each other with respect.	

Note: All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

APPENDIX B. Benchmarking analysis and calculating the school climate index scores

In this appendix, we describe in detail how we conducted the benchmarking analysis and calculated the school climate index scores.

A. Benchmarking analysis

To create an interpretable school climate index and sub-indices, the project team used Rasch modeling to conduct a benchmarking analysis. This analysis yielded cut points that divide the scores on the survey into interpretable ranges.

1. Estimating the Rasch model

To interpret the scores for school climate domains and the overall index, we used Rasch modeling to benchmark the scores. This analysis produces cut points that divide the scores on the survey into interpretable ranges. The benchmarks will allow PDE to assign more intuitive descriptions to the range of scores for a school. For example, schools that score above a particular cut point could be categorized as having the "most favorable" level of climate for a particular domain.

To develop the benchmarks, we followed the approach used to benchmark the U.S. Department of Education's School Climate Survey (National Center for Education Statistics, 2017). Specifically, this approach estimates a Rasch model separately for each type of survey (elementary, middle, and high school students; classroom teachers; and non-instructional staff) and each domain (Social-Emotional Learning, Student Support and Academic Engagement, and Safe and Respectful School Climate). For each item on a survey, this method models the probability of selecting a given response as a function of the respondent's perception of the school's climate. For example, the more favorable the perception of school climate, the more likely a respondent is to select "strongly agree" for items that are positively valenced (items for which more agreement indicates a more favorable school climate). The Rasch model allows us to estimate cut points that correspond to the probability of selecting particular response categories on the survey. For example, a score above the highest cut point indicates that a respondent is most likely to report "strongly agree" to a positively valenced item. The estimates also include a measure of each respondent's perception of school climate for each domain, which is their Rasch score. We estimated the Rasch model using Winsteps software.

Assessing item fit and adjusting the Rasch model. We assessed the item fit for each of the domains for each type of respondent. To do so, we examined the *infit* and *outfit* mean square value (Wright, 1984; Wright & Masters, 1981). These statistics indicate whether the observed answers fit the model as expected. A value of the infit and outfit close to 1 indicates that the data fit the model as expected. A value greater than 1 indicates that there is more variation in the answers than the model would have predicted, and a value lower than 1 indicates that there is less variation. For example, a value of 1.2 indicates that there is 20 percent more variation in responses than would be expected. We assess the infit and outfit statistics using the criteria in Exhibit B.1. The ideal level of fit is close to 1 (between 0.5 and 1.5 for a rating scale). A value greater than 2.0 indicates that the item could degrade the resulting measure, so we suggest dropping such items from the final scales.

Exhibit B.1. Criteria for assessing infit and outfit statistics

Range of infit or outfit mean square value	Description	Recommended action
> 2.0	Distorts or degrades measurement system	Drop item from index
1.5–2.0	Unproductive for measurement, but not degrading	Include item
0.5–1.5	Productive for measurement	Include item
< 0.5	Less productive for measurement	Include item

Source: Linacre, 2002.

Overall, the results reveal that the items fit the Rasch model well. For each survey in each year, all items have fit statistics that place them in the range that indicates that they are productive for measurement. In Exhibits B.2 and B.3, we display the infit and outfit statistics for each of the items in the 2016/2017 middle school and high school student surveys, respectively, as examples. The figures of infit and outfit statistics for each survey in each year are included in Appendix B.a.

Exhibit B.2. Infit and outfit statistics for middle school student survey items, 2016/2017

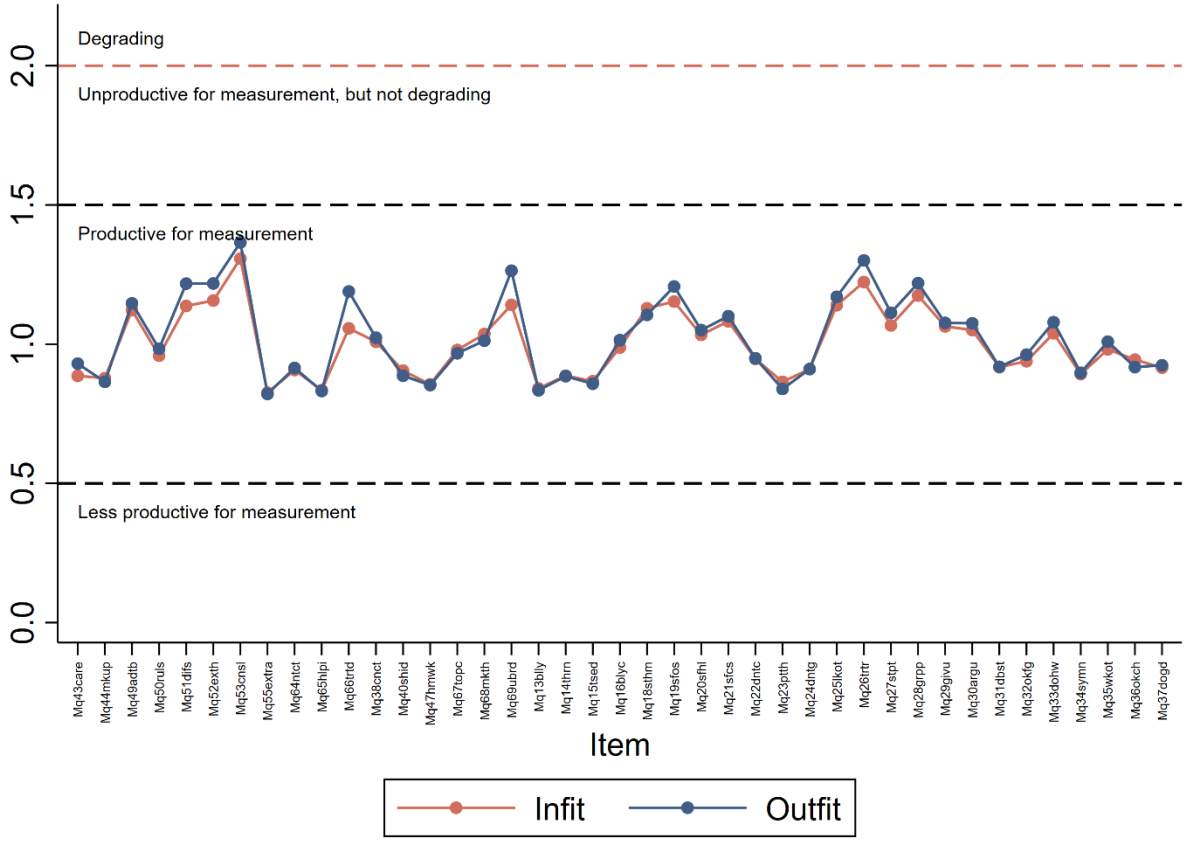
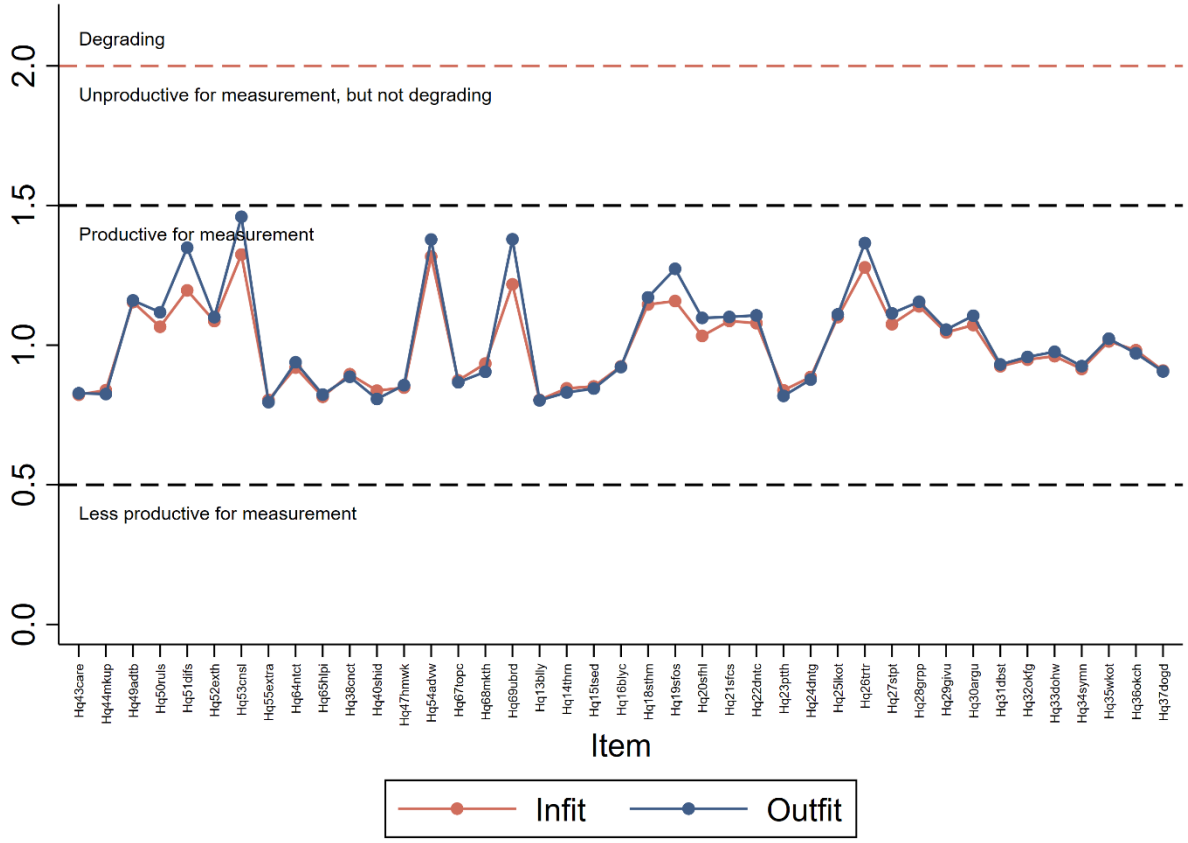


Exhibit B.3. Infit and outfit statistics for high school student survey items, 2016/2017



Examining the step values. In addition to examining the fit of each item, we considered the step values between response categories within each item and across items. The step values, which are in log-odds units, are estimates of the point at which respondents switch from being more likely to select one response category relative to the adjacent category. Because there are four possible response categories for the PDE school climate survey (with the exception of the elementary school student survey, which includes three possible response categories), there are three corresponding step values: one that separates "strongly disagree" and "disagree," one that separates "disagree" and "agree," and one that separates "agree" and "strongly agree." If a respondent's Rasch measure is exactly at the step value, then the respondent is equally likely to select either category. For example, if a respondent's Rasch measure is exactly at the first step value, then he or she is equally likely to select "strongly disagree" and "disagree." If a respondent's Rasch measure is greater than the first step value, then he or she is more likely to select "disagree" than "strongly disagree."

The estimated step values can also shed light on the information provided by respondents who select one category versus another and can help inform how to set benchmarks. If two step values are close to each other, then it suggests that the corresponding response categories do not provide much additional information. In Exhibits B.4 and B.5, we display the step values for each of the items in the 2016/2017 middle school and high school student surveys, respectively, as examples. (Appendix B.b includes the figures for step values for each of the surveys in each year.) For most items in the Pennsylvania school

climate survey, the distance between the lowest and second lowest category (that is, the distance between the red and blue lines in Exhibits 4 and 5) is relatively small, suggesting that these two categories provide a similar amount of information. The Education Department (ED) school climate benchmarking report found similar results and collapsed the lower two categories into a single "strongly disagree/disagree" category (National Center for Education Statistics, 2017).

Because the lowest two categories provide a similar amount of information for most items, we collapsed these two categories and reran the Rasch model for the psychometric benchmarking. For some of the items (for example, for the Social-Emotional Learning domain), there is more distance between the two lowest categories relative to that for the other items. To create a common set of benchmarks for all domains and items and to facilitate ease of interpretation, we collapsed these categories for all domains, including those for which there is more distance between the lowest two categories. The subsequent analyses presented in this memo collapsed the "strongly disagree" and "disagree" categories into a single category ("strongly disagree/disagree").

Exhibit B.4. Step values for the middle school survey items, 2016

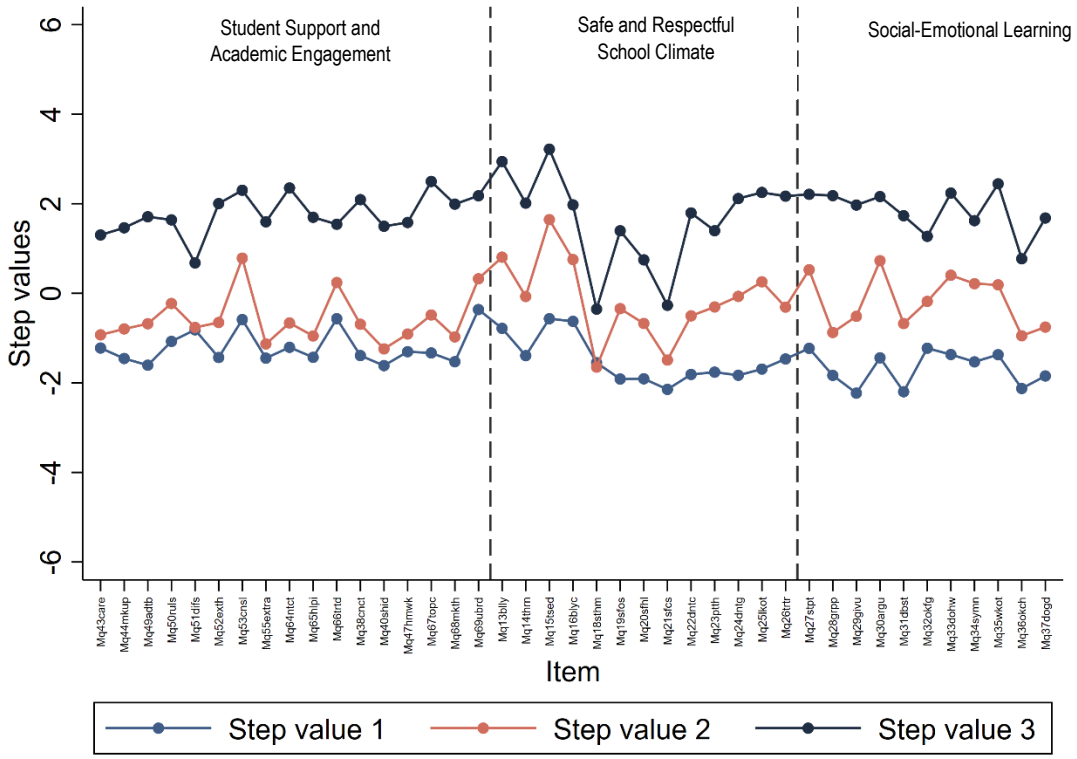
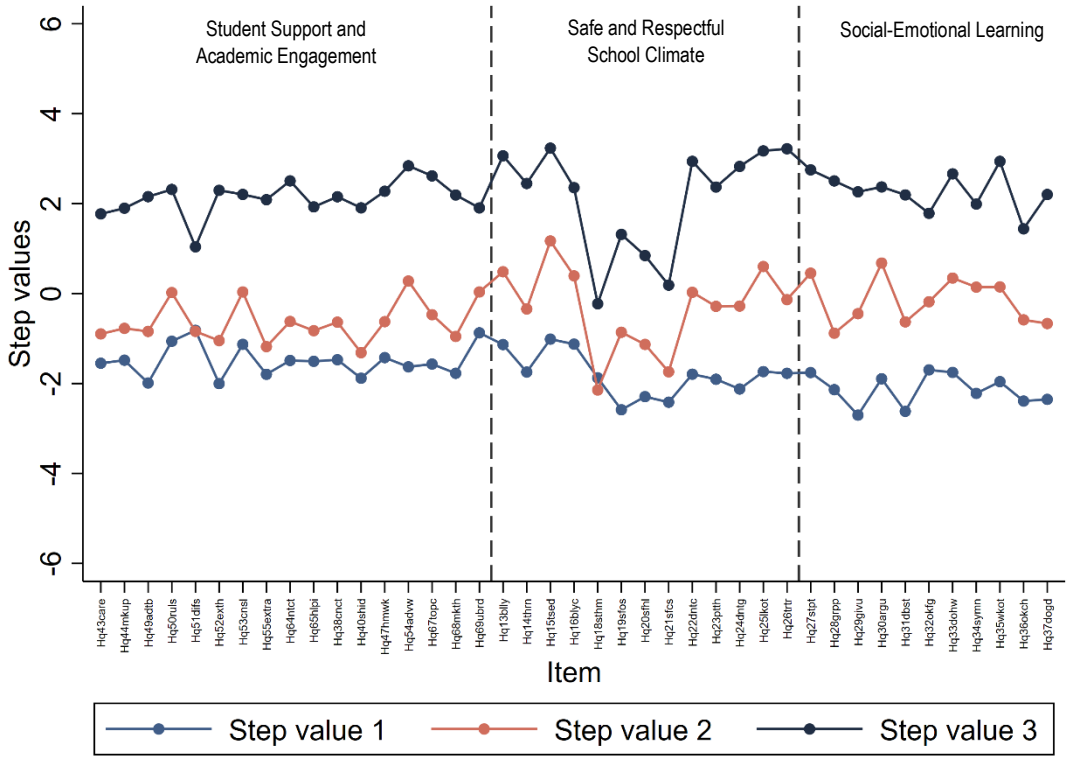


Exhibit B.5. Step values for the high school survey items, 2016/2017



Response categories in the elementary student survey are different from other surveys: the categories are no, sometimes, and yes. The results of the step value estimates show a similar pattern: the step values for the bottom two categories are close to each other for most items (see Appendix B.b for the figures). We collapsed these two categories and reran the Rasch model for the elementary student survey.

2. Identifying the benchmarks

Following a similar approach to the one used for the ED School Climate Survey, we identified the benchmarks based on the estimates from the Rasch model (National Center for Education Statistics, 2017). For each domain, we estimated the cut points (that is, the step values) in Rasch score units that corresponded to the probability of selecting various response categories for the items within the domain. For example, the high cut point corresponds to the point at which a respondent with a Rasch score higher than that cut point is most likely to report "strongly agree" to a positively valenced item. Aligning the cut points to the response categories makes them more interpretable.

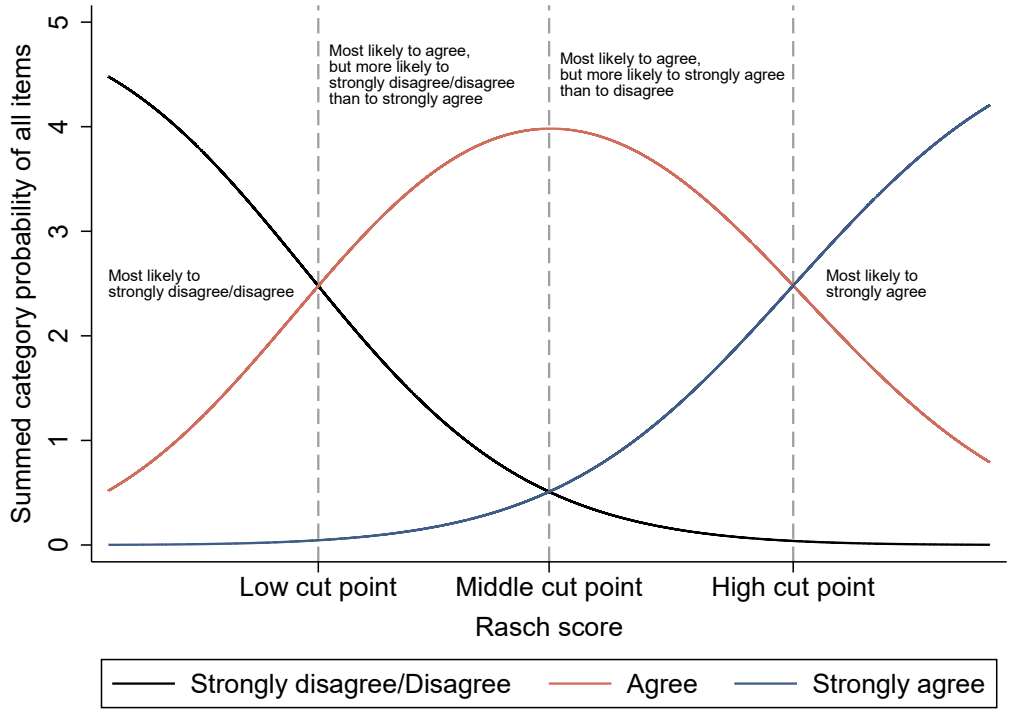
We identified the cut points using a three-step procedure:

1. **Calculating the Category Probability Curve (CPC) for each response category for each item.** The CPC is the probability of selecting a particular category (such as "strongly agree") as a function of each person's perception of school climate θ_i. For example, for a positively valenced item, a respondent is more likely to select "strongly agree" if he or she has a higher value of θ_i .

2. **Calculating the Scale Characteristic Curve (SCC) for each response category for each domain.** The SCC is the sum of the CPCs across items within a domain. It represents the expected number of items within a domain for which a respondent will select a given response category.

   In Exhibit B.6, we show an illustrative SCC for a hypothetical five-item scale, with three response categories for each item ("strongly disagree/disagree," "agree," and "strongly agree"). For example, the green line in the figure displays the expected number of items for which a respondent will select "strongly agree" for a given value of θ_i. The number of items is increasing as a function of θ_i. For very high levels of θ_i, a respondent is more likely to select "strongly agree" with all five items than to select "agree."

Exhibit B.6. Illustrative Scale Characteristic Curve



3. **Identifying the cut points based on the intersections between the SCC curves.** The intersection between two curves, which is the step value, indicates the point at which a respondent is likely to select an equal number of responses of each category type. For example, the intersection between the blue and green curves in Exhibit B.6 represents the value of school climate perception (θ_H) for which a respondent is expected to select "agree" and "strongly agree" equally. Above the intersection between the curves for "agree" and "strongly agree" (θ_H), a respondent is most likely to select "strongly agree" across the items.

   Based on the intersections of the curves, we created four different levels of school climate, separated by three cut points (Exhibit B.7). Let $\hat{\theta}_L$, $\hat{\theta}_M$, and $\hat{\theta}_H$ be the estimates of the lower, middle, and upper cut points. Level 1 represents unfavorable perspective because the respondent is most likely to report

"disagree/strongly disagree." Both Level 2 and Level 3 represent favorable perspectives, but Level 3 is more positive than Level 2. Level 4 represents most favorable perspectives.

Exhibit B.7. Definition and interpretation of benchmarks

Description	Interpretation	Mathematical formulation
Level 4 (Most favorable)	Most likely to respond "strongly agree" to a positively valenced question	$\theta > \theta_H$
Level 3 (More favorable)	Most likely to respond "agree" but more likely to select "strongly agree" than "disagree/strongly disagree" to a positively valenced question	$\theta_M < \theta \leq \theta_H$
Level 2 (Favorable)	Most likely to respond "agree" but more likely to select "disagree/strongly disagree" than "strongly agree" to a positively valenced question	$\theta_L < \theta \leq \theta_M$
Level 1 (Unfavorable)	Most likely to respond "disagree/strongly disagree" to a positively valenced question	$\theta \leq \theta_L$

For the elementary student survey, because the items for the revised Rasch model have only two categories, we defined two levels for the index scores: "less favorable" (the respondent is most likely to select "no/sometimes") and "more favorable" (the respondent is most likely to select "yes").

3. Calculating climate scores for each respondent

Each school's school climate index scores will be the average of respondents' scores on each domain and across domains. We consider two different approaches to calculating the respondents' scores that have some trade-offs. One approach is based on Rasch scores. The other is based on calculating a simple average across items within a domain. We calculate the domain scores and overall climate scores using both approaches.

- **Respondent score approach #1: Using Rasch scores.** As noted above, the Rasch model estimates Rasch scores on each domain for each individual, denoted by θ_i. The Rasch scores relate directly to the parameters of the Rasch model and the cut points described above. For respondents who complete all items within a domain, there is also a one-to-one mapping between Rasch scores and raw total scores (the sum of the numerical values that correspond to the item responses within a domain). The PDE school climate surveys were administered online in a way that respondents had to answer all the questions for the surveys to be submitted. Therefore, every respondent completed all items in the survey. The total scores are based on assigning scores to each response category (after collapsing the lowest two categories) with the following numerical values (assuming a positively valenced item): 1 = "strongly disagree/disagree"; 2 = "agree"; and 3 = "strongly agree." For example, if a respondent selected "strongly agree" on all items in a domain that has 10 items, that respondent would receive a total score of 30 using either approach. Winsteps outputs this mapping between Rasch scores and total scores for respondents who respond to all items.
- **Respondent score approach #2: Using mean scores.** Because calculating the Rasch scores for each respondent can be complex, we also consider a simpler, alternative approach. This approach is to create a simple mean score by averaging the scores associated with each response category across all items within a domain, where the scores for each response category are the same as described under

respondent score approach #1. For example, if a respondent selected "agree" on half of the items and "strongly agree" on the other half of the items, his or her score would be a 2.5. The cut points derived from the Rasch model can be converted from Rasch score units into the mean score units, using the mapping between raw total scores and Rasch scores. This approach is easier to implement but does not account for the fact that different items within a domain provide different amounts of information on school climate. However, this approach still depends on the cut points estimated from the Rasch model.

4. Converting the Rasch scores to scaled scores

The Rasch scores are in the log-odds units, which are difficult to interpret. They are usually converted to a range consisting of positive scores. For example, the ED School Climate Survey benchmarking converted the Rasch scores into scale scores through a linear transformation using the cut points as anchors (National Center for Education Statistics, 2017).

We used a similar approach to rescale the Rasch scores for the PDE survey. In discussion with PDE, we rescaled the scores to the range of 1–99. To place the scores for each domain on a 1–99 point scale, we conducted a linear transformation, where we used the cut points as anchors. In other words, the cut points take the same value across all of the domains. Specifically, we anchored the low-cut point (θ_L) to 20, the mid cut point (θ_M) to 50, and the high cut point (θ_H) to 80. This rescaling means that, for example, scaled scores above 80 fall into the "most favorable" category, as defined above. We conducted this rescaling for both individual-level scoring approaches (the Rasch score and mean score approaches) described above.

B. Creating a school climate Index

We constructed sub-indices that combined responses from different types of respondents (students, classroom teachers, and non-instructional staff) within each climate domain (which will be useful for diagnostic purposes) and an overall index that combined responses across different climate domains. Because different respondent types might have different perceptions of a school's climate, indices that combine all types of respondents will help capture a more complete picture of school climate.

1. Creating the school climate index score

We first calculated each respondent's score for each domain and then created the school climate index within and across domains based on the scaled scores. In Exhibit B.8, we summarize how we weighted the index scores. The analyses included the following steps:

1. **Calculating each individual respondent's score for the domain.** For each respondent that has a valid score for a domain, we calculated a scale score on the domain, applying the steps outlined above. Let the scaled score for person i in school j of respondent type r on domain d be given by SS_{ijrd}. Respondent types can either be s for student, t for classroom teachers, or f for non-instructional staff.
2. **Calculating school-level scores on each domain for each respondent type.** We took the average across individuals within a respondent type and domain for a given school to calculate school-level scores on each domain for each respondent type:

$$\overline{SS}_{jrd} = \sum_{i=1}^{N_{jrd}} w_{ijrd}^{indiv} SS_{ijrd},$$

where N_{jrd} could differ across domains for a given respondent type and school, and w_{ijrd} is the weight that each respondent receives and is constructed so that $\sum_{i=1}^{N_{jrd}} w_{ijrd}^{indiv} = 1$.

Ideally, the school level scores for each respondent type should be weighted by nonresponse weights to adjust for nonresponse patterns that might be different across schools. The existing data, however, did not have identifiers that can link to administrative data that provide information about student and staff characteristics to create nonresponse weights. Therefore, all respondents of a given type were weighted equally in our analyses $(w_{ijrd} = 1/N_{jrd})$.

3. **Calculating the overall school-level index for each respondent type.** We then averaged across each of the domains to create the school-level index for each respondent type:[21]

$$\overline{SS}_{jr} = \sum_{d=1}^{D_r} w_{dr}^{domain} \overline{SS}_{jrd},$$

where w_{dr} is the weight that each domain receives, $\sum_{d=1}^{D_r} w_{dr}^{domain} = 1$, and D_r is the number of domains for each respondent type.

In discussion with PDE, we decided to weight the domains equally $(w_{dr}^{domain} = 1/D_r)$.

4. **Calculating the overall school-level index across respondent types.** We averaged the respondent-specific school-level index across the respondent types to form the school-level overall index:

$$\overline{SS}_{j} = w_s^{resp} \overline{SS}_{js} + w_t^{resp} \overline{SS}_{jt} + w_f^{resp} \overline{SS}_{jf},$$

where w_s^{resp}, w_t^{resp}, or w_f^{resp} is the weight that respondent type r receives.

In discussion with PDE, we decided to weight the respondent types by the proportions of students and staff in the school population. We calculated the proportions of students and staff in each school using PDE administrative enrollment data.

5. **Calculating the scores for each domain across respondent types.** We also calculated the school-level scores for each domain, which is the average of the school-level domain scores across respondent types:

$$\overline{SS}_{jd} = w_s^{resp} \overline{SS}_{jds} + w_t^{resp} SS_{jdt} + w_f^{resp} SS_{jdf}$$

where w_s^{resp}, w_t^{resp}, or w_f^{resp} is the weight that respondent type r receives. Similar to the overall school-level index, we weighted the respondent types by the proportion of students/staff in the school population. These are sub-indices that can be used to identify strength and weakness of school climate for a specific school.

[21] The elementary school survey items have fewer response categories and cannot be rescaled the same way as other surveys. Therefore, elementary school survey will be excluded from the overall index calculation in this round, but it can be included in the index for future surveys because of the planned revision.

Exhibit B.8. Decisions about weighting for the index scores

Weight	Decision
Weights for individual respondents	Weight individual respondents equally
Weights for domains	Weight domains equally
Weights for respondent types (students, classroom teachers, non-instructional staff)	Weight respondent types based on the proportion of students, classroom teachers, and non-instructional staff in the school population

APPENDIX B.a. Infit and outfit statistics for items in each of the surveys in each year

Exhibit B.a.1. Infit and outfit statistics for middle school student survey items, 2017/2018

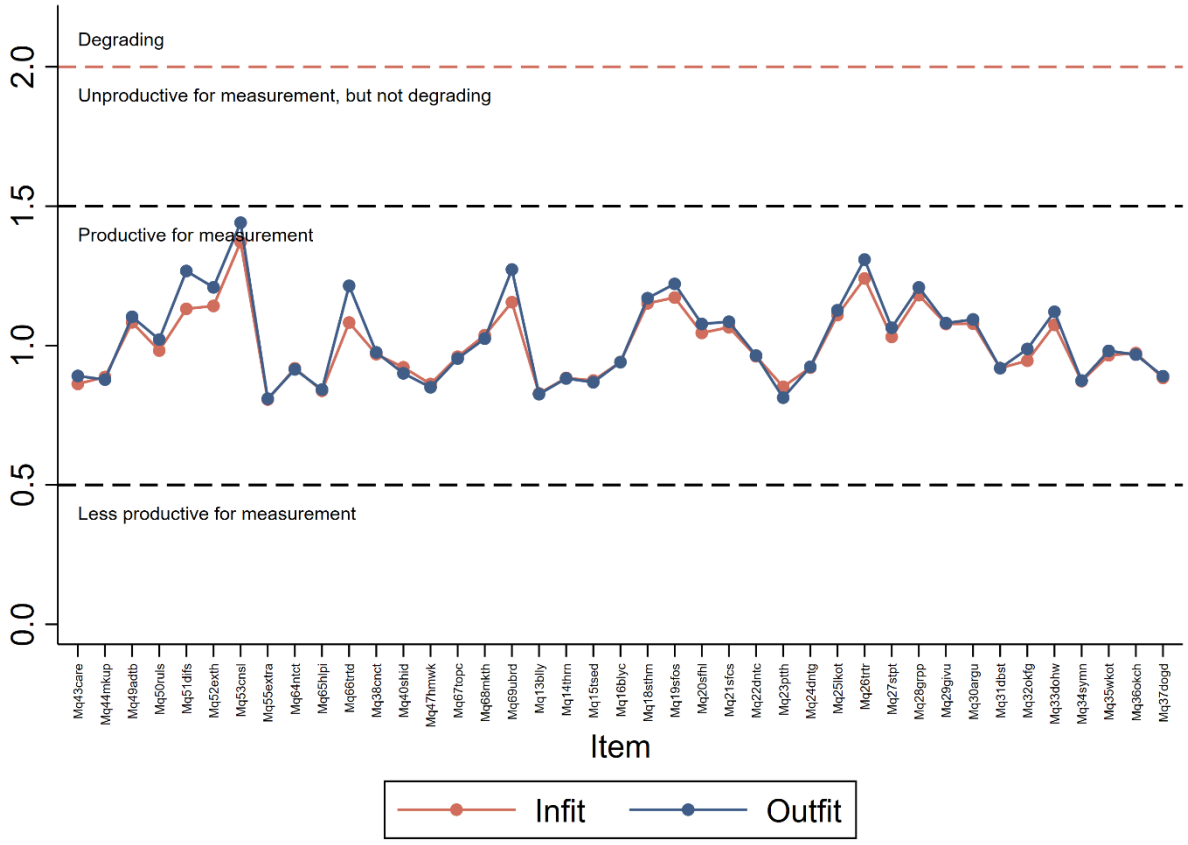


Exhibit B.a.2. Infit and outfit statistics for high school student survey items, 2017/2018

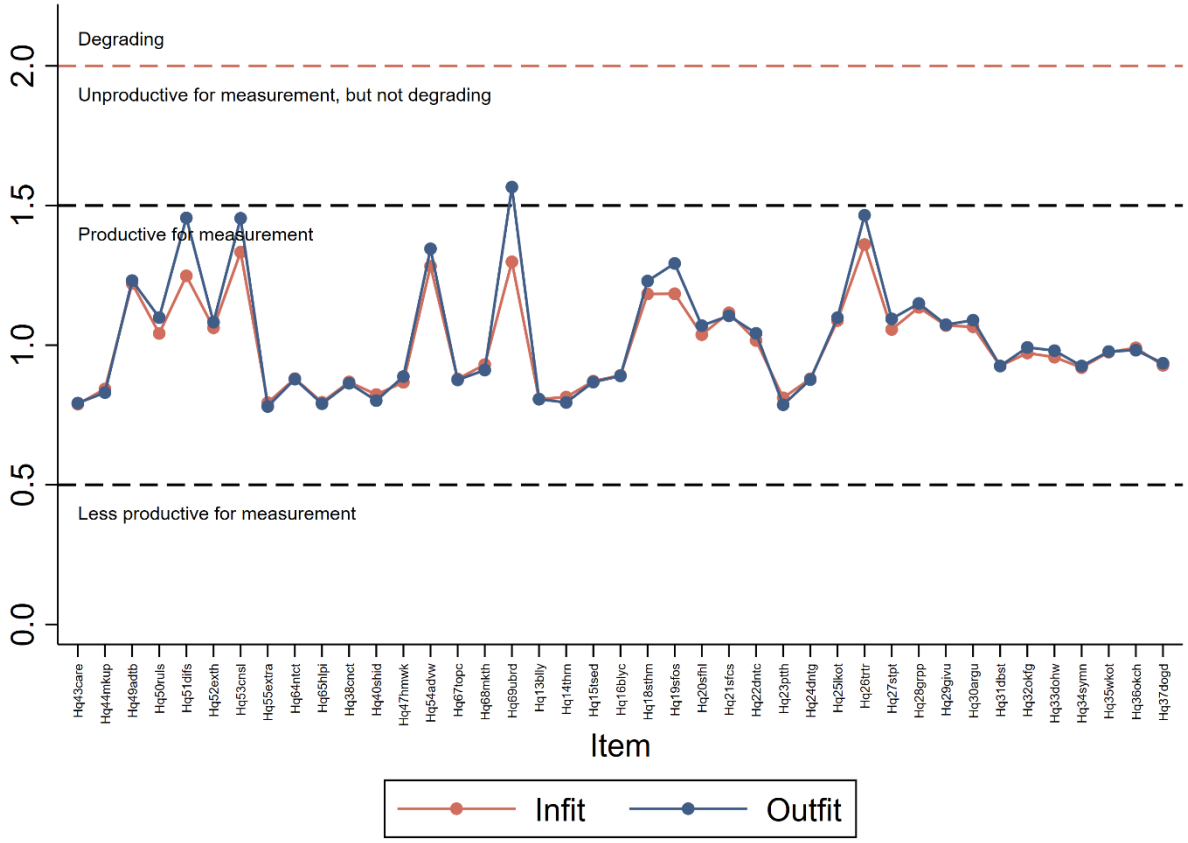


Exhibit B.a.3. Infit and outfit statistics for staff (classroom teacher) survey items, 2016/2017

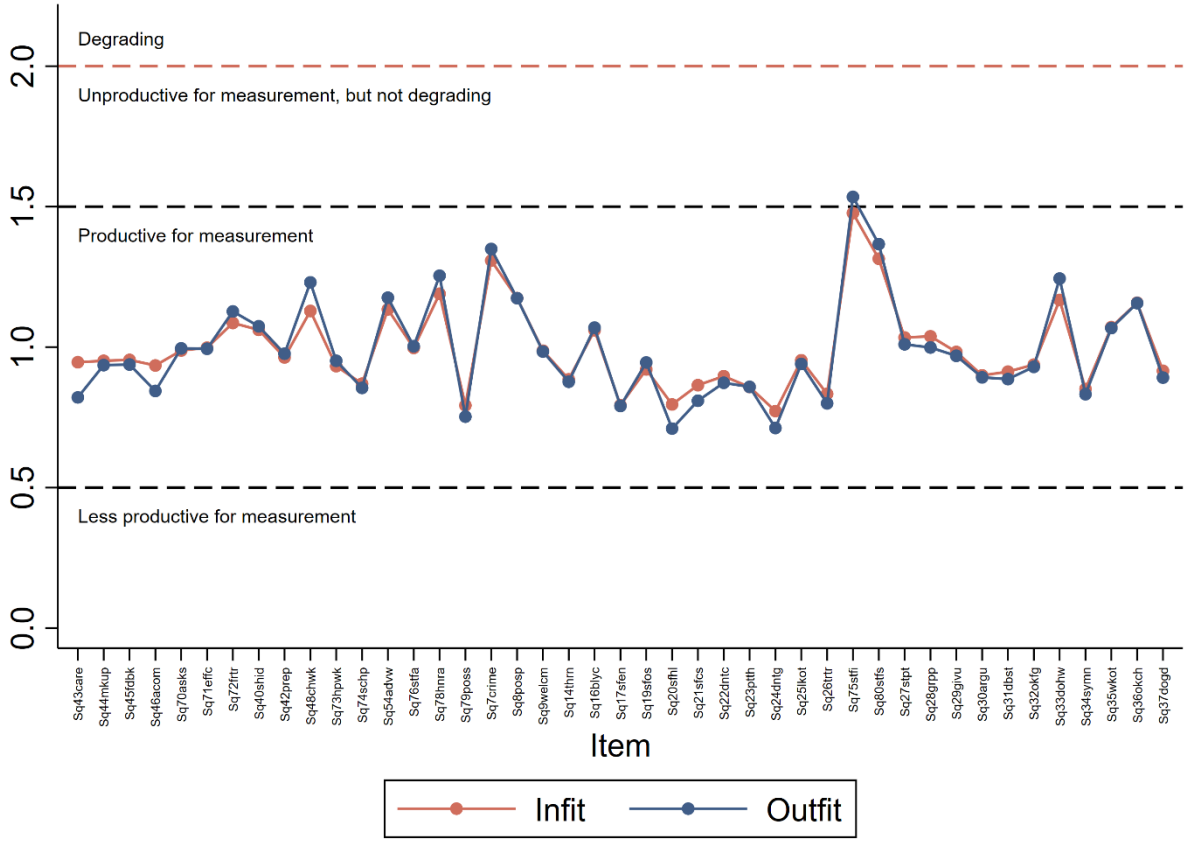


Exhibit B.a.4. Infit and outfit statistics for staff (classroom teacher) survey items, 2017/2018

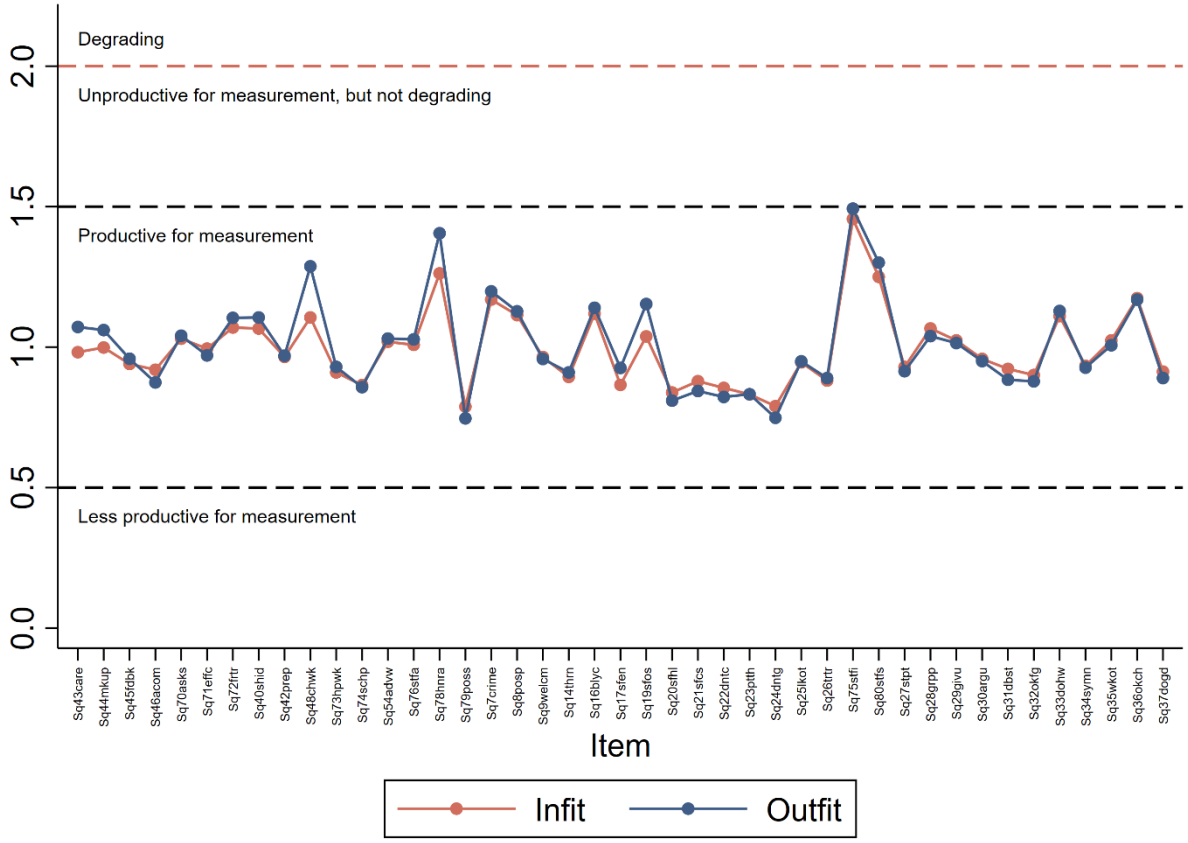


Exhibit B.a.5. Infit and outfit statistics for (non-instructional) staff survey items, 2016/2017

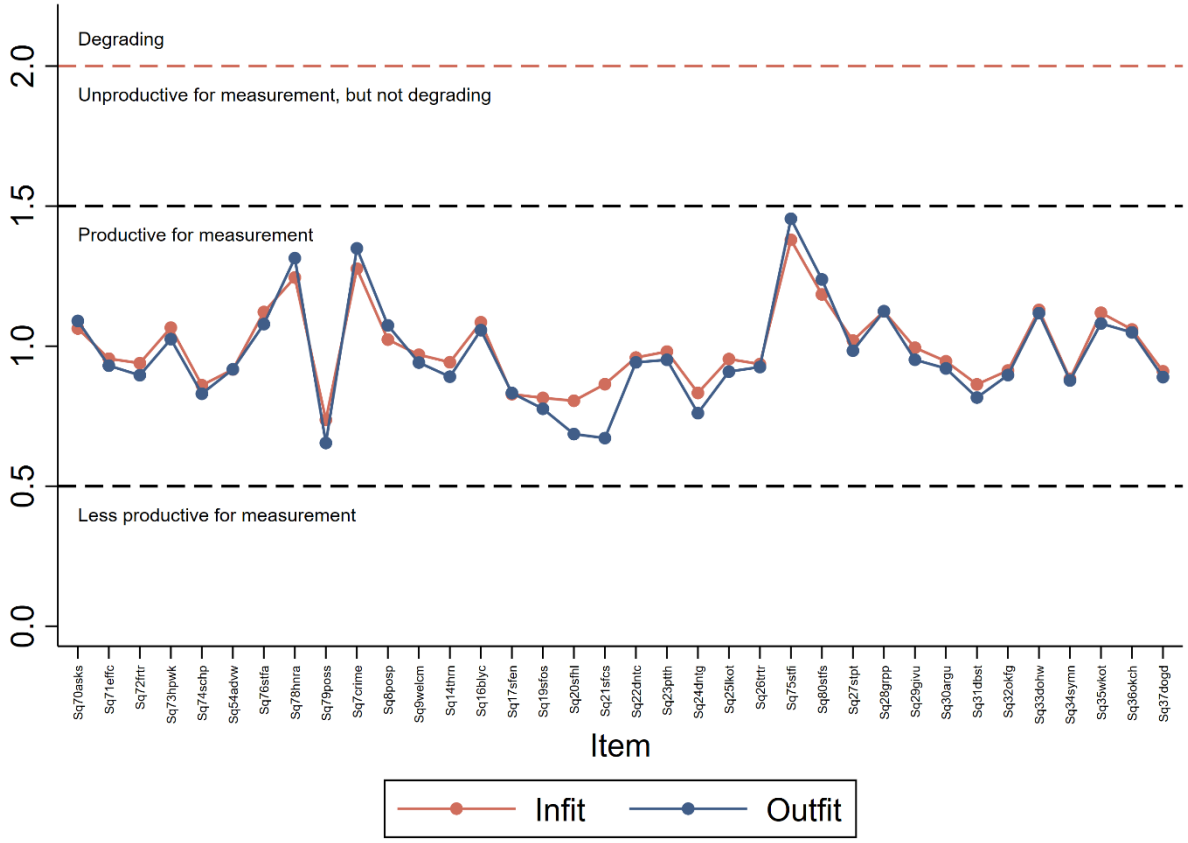


Exhibit B.a.6. Infit and outfit statistics for (non-instructional) staff survey items, 2017/2018

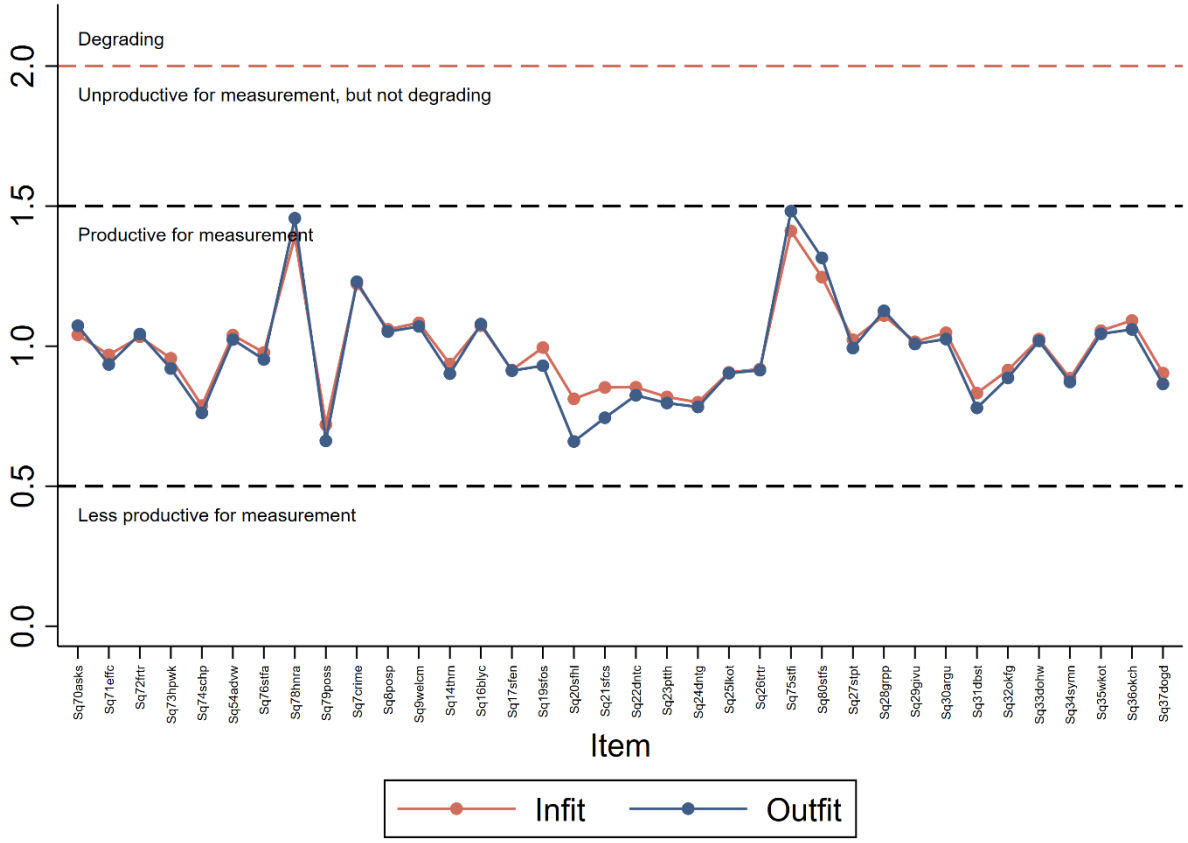


Exhibit B.a.7. Infit and outfit statistics for elementary school student survey items, 2016/2017

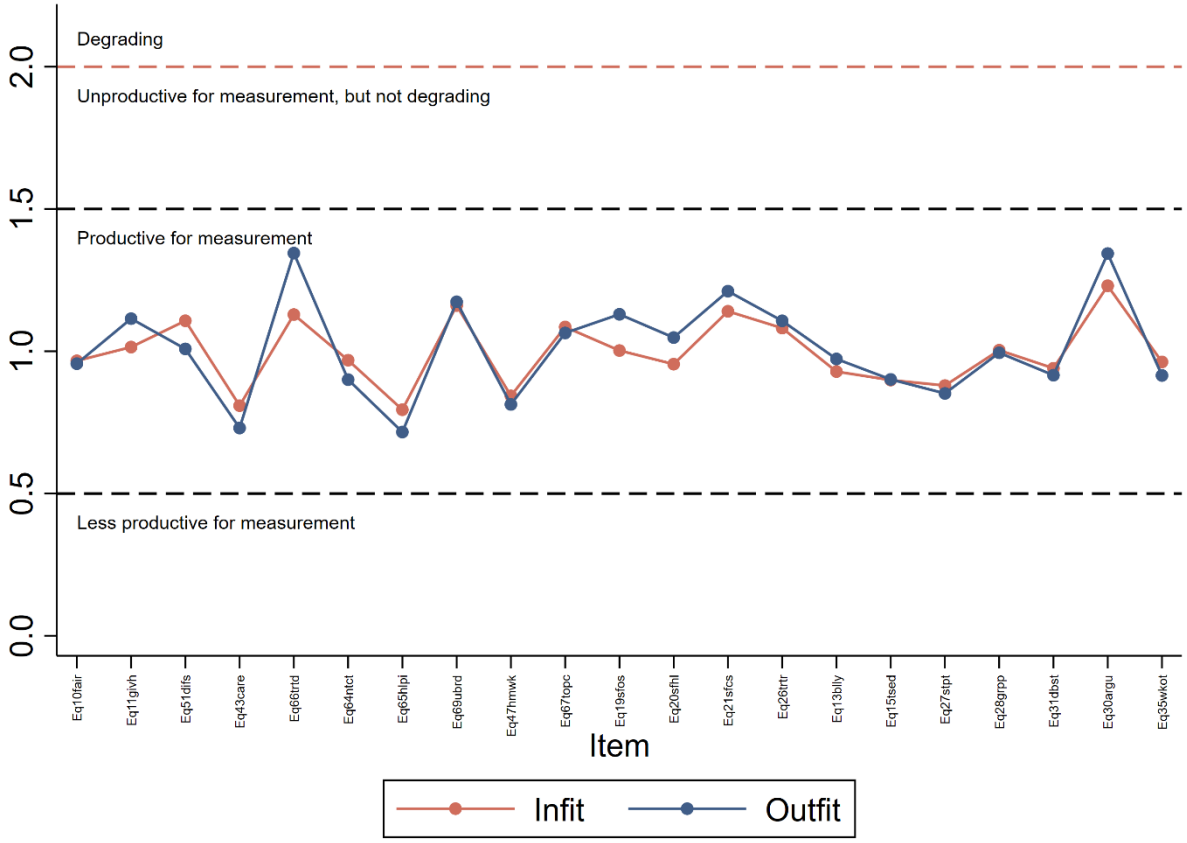
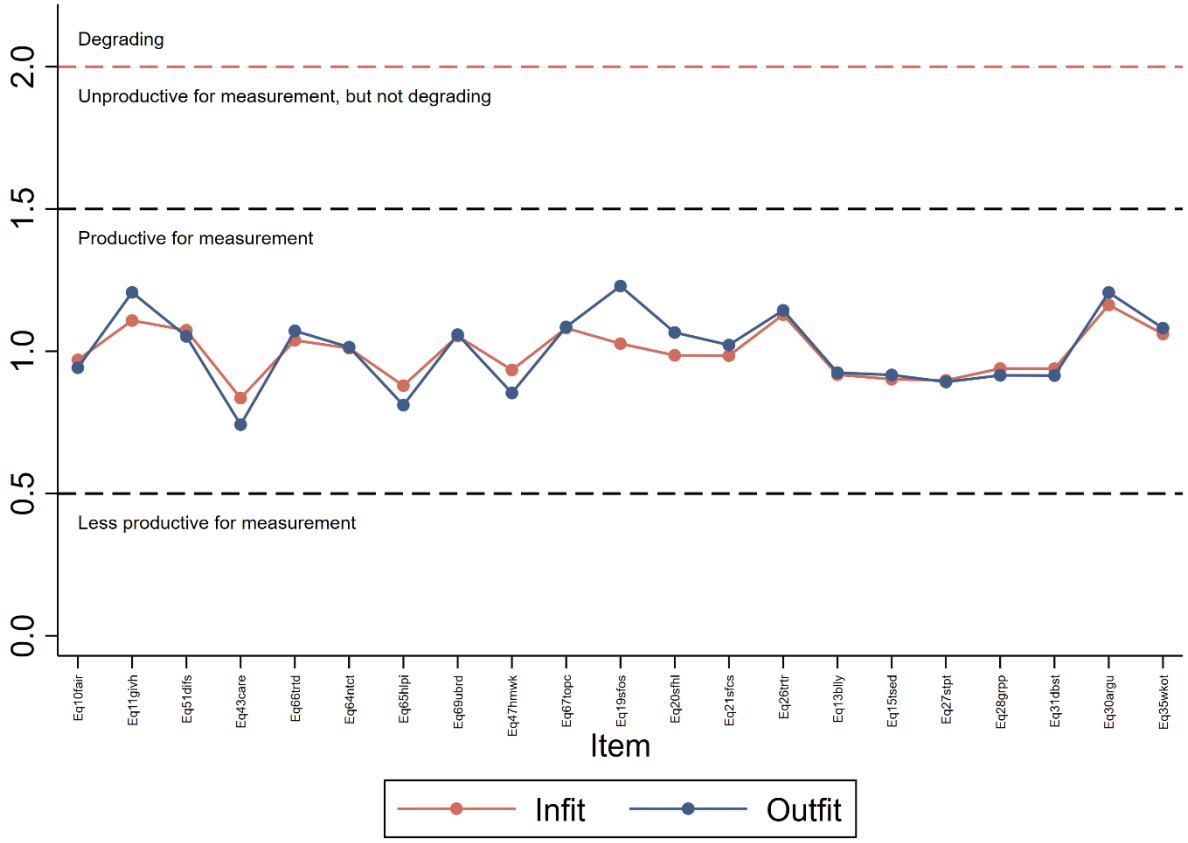


Exhibit B.a.8. Infit and outfit statistics for elementary school student survey items, 2017/2018



APPENDIX B.b. Step values of the items for each of the surveys in each year

Exhibit B.b.1. Step values for the middle school student survey, 2017/2018

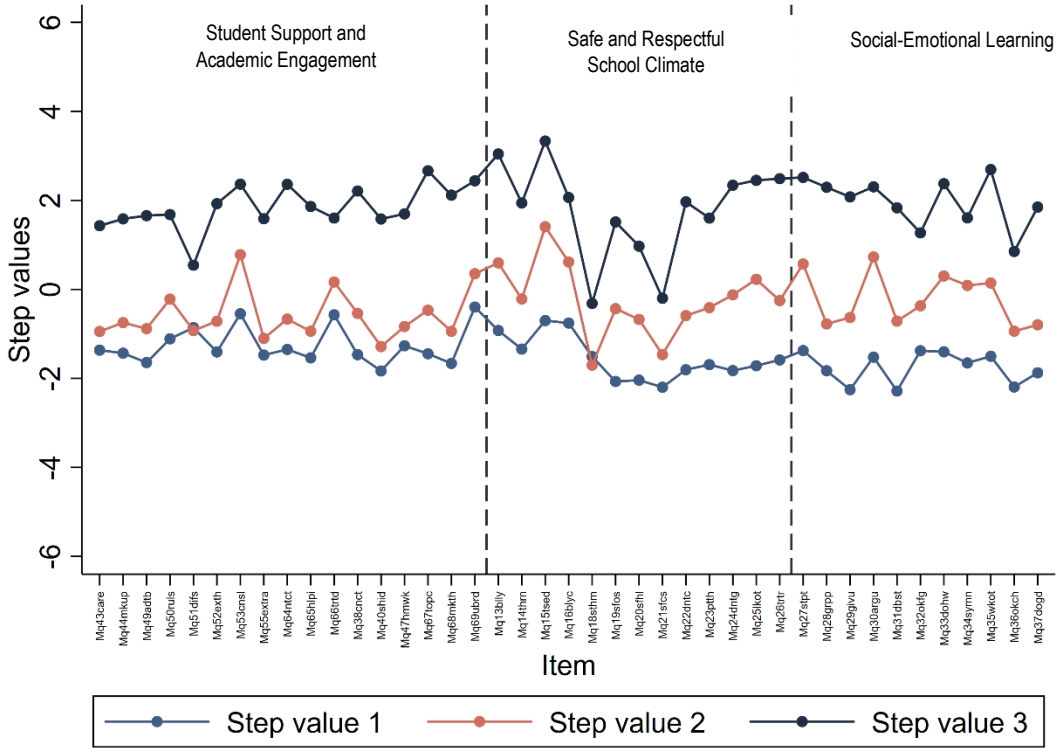


Exhibit B.b.2. Step values for the high school student survey, 2017/2018

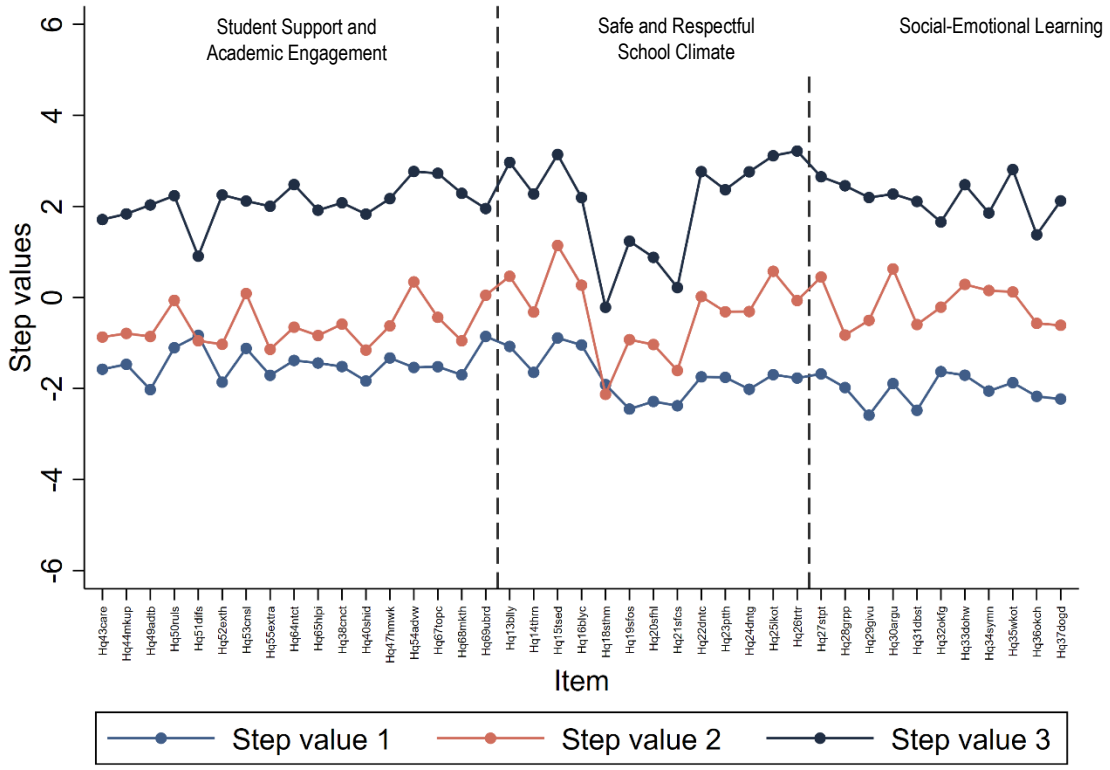


Exhibit B.b.3. Step values for staff (classroom teacher) survey, 2016/2017

Exhibit B.b.4. Step values for staff (classroom teacher) survey, 2017/2018

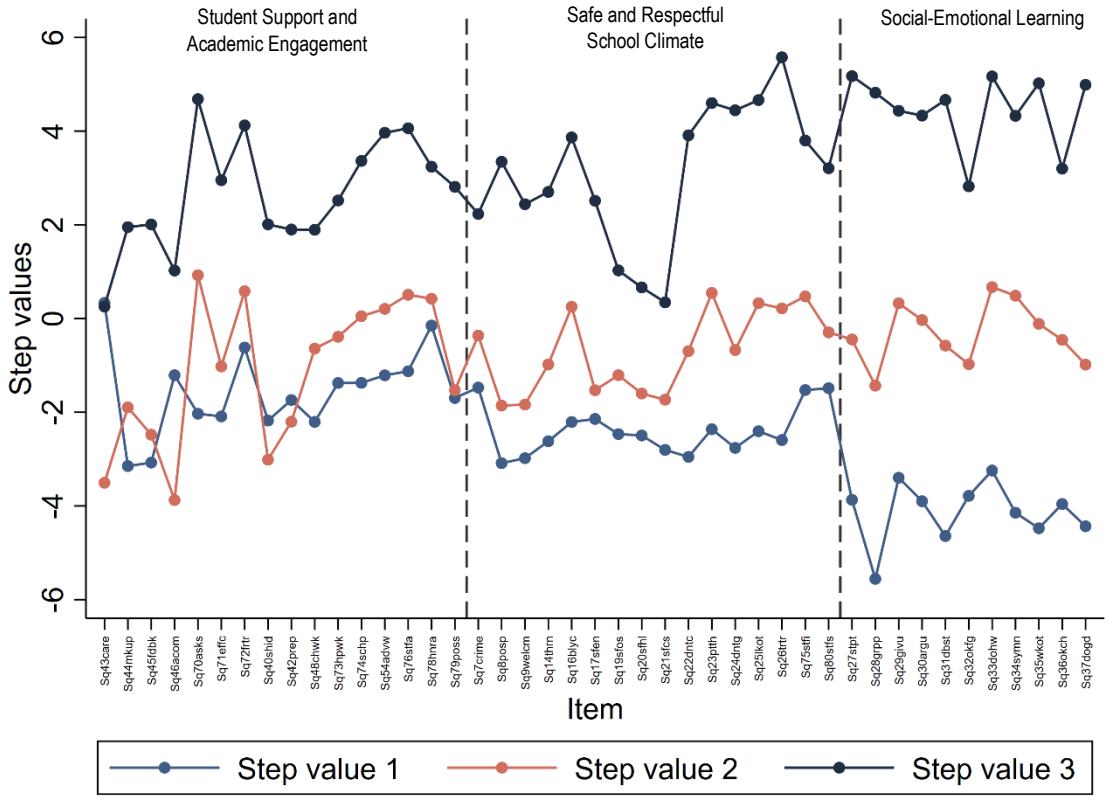


Exhibit B.b.5. Step values for staff (non-instructional staff) survey, 2016/2017

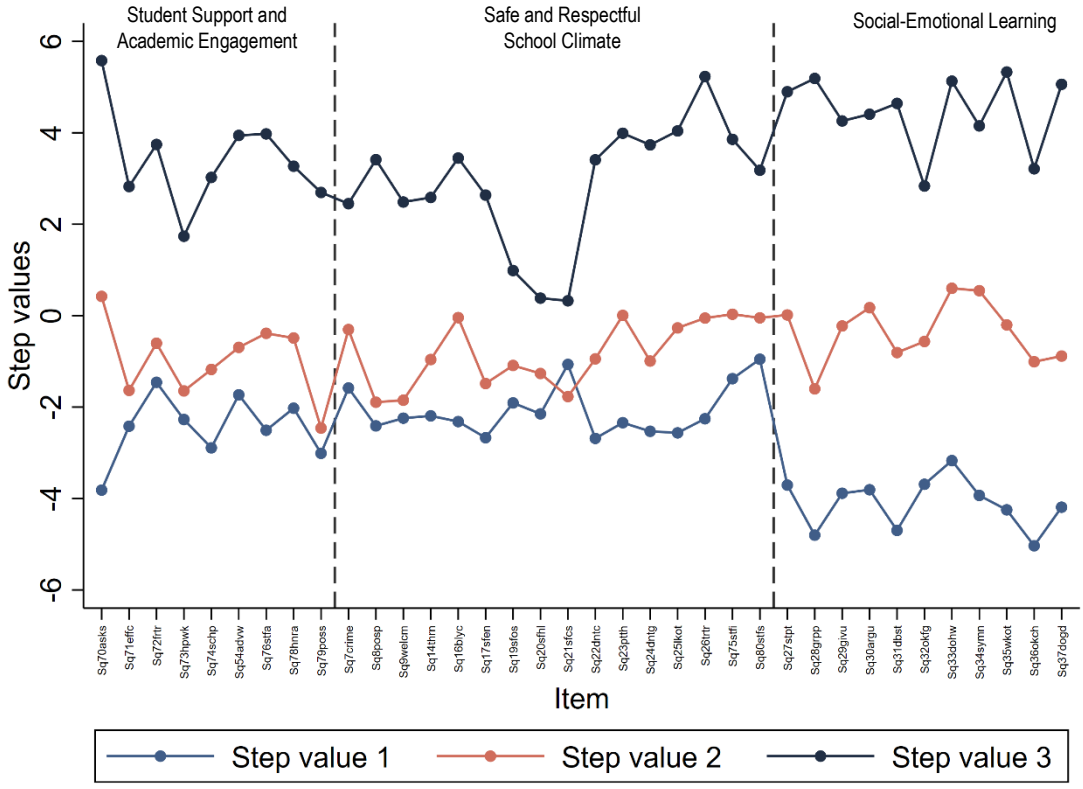


Exhibit B.b.6. Step values for staff (non-instructional staff) survey, 2017/2018

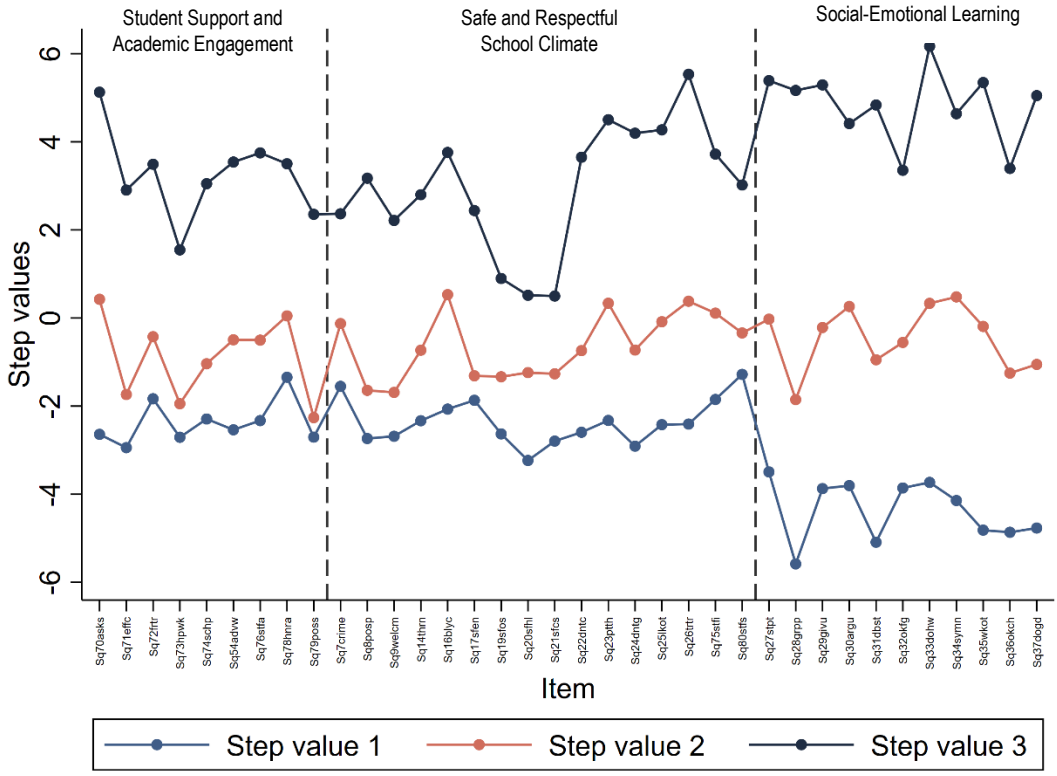


Exhibit B.b.7. Step values for the elementary school student survey, 2016/2017

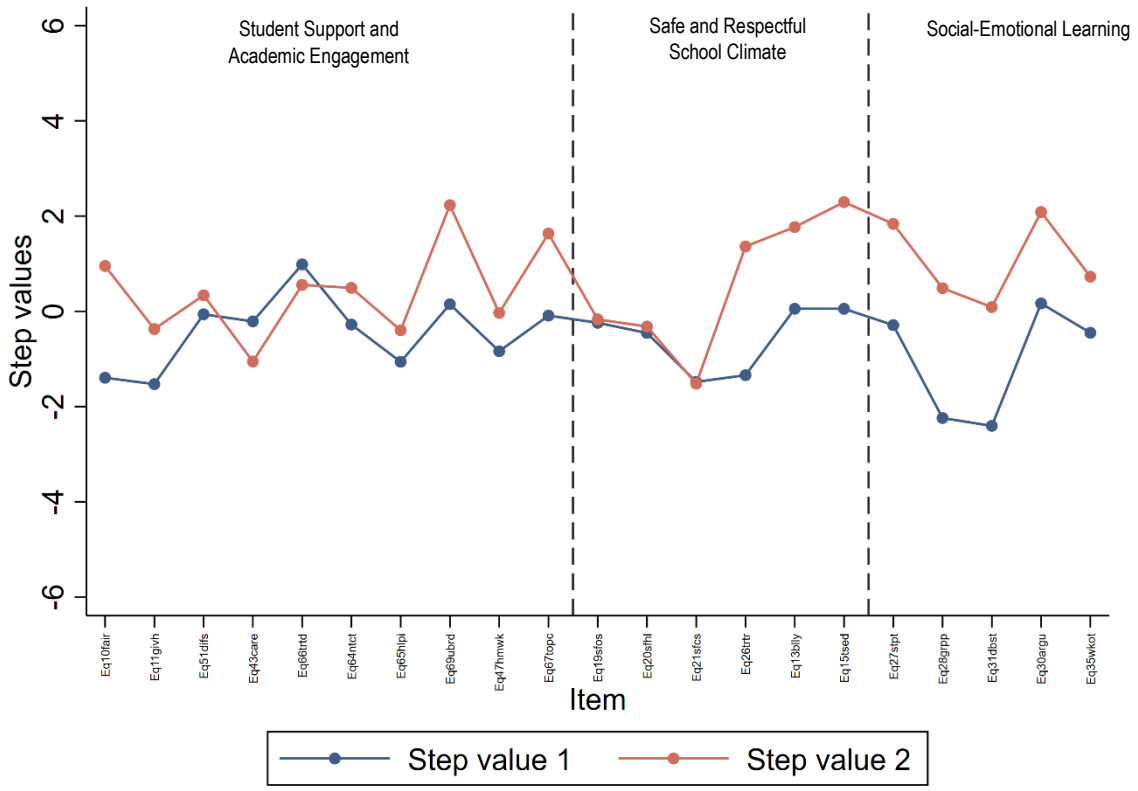
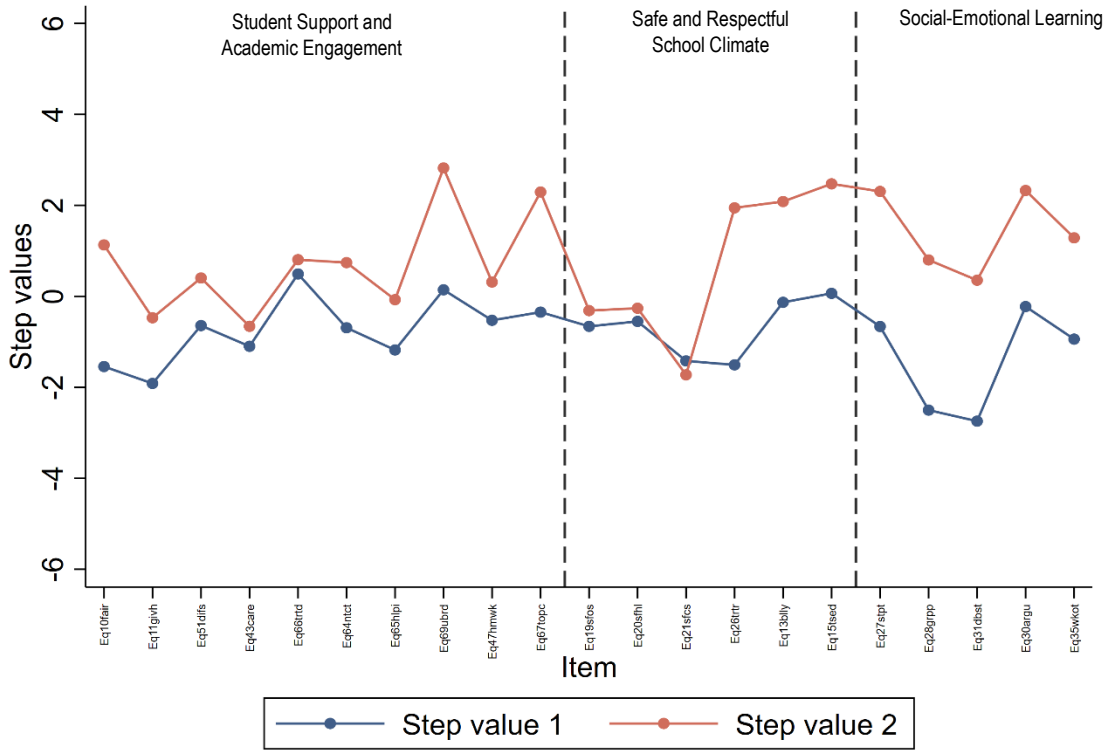


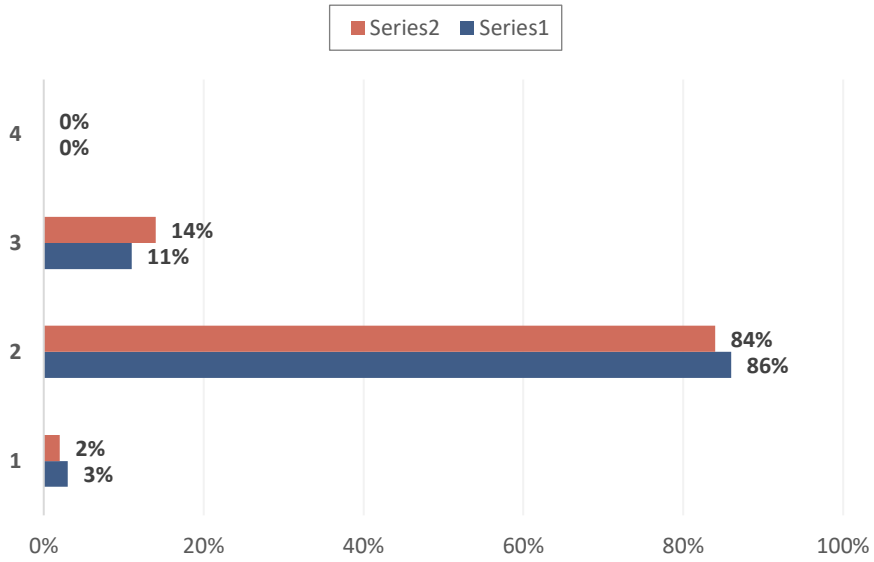
Exhibit B.b.8. Step values for the elementary school student survey, 2017/2018



APPENDIX C. Results of school climate scores based on the mean score approach

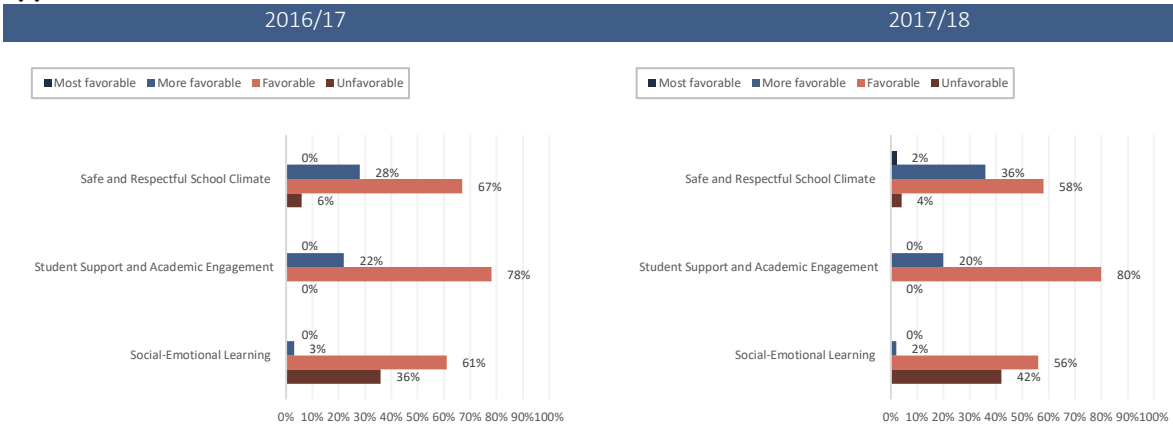
This appendix includes results of school climate scores based on the mean score approach. The scores are for schools that have all three types of respondents.

Exhibit C.1. Percentage of schools that fall into each overall school climate index category by school year, mean score approach



Note: The overall school climate index scores are based on 36 schools in 2016/17 and 50 schools in 2017/18, excluding elementary schools.

Exhibit C.2. Percentage of schools that fall into different levels of scores by domain, mean score approach



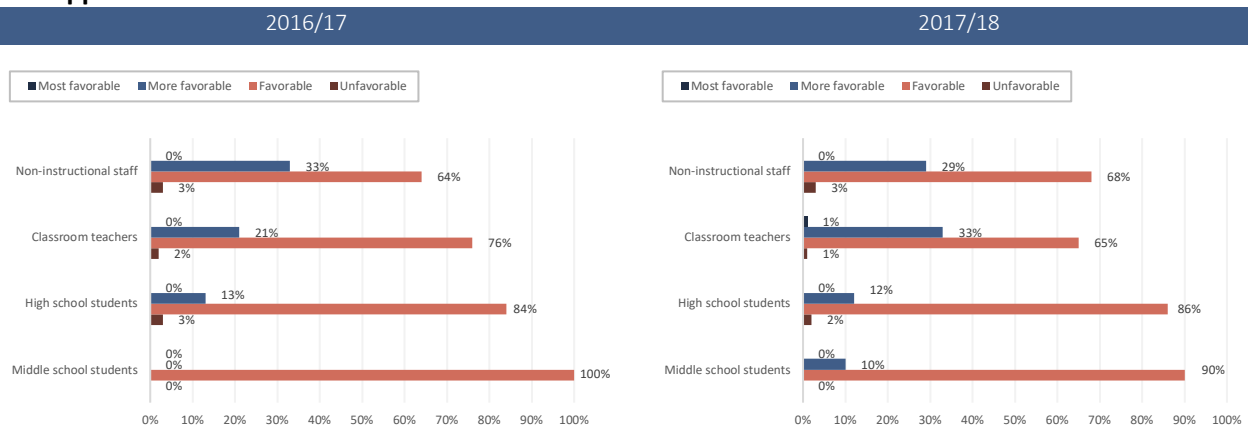
Note: The domain scores are based on 36 schools in 2016/17 and 50 schools in 2017/18, excluding elementary schools.

Exhibit C.3. Mean school climate index scores based on mean scores, by year

Index/domain score	2016/17 Mean (SD)	2017/18 Mean (SD)
Overall school climate index	()	()
Domain score for Student Support and Academic Engagement	()	()
Domain score for Safe and Respectful School Climate	()	()
Domain score for Social-Emotional Learning	()	()

Note: Table includes schools that have data for both years (n =), excluding elementary schools.
SD = standard deviation.

Exhibit C.4. Percentage of schools that fall into different levels of index scores by respondent, mean score approach

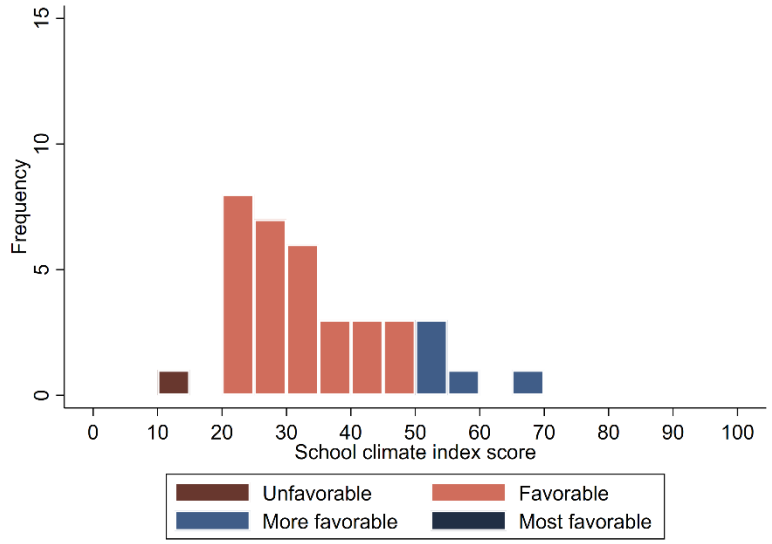


Note: Sample sizes in 2016/17: 23 schools for middle school student survey, 32 schools for high school student survey, 42 schools for classroom teacher survey, and 39 schools for non-instructional staff survey. Sample sizes in 2017/18: 29 schools for middle school student survey, 42 schools for high school student survey, 76 schools for classroom teacher survey, and 69 schools for non-instructional staff survey.

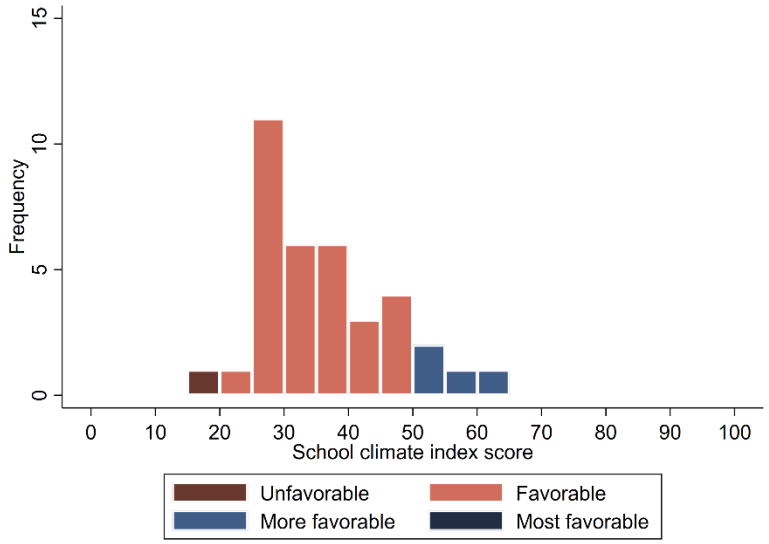
APPENDIX D. Distributions of the overall school climate index scores and scores by domain

This appendix includes the histograms for the distributions of the overall index scores and scores by domain for each survey year. These scores are for schools that have all three types of respondents.

Exhibit D.1. Distribution of the overall school climate index scores, 2016/17 (n = schools)

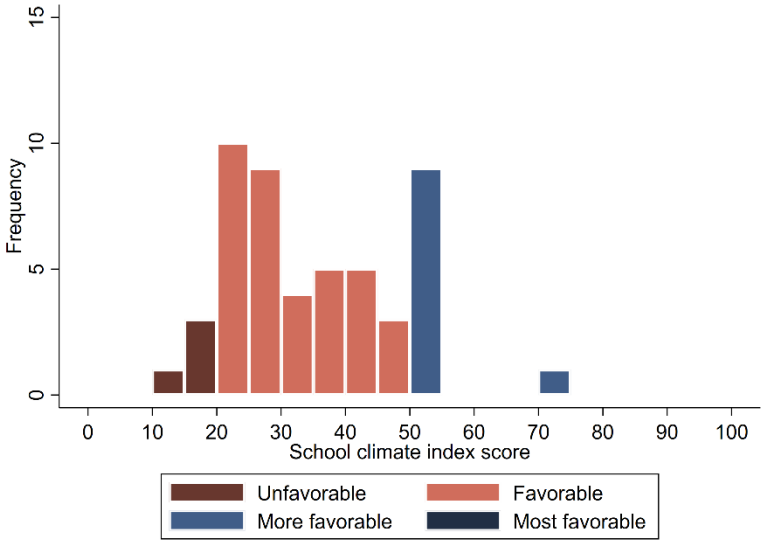


Overall school index based on Rasch scores

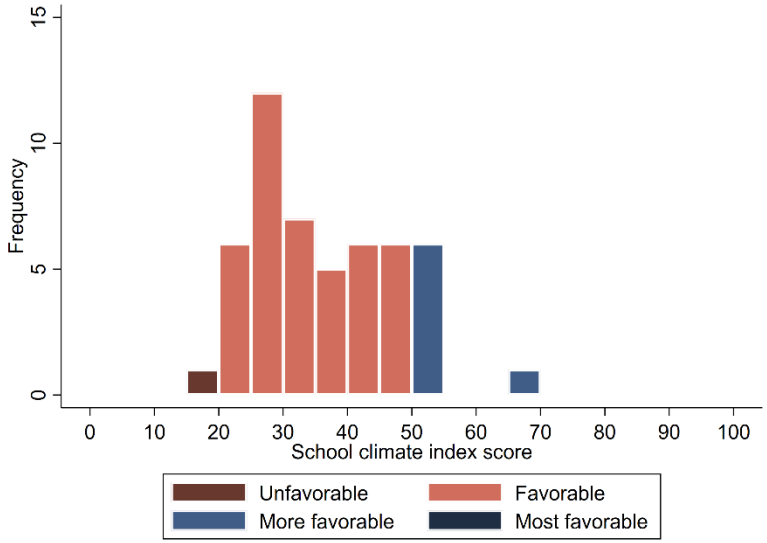


Overall school index based on mean scores

Exhibit D.2. Distribution of the overall school climate index scores, 2017/18 (n = schools)

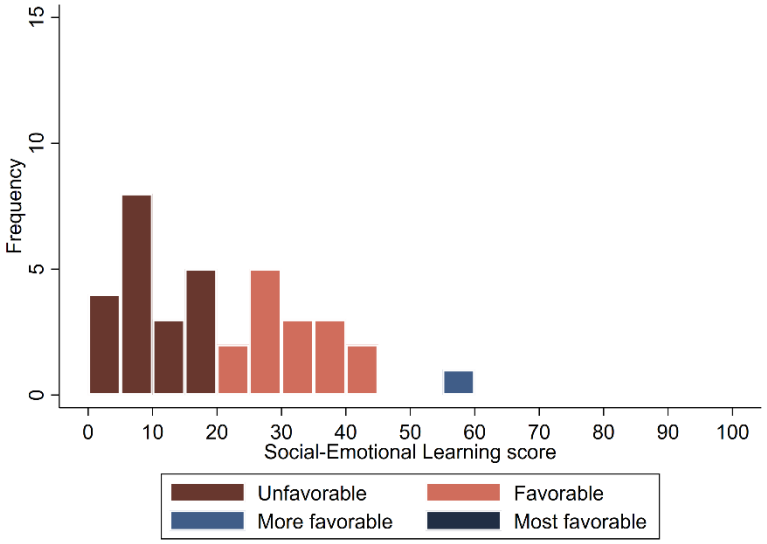


Overall school index based on Rasch scores

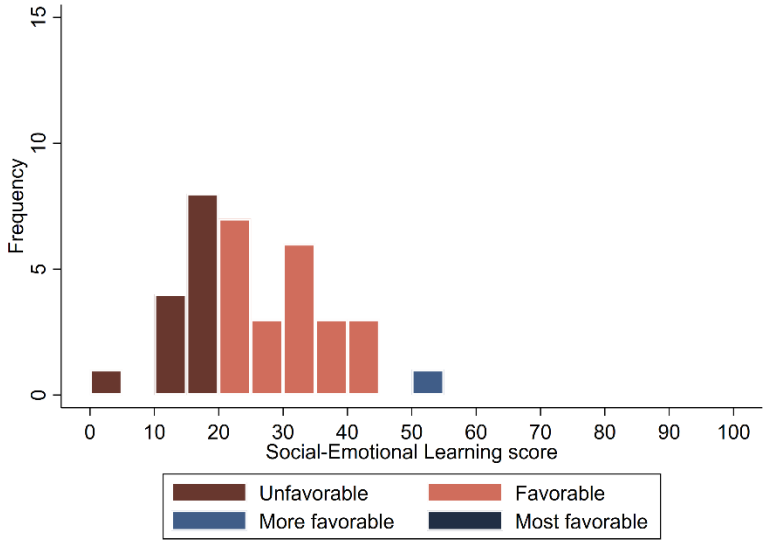


Overall school index based on mean scores

Exhibit D.3. Distribution of the Social-Emotional Learning scores, 2016/17 (n = schools)

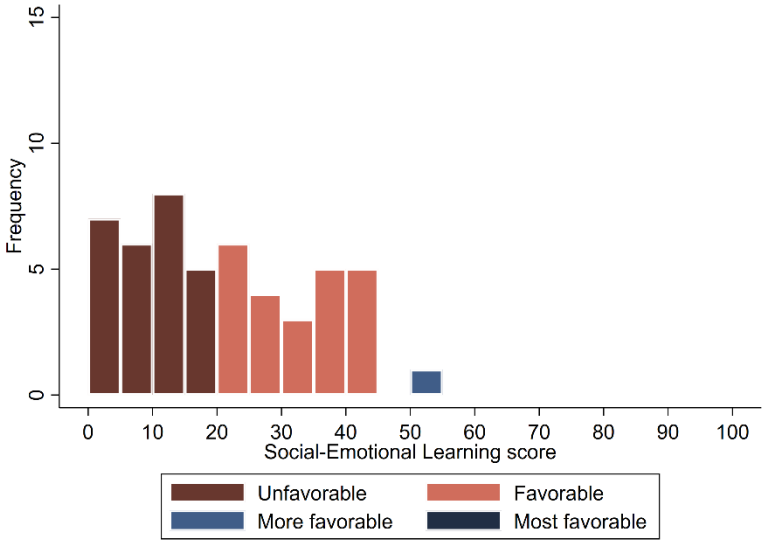


Social-Emotional Learning scores based on Rasch scores

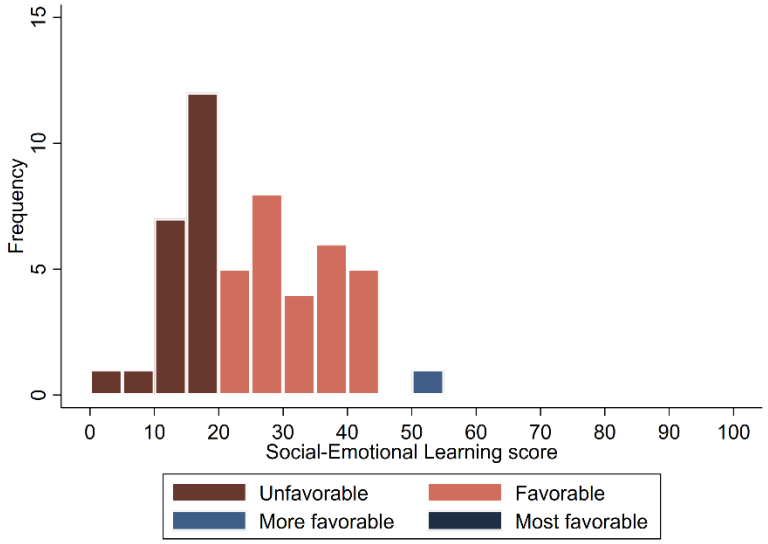


Social-Emotional Learning scores based on mean scores

Exhibit D.4. Distribution of the Social-Emotional Learning sub-index scores for the 2017/18 survey (n = schools)

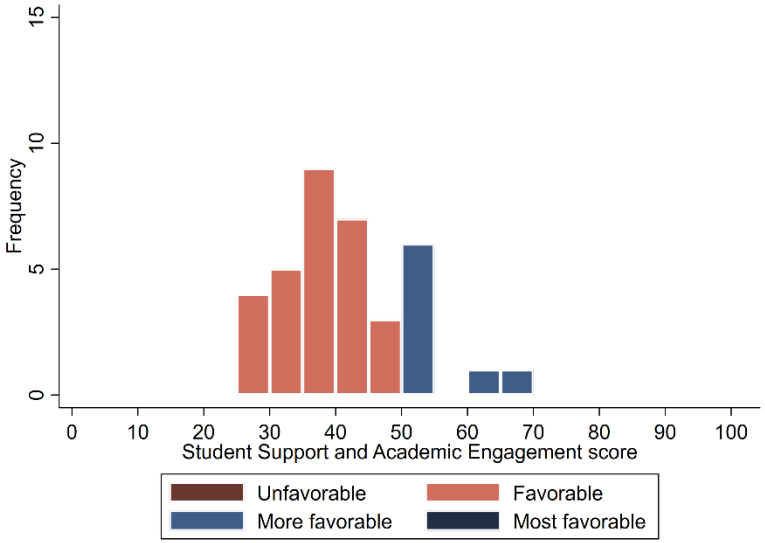


Social-Emotional Learning scores based on Rasch scores

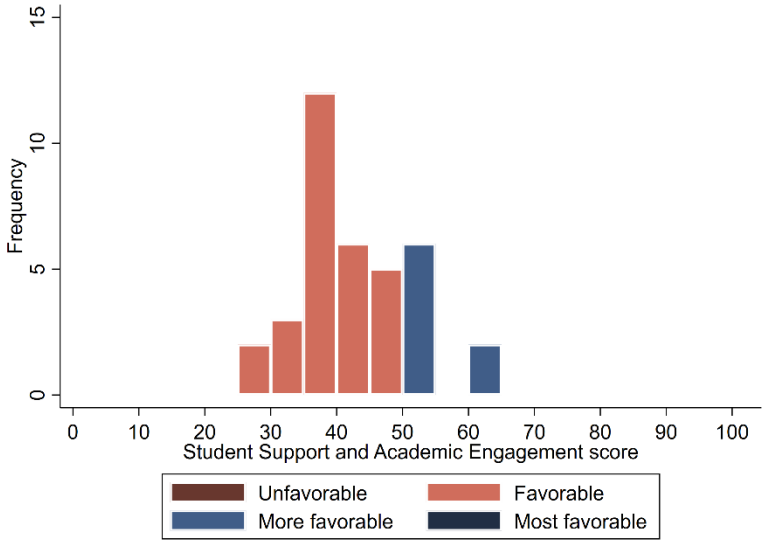


Social-Emotional Learning scores based on mean scores

Exhibit D.5. Distribution of the Student Support and Academic Engagement scores, 2016/17 (n = schools)

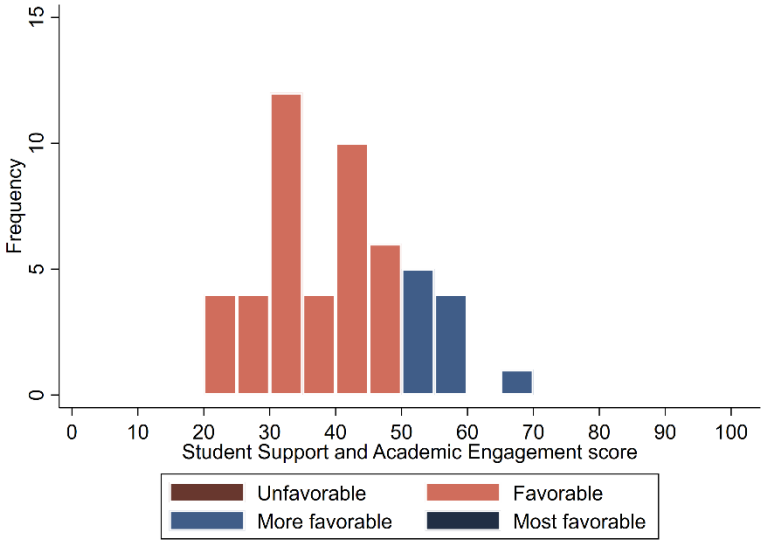


Student Support and Academic Engagement scores based on Rasch

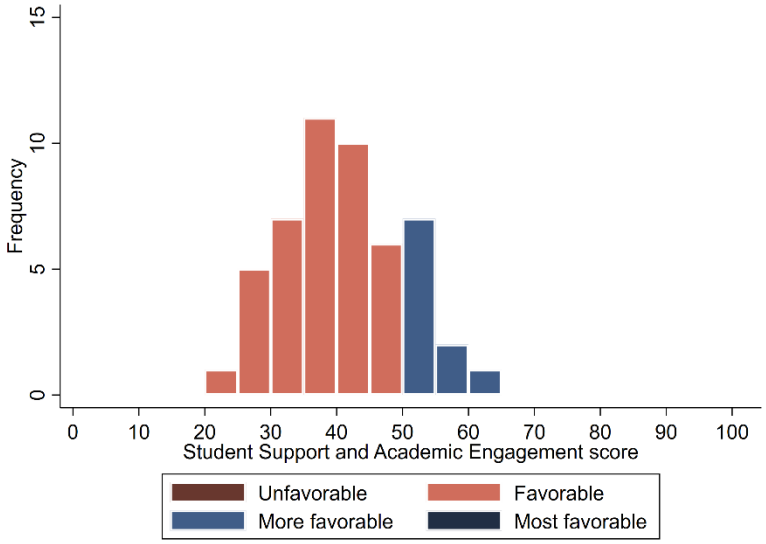


Student Support and Academic Engagement scores based on mean

Exhibit D.6. Distribution of the Student Support and Academic Engagement scores, 2017/18 (n = schools)

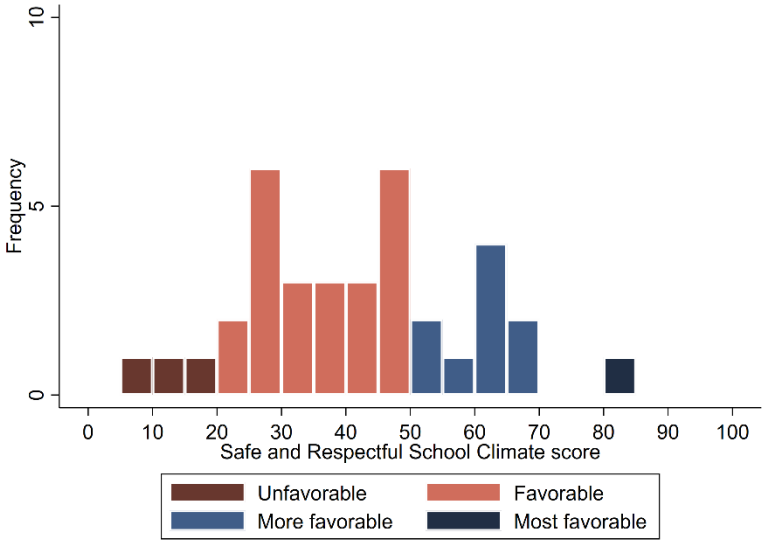


Student Support and Academic Engagement scores based on Rasch

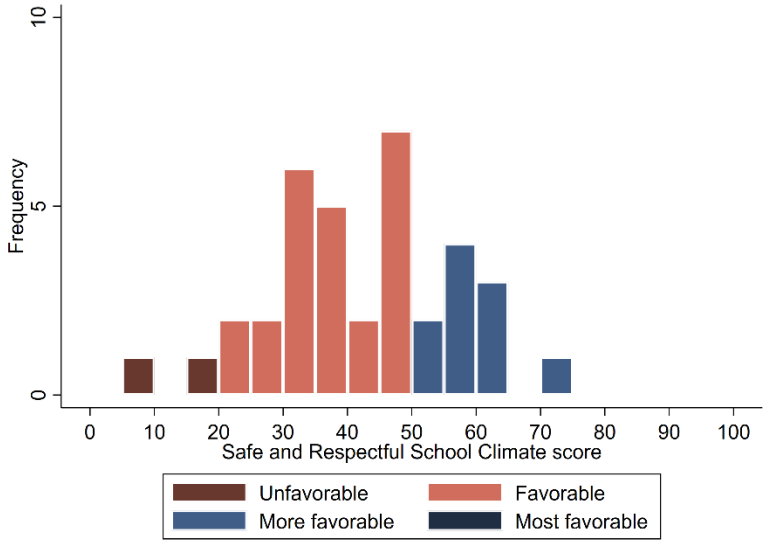


Student Support and Academic Engagement scores based on mean

Exhibit D.7. Distribution of the Safe and Respectful School Climate scores, 2016/17 (n = schools)

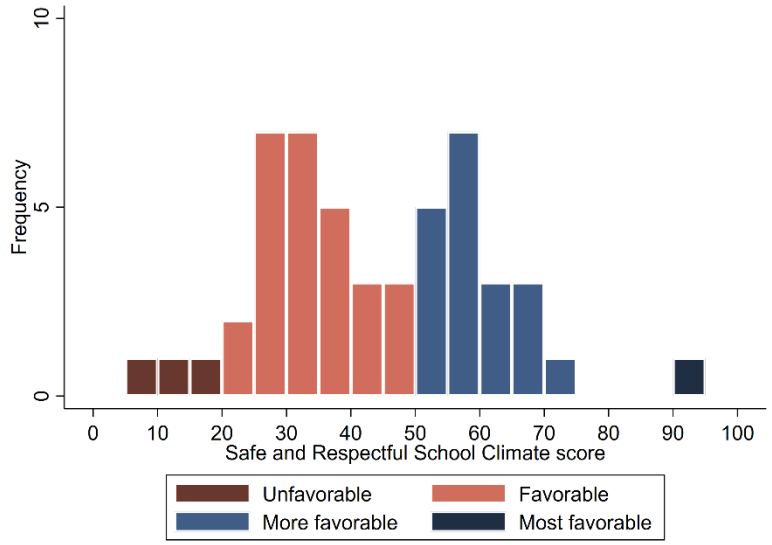


Safe and Respectful School Climate scores based on Rasch scores

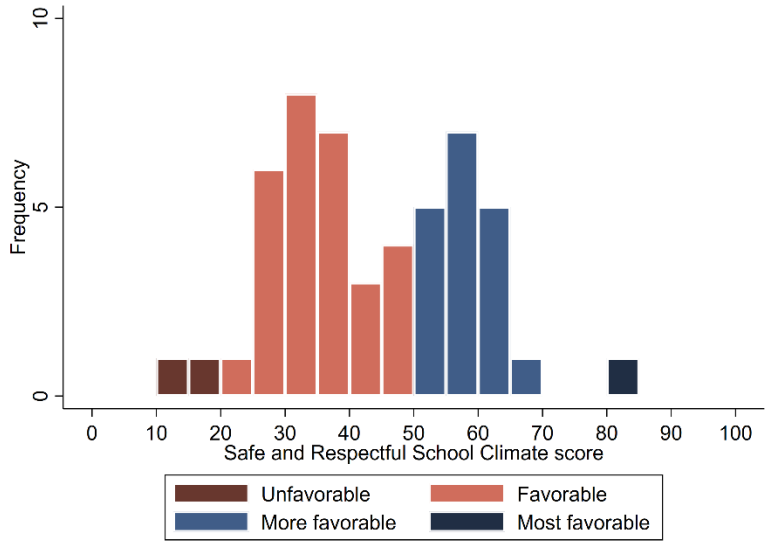


Safe and Respectful School Climate scores based on mean scores

Exhibit D.8. Distribution of the Safe and Respectful School Climate scores, 2017/18 (n = schools)



Safe and Respectful School Climate scores based on Rasch scores



Safe and Respectful School Climate scores based on mean scores

APPENDIX E. Distributions of the across-domain school climate index scores by respondents

This appendix includes the distributions of the across-domain school climate index scores by respondents. These scores are for all schools that have data for the specific respondents.

Exhibit E.1. Percentage of schools that fall into each overall school climate index score category by respondent group, 2016/17

	Based on Rasch scores				Based on mean scores			
Respondent group	Unfavorable	Favorable	More favorable	Most favorable	Unfavorable	Favorable	More favorable	Most favorable
Elementary school students (n =)[a]	na	%	%	na	na	%	%	na
Middle school students (n =)	%	%	%	%	%	%	%	%
High school students (n =)	%	%	%	%	%	%	%	%
Classroom teachers (n=)	%	%	%	%	%	%	%	%
Non-instructional staff (n =)	%	%	%	%	%	%	%	%

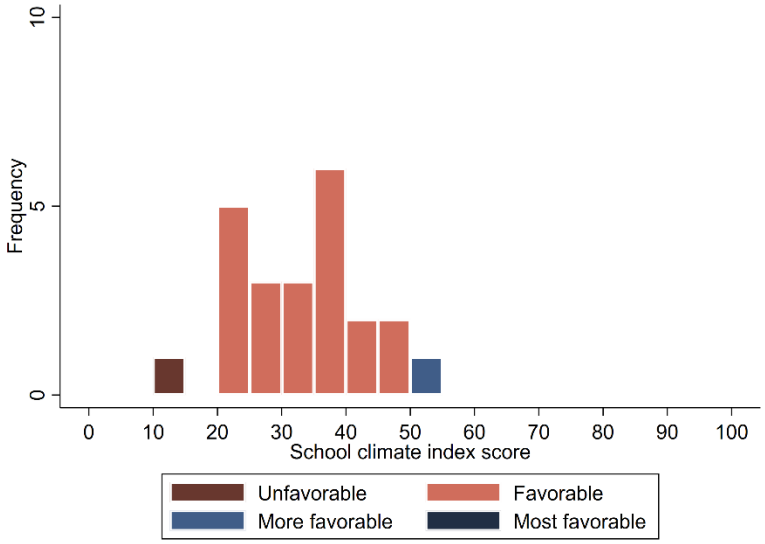
[a] For elementary school survey, there are only two levels: “less favorable” and “more favorable.”
na = not applicable.

Exhibit E.2. Percentage of schools that fall into different levels of school climate index scores by respondent group, 2017/18

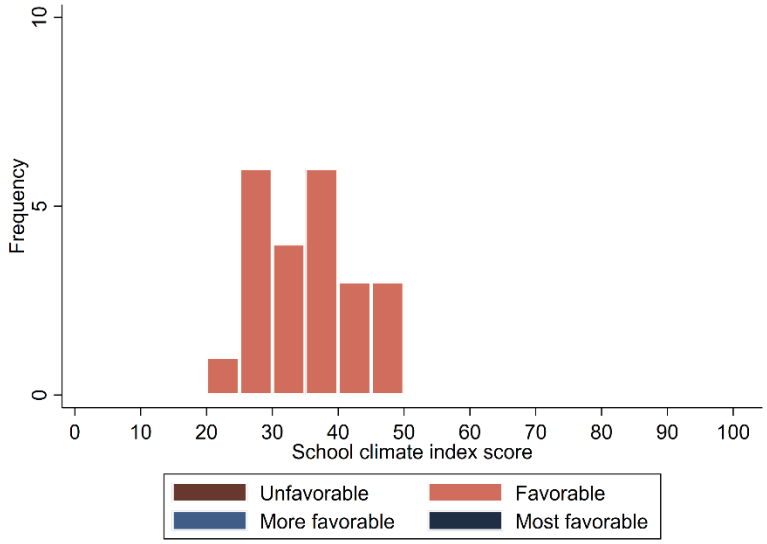
	Based on Rasch scores				Based on mean scores			
Respondent group	Unfavorable	Favorable	More favorable	Most favorable	Unfavorable	Favorable	More favorable	Most favorable
Elementary school students (n =)[a]	na	%	%	na	na	%	%	na
Middle school students (n =)	%	%	%	%	%	%	%	%
High school students (n =)	%	%	%	%	%	%	%	%
Classroom teachers (n=)	%	%	%	%	%	%	%	%
Non-instructional staff (n =)	%	%	%	%	%	%	%	%

[a] For elementary school survey, there are only two levels: “less favorable” and “more favorable.”
na = not applicable.

Exhibit E.3. Distribution of the school climate index scores reported by middle school students, 2016/17 (n = schools)

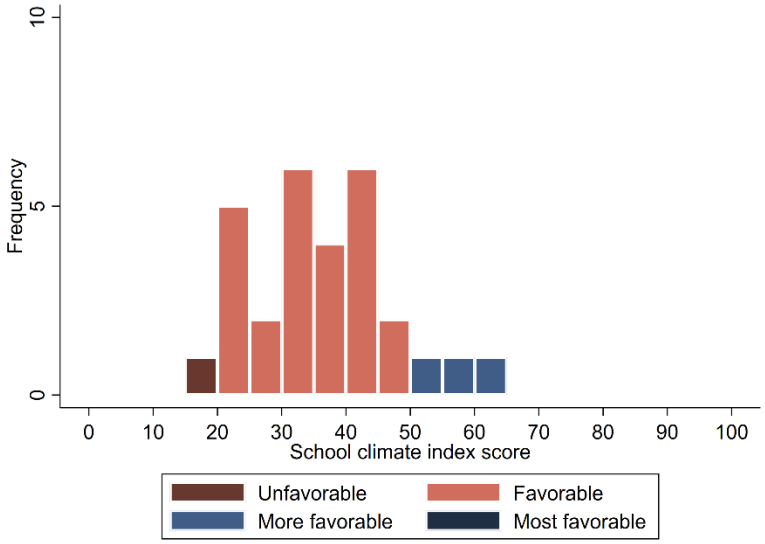


School index scores based on Rasch scores

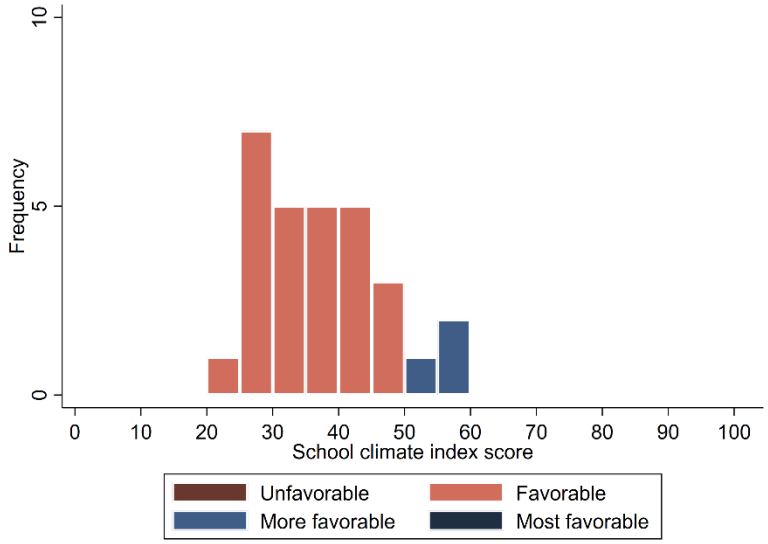


School index scores based on mean scores

Exhibit E.4. Distribution of the school climate index scores reported by middle school students, 2017/18 (n = schools)

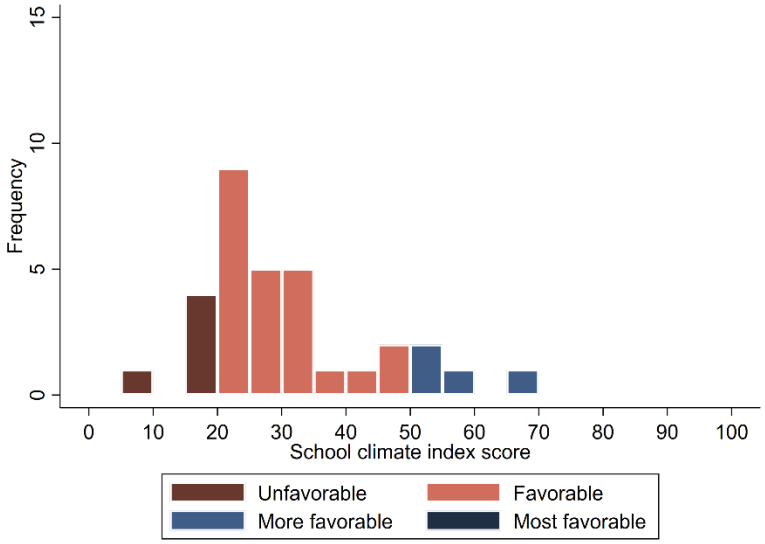


School index scores based on Rasch scores

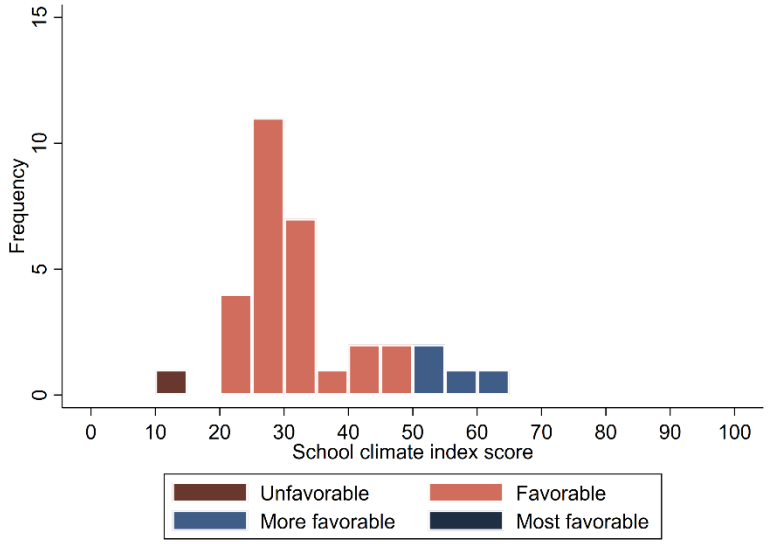


School index scores based on mean scores

Exhibit E.5. Distribution of the school climate index scores reported by high school students, 2016/17 (n = schools)

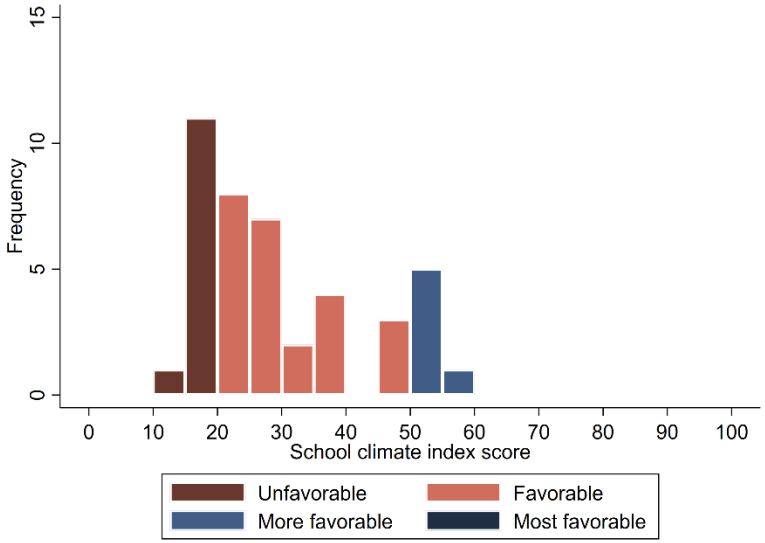


School index scores based on Rasch scores

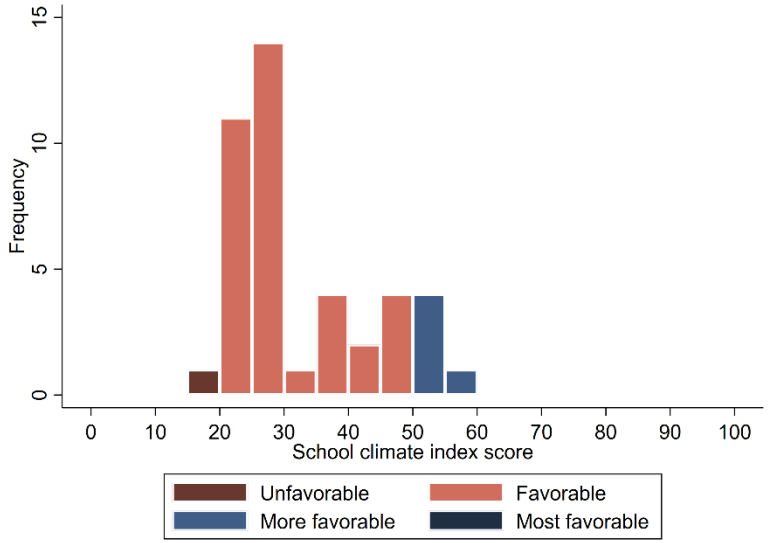


School index scores based on mean scores

Exhibit E.6. Distribution of the school climate index scores reported by high school students, 2017/18 (n = schools)

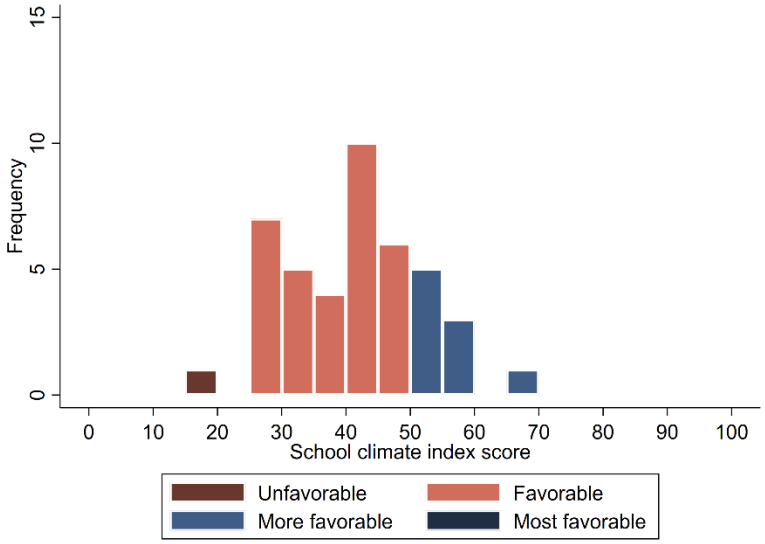


School index scores based on Rasch scores

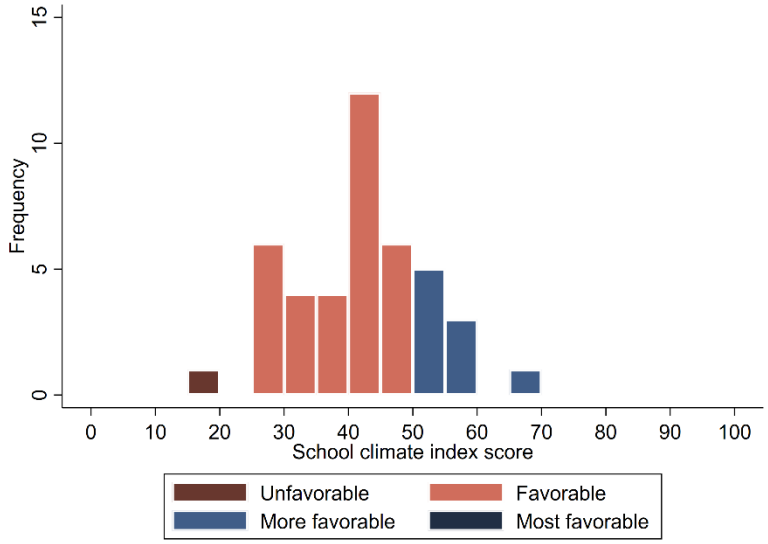


School index scores based on mean scores

Exhibit E.7. Distribution of the school climate index scores reported by classroom teachers, 2016/17 (n = schools)

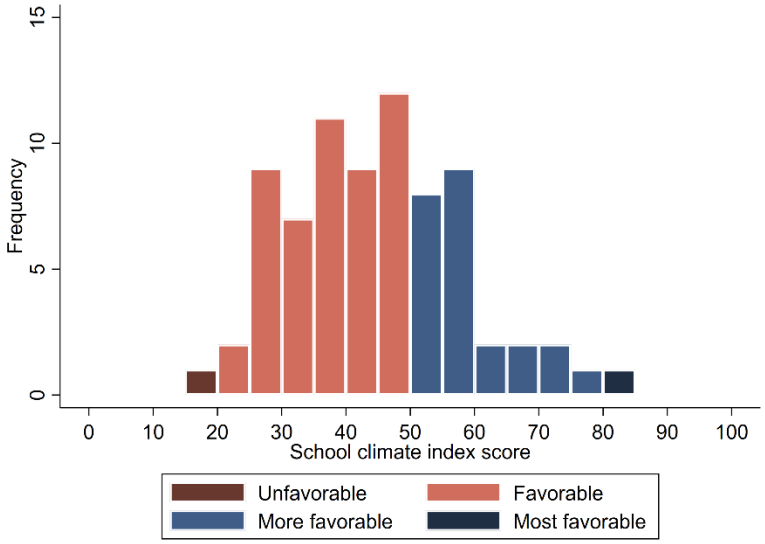


School index scores based on Rasch scores

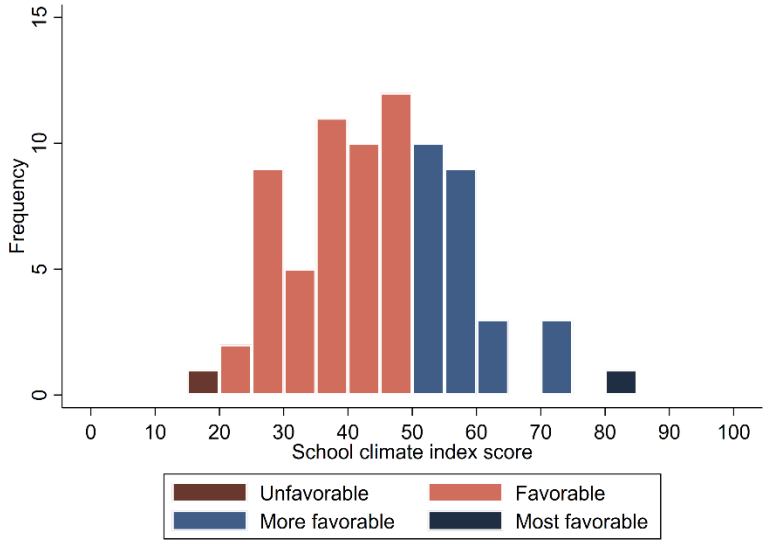


School index scores based on mean scores

Exhibit E.8. Distribution of the school climate index scores reported by classroom teachers, 2017/18 (n = schools)

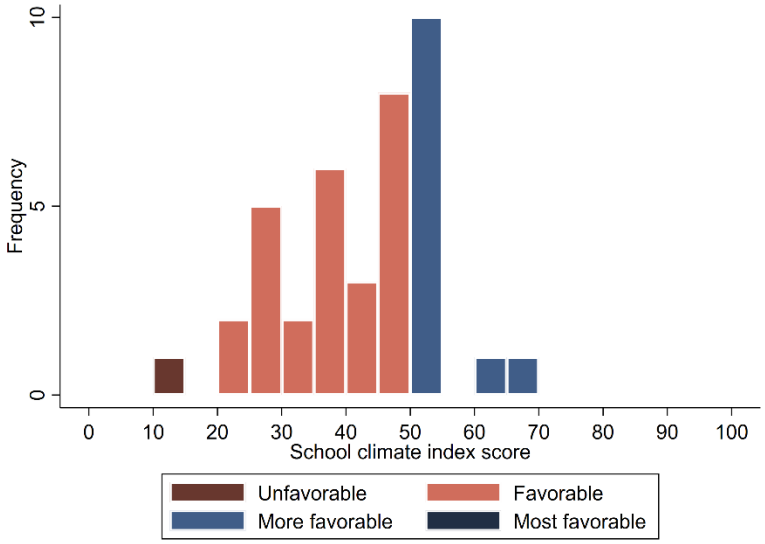


School index scores based on Rasch scores

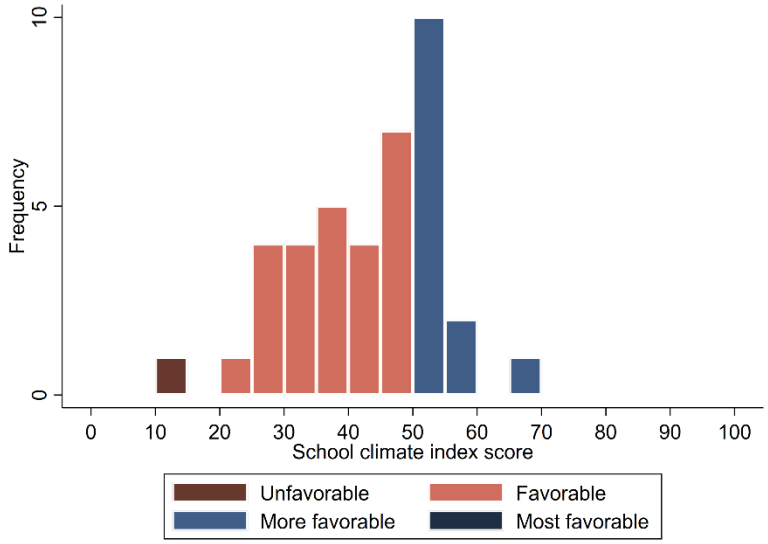


School index scores based on mean scores

Exhibit E.9. Distribution of the school climate index scores reported by non-instructional staff, 2016/17 (n = schools)

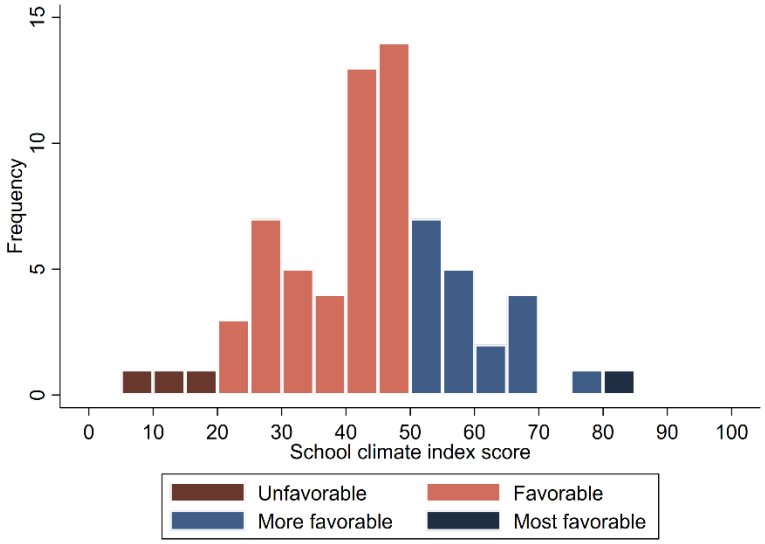


School index scores based on Rasch scores

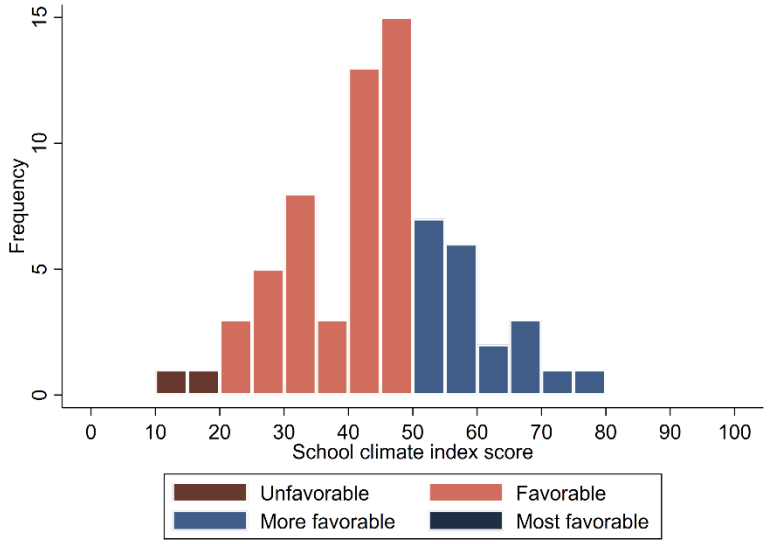


School index scores based on mean scores

Exhibit E.10. Distribution of the school climate index scores reported by non-instructional staff, 2017/18 (n = schools)

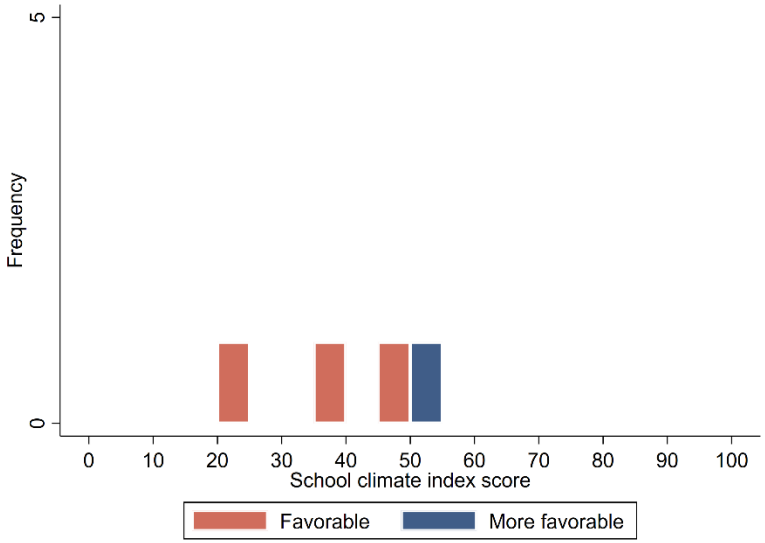


School index scores based on Rasch scores

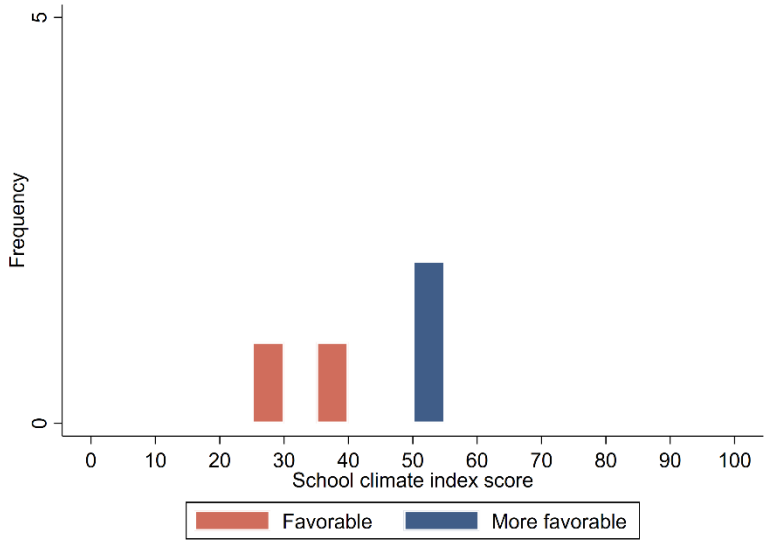


School index scores based on mean scores

Exhibit E.11. Distribution of the school climate index scores reported by elementary school students, 2016/17 (n = schools)

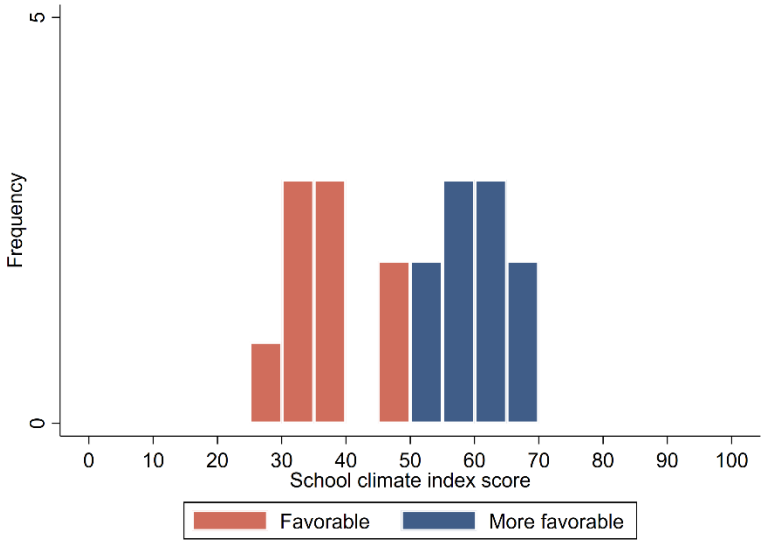


School index scores based on Rasch scores

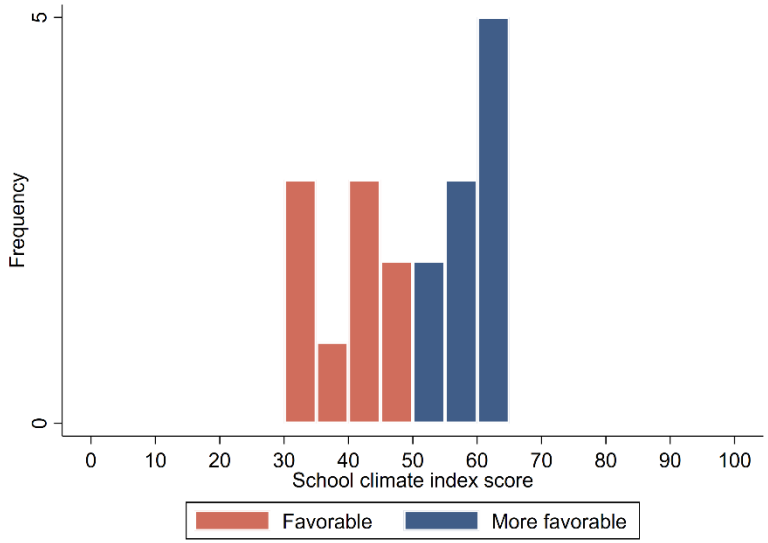


School index scores based on mean scores

Exhibit E.12. Distribution of the school climate index scores reported by elementary school students, 2017/18 (n = schools)



School index scores based on Rasch scores



School index scores based on mean scores

APPENDIX F. Memo summarizing initial and revised measurement models

Mathematica
Progress Together

Memo

To: Office for Safe Schools, Pennsylvania Department Education
From: Mathematica PDE School Climate Project Team
Date: 7/24/2019
Subject: Summary of Initial and Revised Measurement Models

This project explores the properties of Pennsylvania's school climate surveys with the aim of developing a summary index of school climate that could be calculated for each school. Data to develop measures of school climate generally are gathered from surveys of various groups associated with schools: students, teachers, other staff, parents, and community members (Voight and Hanson 2012). Pennsylvania Department of Education (PDE) offered web-based school climate surveys to school staff, students (beginning in grade 3), parents, and community members in the 2016–17 and 2017–18 school years. The surveys ask questions in four main 'domains' of school climate: Social/Emotional Learning, Student Support, High Expectations/Academic Rigor & Challenge, and Safe and Respectful School Climate. These surveys intend to provide Pennsylvania schools and educators with data that can be used for needs assessments, program development, and short- and long-term improvement planning. The measures of school climate resulting from surveys could also be used by PDE to compare schools in the state.

PDE developed the school climate survey instruments drawing largely from the American Institutes for Research Conditions for Learning survey and an instrument from the Alaska Department of Education. PDE conducted a small pilot of the survey in 2015 and made the surveys available statewide from the 2016–17 school year. The surveys are not currently mandatory and are administered by schools with the support of districts and intermediate units (IUs). The data used for our analysis are come from schools involved in a School Climate Leadership Initiative, a five-stage strategic planning process that is based on a technical assistance model developed by the National School Climate Center. These schools previously agreed to implement climate surveys and make their data available.

Currently, 76 schools in Pennsylvania are involved in the School Climate Leadership Initiative. The process is designed to ultimately produce a yearly action plan that reflects long-term school climate improvement goals. For schools that have self-assessed as having adequate readiness to implement changes to improve school climate and have established shared leadership practices, action plans will focus on strategies to improve one or more of the school climate domains reflected in the surveys. Readiness is defined as the school's capacity, commitment and competence to carry out comprehensive school climate improvement. Assessing readiness involves reflecting on the school's leadership capacity, vision for school climate, and relevant standards. Action plans for other schools will prioritize readiness and community engagement goals, followed by climate-targeted practices. Schools involved in the School Climate Leadership Initiative are using the school climate surveys as part of the improvement process. The survey results will be triangulated with other data to identify needs/priorities for action planning. PDE would like support in examining and improving measures of school climate based on the climate surveys to strengthen the quality of data available to LEAs for improvement planning. PDE

envisions LEAs using the data to identify schools with lower ratings in particular areas of climate in order to target assistance to these schools. To achieve that objective, we are working with Pennsylvania Department of Education (PDE) staff in two phases of the project, each of which consists of several components:

1. Initial analysis of PDE's surveys
    a. Examine the reliability and discriminant validity of the School Climate Surveys
    b. Examine the distribution of the scales of the surveys across schools
    c. Examine differences in response rates and frequencies by respondent type
2. Creating an index and domain-level sub-indices
    a. Adjust for small numbers of respondents
    b. Adjust for nonresponse bias
    c. Consistently weight types of respondents across schools
    d. Account for measurement error in items

This memo presents an overview of the first step of phase I of this project and particularly the results that will help inform the survey revisions. Specifically, it presents the validity findings from the initial analysis, describing the methods we used to examine the validity of the surveys, and summarizing the results for the initial models and the revised and final models that improve the model fit statistics and discriminant validity. The information will be used for our discussions about modifications to the surveys, such as removing items and combining the domains. All the analyses used the survey data from fall 2016 and fall 2017 administration (Table 1 presents the numbers of respondents and schools that completed the surveys in the fall of each year). Some schools administered the surveys twice in a school year, in the fall and in the spring, but most schools administered the surveys only in the fall. We did not examine the spring data because of small sample sizes. We conclude the memo with recommendations for future surveys and next steps for the analyses (including analyses on response rates and representativeness of the samples).

Table 1. Number of respondents and schools that completed the surveys, by year

Sample	Year	Classroom teacher survey	Other staff survey	Parent survey	Community survey	ES student survey	MS student survey	HS student survey
Number of respondents	2016	1,371	537	2,176	484	673	6,495	11,265
	2017	2,385	1,098	4,375	882	5,208	9,033	16,319
Number of schools	2016	54	52	77	90	10	59	76
	2017	87	85	85	103	21	40	59

Approach for factor analysis

To explore how well the Pennsylvania school data support the pre-defined underlying structure of school climate (the four domains described above), we estimated a structural equation model for confirmatory factor analysis (CFA) using Mplus software separately for each respondent type (elementary, middle school, and high school students, school staff, parents, and community members) and for each year. In CFA, researchers defines a measurement model that imposes a set of assumptions about the relationships between the items in a survey and unobserved underlying latent constructs and test whether the data support these assumptions. CFA is appropriate for validating existing scales or underlying constructs specified based on theory.

We considered three overall model fit criteria[22] that are presented in Table 2 for assessing whether the data support the grouping of items into the domains (that is, assessing model fit).

Table 2. Recommended overall model fit statistics for confirmatory factor analysis

Fit statistics	Recommended fit
Comparative Fit Index (CFI)	Brown (2015) suggests that a value of .90 or above is acceptable.
Tucker Lewis Index (TLI)	The TLI is designed to correct for the complexity of the model, and is sensitive to small sample sizes. Brown (2015) suggests that a value of .90 or above is acceptable.
Root Mean Square Error of Approximation (RMSEA)	RMSEA is sensitive to model complexity. MacCallum, Browne and Sugawara (1996) suggest that 0.01, 0.05, and 0.08 for RMSEA indicate excellent, good, and mediocre fit, respectively. Others have used 0.10 as the cutoff for poorly fitting models (Kenny 2015).

The CFA models also estimate standardized factor loadings and correlations between latent factors that can shed light on whether the groupings of items are appropriate. Factor loadings indicate the strength of the associations between the items and the underlying latent construct corresponding to each domain. Latent constructs are unobservable abstract concepts that can be inferred from measurable quantities such as ratings on the items in the school climate survey. Standardized factor loadings typically range from -1 to 1. A factor loading close to zero indicates that the item is not contributing to the measurement of the latent construct. Items with factor loadings less than 0.40 suggest weaker associations with the latent constructs (Stevens 2012) and we recommend not including them in survey domains.

Correlations between latent factors provide evidence of discriminant validity (the extent to which the individual factors capture different underlying constructs). A high correlation (greater than 0.85) between two factors suggests that they measure the same underlying construct.

We used the weighted least squares with mean and variance adjustment (robust) estimator, which are both robust and feasible for models with categorical measures and relatively high numbers of factors (Brown 2015; Muthén and Muthén 2010). We modeled the survey items as ordered categorical variables. This approach allows for the possibility that the same response could mean different things for different items. For example, it allows for the possibility that a response of "Strongly Agree" versus "Agree" could be a stronger indication of a positive school climate for some items compared with others. It also allows for the possibility that within an item, the "distance" between two adjacent response categories could differ. For example, selecting "Agree" relative to "Disagree" might reflect a bigger difference than selecting "Strongly Agree" relative to "Agree." The analyses also account for the clustering of respondents within schools.

For each survey in each year, we estimated three sets of models (described in detail below): first, we fit models that conform to the prespecification of the items in the four domains (the initial models) to examine how these model fit the data; we then revise the models when a lack of fit is evident and re-estimate (the revised models); finally, we combine some domains to improve the discriminant validity of the survey (the final models). In the staff survey, the survey items differ for classroom teachers and non-

[22] These are standard thresholds used in the structural equation model literature to assess whether the model has acceptable fit.

instructional staff (there is one set of items that are only applicable to classroom teachers), so we split the sample into two groups and conducted the analyses for the two groups separately.

The initial model. The factor structure for the initial model for each respondent type is aligned with the pre-defined domains described above that have organized the survey items into four scales. The estimates for the original models include all survey items in a specific survey. We grouped together the items that capture the same underlying latent constructs—for example, all of the Safe and Respectful School Climate items were grouped together to measure a single underlying construct, and all the Social Emotional/Learning items are assume to measure a different construct. Each of the initial models includes four latent factors that correspond to the four domains of school climate defined in the original survey.

The revised model. The revised models also include four latent factors for the four domains (with the exception of the parent survey), but we excluded items with factor loadings less than 0.40 and added correlations between the error terms based on the modification indices provided in the CFA output in order to improve model fit. In a factor model, each item is assumed to partially capture the latent construct and a component due to noise called the error term (the residual variance in an item not explained by the latent factor). By default, the error terms for the items are assumed to be uncorrelated with each other. If, in fact, some of the error terms are correlated across items, then the fit statistics might suggest a poor fit, even though the groupings of items are appropriate. For this reason, if the groupings of items appear to fit the data well, but the overall fit statistics do not meet the pre-determined criteria, we suggest removing restrictions on the correlation between error terms. This step helps to rule out the possibility that the model does not fit the data because the groupings are not appropriate. To achieve this, we examine the "modification indices," which are provided in the CFA output and suggest how the overall model fit would change if the model were changed in the particular way, and add the correlations between the error terms as specified in the modification indices. For the parent survey, we deleted the Social-Emotional Learning factor that has two indicator variables because the original model converged with a warning message for a 2-indicator factor, suggesting the original model does not fit the data.

We also examined the variation in item responses and item nonresponse along with the analyses for the revised models. Items with little variation in the responses (more than 90 percent of respondents chose a specific response category for the item) and high item nonresponse rate (more than 10 percent of respondents did not respond to the item) will not make much contribution to the measurement of latent constructs. We found no item with more than 90 percent of respondents choosing a specific category for any items in the surveys. The surveys were administered online in a way that respondents had to answer all the questions for the surveys to be submitted. As such, there is no item nonresponse in the data we received.

In order to obtain better model fit estimates, we also tried some models based on exploratory factor analysis (EFA) results. The resulting factors, however, either are hard to interpret or do not improve the model fit. We did not report those results in this memo.

The final model. In order to improve discriminant validity, we combined the Student Support and High Expectation/Academic Rigor & Challenge domains in the final models for all the surveys except the parent survey because results from the revised models indicate that these two domains are highly

correlated (with the correlations between the domains greater than 0.85 for almost all the surveys). The high correlations suggest that the two factors measure underlying constructs that are theoretically similar.

The latent constructs for the parent survey are all highly correlated with each other, suggesting a one-factor structure. EFA confirmed only one factor for all the items in the parent survey. Therefore the final models for the parent survey include only one factor.

Results for the initial models

The CFA models based on the originally defined domains/scales demonstrate poor model fit based on CFI and TLI (below the acceptable limit of 0.90; bolded in Table 3) for both fall 2016 and fall 2017 data for most of the surveys (see Table 3). The models for the parent survey and community survey converged with a warning message "The latent variable covariance matrix is not positive definite" and there are estimated correlations greater than 1.0 between latent factors, suggesting that the factor structures in these models do not fit the data. The initial CFA models also show factor loadings below the acceptable 0.4 cutoff for some items in the models (see Tables A.1 to A.7 in Appendix A for the factor loadings from the initial models).

Table 3. Fit statistics for the initial models

Statistic	Suggested	Year	Classroom teacher survey	Other staff survey	Parent survey[a]	Community survey[a]	ES survey	MS survey	HS survey
CFI	≥0.90	2016	**0.86**	0.91	0.98	0.95	0.92	**0.83**	**0.76**
		2017	**0.80**	0.92	0.99	0.90	0.90	**0.82**	**0.70**
TLI	≥0.90	2016	**0.86**	0.90	0.98	0.95	0.91	**0.82**	**0.75**
		2017	**0.79**	0.91	0.99	0.88	**0.89**	**0.81**	**0.68**
RMSEA	≤0.10	2016	0.05	0.05	0.05	**0.10**	0.03	0.02	0.02
		2017	0.05	0.06	0.04	**0.11**	0.03	0.03	0.03

Note. Statistics that do not meet the threshold are bolded in the table.

[a] The model converged with a warning message and there are estimated correlations greater than 1.0 between latent factors in these models, suggesting the factor structure does not fit the data.

The results of model fit statistics and parameter estimates suggest that the originally defined domains/scales do not perform well in the Pennsylvania populations. Items with factor loadings less than 0.40 do not contribute much to the measurement of the latent constructs and can be removed from the measurement model. The poor model fit statistics also suggest that some items might need to be rearranged across the domains.

Results for the revised models

The factor structures for the revised models are the same in both years for a specific survey. We kept the items that have low factor loadings in one year but not the other. After excluding the items with low factor loadings in both years and modifying the models based on the modification indices, the revised CFA models demonstrate acceptable overall model fit. The CFI and TLI estimates are above acceptable limit of 0.90 for all the models and the RMSEA estimates are below 0.05 for most of the models for both fall 2016 and fall 2017 data (see Table 4 for model fit statistics for the revised models).

However, models for the parent survey in both years and for the community survey in 2016 converged with the same warning message as that for the original model and there are estimated correlations greater than 1.0 between latent factors, suggesting that the factor structures in these revised models still do not fit the data and the four-factor models do not work well. The factor loadings for the models are presented in Tables B.1 to B.7 in Appendix B.

Tables 5 and 6 show correlations between the latent factors for each of the surveys for fall 2016 and fall 2017, respectively. The domains of Student Support and High Expectation/Academic Rigor/Challenge are highly correlated with each other for all surveys in both years (with the correlations greater than 0.85 except for the fall 2016 elementary school student survey where the correlation is 0.833).[23] These results suggest that these two factors do not exhibit discriminant validity: they measure the same underlying construct. We will consider combining the two domains into a single factor in the final models.

Table 4. Fit statistics for the revised models

Statistic	Suggested	Year	Classroom teacher survey	Other staff survey	Parent survey[a]	Community survey[a]	ES survey	MS survey	HS survey
CFI	≥0.90	2016	0.91	0.92	0.99	0.96	0.95	0.91	0.92
		2017	0.91	0.93	0.99	0.93	0.94	0.91	0.92
TLI	≥0.90	2016	0.90	0.91	0.98	0.95	0.94	0.90	0.91
		2017	0.90	0.92	0.99	0.92	0.93	0.90	0.90
RMSEA	≤0.10	2016	0.04	0.05	0.05	0.09	0.03	0.02	0.02
		2017	0.03	0.06	0.04	0.09	0.02	0.03	0.02

[a]The model converged with a warning message and there are estimated correlations greater than 1.0 between latent factors for parent survey in both years and community survey in 2016, suggesting the factor structure does not fit the data.

Table 5. Correlations between latent factors for the surveys in fall 2016

Domain	Social Emotional Learning	Student Support	High Expectation/Academic Rigor/Challenge
High school student survey			
Social Emotional Learning	--		
Student Support	0.560		
High Expectation/Academic Rigor/Challenge	0.482	**0.889**	
Safe and Respectful School Climate	0.634	0.489	0.414
Middle school student survey			
Social Emotional Learning	--		
Student Support	0.496		

[23] The estimated correlations between Student Support and High Expectation/Academic Rigor/Challenge are greater than 1.0, suggesting that the factor structures in the models for parent survey in both years and community survey in 2016 do not fit the data.

Domain	Social Emotional Learning	Student Support	High Expectation/Academic Rigor/Challenge
High Expectation/Academic Rigor/Challenge	0.449	**0.909**	
Safe and Respectful School Climate	0.651	0.449	0.323
Elementary school student survey			
Social Emotional Learning	--		
Student Support	0.825		
High Expectation/Academic Rigor/Challenge	0.643	0.833	
Safe and Respectful School Climate	**0.956**	0.841	0.623
Classroom teachers			
Social Emotional Learning	--		
Student Support	0.367		
High Expectation/Academic Rigor/Challenge	0.552	**0.883**	
Safe and Respectful School Climate	0.782	0.416	0.724
Non-instructional staff			
Social Emotional Learning	--		
Student Support	0.538		
High Expectation/Academic Rigor/Challenge	0.550	**0.998**	
Safe and Respectful School Climate	0.815	0.799	0.787
Parent survey[a]			
Social Emotional Learning	--		
Student Support	n.a.		
High Expectation/Academic Rigor/Challenge	n.a.	n.r.	
Safe and Respectful School Climate	n.a.	0.999	0.958
Community survey[a]			
Social Emotional Learning	--		
Student Support	0.703		
High Expectation/Academic Rigor/Challenge	0.740	n.r.	
Safe and Respectful School Climate	0.663	0.663	0.665

Source: PDE School Climate Survey fall 2016.
Note: Correlations over 0.85 are bolded in the table.
[a]The model converged with a warning message and the correlation between Student Support and High Expectation/Academic Rigor/Challenge is greater than 1.0, suggesting the factor structure does not fit the data.
n.r. = not reported because of correlation coefficient greater than 1.0.
n.a. = not applicable. The Social-Emotional Learning domain has two indicators for the parent survey and was deleted in the revised model.

Table 6. Correlations between latent factors for the surveys in fall 2017

Domain	Social Emotional Learning	Student Support	High Expectation/Academic Rigor/Challenge
High school student survey			
Social Emotional Learning	--		
Student Support	0.569		
High Expectation/Academic Rigor/Challenge	0.556	**0.926**	
Safe and Respectful School Climate	0.550	0.455	0.374
Middle school student survey			
Social Emotional Learning	--		
Student Support	0.581		
High Expectation/Academic Rigor/Challenge	0.551	**0.957**	
Safe and Respectful School Climate	0.726	0.566	0.425
Elementary school student survey			
Social Emotional Learning	--		
Student Support	0.738		
High Expectation/Academic Rigor/Challenge	0.718	**0.904**	
Safe and Respectful School Climate	**0.855**	0.771	0.595
Classroom teachers			
Social Emotional Learning	--		
Student Support	0.392		
High Expectation/Academic Rigor/Challenge	0.582	**0.859**	
Safe and Respectful School Climate	0.777	0.574	0.798
Non-instructional staff			
Social Emotional Learning	--		
Student Support	0.633		
High Expectation/Academic Rigor/Challenge	0.640	**0.992**	
Safe and Respectful School Climate	0.818	0.767	0.820
Parent survey[a]			
Social Emotional Learning	--		
Student Support	n.a.		
High Expectation/Academic Rigor/Challenge	n.a	n.r.	
Safe and Respectful School Climate	n.a.	0.984	0.949
Community survey			
Social Emotional Learning	--		

Domain	Social Emotional Learning	Student Support	High Expectation/Academic Rigor/Challenge
Student Support	0.642		
High Expectation/Academic Rigor/Challenge	0.599	**0.962**	
Safe and Respectful School Climate	0.801	0.810	0.776

Source: PDE School Climate Survey fall 2017.
Note: Correlations over 0.85 are bolded in the table.
[a]The model converged with a warning message and the correlation between Student Support and High Expectation/Academic Rigor/Challenge is greater than 1.0, suggesting the factor structure does not fit the data.
n.r. = not reported because of correlation coefficient greater than 1.0.
n.a. = not applicable. The Social-Emotional Learning domain has two indicators for the parent survey and was deleted in the revised model.

Results for the final models

The final models all converged without any warning message. Table 7 presents the model fit statistics for the final models that combine the Student Support and High Expectation/Academic Rigor/Challenge domains for all the surveys except for the parent survey (which only includes one factor). All the model fit statistics are acceptable: the CFI and TLI estimates are above 0.90 and the RMSEA estimates are below 0.05 for most of the surveys for both fall 2016 and fall 2017 data. The factor loadings are presented in Tables C.1 to C.7 in Appendix C.

Table 7. Fit statistics for the final models

Statistic	Suggested	Year	Classroom teacher survey	Other staff survey	Parent survey	Community survey	ES survey	MS survey	HS survey
CFI	≥0.90	2016	0.91	0.92	0.98	0.96	0.95	0.91	0.93
		2017	0.91	0.93	0.99	0.94	0.94	0.91	0.92
TLI	≥0.90	2016	0.91	0.91	0.98	0.96	0.94	0.90	0.92
		2017	0.90	0.92	0.99	0.93	0.93	0.90	0.90
RMSEA	≤0.10	2016	0.04	0.05	0.05	0.09	0.03	0.02	0.02
		2017	0.03	0.06	0.04	0.09	0.02	0.03	0.02

Recommendations for the survey domains and content

Based on the results from the final models, we recommend keeping the items in the final models and excluding items with low factor loadings in the initial models. Appendix D presents the items for each survey that we recommend be included and excluded.

With regard to the domains measured in the school climate surveys, the high correlations between the Student Support and High Expectation/Academic Rigor/Challenge factors suggest that the two factors capture theoretically similar concepts. Therefore, we suggest combining the Student Support and High Expectation/Academic Rigor/Challenge domains into one domain, "Academic Engagement and Challenge". Prior school climate studies and other validated surveys (for example, Wang, Willett, and Eccles [2011]; Wang and Eccles [2013]; Veiga [2016]) suggest that school engagement is a multidimensional construct including behavioral, emotional and cognitive factors. Adult support is

implicit in these models because student perceptions of support or the extent to which they feel their school meets their psychological needs is associated with academic motivation and achievement.

Next steps

If our recommendations are acceptable to PDE, the next steps for the analyses include:

- Estimate the reliability of the latent constructs in each of the surveys
- Examine the distribution of survey responses by domain, school, district, and respondent type and characteristics
- Examine differences in response rates by respondent type.

We are planning to complete these analyses and provide the results in one month.

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Appendix A. Factor loadings for the initial models

Table A.1. Factor loadings for staff survey - classroom teachers, original model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Sq38cnct: Teachers work to connect studies to life outside the classroom	0.443	0.033	0.464	0.021
Sq40shid: Teachers encourage students to share ideas about class study topics	0.489	0.018	0.511	0.022
Sq41expa: Teachers require students to explain answers	**0.374**	0.025	**0.394**	0.024
Sq42prep: Teachers prepare all students for success in the next grade/college/job	0.555	0.026	0.576	0.022
Sq48chwk: Teachers believe all students can do challenging school work	0.424	0.025	0.449	0.022
Sq54advw: When students already know material, they are given more advanced assignments	0.509	0.024	0.621	0.022
Sq73hpwk: Happy working at this school	0.775	0.016	0.786	0.016
Sq74schp: District/school is making steady academic progress	0.744	0.022	0.753	0.018
Sq76stfa: School staff members have a 'can do' attitude	0.629	0.026	0.674	0.021
Sq77cmpt: Students have adequate access to computers at this school	**0.334**	0.056	**0.350**	0.040
Sq78hnra: Students are encouraged to take advanced classes	0.504	0.039	0.502	0.030
Sq79poss: District/school provides positive experiences for students	0.831	0.015	0.859	0.013
Safe and Respectful School Climate				
Sq7crime: School is badly affected by crime and violence in the community	0.533	0.030	0.604	0.031
Sq8posp: School provides positive experiences for parents/community members	0.616	0.032	0.652	0.021
Sq9welcm: School provides a welcoming environment	0.683	0.020	0.775	0.016
Sq14thrn: Students are often threatened	0.719	0.023	0.670	0.024
Sq16blyc: Students are often bullied because of personal characteristics	0.633	0.019	0.591	0.021
Sq17sfen: School provides a safe environment for teaching and learning	0.756	0.019	0.710	0.027
Sq19sfos: Safety outside around the school	0.722	0.022	0.651	0.021
Sq20sfhl: Safety in the hallways and bathrooms of the school	0.891	0.011	0.831	0.010
Sq21sfcs: Safety in classroom or work area	0.840	0.012	0.795	0.015
Sq22dntc: Students don't really care about each other	0.797	0.011	0.800	0.013
Sq23ptth: Students like to put others down	0.828	0.014	0.858	0.010
Sq24dntg: Students don't get along together very well	0.869	0.011	0.844	0.009
Sq25lkot: Students just look out for themselves	0.779	0.011	0.777	0.015
Sq26trtr: Students treat each other with respect	0.801	0.014	0.778	0.013
Sq75stfi: School staff members have a lot of informal opportunities to influence school	0.555	0.023	0.551	0.023

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Sq80stfs: School staff members are supported by administration	0.646	0.022	0.695	0.021
Social-Emotional Learning (SEL)				
Sq27stpt: Students stop and think before doing anything when they get angry	0.716	0.021	0.772	0.018
Sq28grpp: Students do their share of the work on group projects	0.720	0.020	0.672	0.013
Sq29givu: Students give up when they can't solve a problem easily	0.661	0.018	0.688	0.011
Sq30argu: Students get into arguments when they disagree with people	0.736	0.019	0.751	0.015
Sq31dbst: Students do their best, even when their school work is difficult	0.748	0.018	0.770	0.013
Sq32okfg: Students think it's OK to fight if someone insults them	0.769	0.016	0.796	0.017
Sq33dohw: Students do all their homework	0.595	0.023	0.644	0.021
Sq34symn: Students say mean things to other students when they feel it is deserved	0.798	0.013	0.787	0.013
Sq35wkot: Students try to work out disagreements with other students by talking to them	0.651	0.021	0.707	0.014
Sq36okch: Students think it's OK to cheat if other students are cheating	0.611	0.021	0.638	0.021
Sq37dogd: Students try to do a good job on school work even when it is not interesting	0.730	0.014	0.760	0.015
Student Support				
Sq43care: Teachers really care about students	0.712	0.038	0.700	0.020
Sq44mkup: Teachers help students make up work after an excused absence	0.658	0.016	0.600	0.022
Sq45fdbk: Teachers give students feedback on class assignments to help improve their work	0.705	0.022	0.657	0.018
Sq46acom: Teachers provide accommodations to students who need them	0.670	0.023	0.637	0.019
Sq70asks: Principal asks students about their ideas	0.654	0.028	0.640	0.022
Sq71effc: Stakeholders receive effective communication about academic progress	0.627	0.019	0.645	0.022
Sq72frtr: When students break rules, they are treated fairly	0.717	0.028	0.728	0.023

Note: Factor loadings lower than 0.40 are bolded in the table.

Table A.2. Factor loadings for staff survey – non-instructional staff, original model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Sq54advw: When students already know material, they are given more advanced assignments	0.718	0.032	0.644	0.027
Sq73hpwk: Happy working at this school	0.693	0.038	0.730	0.026
Sq74schp: District/school is making steady academic progress	0.758	0.029	0.830	0.019
Sq76stfa: School staff members have a 'can do' attitude	0.663	0.027	0.686	0.023
Sq77cmpt: Students have adequate access to computers at this school	0.502	0.047	0.487	0.034
Sq78hnra: Students are encouraged to take advanced classes	0.610	0.042	0.530	0.038
Sq79poss: District/school provides positive experiences for students	0.853	0.024	0.886	0.017
Safe and Respectful School Climate				
Sq7crime: School is badly affected by crime and violence in the community	0.530	0.039	0.603	0.027
Sq8posp: School provides positive experiences for parents/community members	0.690	0.017	0.677	0.029
Sq9welcm: School provides a welcoming environment	0.715	0.027	0.728	0.026
Sq14thrn: Students are often threatened	0.677	0.026	0.723	0.017
Sq16blyc: Students are often bullied because of personal characteristics	0.639	0.032	0.669	0.019
Sq17sfen: School provides a safe environment for teaching and learning	0.754	0.025	0.704	0.020
Sq19sfos: Safety outside around the school	0.718	0.022	0.732	0.023
Sq20sfhl: Safety in the hallways and bathrooms of the school	0.731	0.032	0.898	0.010
Sq21sfcs: Safety in classroom or work area	0.727	0.023	0.865	0.010
Sq22dntc: Students don't really care about each other	0.624	0.032	0.788	0.013
Sq23ptth: Students like to put others down	0.826	0.014	0.904	0.009
Sq24dntg: Students don't get along together very well	0.832	0.018	0.867	0.009
Sq25lkot: Students just look out for themselves	0.686	0.028	0.799	0.012
Sq26trtr: Students treat each other with respect	0.726	0.018	0.772	0.015
Sq75stfi: School staff members have a lot of informal opportunities to influence school	0.541	0.028	0.579	0.024
Sq80stfs: School staff members are supported by administration	0.724	0.025	0.688	0.019
Social-Emotional Learning (SEL)				
Sq27stpt: Students stop and think before doing anything when they get angry	0.710	0.030	0.737	0.021
Sq28grpp: Students do their share of the work on group projects	0.680	0.030	0.755	0.021
Sq29givu: Students give up when they can't solve a problem easily	0.643	0.019	0.735	0.019

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Sq30argu: Students get into arguments when they disagree with people	0.708	0.020	0.722	0.021
Sq31dbst: Students do their best, even when their school work is difficult	0.790	0.021	0.842	0.011
Sq32okfg: Students think it's OK to fight if someone insults them	0.771	0.017	0.828	0.016
Sq33dohw: Students do all their homework	0.642	0.024	0.714	0.020
Sq34symn: Students say mean things to other students when they feel it is deserved	0.773	0.021	0.812	0.015
Sq35wkot: Students try to work out disagreements with other students by talking to them	0.659	0.026	0.724	0.021
Sq36okch: Students think it's OK to cheat if other students are cheating	0.672	0.018	0.725	0.018
Sq37dogd: Students try to do a good job on school work even when it is not interesting	0.777	0.023	0.783	0.018
Student Support				
Sq70asks: Principal asks students about their ideas	0.635	0.042	0.661	0.023
Sq71effc: Stakeholders receive effective communication about academic progress	0.723	0.028	0.686	0.023
Sq72frtr: When students break rules, they are treated fairly	0.761	0.026	0.719	0.020

Table A.3. Factor loadings for parent survey, original model[a]

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Pq85gded: Child receiving a good education at school	0.913	0.009	0.938	0.005
Pq91hiex: Adults at school have high expectations for all children	0.864	0.010	0.898	0.010
Pq93prni: Feel actively involved in child's education	0.766	0.019	0.772	0.019
Safe and Respectful School Climate				
Pq81spps: School is a supportive and inviting place for students	0.927	0.007	0.942	0.005
Pq82chds: Child is safe at school	0.822	0.016	0.866	0.007
Pq83prnw: Feel welcome at school	0.906	0.006	0.940	0.003
Pq86chdf: Child is treated fairly at school	0.896	0.010	0.917	0.005
Pq89sptp: School is supportive and inviting for parents	0.933	0.007	0.951	0.003
Pq90adtd: Adults at school respect cultural diversity	0.864	0.013	0.885	0.008
Social-Emotional Learning (SEL)				
Pq88sppd: School offers good supports for all children, regardless of learning issues	0.868	0.011	0.868	0.007
Pq92tchi: Teachers at school are interested in parents' opinions	0.899	0.008	0.887	0.008
Student Support				
Pq84tchc: Satisfied with communication from student's teachers	0.831	0.015	0.841	0.011
Pq87chdl: Child likes teachers	0.797	0.020	0.813	0.012
Pq94prnr: Would recommend child's school to others	0.915	0.009	0.912	0.005

[a] The models converged with a warning message "The latent variable covariance matrix is not positive definite," suggesting that the factor structure does not fit the data.

Table A.4. Factor loadings for community survey, original model[a]

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Cq42prep: Teachers prepare all students for success in the next grade/college/job	0.614	0.017	0.880	0.013
Cq48chwk: Teachers believe all students can do challenging school work	0.678	0.026	0.743	0.015
Cq74schp: District/school is making steady academic progress	0.883	0.012	0.844	0.013
Cq101acs: Students have adequate access to technology in district	0.688	0.014	0.680	0.020
Safe and Respectful School Climate				
Cq8posp: School provides positive experiences for parents/community members	0.975	0.004	0.869	0.021
Cq9welcm: School provides a welcoming environment	0.907	0.010	0.811	0.015
Cq17sfen: School provides a safe environment for teaching and learning	0.908	0.007	0.811	0.013
Cq22dntc: Students don't really care about each other	0.455	0.049	0.484	0.034
Cq26trtr: Students treat each other with respect	0.824	0.014	0.790	0.014
Cq95comr: Schools have a good relationship with community	0.907	0.008	0.792	0.016
Cq96comc: Students care about others in the community	1.109[b]	0.032	0.877	0.014
Social-Emotional Learning (SEL)				
Cq79poss: District/school provides positive experiences for students	0.867	0.009	0.904	0.006
Cq97comh: Students help others in the community in times of need	0.762	0.012	0.806	0.015
Cq98comp: Students respect community property	0.538	0.018	0.782	0.018
Cq99volw: Community volunteers are welcome in the district	0.848	0.013	0.645	0.025
Cq100inp: Input from community members is welcomed by district	0.769	0.024	0.788	0.020
Cq102sts: Students are encouraged to be successful	0.820	0.008	0.905	0.007
Student Support				
Cq43care: Teachers really care about students	0.820	0.020	0.807	0.013
Cq71effc: Stakeholders receive effective communication about academic progress	0.891	0.016	0.721	0.024
Cq72frtr: When students break rules, they are treated fairly	0.868	0.014	0.829	0.014

[a] The models converged with a warning message "The latent variable covariance matrix is not positive definite," suggesting that the factor structure does not fit the data.

[b] Factor loading is greater than 1.0 because the factor structure does not fit the data.

Table A.5. Factor loadings for elementary school student survey, original model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Eq39tlko: Teacher want students to talk with other about topics of study	0.429	0.033	0.299	0.018
Eq41expa: Teachers require students to explain answers	**0.398**	0.040	**0.289**	0.023
Eq47hmwk: Teachers assign homework that helps students learn	0.883	0.028	0.725	0.014
Eq67topc: Topics of study are interesting	0.636	0.024	0.593	0.018
Eq69ubrd: Usually bored in class	**0.389**	0.028	0.576	0.013
Safe and Respectful School Climate				
Eq13blly: Students are bullied	0.605	0.067	0.655	0.019
Eq15tsed: Students are teased	0.666	0.037	0.675	0.020
Eq19sfos: Safety outside around the school	0.410	0.027	0.546	0.020
Eq20sfhl: Safety in the hallways and bathrooms of the school	0.546	0.018	0.592	0.021
Eq21sfcs: Safety in classroom or work area	0.658	0.049	0.780	0.033
Eq26trtr: Students treat each other with respect	0.877	0.024	0.748	0.017
Social-Emotional Learning (SEL)				
Eq27stpt: Students stop and think before doing anything when they get angry	0.581	0.019	0.668	0.017
Eq28grpp: Students do their share of the work on group projects	0.602	0.034	0.659	0.018
Eq30argu: Students get into arguments when they disagree with people	0.448	0.040	0.483	0.022
Eq31dbst: Students do their best, even when their school work is difficult	0.583	0.037	0.654	0.016
Eq35wkot: Students try to work out disagreements with other students by talking to them	0.516	0.041	0.486	0.015
Student Support				
Eq10fair: Teachers and staff treat students fairly	0.679	0.027	0.665	0.016
Eq11givh: Teachers and staff are willing to help students	0.596	0.058	0.549	0.023
Eq43care: Teachers really care about students	0.827	0.041	0.769	0.014
Eq51difs: Wish I went to a different school	0.407	0.038	0.607	0.012
Eq64ntct: Teachers notice if students have trouble learning something	0.687	0.026	0.612	0.015
Eq65hlpi: Teachers help students improve on school work	0.781	0.020	0.713	0.015
Eq66trtd: Teachers treat some students differently than others	0.492	0.027	0.610	0.022

Note: Factor loadings lower than 0.40 are bolded in the table.

Table A.6. Factor loadings for middle school student survey, original model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Mq38cnct: Teachers work to connect studies to life outside the classroom	0.618	0.017	0.649	0.013
Mq40shid: Teachers encourage students to share ideas about class study topics	0.709	0.014	0.708	0.009
Mq41expa: Teachers require students to explain answers	**0.291**	0.028	**0.353**	0.015
Mq47hmwk: Teachers assign homework that helps students learn	0.759	0.028	0.747	0.011
Mq48chwk: Teachers believe all students can do challenging school work	**0.364**	0.022	**0.373**	0.016
Mq54advw: When students already know material, they are given more advanced assignments	**0.328**	0.019	**0.326**	0.019
Mq56chma: Students are expected to learn challenging math material	**0.343**	0.025	**0.347**	0.018
Mq57rsch: Write a research paper	**0.085**	0.031	**0.057**	0.027
Mq58defn: Write a paper defending your own point of view or ideas	**0.144**	0.031	**0.122**	0.022
Mq59fmpr: Make a formal research presentation to class	**0.097**	0.031	**0.068**	0.022
Mq67topc: Topics of study are interesting	0.600	0.010	0.650	0.008
Mq68mkth: Classes inspire thought	0.580	0.019	0.591	0.009
Mq69ubrd: Usually bored in class	0.554	0.021	0.558	0.015
Safe and Respectful School Climate				
Mq12wory: Worry about crime and violence in school	**0.303**	0.016	**0.369**	0.015
Mq13blly: Students are bullied	0.655	0.021	0.740	0.008
Mq14thrn: Students are often threatened	0.620	0.014	0.672	0.013
Mq15tsed: Students are teased	0.652	0.016	0.738	0.008
Mq16blyc: Students are often bullied because of personal characteristics	0.546	0.014	0.666	0.008
Mq18sthm: Stay at home sometimes because do not feel safe at school	0.448	0.023	0.489	0.019
Mq19sfos: Safety outside around the school	**0.370**	0.013	0.539	0.019
Mq20sfhl: Safety in the hallways and bathrooms of the school	0.538	0.014	0.613	0.015
Mq21sfcs: Safety in classroom or work area	0.539	0.015	0.625	0.015
Mq22dntc: Students don't really care about each other	0.716	0.011	0.724	0.009
Mq23ptth: Students like to put others down	0.842	0.009	0.830	0.005
Mq24dntg: Students don't get along together very well	0.718	0.011	0.709	0.009
Mq25lkot: Students just look out for themselves	0.484	0.013	0.580	0.009
Mq26trtr: Students treat each other with respect	0.654	0.021	0.690	0.015
Social-Emotional Learning (SEL)				
Mq27stpt: Students stop and think before doing anything when they get angry	0.570	0.015	0.605	0.013

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Mq28grpp: Students do their share of the work on group projects	0.579	0.011	0.560	0.008
Mq29givu: Students give up when they can't solve a problem easily	0.594	0.013	0.603	0.015
Mq30argu: Students get into arguments when they disagree with people	0.608	0.012	0.607	0.009
Mq31dbst: Students do their best, even when their school work is difficult	0.720	0.013	0.728	0.008
Mq32okfg: Students think it's OK to fight if someone insults them	0.732	0.010	0.738	0.012
Mq33dohw: Students do all their homework	0.612	0.012	0.590	0.009
Mq34symn: Students say mean things to other students when they feel it is deserved	0.734	0.010	0.745	0.010
Mq35wkot: Students try to work out disagreements with other students by talking to them	0.627	0.015	0.641	0.011
Mq36okch: Students think it's OK to cheat if other students are cheating	0.698	0.012	0.669	0.009
Mq37dogd: Students try to do a good job on school work even when it is not interesting	0.666	0.009	0.723	0.013
Student Support				
Mq43care: Teachers really care about students	0.678	0.020	0.691	0.011
Mq44mkup: Teachers help students make up work after an excused absence	0.679	0.014	0.656	0.010
Mq49adtb: Adults in school too busy to give students extra help	0.594	0.021	0.566	0.016
Mq50ruls: Adults in school apply same rules to all students equally	0.642	0.020	0.633	0.013
Mq51difs: Wish I went to a different school	0.677	0.017	0.650	0.014
Mq52exth: Can get extra help at school outside of regular classes	0.423	0.021	0.497	0.013
Mq53cnsl: Counselor at school has helped plan for life after high school	0.407	0.025	0.405	0.019
Mq55extra: Adults in school usually willing to give students extra help	0.701	0.016	0.727	0.010
Mq60tlkt: Talked to a teacher about a problem you are having in class	**0.108**	0.022	**0.115**	0.019
Mq61tlka: Talked to an adult at school about something bothering you	**0.024**	0.034	**0.023**	0.021
Mq62tkou: Talked to an adult at school about a non-school topic important to you	**0.112**	0.030	**0.085**	0.020
Mq64ntct: Teachers notice if students have trouble learning something	0.591	0.018	0.658	0.008
Mq65hlpi: Teachers help students improve on school work	0.689	0.018	0.733	0.008
Mq66trtd: Teachers treat some students differently than others	0.584	0.015	0.620	0.017

Note: Factor loadings lower than 0.40 are bolded in the table.

Table A.7. Factor loadings for high school student survey, original model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Hq38cnct: Teachers work to connect studies to life outside the classroom	0.762	0.007	0.765	0.009
Hq40shid: Teachers encourage students to share ideas about class study topics	0.797	0.012	0.797	0.009
Hq41expa: Teachers require students to explain answers	0.444	0.016	0.468	0.010
Hq47hmwk: Teachers assign homework that helps students learn	0.771	0.007	0.754	0.009
Hq48chwk: Teachers believe all students can do challenging school work	0.414	0.022	0.399	0.014
Hq54advw: When students already know material, they are given more advanced assignments	0.408	0.013	0.455	0.013
Hq56chma: Students are expected to learn challenging math material	**0.318**	0.021	**0.323**	0.020
Hq57rsch: Write a research paper	**0.033**	0.033	**0.043**	0.020
Hq58defn: Write a paper defending your own point of view or ideas	**0.155**	0.023	**0.141**	0.028
Hq59fmpr: Make a formal research presentation to class	**0.107**	0.032	**0.104**	0.030
Hq67topc: Topics of study are interesting	0.735	0.014	0.714	0.009
Hq68mkth: Classes inspire thought	0.684	0.012	0.678	0.011
Hq69ubrd: Usually bored in class	0.533	0.029	0.507	0.025
Safe and Respectful School Climate				
Hq12wory: Worry about crime and violence in school	0.414	0.011	0.506	0.014
Hq13blly: Students are bullied	0.801	0.010	0.846	0.007
Hq14thrn: Students are often threatened	0.696	0.013	0.738	0.010
Hq15tsed: Students are teased	0.815	0.008	0.826	0.006
Hq16blyc: Students are often bullied because of personal characteristics	0.719	0.011	0.753	0.007
Hq18sthm: Stay at home sometimes because do not feel safe at school	0.512	0.014	0.508	0.013
Hq19sfos: Safety outside around the school	0.600	0.013	0.639	0.010
Hq20sfhl: Safety in the hallways and bathrooms of the school	0.732	0.007	0.775	0.007
Hq21sfcs: Safety in classroom or work area	0.730	0.011	0.791	0.009
Hq22dntc: Students don't really care about each other	0.727	0.007	0.736	0.006
Hq23ptth: Students like to put others down	0.780	0.008	0.807	0.005
Hq24dntg: Students don't get along together very well	0.731	0.008	0.750	0.008
Hq25lkot: Students just look out for themselves	0.660	0.011	0.647	0.011
Hq26trtr: Students treat each other with respect	0.672	0.009	0.654	0.007

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Social-Emotional Learning (SEL)				
Hq27stpt: Students stop and think before doing anything when they get angry	0.573	0.012	0.583	0.009
Hq28grpp: Students do their share of the work on group projects	0.622	0.011	0.595	0.010
Hq29givu: Students give up when they can't solve a problem easily	0.627	0.015	0.616	0.010
Hq30argu: Students get into arguments when they disagree with people	0.589	0.021	0.634	0.008
Hq31dbst: Students do their best, even when their school work is difficult	0.721	0.007	0.737	0.006
Hq32okfg: Students think it's OK to fight if someone insults them	0.734	0.011	0.722	0.008
Hq33dohw: Students do all their homework	0.684	0.011	0.655	0.008
Hq34symn: Students say mean things to other students when they feel it is deserved	0.675	0.014	0.748	0.008
Hq35wkot: Students try to work out disagreements with other students by talking to them	0.643	0.012	0.653	0.010
Hq36okch: Students think it's OK to cheat if other students are cheating	0.638	0.015	0.666	0.012
Hq37dogd: Students try to do a good job on school work even when it is not interesting	0.747	0.006	0.715	0.006
Student Support				
Hq43care: Teachers really care about students	0.735	0.012	0.751	0.008
Hq44mkup: Teachers help students make up work after an excused absence	0.743	0.008	0.727	0.008
Hq49adtb: Adults in school too busy to give students extra help	0.524	0.011	0.556	0.012
Hq50ruls: Adults in school apply same rules to all students equally	0.635	0.009	0.640	0.009
Hq51difs: Wish I went to a different school	0.657	0.017	0.652	0.015
Hq52exth: Can get extra help at school outside of regular classes	0.532	0.010	0.547	0.013
Hq53cnsl: Counselor at school has helped plan for life after high school	0.451	0.012	0.444	0.014
Hq55extra: Adults in school usually willing to give students extra help	0.726	0.008	0.743	0.006
Hq60tlkt: Talked to a teacher about a problem you are having in class	**0.174**	0.024	**0.155**	0.020
Hq61tlka: Talked to an adult at school about something bothering you	**0.144**	0.019	**0.104**	0.019
Hq62tkou: Talked to an adult at school about a non-school topic important to you	**0.191**	0.018	**0.189**	0.016
Hq63tkcn: Talked to a counselor at school in depth about planning for college	**0.223**	0.025	**0.205**	0.016
Hq64ntct: Teachers notice if students have trouble learning something	0.648	0.012	0.671	0.010

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Hq65hlpi: Teachers help students improve on school work	0.732	0.007	0.754	0.007

Note: Factor loadings lower than 0.40 are bolded in the table.

Appendix B. Factor loadings for the revised models

Table B.1. Factor loadings for staff survey - classroom teachers, revised model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Sq38cnct: Teachers work to connect studies to life outside the classroom	0.428	0.034	**0.348**	0.024
Sq40shid: Teachers encourage students to share ideas about class study topics	0.464	0.019	0.340	0.029
Sq42prep: Teachers prepare all students for success in the next grade/college/job	0.535	0.028	0.461	0.028
Sq48chwk: Teachers believe all students can do challenging school work	**0.382**	0.026	0.417	0.024
Sq54advw: When students already know material, they are given more advanced assignments	0.458	0.026	0.622	0.022
Sq73hpwk: Happy working at this school	0.753	0.016	0.768	0.016
Sq74schp: District/school is making steady academic progress	0.758	0.022	0.770	0.018
Sq76stfa: School staff members have a 'can do' attitude	0.646	0.026	0.685	0.021
Sq78hnra: Students are encouraged to take advanced classes	0.518	0.039	0.510	0.032
Sq79poss: District/school provides positive experiences for students	0.846	0.015	0.828	0.015
Safe and Respectful School Climate				
Sq7crime: School is badly affected by crime and violence in the community	0.539	0.030	0.617	0.033
Sq8posp: School provides positive experiences for parents/community members	0.574	0.036	0.644	0.025
Sq9welcm: School provides a welcoming environment	0.666	0.021	0.727	0.020
Sq14thrn: Students are often threatened	0.675	0.025	0.657	0.027
Sq16blyc: Students are often bullied because of personal characteristics	0.605	0.021	0.567	0.025
Sq17sfen: School provides a safe environment for teaching and learning	0.773	0.019	0.769	0.028
Sq19sfos: Safety outside around the school	0.743	0.022	0.551	0.029
Sq20sfhl: Safety in the hallways and bathrooms of the school	0.761	0.019	0.613	0.025
Sq21sfcs: Safety in classroom or work area	0.683	0.023	0.604	0.029
Sq22dntc: Students don't really care about each other	0.805	0.010	0.751	0.018
Sq23ptth: Students like to put others down	0.837	0.013	0.631	0.022
Sq24dntg: Students don't get along together very well	0.876	0.011	0.648	0.020
Sq25lkot: Students just look out for themselves	0.784	0.011	0.633	0.024
Sq26trtr: Students treat each other with respect	0.809	0.014	0.699	0.017
Sq75stfi: School staff members have a lot of informal opportunities to influence school	0.514	0.025	0.517	0.026

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Sq80stfs: School staff members are supported by administration	0.566	0.025	0.679	0.021
Social-Emotional Learning (SEL)				
Sq27stpt: Students stop and think before doing anything when they get angry	0.715	0.021	0.770	0.018
Sq28grpp: Students do their share of the work on group projects	0.722	0.019	0.680	0.013
Sq29givu: Students give up when they can't solve a problem easily	0.660	0.018	0.675	0.012
Sq30argu: Students get into arguments when they disagree with people	0.734	0.019	0.722	0.017
Sq31dbst: Students do their best, even when their school work is difficult	0.748	0.018	0.758	0.014
Sq32okfg: Students think it's OK to fight if someone insults them	0.769	0.016	0.803	0.017
Sq33dohw: Students do all their homework	0.596	0.023	0.653	0.021
Sq34symn: Students say mean things to other students when they feel it is deserved	0.796	0.013	0.749	0.014
Sq35wkot: Students try to work out disagreements with other students by talking to them	0.652	0.021	0.713	0.014
Sq36okch: Students think it's OK to cheat if other students are cheating	0.612	0.021	0.647	0.021
Sq37dogd: Students try to do a good job on school work even when it is not interesting	0.732	0.014	0.749	0.016
Student Support				
Sq43care: Teachers really care about students	0.742	0.043	0.579	0.026
Sq44mkup: Teachers help students make up work after an excused absence	0.551	0.021	0.574	0.026
Sq45fdbk: Teachers give students feedback on class assignments to help improve their work	0.603	0.029	0.589	0.023
Sq46acom: Teachers provide accommodations to students who need them	0.556	0.028	0.605	0.024
Sq70asks: Principal asks students about their ideas	0.695	0.033	0.698	0.026
Sq71effc: Stakeholders receive effective communication about academic progress	0.662	0.021	0.692	0.025
Sq72frtr: When students break rules, they are treated fairly	0.734	0.036	0.764	0.024

Note: Factor loadings lower than 0.40 are bolded in the table.

Table B.2. Factor loadings for staff survey – non-instructional staff, revised model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Sq54advw: When students already know material, they are given more advanced assignments	0.719	0.032	0.643	0.027
Sq73hpwk: Happy working at this school	0.692	0.038	0.730	0.026
Sq74schp: District/school is making steady academic progress	0.759	0.029	0.830	0.019
Sq76stfa: School staff members have a 'can do' attitude	0.662	0.027	0.686	0.023
Sq77cmpt: Students have adequate access to computers at this school	0.502	0.047	0.486	0.034
Sq78hnra: Students are encouraged to take advanced classes	0.610	0.042	0.531	0.038
Sq79poss: District/school provides positive experiences for students	0.853	0.024	0.886	0.017
Safe and Respectful School Climate				
Sq7crime: School is badly affected by crime and violence in the community	0.531	0.039	0.606	0.027
Sq8posp: School provides positive experiences for parents/community members	0.648	0.018	0.630	0.031
Sq9welcm: School provides a welcoming environment	0.669	0.029	0.684	0.029
Sq14thrn: Students are often threatened	0.646	0.028	0.700	0.018
Sq16blyc: Students are often bullied because of personal characteristics	0.596	0.037	0.645	0.020
Sq17sfen: School provides a safe environment for teaching and learning	0.757	0.025	0.708	0.020
Sq19sfos: Safety outside around the school	0.674	0.025	0.667	0.028
Sq20sfhl: Safety in the hallways and bathrooms of the school	0.697	0.034	0.867	0.012
Sq21sfcs: Safety in classroom or work area	0.729	0.023	0.881	0.010
Sq22dntc: Students don't really care about each other	0.626	0.032	0.790	0.013
Sq23ptth: Students like to put others down	0.827	0.014	0.904	0.009
Sq24dntg: Students don't get along together very well	0.834	0.018	0.869	0.009
Sq25lkot: Students just look out for themselves	0.689	0.028	0.801	0.011
Sq26trtr: Students treat each other with respect	0.728	0.018	0.774	0.015
Sq75stfi: School staff members have a lot of informal opportunities to influence school	0.541	0.027	0.549	0.026
Sq80stfs: School staff members are supported by administration	0.724	0.025	0.650	0.021
Social-Emotional Learning (SEL)				
Sq27stpt: Students stop and think before doing anything when they get angry	0.709	0.030	0.738	0.021
Sq28grpp: Students do their share of the work on group projects	0.680	0.030	0.755	0.021
Sq29givu: Students give up when they can't solve a problem easily	0.644	0.019	0.736	0.019

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Sq30argu: Students get into arguments when they disagree with people	0.708	0.020	0.723	0.021
Sq31dbst: Students do their best, even when their school work is difficult	0.790	0.021	0.841	0.011
Sq32okfg: Students think it's OK to fight if someone insults them	0.771	0.017	0.828	0.016
Sq33dohw: Students do all their homework	0.642	0.024	0.714	0.020
Sq34symn: Students say mean things to other students when they feel it is deserved	0.772	0.021	0.811	0.015
Sq35wkot: Students try to work out disagreements with other students by talking to them	0.660	0.026	0.726	0.021
Sq36okch: Students think it's OK to cheat if other students are cheating	0.672	0.018	0.725	0.018
Sq37dogd: Students try to do a good job on school work even when it is not interesting	0.777	0.023	0.782	0.018
Student Support				
Sq70asks: Principal asks students about their ideas	0.635	0.042	0.670	0.023
Sq71effc: Stakeholders receive effective communication about academic progress	0.723	0.028	0.694	0.023
Sq72frtr: When students break rules, they are treated fairly	0.761	0.026	0.704	0.020

Table B.3. Factor loadings for parent survey, revised model[a]

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Pq85gded: Child receiving a good education at school	0.917	0.009	0.940	0.005
Pq91hiex: Adults at school have high expectations for all children	0.862	0.011	0.898	0.010
Pq93prni: Feel actively involved in child's education	0.761	0.019	0.767	0.019
Safe and Respectful School Climate				
Pq81spps: School is a supportive and inviting place for students	0.932	0.006	0.943	0.005
Pq82chds: Child is safe at school	0.830	0.015	0.871	0.007
Pq83prnw: Feel welcome at school	0.908	0.007	0.944	0.003
Pq86chdf: Child is treated fairly at school	0.894	0.010	0.916	0.005
Pq89sptp: School is supportive and inviting for parents	0.929	0.008	0.946	0.003
Pq90adtd: Adults at school respect cultural diversity	0.858	0.013	0.882	0.008
Student Support				
Pq84tchc: Satisfied with communication from student's teachers	0.821	0.015	0.836	0.011
Pq87chdl: Child likes teachers	0.802	0.020	0.814	0.012
Pq94prnr: Would recommend child's school to others	0.923	0.008	0.915	0.005

[a] The models converged with a warning message "The latent variable covariance matrix is not positive definite," suggesting that the factor structure does not fit the data.

Table B.4. Factor loadings for community survey, revised model

Item	Fall 2016[a]		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Cq42prep: Teachers prepare all students for success in the next grade/college/job	0.629	0.018	0.874	0.013
Cq48chwk: Teachers believe all students can do challenging school work	0.677	0.025	0.745	0.015
Cq74schp: District/school is making steady academic progress	0.881	0.011	0.847	0.013
Cq101acs: Students have adequate access to technology in district	0.683	0.014	0.684	0.019
Safe and Respectful School Climate				
Cq8posp: School provides positive experiences for parents/community members	0.977	0.004	0.889	0.021
Cq9welcm: School provides a welcoming environment	0.919	0.010	0.829	0.015
Cq17sfen: School provides a safe environment for teaching and learning	0.908	0.007	0.834	0.014
Cq22dntc: Students don't really care about each other	0.520	0.051	0.495	0.035
Cq26trtr: Students treat each other with respect	0.857	0.015	0.822	0.017
Cq95comr: Schools have a good relationship with community	0.914	0.008	0.814	0.016
Social-Emotional Learning (SEL)				
Cq96comc: Students care about others in the community	0.968	0.009	0.942	0.008
Cq97comh: Students help others in the community in times of need	0.895	0.009	0.893	0.009
Cq98comp: Students respect community property	0.664	0.017	0.859	0.014
Student Support				
Cq43care: Teachers really care about students	0.809	0.018	0.815	0.012
Cq71effc: Stakeholders receive effective communication about academic progress	0.882	0.009	0.734	0.022
Cq72frtr: When students break rules, they are treated fairly	0.856	0.016	0.838	0.013
Cq79poss: District/school provides positive experiences for students	0.919	0.007	0.921	0.005
Cq99volw: Community volunteers are welcome in the district	0.885	0.012	0.652	0.024
Cq100inp: Input from community members is welcomed by district	0.816	0.026	0.812	0.019
Cq102sts: Students are encouraged to be successful	0.863	0.006	0.905	0.007

[a] The model converged with a warning message "The latent variable covariance matrix is not positive definite," suggesting that the factor structure does not fit the data.

Table B.5. Factor loadings for elementary school student survey, revised model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Eq47hmwk: Teachers assign homework that helps students learn	0.921	0.031	0.727	0.014
Eq67topc: Topics of study are interesting	0.598	0.022	0.584	0.018
Eq69ubrd: Usually bored in class	0.405	0.026	0.586	0.013
Safe and Respectful School Climate				
Eq13blly: Students are bullied	0.475	0.077	0.491	0.024
Eq15tsed: Students are teased	0.587	0.038	0.544	0.025
Eq19sfos: Safety outside around the school	0.456	0.026	0.528	0.020
Eq20sfhl: Safety in the hallways and bathrooms of the school	0.556	0.018	0.570	0.021
Eq21sfcs: Safety in classroom or work area	0.630	0.044	0.754	0.033
Eq26trtr: Students treat each other with respect	0.839	0.021	0.728	0.019
Social-Emotional Learning (SEL)				
Eq27stpt: Students stop and think before doing anything when they get angry	0.600	0.021	0.668	0.017
Eq28grpp: Students do their share of the work on group projects	0.586	0.035	0.662	0.018
Eq30argu: Students get into arguments when they disagree with people	0.457	0.041	0.488	0.022
Eq31dbst: Students do their best, even when their school work is difficult	0.578	0.037	0.649	0.016
Eq35wkot: Students try to work out disagreements with other students by talking to them	0.487	0.038	0.485	0.015
Student Support				
Eq10fair: Teachers and staff treat students fairly	0.682	0.031	0.671	0.016
Eq11givh: Teachers and staff are willing to help students	0.577	0.058	0.540	0.022
Eq43care: Teachers really care about students	0.834	0.047	0.765	0.015
Eq51difs: Wish I went to a different school	0.441	0.044	0.615	0.012
Eq64ntct: Teachers notice if students have trouble learning something	0.668	0.025	0.604	0.016
Eq65hlpi: Teachers help students improve on school work	0.760	0.022	0.695	0.016
Eq66trtd: Teachers treat some students differently than others	0.498	0.027	0.630	0.022

Table B.6. Factor loadings for middle school student survey, revised model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Mq38cnct: Teachers work to connect studies to life outside the classroom	0.591	0.016	0.578	0.015
Mq40shid: Teachers encourage students to share ideas about class study topics	0.682	0.014	0.647	0.011
Mq47hmwk: Teachers assign homework that helps students learn	0.733	0.031	0.720	0.011
Mq67topc: Topics of study are interesting	0.555	0.010	0.607	0.009
Mq68mkth: Classes inspire thought	0.503	0.020	0.533	0.010
Mq69ubrd: Usually bored in class	0.566	0.018	0.560	0.013
Safe and Respectful School Climate				
Mq13blly: Students are bullied	0.490	0.028	0.529	0.012
Mq14thrn: Students are often threatened	0.561	0.016	0.558	0.015
Mq15tsed: Students are teased	0.550	0.021	0.545	0.013
Mq16blyc: Students are often bullied because of personal characteristics	0.464	0.016	0.528	0.011
Mq18sthm: Stay at home sometimes because do not feel safe at school	0.427	0.024	0.468	0.019
Mq19sfos: Safety outside around the school	**0.302**	0.014	0.403	0.023
Mq20sfhl: Safety in the hallways and bathrooms of the school	0.420	0.017	0.480	0.019
Mq21sfcs: Safety in classroom or work area	0.449	0.015	0.549	0.017
Mq22dntc: Students don't really care about each other	0.734	0.011	0.751	0.009
Mq23ptth: Students like to put others down	0.813	0.008	0.827	0.005
Mq24dntg: Students don't get along together very well	0.729	0.012	0.712	0.009
Mq25lkot: Students just look out for themselves	0.522	0.014	0.597	0.010
Mq26trtr: Students treat each other with respect	0.740	0.021	0.733	0.015
Social-Emotional Learning (SEL)				
Mq27stpt: Students stop and think before doing anything when they get angry	0.578	0.016	0.609	0.013
Mq28grpp: Students do their share of the work on group projects	0.582	0.010	0.559	0.007
Mq29givu: Students give up when they can't solve a problem easily	0.600	0.013	0.609	0.015
Mq30argu: Students get into arguments when they disagree with people	0.603	0.013	0.605	0.009
Mq31dbst: Students do their best, even when their school work is difficult	0.725	0.012	0.727	0.008
Mq32okfg: Students think it's OK to fight if someone insults them	0.736	0.010	0.743	0.012
Mq33dohw: Students do all their homework	0.618	0.012	0.592	0.009
Mq34symn: Students say mean things to other students when they feel it is deserved	0.714	0.010	0.735	0.009

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Mq35wkot: Students try to work out disagreements with other students by talking to them	0.634	0.015	0.653	0.011
Mq36okch: Students think it's OK to cheat if other students are cheating	0.689	0.012	0.657	0.009
Mq37dogd: Students try to do a good job on school work even when it is not interesting	0.665	0.009	0.725	0.013
Student Support				
Mq43care: Teachers really care about students	0.669	0.019	0.684	0.011
Mq44mkup: Teachers help students make up work after an excused absence	0.672	0.014	0.653	0.010
Mq49adtb: Adults in school too busy to give students extra help	0.605	0.020	0.578	0.016
Mq50ruls: Adults in school apply same rules to all students equally	0.635	0.020	0.634	0.013
Mq51difs: Wish I went to a different school	0.672	0.017	0.656	0.014
Mq52exth: Can get extra help at school outside of regular classes	0.415	0.020	0.487	0.014
Mq53cnsl: Counselor at school has helped plan for life after high school	0.402	0.024	**0.395**	0.019
Mq55extra: Adults in school usually willing to give students extra help	0.689	0.015	0.723	0.010
Mq64ntct: Teachers notice if students have trouble learning something	0.556	0.018	0.602	0.009
Mq65hlpi: Teachers help students improve on school work	0.659	0.019	0.681	0.008
Mq66trtd: Teachers treat some students differently than others	0.603	0.015	0.639	0.016

Note: Factor loadings lower than 0.40 are bolded in the table.

Table B.7. Factor loadings for high school student survey, revised model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
High Expectation/Academic Rigor/Challenge				
Hq38cnct: Teachers work to connect studies to life outside the classroom	0.757	0.008	0.756	0.009
Hq40shid: Teachers encourage students to share ideas about class study topics	0.792	0.012	0.766	0.009
Hq41expa: Teachers require students to explain answers	0.416	0.016	0.473	0.010
Hq47hmwk: Teachers assign homework that helps students learn	0.744	0.008	0.726	0.009
Hq54advw: When students already know material, they are given more advanced assignments	0.405	0.013	0.445	0.013
Hq67topc: Topics of study are interesting	0.704	0.016	0.669	0.010
Hq68mkth: Classes inspire thought	0.647	0.013	0.625	0.013
Hq69ubrd: Usually bored in class	0.556	0.029	0.555	0.026
Safe and Respectful School Climate				
Hq13blly: Students are bullied	0.606	0.020	0.637	0.017
Hq14thrn: Students are often threatened	0.611	0.017	0.678	0.012
Hq15tsed: Students are teased	0.613	0.020	0.654	0.014
Hq16blyc: Students are often bullied because of personal characteristics	0.591	0.019	0.637	0.013
Hq18sthm: Stay at home sometimes because do not feel safe at school	0.490	0.019	0.549	0.013
Hq19sfos: Safety outside around the school	0.458	0.020	0.471	0.015
Hq20sfhl: Safety in the hallways and bathrooms of the school	0.507	0.017	0.550	0.014
Hq21sfcs: Safety in classroom or work area	0.558	0.020	0.851	0.021
Hq22dntc: Students don't really care about each other	0.735	0.007	0.741	0.005
Hq23ptth: Students like to put others down	0.829	0.009	0.788	0.010
Hq24dntg: Students don't get along together very well	0.767	0.009	0.758	0.007
Hq25lkot: Students just look out for themselves	0.671	0.011	0.640	0.011
Hq26trtr: Students treat each other with respect	0.801	0.020	0.776	0.019
Social-Emotional Learning (SEL)				
Hq27stpt: Students stop and think before doing anything when they get angry	0.566	0.013	0.585	0.010
Hq28grpp: Students do their share of the work on group projects	0.639	0.012	0.656	0.010
Hq29givu: Students give up when they can't solve a problem easily	0.629	0.015	0.409	0.017
Hq30argu: Students get into arguments when they disagree with people	0.583	0.023	0.437	0.016
Hq31dbst: Students do their best, even when their school work is difficult	0.666	0.009	0.779	0.005
Hq32okfg: Students think it's OK to fight if someone insults them	0.661	0.013	0.460	0.016

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Hq33dohw: Students do all their homework	0.649	0.014	0.731	0.008
Hq34symn: Students say mean things to other students when they feel it is deserved	0.643	0.014	0.467	0.017
Hq35wkot: Students try to work out disagreements with other students by talking to them	0.670	0.015	0.688	0.010
Hq36okch: Students think it's OK to cheat if other students are cheating	0.657	0.015	0.500	0.018
Hq37dogd: Students try to do a good job on school work even when it is not interesting	0.686	0.009	0.783	0.007
Student Support				
Hq43care: Teachers really care about students	0.744	0.013	0.760	0.008
Hq44mkup: Teachers help students make up work after an excused absence	0.726	0.009	0.720	0.008
Hq49adtb: Adults in school too busy to give students extra help	0.544	0.010	0.528	0.014
Hq50ruls: Adults in school apply same rules to all students equally	0.643	0.010	0.613	0.009
Hq51difs: Wish I went to a different school	0.570	0.019	0.613	0.016
Hq52exth: Can get extra help at school outside of regular classes	0.494	0.011	0.532	0.013
Hq53cnsl: Counselor at school has helped plan for life after high school	0.420	0.013	0.434	0.015
Hq55extra: Adults in school usually willing to give students extra help	0.717	0.009	0.738	0.006
Hq64ntct: Teachers notice if students have trouble learning something	0.619	0.012	0.648	0.010
Hq65hlpi: Teachers help students improve on school work	0.709	0.008	0.738	0.007

Appendix C. Factor loadings for the final models

Table C.1. Factor loadings for staff survey - classroom teachers, final model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Academic Engagement and Challenge				
Sq38cnct: Teachers work to connect studies to life outside the classroom	0.402	0.035	**0.343**	0.025
Sq40shid: Teachers encourage students to share ideas about class study topics	0.451	0.019	**0.335**	0.029
Sq42prep: Teachers prepare all students for success in the next grade/college/job	0.562	0.028	**0.395**	0.042
Sq43care: Teachers really care about students	0.602	0.036	**0.385**	0.028
Sq44mkup: Teachers help students make up work after an excused absence	0.481	0.022	0.425	0.025
Sq45fdbk: Teachers give students feedback on class assignments to help improve their work	0.519	0.026	0.437	0.024
Sq46acom: Teachers provide accommodations to students who need them	0.561	0.026	0.464	0.022
Sq48chwk: Teachers believe all students can do challenging school work	0.429	0.026	0.438	0.024
Sq54advw: When students already know material, they are given more advanced assignments	0.541	0.023	0.650	0.021
Sq70asks: Principal asks students about their ideas	0.577	0.025	0.592	0.021
Sq71effc: Stakeholders receive effective communication about academic progress	0.555	0.021	0.601	0.023
Sq72frtr: When students break rules, they are treated fairly	0.655	0.024	0.682	0.020
Sq73hpwk: Happy working at this school	0.766	0.017	0.761	0.017
Sq74schp: District/school is making steady academic progress	0.775	0.021	0.776	0.019
Sq76stfa: School staff members have a 'can do' attitude	0.669	0.025	0.700	0.021
Sq78hnra: Students are encouraged to take advanced classes	0.526	0.039	0.517	0.032
Sq79poss: District/school provides positive experiences for students	0.873	0.016	0.896	0.026
Safe and Respectful School Climate				
Sq7crime: School is badly affected by crime and violence in the community	0.552	0.030	0.618	0.032
Sq8posp: School provides positive experiences for parents/community members	0.484	0.039	0.507	0.027
Sq9welcm: School provides a welcoming environment	0.598	0.022	0.590	0.025
Sq14thrn: Students are often threatened	0.697	0.026	0.654	0.027
Sq16blyc: Students are often bullied because of personal characteristics	0.623	0.021	0.588	0.023
Sq17sfen: School provides a safe environment for teaching and learning	0.792	0.020	0.676	0.027
Sq19sfos: Safety outside around the school	0.762	0.022	0.554	0.030

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Sq20sfhl: Safety in the hallways and bathrooms of the school	0.780	0.019	0.611	0.025
Sq21sfcs: Safety in classroom or work area	0.700	0.023	0.599	0.029
Sq22dntc: Students don't really care about each other	0.781	0.012	0.780	0.016
Sq23ptth: Students like to put others down	0.857	0.014	0.870	0.010
Sq24dntg: Students don't get along together very well	0.854	0.013	0.849	0.010
Sq25lkot: Students just look out for themselves	0.797	0.011	0.733	0.019
Sq26trtr: Students treat each other with respect	0.829	0.014	0.797	0.013
Sq75stfi: School staff members have a lot of informal opportunities to influence school	0.409	0.027	0.463	0.028
Sq80stfs: School staff members are supported by administration	0.483	0.028	0.696	0.022
Social-Emotional Learning (SEL)				
Sq27stpt: Students stop and think before doing anything when they get angry	0.717	0.021	0.765	0.018
Sq28grpp: Students do their share of the work on group projects	0.721	0.019	0.678	0.013
Sq29givu: Students give up when they can't solve a problem easily	0.663	0.018	0.688	0.011
Sq30argu: Students get into arguments when they disagree with people	0.732	0.018	0.752	0.015
Sq31dbst: Students do their best, even when their school work is difficult	0.747	0.018	0.753	0.014
Sq32okfg: Students think it's OK to fight if someone insults them	0.769	0.016	0.802	0.017
Sq33dohw: Students do all their homework	0.597	0.023	0.650	0.021
Sq34symn: Students say mean things to other students when they feel it is deserved	0.798	0.013	0.772	0.013
Sq35wkot: Students try to work out disagreements with other students by talking to them	0.651	0.021	0.711	0.014
Sq36okch: Students think it's OK to cheat if other students are cheating	0.612	0.021	0.645	0.021
Sq37dogd: Students try to do a good job on school work even when it is not interesting	0.731	0.014	0.745	0.016

Note: Factor loadings lower than 0.40 are bolded in the table.

Table C.2. Factor loadings for staff survey – non-instructional staff, final model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Academic Engagement and Challenge				
Sq54advw: When students already know material, they are given more advanced assignments	0.717	0.031	0.648	0.027
Sq70asks: Principal asks students about their ideas	0.636	0.040	0.653	0.022
Sq71effc: Stakeholders receive effective communication about academic progress	0.724	0.028	0.678	0.024
Sq72frtr: When students break rules, they are treated fairly	0.760	0.025	0.688	0.024
Sq73hpwk: Happy working at this school	0.691	0.038	0.736	0.027
Sq74schp: District/school is making steady academic progress	0.759	0.028	0.836	0.020
Sq76stfa: School staff members have a 'can do' attitude	0.662	0.027	0.691	0.023
Sq77cmpt: Students have adequate access to computers at this school	0.501	0.047	0.490	0.034
Sq78hnra: Students are encouraged to take advanced classes	0.608	0.042	0.535	0.038
Sq79poss: District/school provides positive experiences for students	0.853	0.023	0.893	0.016
Safe and Respectful School Climate				
Sq7crime: School is badly affected by crime and violence in the community	0.530	0.040	0.606	0.027
Sq8posp: School provides positive experiences for parents/community members	0.650	0.019	0.630	0.031
Sq9welcm: School provides a welcoming environment	0.668	0.029	0.684	0.029
Sq14thrn: Students are often threatened	0.645	0.029	0.700	0.018
Sq16blyc: Students are often bullied because of personal characteristics	0.599	0.037	0.645	0.020
Sq17sfen: School provides a safe environment for teaching and learning	0.758	0.025	0.708	0.020
Sq19sfos: Safety outside around the school	0.674	0.025	0.667	0.028
Sq20sfhl: Safety in the hallways and bathrooms of the school	0.700	0.034	0.867	0.012
Sq21sfcs: Safety in classroom or work area	0.731	0.023	0.881	0.010
Sq22dntc: Students don't really care about each other	0.626	0.032	0.790	0.013
Sq23ptth: Students like to put others down	0.775	0.021	0.905	0.009
Sq24dntg: Students don't get along together very well	0.771	0.027	0.869	0.009
Sq25lkot: Students just look out for themselves	0.691	0.028	0.801	0.011
Sq26trtr: Students treat each other with respect	0.734	0.018	0.774	0.015
Sq75stfi: School staff members have a lot of informal opportunities to influence school	0.542	0.027	0.550	0.026
Sq80stfs: School staff members are supported by administration	0.723	0.025	0.650	0.021
Social-Emotional Learning (SEL)				
Sq27stpt: Students stop and think before doing anything when they get angry	0.709	0.030	0.738	0.021

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Sq28grpp: Students do their share of the work on group projects	0.682	0.030	0.755	0.021
Sq29givu: Students give up when they can't solve a problem easily	0.643	0.019	0.736	0.019
Sq30argu: Students get into arguments when they disagree with people	0.708	0.020	0.723	0.021
Sq31dbst: Students do their best, even when their school work is difficult	0.790	0.021	0.841	0.011
Sq32okfg: Students think it's OK to fight if someone insults them	0.772	0.017	0.828	0.016
Sq33dohw: Students do all their homework	0.641	0.024	0.714	0.020
Sq34symn: Students say mean things to other students when they feel it is deserved	0.772	0.021	0.811	0.015
Sq35wkot: Students try to work out disagreements with other students by talking to them	0.659	0.026	0.726	0.021
Sq36okch: Students think it's OK to cheat if other students are cheating	0.671	0.018	0.725	0.018
Sq37dogd: Students try to do a good job on school work even when it is not interesting	0.777	0.023	0.782	0.018

Table C.3. Factor loadings for parent survey, final model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
One School Climate factor				
Pq81spps: School is a supportive and inviting place for students	0.922	0.007	0.942	0.005
Pq82chds: Child is safe at school	0.818	0.016	0.862	0.008
Pq83prnw: Feel welcome at school	0.885	0.008	0.904	0.006
Pq84tchc: Satisfied with communication from student's teachers	0.846	0.013	0.849	0.010
Pq85gded: Child receiving a good education at school	0.902	0.009	0.919	0.006
Pq86chdf: Child is treated fairly at school	0.891	0.010	0.917	0.005
Pq87chdl: Child likes teachers	0.809	0.019	0.820	0.012
Pq88sppd: School offers good supports for all children, regardless of learning issues	0.874	0.011	0.877	0.006
Pq89sptp: School is supportive and inviting for parents	0.913	0.008	0.918	0.003
Pq90adtd: Adults at school respect cultural diversity	0.861	0.013	0.878	0.008
Pq91hiex: Adults at school have high expectations for all children	0.853	0.011	0.881	0.010
Pq92tchi: Teachers at school are interested in parents' opinions	0.907	0.007	0.896	0.007
Pq93prni: Feel actively involved in child's education	0.755	0.019	0.758	0.018
Pq94prnr: Would recommend child's school to others	0.936	0.006	0.921	0.004

Table C.4. Factor loadings for community survey, final model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Academic Engagement and Challenge				
Cq42prep: Teachers prepare all students for success in the next grade/college/job	0.562	0.019	0.826	0.013
Cq43care: Teachers really care about students	0.820	0.019	0.819	0.012
Cq48chwk: Teachers believe all students can do challenging school work	0.656	0.028	0.689	0.018
Cq71effc: Stakeholders receive effective communication about academic progress	0.830	0.015	0.736	0.022
Cq72frtr: When students break rules, they are treated fairly	0.867	0.017	0.841	0.013
Cq74schp: District/school is making steady academic progress	0.931	0.007	0.824	0.013
Cq79poss: District/school provides positive experiences for students	0.930	0.008	0.921	0.005
Cq99volw: Community volunteers are welcome in the district	0.792	0.021	0.653	0.024
Cq100inp: Input from community members is welcomed by district	0.824	0.026	0.814	0.019
Cq101acs: Students have adequate access to technology in district	0.723	0.013	0.670	0.020
Cq102sts: Students are encouraged to be successful	0.881	0.007	0.906	0.007
Safe and Respectful School Climate				
Cq8posp: School provides positive experiences for parents/community members	0.977	0.004	0.890	0.021
Cq9welcm: School provides a welcoming environment	0.919	0.011	0.826	0.015
Cq17sfen: School provides a safe environment for teaching and learning	0.908	0.007	0.858	0.013
Cq22dntc: Students don't really care about each other	0.526	0.051	0.496	0.035
Cq26trtr: Students treat each other with respect	0.856	0.015	0.851	0.017
Cq95comr: Schools have a good relationship with community	0.914	0.008	0.815	0.016
Social-Emotional Learning (SEL)				
Cq96comc: Students care about others in the community	0.966	0.009	0.941	0.008
Cq97comh: Students help others in the community in times of need	0.898	0.009	0.894	0.009
Cq98comp: Students respect community property	0.656	0.017	0.859	0.014

Table C.5. Factor loadings for elementary school student survey, final model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Academic Engagement and Challenge				
Eq10fair: Teachers and staff treat students fairly	0.730	0.036	0.672	0.015
Eq11givh: Teachers and staff are willing to help students	0.569	0.059	0.541	0.022
Eq43care: Teachers really care about students	0.825	0.042	0.766	0.015
Eq47hmwk: Teachers assign homework that helps students learn	0.801	0.021	0.678	0.014
Eq51difs: Wish I went to a different school	0.437	0.042	0.614	0.012
Eq64ntct: Teachers notice if students have trouble learning something	0.667	0.022	0.602	0.015
Eq65hlpi: Teachers help students improve on school work	0.758	0.025	0.695	0.016
Eq66trtd: Teachers treat some students differently than others	0.510	0.030	0.631	0.023
Eq67topc: Topics of study are interesting	0.542	0.020	0.538	0.017
Eq69ubrd: Usually bored in class	**0.391**	0.018	0.551	0.010
Safe and Respectful School Climate				
Eq13blly: Students are bullied	0.484	0.078	0.488	0.025
Eq15tsed: Students are teased	0.599	0.039	0.541	0.025
Eq19sfos: Safety outside around the school	0.412	0.024	0.503	0.021
Eq20sfhl: Safety in the hallways and bathrooms of the school	0.522	0.020	0.539	0.021
Eq21sfcs: Safety in classroom or work area	0.639	0.045	0.745	0.033
Eq26trtr: Students treat each other with respect	0.817	0.019	0.728	0.019
Social-Emotional Learning (SEL)				
Eq27stpt: Students stop and think before doing anything when they get angry	0.605	0.023	0.667	0.017
Eq28grpp: Students do their share of the work on group projects	0.594	0.032	0.663	0.018
Eq30argu: Students get into arguments when they disagree with people	0.457	0.038	0.489	0.022
Eq31dbst: Students do their best, even when their school work is difficult	0.576	0.036	0.648	0.016
Eq35wkot: Students try to work out disagreements with other students by talking to them	0.474	0.028	0.485	0.015

Note: Factor loadings lower than 0.40 are bolded in the table.

Table C.6. Factor loadings for middle school student survey, final model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Academic Engagement and Challenge				
Mq38cnct: Teachers work to connect studies to life outside the classroom	0.543	0.015	0.545	0.012
Mq40shid: Teachers encourage students to share ideas about class study topics	0.628	0.015	0.620	0.009
Mq43care: Teachers really care about students	0.670	0.020	0.688	0.011
Mq44mkup: Teachers help students make up work after an excused absence	0.673	0.014	0.659	0.010
Mq47hmwk: Teachers assign homework that helps students learn	0.682	0.028	0.690	0.010
Mq49adtb: Adults in school too busy to give students extra help	0.603	0.020	0.575	0.016
Mq50ruls: Adults in school apply same rules to all students equally	0.639	0.020	0.640	0.013
Mq51difs: Wish I went to a different school	0.687	0.017	0.664	0.014
Mq52exth: Can get extra help at school outside of regular classes	0.416	0.020	0.491	0.014
Mq53cnsl: Counselor at school has helped plan for life after high school	0.404	0.024	0.401	0.020
Mq55extra: Adults in school usually willing to give students extra help	0.692	0.016	0.729	0.010
Mq64ntct: Teachers notice if students have trouble learning something	0.587	0.018	0.608	0.010
Mq65hlpi: Teachers help students improve on school work	0.687	0.018	0.687	0.009
Mq66trtd: Teachers treat some students differently than others	0.598	0.014	0.643	0.016
Mq67topc: Topics of study are interesting	0.520	0.011	0.577	0.009
Mq68mkth: Classes inspire thought	0.463	0.020	0.502	0.009
Mq69ubrd: Usually bored in class	0.525	0.014	0.537	0.012
Safe and Respectful School Climate				
Mq13blly: Students are bullied	0.487	0.028	0.555	0.013
Mq14thrn: Students are often threatened	0.484	0.018	0.563	0.015
Mq15tsed: Students are teased	0.515	0.022	0.547	0.013
Mq16blyc: Students are often bullied because of personal characteristics	0.432	0.017	0.549	0.010
Mq18sthm: Stay at home sometimes because do not feel safe at school	0.437	0.024	0.469	0.020
Mq19sfos: Safety outside around the school	**0.304**	0.014	**0.398**	0.023
Mq20sfhl: Safety in the hallways and bathrooms of the school	0.441	0.016	0.485	0.020
Mq21sfcs: Safety in classroom or work area	0.453	0.016	0.567	0.017
Mq22dntc: Students don't really care about each other	0.736	0.011	0.785	0.008
Mq23ptth: Students like to put others down	0.832	0.009	0.833	0.006
Mq24dntg: Students don't get along together very well	0.726	0.011	0.716	0.010

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Mq25lkot: Students just look out for themselves	0.523	0.014	0.616	0.010
Mq26trtr: Students treat each other with respect	0.692	0.022	0.815	0.017
Social-Emotional Learning (SEL)				
Mq27stpt: Students stop and think before doing anything when they get angry	0.559	0.015	0.607	0.013
Mq28grpp: Students do their share of the work on group projects	0.556	0.011	0.556	0.007
Mq29givu: Students give up when they can't solve a problem easily	0.602	0.013	0.606	0.015
Mq30argu: Students get into arguments when they disagree with people	0.606	0.013	0.602	0.009
Mq31dbst: Students do their best, even when their school work is difficult	0.731	0.012	0.723	0.008
Mq32okfg: Students think it's OK to fight if someone insults them	0.737	0.010	0.739	0.012
Mq33dohw: Students do all their homework	0.621	0.012	0.590	0.009
Mq34symn: Students say mean things to other students when they feel it is deserved	0.714	0.010	0.751	0.009
Mq35wkot: Students try to work out disagreements with other students by talking to them	0.635	0.015	0.649	0.011
Mq36okch: Students think it's OK to cheat if other students are cheating	0.706	0.012	0.669	0.009
Mq37dogd: Students try to do a good job on school work even when it is not interesting	0.667	0.009	0.721	0.013

Table C.7. Factor loadings for high school student survey, final model

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Academic Engagement and Challenge				
Hq38cnct: Teachers work to connect studies to life outside the classroom	0.664	0.011	0.715	0.010
Hq40shid: Teachers encourage students to share ideas about class study topics	0.696	0.016	0.733	0.010
Hq43care: Teachers really care about students	0.742	0.013	0.761	0.008
Hq44mkup: Teachers help students make up work after an excused absence	0.727	0.009	0.736	0.008
Hq47hmwk: Teachers assign homework that helps students learn	0.696	0.008	0.709	0.009
Hq49adtb: Adults in school too busy to give students extra help	0.529	0.010	0.455	0.016
Hq50ruls: Adults in school apply same rules to all students equally	0.642	0.010	0.618	0.009
Hq51difs: Wish I went to a different school	0.572	0.019	0.516	0.019
Hq52exth: Can get extra help at school outside of regular classes	0.488	0.011	0.525	0.014
Hq53cnsl: Counselor at school has helped plan for life after high school	0.420	0.013	0.436	0.015
Hq54advw: When students already know material, they are given more advanced assignments	**0.374**	0.014	0.430	0.014
Hq55extra: Adults in school usually willing to give students extra help	0.711	0.009	0.738	0.006
Hq64ntct: Teachers notice if students have trouble learning something	0.618	0.012	0.651	0.010
Hq65hlpi: Teachers help students improve on school work	0.707	0.008	0.739	0.007
Hq67topc: Topics of study are interesting	0.655	0.016	0.643	0.010
Hq68mkth: Classes inspire thought	0.601	0.015	0.596	0.013
Hq69ubrd: Usually bored in class	0.544	0.030	0.534	0.026
Safe and Respectful School Climate				
Hq13blly: Students are bullied	0.610	0.020	0.655	0.016
Hq14thrn: Students are often threatened	0.615	0.017	0.674	0.013
Hq15tsed: Students are teased	0.620	0.020	0.672	0.014
Hq16blyc: Students are often bullied because of personal characteristics	0.592	0.019	0.644	0.013
Hq18sthm: Stay at home sometimes because do not feel safe at school	0.506	0.018	0.579	0.013
Hq19sfos: Safety outside around the school	0.455	0.019	0.502	0.015
Hq20sfhl: Safety in the hallways and bathrooms of the school	0.504	0.017	0.591	0.013
Hq21sfcs: Safety in classroom or work area	0.552	0.020	0.698	0.014
Hq22dntc: Students don't really care about each other	0.725	0.007	0.756	0.006
Hq23ptth: Students like to put others down	0.829	0.009	0.846	0.004

Item	Fall 2016		Fall 2017	
	Factor loading	SE	Factor loading	SE
Hq24dntg: Students don't get along together very well	0.750	0.010	0.767	0.007
Hq25lkot: Students just look out for themselves	0.650	0.011	0.651	0.011
Hq26trtr: Students treat each other with respect	0.793	0.019	0.795	0.022
Social-Emotional Learning (SEL)				
Hq27stpt: Students stop and think before doing anything when they get angry	0.563	0.013	0.594	0.009
Hq28grpp: Students do their share of the work on group projects	0.636	0.011	0.652	0.010
Hq29givu: Students give up when they can't solve a problem easily	0.632	0.015	0.456	0.016
Hq30argu: Students get into arguments when they disagree with people	0.584	0.022	0.397	0.023
Hq31dbst: Students do their best, even when their school work is difficult	0.668	0.009	0.804	0.005
Hq32okfg: Students think it's OK to fight if someone insults them	0.662	0.013	0.496	0.014
Hq33dohw: Students do all their homework	0.648	0.014	0.720	0.008
Hq34symn: Students say mean things to other students when they feel it is deserved	0.645	0.014	0.462	0.017
Hq35wkot: Students try to work out disagreements with other students by talking to them	0.668	0.015	0.707	0.010
Hq36okch: Students think it's OK to cheat if other students are cheating	0.656	0.015	0.484	0.018
Hq37dogd: Students try to do a good job on school work even when it is not interesting	0.689	0.009	0.798	0.006

Note: Factor loadings lower than 0.40 are bolded in the table.

Appendix D. Recommendations of items included in and excluded from the surveys

Parent survey items[a]

Keep all original items

One School Climate factor (all original items)

Variable name	Item
Pq88sppd	At this school there are good supports for all children, including children with learning problems.
Pq92tchi	Teachers at my child's school are interested in what I have to say.
Pq84tchc	I am satisfied with communication with my child's teacher(s).
Pq87chdl	My child likes his/her teachers.
Pq94prnr	I would recommend my child's school to others.
Pq85gded	My child is getting a good education at this school.
Pq91hiex	Adults at this school have high expectations for all children.
Pq93prni	I feel like I am actively involved in my child's education.
Pq81spps	My child's school is a supportive and inviting place for students.
Pq82chds	My child is safe at school.
Pq83prnw	I feel welcome at this school.
Pq86chdf	My child is treated fairly at this school.
Pq89sptp	This is a supportive and inviting place for parents/guardians.
Pq90adtd	Adults at this school respect cultural diversity.

[a] All parent survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

To: Office for Safe Schools, Pennsylvania Department Education
From: Mathematica PDE School Climate Project Team
Date: 7/24/2019
Page: 137

Staff Survey Items

Drop 2 items for classroom teachers

Social-Emotional Learning (all original items)

Variable name	Item
Sq27stpt	Stop and think before doing anything when they get angry.
Sq28grpp	Do their share of the work when doing group projects.
Sq29givu	Give up when they can't solve a problem easily.
Sq30argu	Get into arguments when they disagree with people.
Sq31dbst	Do their best, even when their school work is difficult.
Sq32okfg	Think it's OK to fight if someone insults them.
Sq33dohw	Do all their homework.
Sq34symn	Say mean things to other students when they think the other students deserve it.
Sq35wkot	Try to work out their disagreements with other students by talking to them.
Sq36okch	Think it's OK to cheat if other students are cheating.
Sq37dogd	Try to do a good job on school work even when it is not interesting.

Student Support (all original items; combined with High Expectations/Academic Rigor/Challenge items)

Variable name	Item	Note
Sq43care	Really care about my students.	Classroom teacher only
Sq44mkup	Help my students make up work after an excused absence.	Classroom teacher only
Sq45fdbk	Give my students feedback on class assignments that helps improve their work.	Classroom teacher only
Sq46acom	Provide accommodations to students who need them.	Classroom teacher only
Sq70asks	The principal asks students about their ideas.	
Sq71effc	Students and parents receive effective communication about academic progress.	
Sq72frtr	When students break rules, they are treated fairly.	

High Expectations/Academic Rigor/Challenge (combined with Student Support items; drop 2 items for classroom teachers)

Variable name	Item	Note
Sq38cnct	Work to connect what I am teaching to life outside the classroom.	Classroom teacher only
Sq40shid	Encourage students to share their ideas about things we are studying in class.	Classroom teacher only
Sq41expa	Require my students to explain their answers.	Classroom teacher only, drop
Sq42prep	Prepare all students for success in the next grade, in college, or in a job.	Classroom teacher only
Sq48chwk	Believe all students can do challenging school work.	Classroom teacher only
Sq73hpwk	I am happy working at this school.	
Sq74schp	This school is making steady progress implementing rigorous academic standards.	
Sq54advw	When students in this school already know the material that is being taught, they are given more advanced assignments.	

Variable name	Item	Note
Sq76stfa	In this school, staff members have a "can do" attitude.	
Sq77cmpt	Students have adequate access to computers at this school.	Low factor loading for classroom teacher, drop
Sq78hnra	Students in this school are encouraged to take advanced classes, such as honors, Advanced Placement (AP), or International Baccalaureate (IB), or classes that lead to professional certification.	
Sq79poss	This school provides positive experiences for students.	

Safe and Respectful School Climate (all original items)

Variable name	Item
Sq7crime	This school is badly affected by crime and violence in the community.
Sq8posp	This school provides positive experiences for parents.
Sq9welcm	This school provides a welcoming environment.
Sq14thrn	Students at this school are often threatened.
Sq16blyc	Students at this school are often bullied because of certain characteristics (for example, their race, religion, weight, or sexual orientation)
Sq17sfen	This school provides a safe environment for teaching and learning.
Sq19sfos	(How safe do you feel) Outside around the school?[a]
Sq20sfhl	(How safe do you feel) In the hallways and bathrooms of the school?[a]
Sq21sfcs	(How safe do you feel) In your classroom or work area?[a]
Sq22dntc	(Students) Don't really care about each other.
Sq23ptth	Like to put others down.
Sq24dntg	Don't get along together very well.
Sq25lkot	Just look out for themselves.
Sq26trtr	Treat each other with respect.
Sq75stfi	School staff members have a lot of informal opportunities to influence what happens here.
Sq80stfs	School staff members are supported by administration.

[a] These items in the staff survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe. The remaining items in the staff survey have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Elementary School Student Survey Items (Grade 3–5)[a]

Drop 2 items

Social-Emotional Learning (all original items)

Variable name	Item
Eq27stpt	Most students in my school stop and think before they get too angry.
Eq28grpp	Most of the students in my school do their part when we work together on a group project.
Eq31dbst	Most students in my school do their best, even when their school work is hard.
Eq30argu	Most students in my school get mad when they disagree with people.
Eq35wkot	Most students in my school try to talk to other students if they are having a problem with them.

Student Support (all original items; combined with High Expectations/Academic Rigor/Challenge items)

Variable name	Item
Eq10fair	Teachers and other staff in this school are fair to all students.
Eq11givh	Teachers and other staff in this school are willing to give students help.
Eq51difs	I wish I went to a different school.
Eq43care	My teachers really care about me.
Eq66trtd	My teachers treat some students better than others.
Eq64ntct	My teachers notice if I have trouble learning something.
Eq65hlpi	My teachers help me do better on my school work.

High Expectations/Academic Rigor/Challenge (combined with Student Support items; drop 2 items)

Variable name	Item	Note
Eq69ubrd	I am bored in school.	
Eq39tlko	My teachers want us to talk with others about things we are studying.	Drop
Eq41expa	My teachers ask me to explain my answers.	Drop
Eq47hmwk	The homework I get from my teachers helps me learn.	
Eq67topc	My teachers give me work that is interesting.	

Safe and Respectful School Climate (all original items)

Variable name	Item
Eq19sfos	I feel safe outside around the school.
Eq20sfhl	I feel safe in the hallways and bathrooms of the school.
Eq21sfcs	I feel safe in my classroom.
Eq26trtr	Most students in my school treat each other with respect.
Eq13blly	Students at my school are bullied.
Eq15tsed	Students at my school are teased, picked on, made fun of, or called names.

[a] Items in the elementary school student survey have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

Middle School Student Survey Items (Grade 6–8)

Drop 11 items

Social-Emotional Learning (all original items)

Variable name	Item
Mq27stpt	Stop and think before doing anything when they get angry.
Mq28grpp	Do their share of the work when we have group projects.
Mq29givu	Give up when they can't solve a problem easily.
Mq30argu	Get into arguments when they disagree with people.
Mq31dbst	Do their best, even when their school work is difficult.
Mq32okfg	Think it's OK to fight if someone insults them.
Mq33dohw	Do all their homework.
Mq34symn	Say mean things to other students when they think the other students deserve it.
Mq35wkot	Try to work out their disagreements with other students by talking to them.
Mq36okch	Think it's OK to cheat if other students are cheating.
Mq37dogd	Try to do a good job on school work even when it is not interesting.

Student Support (combined with High Expectations/Academic Rigor/Challenge items; drop 3 items)

Variable name	Item	Note
Mq43care	Really care about me.	
Mq44mkup	Help me make up work after an excused absence.	
Mq49adtb	Adults in this school are often too busy to give students extra help.	
Mq50ruls	Adults in this school apply the same rules to all students equally.	
Mq51difs	I wish I went to a different school.	
Mq52exth	I can get extra help at school outside of my regular classes.	
Mq53cnsl	A counselor at this school has helped me plan for life after high school.	
Mq55extra	Adults in this school are usually willing to take the time to give students extra help.	
Mq60tlkt	Talked to a teacher about a problem you were having in class.[b]	Drop
Mq61tlka	Talked to an adult at school about something that was bothering you.[b]	Drop
Mq62tkou	Talked to an adult at school about something outside of school that is important to you.[b]	Drop
Mq64ntct	Teachers notice if I have trouble learning something.	
Mq65hlpi	Will help me improve my work if I do poorly on an assignment.	
Mq66trtd	Treats some students better than others.	

High Expectations/Academic Rigor/Challenge (combined with Student Support items; drop 7 items)

Variable name	Item	Note
Mq38cnct	Often connect what I am learning to life outside the classroom.	
Mq40shid	Encourage students to share their ideas about things we are studying in class.	
Mq41expa	Often require me to explain my answers.	Drop
Mq47hmwk	Often assign homework that helps me learn.	
Mq48chwk	Think all students can do challenging school work.	Drop

Variable name	Item	Note
Mq54advw	When students in this school already know the material that is being taught, the teacher gives them more advanced assignments.	Drop
Mq56chma	Students at this school are expected to learn challenging math material to get them ready for high school.	Drop
Mq57rsch	Write a research paper of 2 or more pages.[b]	Drop
Mq58defn	Write a paper in which you defended your own point of view or ideas.[b]	Drop
Mq59fmpr	Make a formal presentation to a class about something you read or researched.[b]	Drop
Mq67topc	The topics we are studying are interesting and challenging.	
Mq68mkth	This class really makes me think.	
Mq69ubrd	I am usually bored in this class.	

Safe and Respectful School Climate (drop 1 item)

Variable name	Item	Note
Mq12wory	I worry about crime and violence in school.	Drop
Mq13blly	Students at this school are often bullied.	
Mq14thrn	Students at this school are often threatened.	
Mq15tsed	Students at this school are often teased or picked on.	
Mq16blyc	Students at this school are often bullied because of certain characteristics (ex: race, religion, or weight)?	
Mq18sthm	I sometimes stay home because I don't feel safe at school.	
Mq19sfos	(How safe do you feel) Outside around the school?[a]	
Mq20sfhl	(How safe do you feel) In the hallways and bathrooms of the school?[a]	
Mq21sfcs	(How safe do you feel) In your classes?[a]	
Mq22dntc	Don't really care about each other.	
Mq23ptth	Like to put others down.	
Mq24dntg	Don't get along together well.	
Mq25lkot	Just look out for themselves.	
Mq26trtr	Treat each other with respect.	

Note. All the items in the middle school student survey except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the middle school student survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe.

[b] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

High School Student Survey Items (Grade 9–12)

Drop 11 items

Social-Emotional Learning (all original items)

Variable name	Item
Hq27stpt	Stop and think before doing anything when they get angry.
Hq28grpp	Do their share of the work when we have group projects.
Hq29givu	Give up when they can't solve a problem easily.
Hq30argu	Get into arguments when they disagree with people.
Hq31dbst	Do their best, even when their school work is difficult.
Hq32okfg	Think it's OK to fight if someone insults them.
Hq33dohw	Do all their homework.
Hq34symn	Say mean things to other students when they think the other students deserve it.
Hq35wkot	Try to work out their disagreements with other students by talking to them.
Hq36okch	Think it's OK to cheat if other students are cheating.
Hq37dogd	Try to do a good job on school work even when it is not interesting.

Student Support (combined with High Expectations/Academic Rigor/Challenge items; drop 4 items)

Variable name	Item	Note
Hq43care	Really care about me.	
Hq44mkup	Help me make up work after an excused absence.	
Hq49adtb	Adults in this school are often too busy to give students extra help.	
Hq50ruls	Adults in this school apply the same rules to all students equally.	
Hq51difs	I wish I went to a different school.	
Hq52exth	I can get extra help at school outside of my regular classes.	
Hq53cnsl	A counselor at this school has helped me plan for life after high school.	
Hq55extra	Adults in this school are usually willing to take the time to give students extra help.	
Hq60tlkt	Talked to a teacher about a problem you were having in class.[b]	Drop
Hq61tlka	Talked to an adult at school about something that was bothering you.[b]	Drop
Hq62tkou	Talked to an adult at school about something outside of school that is important to you.[b]	Drop
Hq63tkcn	Talked to a counselor at school in depth about planning for college.[b]	Drop
Hq64ntct	Teachers notice if I have trouble learning something.	
Hq65hlpi	Will help me improve my work if I do poorly on an assignment.	

High Expectations/Academic Rigor/Challenge (combined with Student Support items; drop 6 items)

Variable name	Item	Note
Hq38cnct	Often connect what I am learning to life outside the classroom.	
Hq40shid	Encourage students to share their ideas about things we are studying in class.	
Hq41expa	Often require me to explain my answers.	Drop
Hq47hmwk	Often assign homework that helps me learn.	
Hq48chwk	Think all students can do challenging school work.	Drop

Variable name	Item	Note
Hq54advw	When students in this school already know the material that is being taught, the teacher gives them more advanced assignments.	
Hq56chma	Students at this school are expected to learn challenging math material to get them ready for graduation.	Drop
Hq57rsch	Write a research paper of 5 or more pages.[b]	Drop
Hq58defn	Write a paper in which you defended your own point of view or ideas.[b]	Drop
Hq59fmpr	Make a formal presentation to a class about something you read or researched.[b]	Drop
Hq67topc	The topics we are studying are interesting and challenging.	
Hq68mkth	This class really makes me think.	
Hq69ubrd	I am usually bored in this class.	

Safe and Respectful School Climate (drop 1 item)

Variable name	Item	Note
Hq12wory	I worry about crime and violence in school.	Drop
Hq13blly	Students at this school are often bullied.	
Hq14thrn	Students at this school are often threatened.	
Hq15tsed	Students at this school are often teased or picked on.	
Hq16blyc	Students at this school are often bullied because of certain characteristics (ex: race, religion, or weight)?	
Hq18sthm	I sometimes stay home because I don't feel safe at school.	
Hq19sfos	(How safe do you feel) Outside around the school?[a]	
Hq20sfhl	(How safe do you feel) In the hallways and bathrooms of the school?[a]	
Hq21sfcs	(How safe do you feel) In your classes?[a]	
Hq22dntc	Don't really care about each other.	
Hq23ptth	Like to put others down.	
Hq24dntg	Don't get along together well.	
Hq25lkot	Just look out for themselves.	
Hq26trtr	Treat each other with respect.	

Note. All the items in the high school student survey except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the high school student survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe.

[b] These items in the high school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

Community Survey Items[a]

Keep all items

Social-Emotional Learning (all original items)

Variable name	Item
Cq97comh	Help others in the community in times of need.
Cq98comp	Respects community property.
Cq99volw	Community volunteers are welcome in this district.
Cq100inp	Input from community members is welcomed by our district.
Cq102sts	Students in this school are encouraged to be successful.
Cq79poss	This district provides positive experiences for students.

Student Support (combined with High Expectations/Academic Rigor/Challenge items)

Variable name	Item
Cq43care	Care about their students.
Cq71effc	Parents and community members receive effective communication about progress in our schools.
Cq72frtr	All students in our district are treated fairly.

High Expectations/Academic Rigor/Challenge (combined with Student Support items)

Variable name	Item
Cq48chwk	Believe all students can do challenging school work.
Cq42prep	Prepare all students for success in the next grade, in college, or in a job.
Cq74schp	This district is making steady academic progress.
Cq101acs	Students have adequate access to technology in this district.

Safe and Respectful School Climate (all original items)

Variable name	Item
Cq8posp	The Schools provide positive experiences for parents and community members.
Cq9welcm	The schools provide a welcoming environment.
Cq95comr	The schools have a good relationship with the community.
Cq17sfen	The schools provide a safe environment for teaching and learning.
Cq22dntc	Don't really care about each other.
Cq26trtr	Treat each other with respect.
Cq96comc	Care about others in the community.

[a] All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

APPENDIX G. Memo summarizing the first phase of School Climate Index development

Mathematica
Progress Together

Memo

To: Office for Safe Schools, Pennsylvania Department Education
From: Mathematica PDE School Climate Project Team
Date: 12/13/2019
Subject: School Climate Index Development First Phase Summary and Next Steps

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This project explores the properties of Pennsylvania's school climate surveys with the aim of developing a summary index of school climate that could be calculated for each school. Data to develop measures of school climate generally are gathered from surveys of various groups associated with schools: students, teachers, other staff, parents, and community members (Voight and Hanson 2012). Pennsylvania Department of Education (PDE) offered web-based school climate surveys to school staff, students (grades 3 to 12), parents, and community members in the 2016–2017 and 2017–2018 school years. The surveys asked questions in four main domains of school climate:

1. Social/Emotional Learning
2. Student Support
3. High Expectations/Academic Rigor & Challenge
4. Safe and Respectful School Climate

These surveys intend to provide Pennsylvania schools and educators with data that can be used for needs assessments, program development, and short- and long-term improvement planning. The measures of school climate resulting from surveys could also be used by PDE to compare schools in the state.

PDE developed the school climate survey instruments drawing largely from the American Institutes for Research Conditions for Learning Survey[24] and an instrument from the Alaska Department of Education.[25] PDE conducted a small pilot of the survey in 2015 and made the surveys available statewide from the 2016–2017 school year. The surveys are not mandatory and are administered by schools with the support of districts and intermediate units (IUs). The data used for our analysis come from schools involved in a School Climate Leadership Initiative, a five-stage strategic planning process that is based on a technical assistance model developed by the National School Climate Center. These schools previously agreed to implement climate surveys and make their data available.

[24] https://safesupportivelearning.ed.gov/survey/american-institutes-research-conditions-learning-survey

[25] https://eric.ed.gov/?id=ED577047

Seventy-six schools in Pennsylvania were involved in the School Climate Leadership Initiative at the outset of this engagement. The process is designed ultimately to produce a yearly action plan that reflects long-term school climate improvement goals. For schools that have self-assessed as having adequate readiness to implement changes to improve school climate and have established shared leadership practices, action plans will focus on strategies to improve one or more of the school climate domains reflected in the surveys. Readiness is defined as the school's capacity, commitment, and competence to carry out comprehensive school climate improvement. Assessing readiness involves reflecting on the school's leadership capacity, vision for school climate, and relevant standards. Action plans for other schools will prioritize readiness and community engagement goals, followed by climate-targeted practices. Schools involved in the School Climate Leadership Initiative are using the school climate surveys as part of the improvement process. The survey results will be triangulated with other data to identify needs/priorities for action planning. PDE would like support in examining and improving measures of school climate based on the climate surveys to identify schools with lower ratings in particular areas of climate in order to target assistance to these schools. To achieve that objective, we are working with PDE staff in two phases of the project.

The first phase involved calculating survey response rates and assessing the validity and reliability of the survey instruments. The second phase will build on these initial analyses to co-develop a school climate index and domain-level sub-indices.

This memo presents an overview of the first phase, summarizes our recommendations for refining and improving the surveys for future administrations, and shares a plan for the development of a school climate index and domain-level indices. Specifically, we discuss the following:

- **Survey response rates.** The National Center for Education Statistics establishes a response rate target of 85 percent or greater to ensure credible and generalizable survey data for the relevant population. [26] Overall response rates fell below this standard. However, a number of local education agencies (LEAs) and schools met the 85 percent standard for student and classroom teacher participation in both survey years. Although low response rates can affect survey reliability and validity when respondents do not accurately reflect the true composition of a school's or LEA's population, our validity estimates can still help indicate whether (1) the four survey domains adequately capture the underlying school climate construct associated with each and (2) a specific survey item fits in a particular domain or should be removed from a survey entirely.
- **Survey validity.** To explore how well PDE's school climate surveys measure what they seek to measure in each of the surveys' four domains of school climate, we conducted confirmatory factor analyses (CFA). Our validity estimates suggest that the original versions of the surveys do not perform well in Pennsylvania public schools. This indicates that some survey items might need to be reorganized across the domains or

[26] https://nces.ed.gov/statprog/2012

removed altogether. We suggest (1) combining the Student Support and High Expectations/Academic Rigor & Challenge domains into one domain called Academic Engagement and Challenge and (2) excluding items with low validity.

- **Survey reliability.** Reliability refers to the extent to which an assessment tool produces consistent results. With the exception of the elementary school student survey, our analyses indicated that all domains, across all other surveys, met the threshold for acceptable reliability. To improve the reliability of the elementary school student survey, we recommend changing the rating scales for the elementary school student survey and adding items to the Social-Emotional Learning domain.
- **Creating a school climate index.** Because different respondent types might have different perceptions of a school's climate, our next phase of analysis builds on the validity and reliability estimates to develop (1) sub-indices that combine responses from different types of respondents within each climate domain and (2) an overall index that combines responses across different climate domains. Each school's overall school climate score will be the average of respondents' scores on each domain. To support interpretation, our analysis will include developing benchmarks that will allow PDE to assign more intuitive descriptions to a school's climate score. For example, schools that score above a particular cut point could be categorized as having a highly positive or favorable climate for a particular domain.
- **Action items for PDE.** To inform development of the index, PDE has the opportunity to make a number of decisions, including whether or how we should weight individual respondents, how we should weight school climate domains, which respondent types we should include in the index and how to weight each type, and which index to create of a set of options.

OVERVIEW OF INITIAL ANALYSIS

PDE offered participating schools six web-based school climate surveys: school staff, elementary students (grades 3 to 6), middle school students, high school students, parents, and community members. The surveys were administered by schools during the 2016–2017 and 2017–2018 school years. Table 1 summarizes the total number of respondents and participating schools for each administration by survey.

Table 1. Number of respondents and schools that completed the surveys, by year

Sample	Year	Classroom staff survey	Other staff survey	Parent survey	Community survey	ES student survey	MS student survey	HS student survey
Number of respondents	2016–2017	1,371	537	2,176	484	673	6,495	11,265
	2017–2018	2,385	1,098	4,375	882	5,208	9,033	16,319
Number of schools	2016–2017	54	52	77	90	10	59	76
	2017–2018	87	85	85	103	21	40	59

ES = elementary school; HS = high school; MS = middle school.

Our initial analysis involved calculating school climate survey frequencies and response rates for both survey administration years as well as assessing each of the six surveys' discriminant validity and internal reliability. Below, we summarize the purpose, approach, and findings for each analysis as well as provide recommendations for improving the surveys.

School climate survey response rates

Survey response rates refer to the percentage of people invited to participate in a survey who ultimately complete the survey. The administration of the school climate surveys was not centralized at the state level. As a result, it was difficult for PDE to confirm (1) which schools and districts agreed to participate in the survey and actually administered the surveys in 2016–2017 and 2017–2018 and (2) the size of the potential respondent pool for each respondent type at the school level (for example, whether and which schools administered the survey as a census or a sample and what kinds of and how many community members were recruited for participation). To address this, we agreed to use PDE enrollment[27] and professional staff[28] data as proxies to calculate survey response rates using the following decision rules:

- **Student response rate denominators** were constructed with grade-level enrollment counts for schools and grades with one or more survey respondents.
- **Classroom staff response rate denominators** were constructed with school-level staff counts for schools with one or more survey respondents.
- **Other staff response rates were not calculated** because we could not estimate the potential respondent pool from available data. PDE professional staff counts under the Other Certified Staff data category best align with the majority of survey respondents. However, that data category excludes noncertified staff, whereas staff respondents include noncertified personnel like janitors.
- **Parent response rate denominators** were constructed with grades 3 to 12 (G3–G12) student enrollment counts for schools with one or more survey respondents, assuming one parent response per student. Actual response rates might be lower than the rates we report in this memo for schools in which parents of lower elementary students (PK–2) were asked to complete a survey.
- **Community response rates were not calculated** because schools and districts did not report the number of community members they invited to participate in the survey.

The National Center for Education Statistics establishes a response rate target of 85 percent or greater to ensure credible and generalizable survey data for the relevant population.[29] The 85 percent standard is achievable when a survey is mandatory, but it can be a difficult target when

[27] https://www.education.pa.gov/Data-and-Statistics/Pages/Enrollment%20Reports%20and%20Projections.aspx

[28] https://www.education.pa.gov/Data-and-Statistics/Pages/Professional-and-Support-Personnel.aspx

[29] https://nces.ed.gov/statprog/2012

survey participation is voluntary. Overall, response rates for both survey administrations did not meet this target (Table 2). However, it should be noted that these response rates could be slightly higher or lower than actual rates because we approximated potential survey respondent pools, as previously discussed.

Table 2. Response rates (percentage) by year

Year	Students (G3–G12)	Classroom staff	Parents
2016–2017	61	66	6
2017–2018	71	67	10

Notes: For students, the denominators for response rates are constructed with grade-level enrollment counts for schools and grades with one or more survey respondents. For staff, the denominators are constructed with school-level staff counts for schools with one or more survey respondents. For parents, the denominators are constructed with G3–G12 student enrollment counts for schools with one or more survey respondents, assuming one parent response per student.

Further improvement toward an 85 percent goal might be possible. As reflected in Table 2, response rates rose from 2016–2017 to 2017–2018, particularly among students. Additionally, a number of local education agencies (LEAs) (Table 3) and schools (Table 4) met the standard for student and classroom teacher participation in each survey year:

Table 3. LEAs (count) that met or exceeded the 85 percent standard by year

Year	LEA (count) Student surveys (G3–G12)	LEA (count) Classroom staff surveys
2016–2017	5	6
2017–2018	9	12

Table 4. Schools (count) that met or exceeded the 85 percent standard by year

Year	Student surveys (G3–G12)	Classroom staff surveys
2016–2017	11	13
2017–2018	18	16

Notes: For students, the denominators were constructed with grade-level enrollment counts for schools and grades with one or more survey respondents. For staff, the denominators were constructed with school-level staff counts for schools with one or more survey respondents. The percentage of schools that met or exceeded the 85 percent standard were not calculated and reported because of school matching errors discussed below.

The usefulness of our psychometric analyses of PDE's school climate survey data—both validity and reliability estimates—depends on analyzing data from a set of respondents who represent the school populations. Low response rates suggest that our analyses are at risk of nonresponse bias, which can affect survey reliability and validity. Nonresponse bias, or participation bias, refers to the disproportionate influence that survey respondents with particular personal, professional, or demographic characteristics could have on survey results. When only certain people or groups

participate in a survey, survey results may not depict an accurate picture of school climate because the respondents are not representative of a school's or LEA's actual population. For example, if no or a very small number of English language learners participated in the survey, the survey results are only a reliable and meaningful representation of the perspectives and experiences of native English speakers.

Despite lower response rates than desired, our psychometric analyses are still valuable. The validity estimates we summarize in the next sections can still help indicate whether each group or domain of survey items captures a single underlying construct such as social emotional learning and whether a specific survey item fits in a particular domain or should be removed from the survey entirely.

To improve survey response rates in future administrations, we recommend the following:

- **Adding community member characteristics to the community survey.** Add characteristics such as the respondent's role within the larger school community (for example, parent–teacher association, school board member, local employer) to the community survey to better understand who the respondents are, how well they know and interact with their local schools, and to what extent their perspectives can inform efforts to strengthen school climate. This information could help PDE define a potential respondent pool for the community survey and provide schools and districts stronger guidance to support their efforts to identify and recruit community members for participation in future surveys.
- **Forming a task force comprised of districts and schools with the highest and lowest response rates.** PDE might consider following up with a diverse group of representatives from the districts and schools that had the highest and lowest response rates. This group could help PDE identify survey administration best practices and effective survey recruitment strategies to share with other school communities. The task force can also help identify common survey administration challenges and local technical assistance needs to inform planning, training, and implementation in future years.
- **Offering incentives.** PDE might consider offering monetary or nonmonetary incentives (for example, extended recess, movie night, special parking privileges for classroom staff) to boost interest in the survey.
- **Centrally administering the survey.** PDE might consider centrally administering the survey. This could include:
    - Defining, documenting, and tracking the potential respondent pool—in consultation with districts—at the outset of the survey collection period to support calculating accurate response rates after the survey closes; this could be accomplished by using scannable paper surveys printed with unique respondent identifiers to prevent duplicate responses.
    - Monitoring response rates before the survey response period closes and providing technical support to districts to increase participation.

- Conducting quality control checks on submitted surveys and working with districts to follow up with schools to verify and address anomalous survey data (for example, a large number of duplicate responses from a single school or high school survey responses associated with an elementary school).

Validity of the school climate surveys

To explore how well PDE's school climate surveys measure what they seek to measure in each of the surveys' four domains of school climate—Social/Emotional Learning, Student Support, High Expectations/Academic Rigor & Challenge, and Safe and Respectful School Climate—we conducted confirmatory factor analyses (CFA) separately for each respondent type (elementary, middle school, and high school students; school staff; parents; and community members) and for both school years. CFA allows researchers to:

- Define a statistical model that imposes a set of assumptions about the relationships between survey items and their underlying latent constructs (abstract concepts that cannot be measured or observed directly but can be inferred from measurable factors such as survey items).
- Test a model to determine whether the survey data support the survey's assumptions, in this case, the factors that affect perceptions of school climate in Pennsylvania (PA) public schools.
- Shed light on whether the groupings of survey items are appropriate by estimating standardized factor loadings and correlations between latent factors. Factor loadings indicate the strength of the associations between the items and the underlying latent construct corresponding to each domain. Standardized factor loadings typically range from -1 to 1. A factor loading close to zero indicates that the item is not contributing to the measurement of the latent construct. Items with factor loadings less than 0.40 suggest weak associations with the latent constructs (Stevens 2012) that might be excluded from a survey domain.

For each of the six surveys for both survey administration years, we iteratively built and tested three sets of statistical models:

1. **Initial models.** We built models that aligned with the content and structure of the original version of the school climate surveys administered in 2016–2017 and 2017–2018 within and across the four domains to examine how well the surveys, as designed, fit the context of Pennsylvania public schools—particularly because the surveys on which the PDE school climate surveys are based were originally developed for Chicago and Alaska public schools.
2. **Revised models.** We reestimated the initial models that demonstrated poor fit based on alternative theoretical or research-based assumptions about the underlying constructs that might influence the validity of a particular survey item within one of the four domains or for a specific respondent group.

3. **Final models.** We refined the revised models by restructuring domains or removing survey items to improve the overall construct validity of the surveys. We did so by
    a. Splitting the staff survey sample into two respondent groups—classroom teachers and non-instructional staff—and conducting analyses for the two groups separately because survey items for each differ (there is one set of items that are only applicable to classroom teachers)
    b. Calculating correlations to confirm discriminant validity—whether theoretically different constructs on the survey such as the Student Support and High Expectation/Academic Rigor & Challenge domains are, indeed, measuring unrelated underlying factors. Highly correlated domains (between 0.85 and 1.0) do not exhibit discriminant validity; they measure the same underlying construct. In these cases, we considered combining two convergent constructs under a single domain in the final models.

Our validity estimates suggest that the initial models do not perform well in Pennsylvania public schools. This suggests that some survey items might need to be reorganized across the domains or removed all together. Specifically, we recommend the following:

1. Combining the Student Support and High Expectations/Academic Rigor & Challenge domains into one domain named Academic Engagement and Challenge because these two domains are highly correlated and likely capture theoretically similar concepts. Prior school climate studies and other validated surveys (for example, Wang et al. 2011; Wang and Eccles 2013; Veiga 2016) suggest that school engagement is a complex construct of interrelated concepts that are difficult to disentangle, including behavioral, emotional, and cognitive factors. Adult support is implicit in these models because student perceptions of support or the extent to which they feel their school meets their psychological needs is associated with academic motivation and achievement.
2. Excluding items with low factor loadings (less than 0.40) while keeping the remaining items in the final models.

Appendix A presents the items for each survey that we recommend be included and excluded.

Reliability of the school climate surveys

Reliability refers to the extent to which an assessment tool produces consistent results. Internal consistency is a measure of reliability that evaluates how closely different items within a single construct relate to each other to produce similar results because they are measuring the same construct. We used Cronbach's alpha to examine the internal consistency of the underlying latent constructs (the domains or factors) in each of the surveys for each year.[30] We follow the

[30] Latent constructs or factors are unobservable abstract concepts that can be inferred from measurable quantities such as ratings on the items in the school climate survey.

standards in the literature and consider the reliability of constructs acceptable if they have a Cronbach's alpha of 0.70 or higher (Bland and Altman 1997).

When we examined the domain alphas, we also looked at the alphas with an item deleted to see whether deleting the specific items improved the reliability estimates. Table 5 shows the reliability estimates of the survey domains for each of the surveys and each year.

Across all the surveys except the elementary school student survey, all domains meet the threshold for acceptable reliability with alphas at 0.84 or above.

For the community survey, we excluded one item (students in the community "don't really care about each other") from Safe and Respectful School Climate because of increased alphas after excluding it and low factor loading for the 2016 survey (less than 0.40).[31] Deleting this item will increase the alphas from 0.86 to 0.91 for 2016 and from 0.85 to 0.87 for 2017. We show the alphas for this domain with the item deleted (Table 5).

Table 5. Reliability estimates for each domain, by survey and year

Domain	Number of items	Cronbach's alpha	
		2016–2017	2017–2018
Classroom teacher survey			
Academic Engagement and Challenge	16	0.84	0.85
Safe and Respectful School Climate	16	0.90	0.90
Social Emotional Learning	11	0.88	0.89
Non-instructional staff survey			
Academic Engagement and Challenge	9	0.86	0.85
Safe and Respectful School Climate	16	0.89	0.91
Social Emotional Learning	11	0.89	0.91
Parent survey			
School climate	14	0.96	0.97
Community survey			
Academic Engagement and Challenge	7	0.90	0.88
Safe and Respectful School Climate	5	0.91	0.87
Social Emotional Learning	7	0.90	0.87
Elementary school student survey			
Academic Engagement and Challenge	10	0.73	0.77
Safe and Respectful School Climate	6	0.70	0.69
Social Emotional Learning	5	0.62	0.64
Middle school student survey			
Academic Engagement and Challenge	17	0.87	0.88
Safe and Respectful School Climate	13	0.84	0.86
Social Emotional Learning	11	0.86	0.86

[31] Factor loadings indicate the strength of the associations between the items and the underlying latent construct corresponding to each domain. Items with factor loadings less than 0.40 suggest weak associations with the latent constructs. We recommend not including such items in survey domains.

Domain	Number of items	Cronbach's alpha	
		2016–2017	2017–2018
High school student survey			
Academic Engagement and Challenge	17	0.89	0.89
Safe and Respectful School Climate	13	0.88	0.89
Social Emotional Learning	11	0.86	0.86

For the elementary school student survey, the Social-Emotional Learning domain does not meet the threshold for acceptable reliability. The alphas for the Safe and Respectful School Climate domain in both years are near the threshold, falling just above or below the threshold. The alphas for Academic Engagement and Challenge are acceptable but lower than the alphas for all other surveys. These results suggest that the elementary school student survey requires some revisions to improve reliability estimates of the domains and factors.

We suggest three possible approaches for improving the reliability of the elementary school student survey domains, particularly for the Social-Emotional Learning domain:

1. **Change the rating scales for the elementary school student survey.** The elementary school survey items have the following response categories: (1) No, (2) Sometimes, and (3) Yes. Other surveys use four response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree. Fewer response categories for the elementary school student survey could have contributed to limited variation in student responses and lower reliability estimates.
2. **Add items to the Social-Emotional Learning domain.** Another option for the Social-Emotional Learning domain is to add items to the domain with the goal of increasing the reliability for that particular domain. Options include adapting questions from the middle and high school survey, rewording or rephrasing existing items to make the language and content more relevant to younger students, and identifying items from other validated instruments produced by other organizations such as the National Center on Safe Supportive Learning Environments (NCSSLE) School Climate Survey Compendium.[32] All scales in the compendium have been tested for validity and reliability.[33]
3. **Pre-test revised or new survey items.** Recognizing that students might be better equipped to respond to survey items that reflect or refer to language, practices, and behaviors common in their schools, we recommend that PDE pre-test any revised or new survey questions using a think-aloud protocol with elementary school students. Pre-testing would aim to proactively identify and resolve any potential problems such as terminology with which elementary-aged

[32] https://safesupportivelearning.ed.gov/topic-research/school-climate-measurement/school-climate-survey-compendium

[33] More information about the eligibility requirements for surveys in the compendium is available at https://safesupportivelearning.ed.gov/school-climate-survey-compendium/nominate-school-climate-survey

students or non-native English speakers might be unfamiliar (for example, "police officer" versus "school resource officer").

Appendix A presents the final list of items for each survey that we recommend including and excluding.

CREATING A SCHOOL CLIMATE INDEX

The next phase of our analysis will use the results from the first phase to develop sub-indices that combine responses from different types of respondents (students, school staff, and parents) within each climate domain and develop an overall index that combines responses across different climate domains. Because different respondent types might have different perceptions of a school's climate, indices that combine all types of respondents will help capture a more complete picture of school climate. The team will construct an overall index across domains as well as sub-index for each domain (which will be useful for diagnostic purposes).

We will consider the transparency and simplicity of the index in addition to technical properties. In particular, when a simpler method yields a result comparable to a more technical method, we will favor the simpler method.

Estimate the Rasch model

To interpret the scores for both school climate domains and the index as a whole, we will use Rasch modeling to benchmark the scores. This analysis produces cut points that divide the scores on the survey into interpretable ranges. The benchmarks will allow PDE to assign more intuitive descriptions to the range of scores for a school. For example, schools that score above a particular cut point could be categorized as having the "most favorable" level of climate for a particular domain.

To develop the benchmarks, we will follow the approach used to benchmark the ED School Climate Survey (National Center for Education Statistics 2017). Specifically, this approach estimates a Rasch model separately for each type of survey (for example, elementary, middle, high school, and staff) and each domain. For each item on a survey, this method models the probability of selecting a given response as a function of the respondent's perception of the school's climate. For example, the more favorable the perception of school climate, the more likely a respondent is to select "Strongly agree" for items that are positively valenced (items for which more agreement indicates a more favorable school climate). The Rasch model allows us to estimate cut points that correspond to the probability of selecting particular response categories on the survey. For example, scoring above the highest cut point indicates that a student is most likely to report "Strongly agree" to a positively valenced item. The estimates also include a measure of each respondent's perception of school climate for each domain, which is their "Rasch score." We will estimate the model using Winsteps software.

Assess item fit and adjust the Rasch model. We will assess the item fit for each of the domains for each type of respondent. To do so, we will examine the *infit* and *outfit* mean square value (Wright 1984; Wright and Masters 1981). These statistics indicate whether the observed answers fit the model as expected. A value of the infit and outfit close to 1 indicates that the data fit the model as expected. A value greater than 1 indicates that there is more variation in the answers than the model would have predicted, and a value lower than 1 indicates that there is less. For example, a value of 1.2 indicates that there is 20 percent more variation in responses than would be expected. We assess the infit and outfit statistics using the criteria in Table 6. The ideal level of fit is close to 1 (between 0.5 and 1.5 for a rating scale). For values greater than 2.0, including the item could degrade the resulting measure, so we suggest dropping such items from the final scales.

Table 6. Criteria for assessing infit and outfit statistics

Range of infit or outfit mean square value	Description	Recommended action
> 2.0	Distorts or degrades measurement system	Drop item from index
1.5–2.0	Unproductive for measurement, but not degrading	Include item
0.5–1.5	Productive for measurement	Include item
< 0.5	Less productive for measurement	Include item

Source: Linacre (2002).

Examine the step values. In addition to examining the fit of each item, we will also consider the step values between responses within each item and across items. The step values are estimates of the point at which respondents switch from being more likely to select one response category relative to the adjacent category. Because there are four possible response categories for the PDE school climate survey (with the exception of the elementary school student survey, which includes three possible response categories), there are three corresponding step values: (1) one that separates "Strongly disagree" and "Disagree," (2) one that separates "Disagree" and "Agree," and (3) one that separates "Agree" and "Strongly agree." If a respondent's Rasch measure is exactly at the step value, then the respondent is equally likely to select either category. For example, if a respondent's Rasch measure is exactly at the first step value, then he or she is equally likely to select "Strongly disagree" and "Disagree." If a respondent's Rasch measure is greater than the first step value, then he or she is more likely to select "Disagree" than "Strongly disagree."

The estimated step values can also shed light on the information provided by respondents who select one category versus another and can help inform how to set benchmarks. If two step values are close to each other, then it suggests that the corresponding response categories do not provide much additional information. The ED School Climate Survey benchmarking report found that the distance between the lowest and second lowest category is relatively small and collapsed the lower two categories into a single "Strongly disagree/Disagree" category because

two categories provide a similar amount of information (National Center for Education Statistics 2017).

Identify the Benchmarks

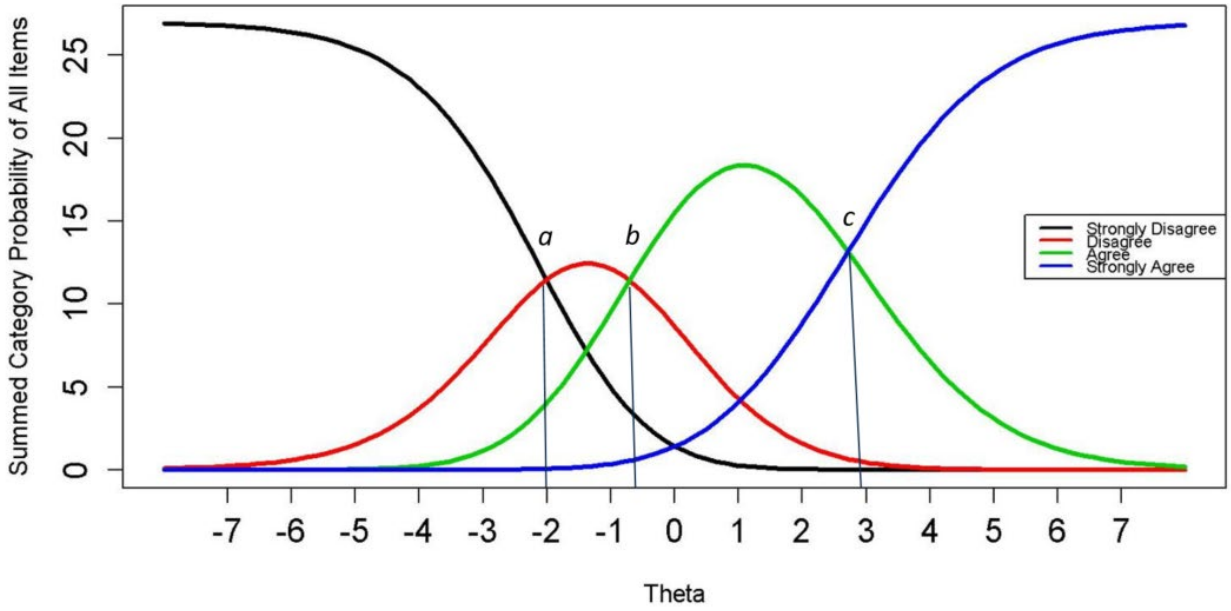
Following a similar approach to the one used for the ED School Climate Survey, we will identify the benchmarks based on the estimates from the Rasch model (National Center for Education Statistics 2017). For each domain, we will estimate the cut points (that is, the step values) in Rasch score units that corresponded to the probability of selecting various response categories for the items within the domain. For example, the high cut point corresponds to the point at which a respondent with a Rasch score higher than that cut point is most likely to report "Strongly agree" to a positively valenced item. Aligning the cut points to the response categories makes them more interpretable.

We will identify the cut points using a three-step procedure:

1. **Calculate the Category Probability Curve (CPC) for each response category for each item.** The CPC is the probability of selecting a particular category (such as "Strongly agree") as a function of each person's perception of school climate θ_i. For example, for a positively valenced item, a respondent is more likely to select "Strongly agree" if he or she has a higher value of θ_i .

   Figure 1 shows an illustrative CPC for a hypothetical positively valenced item with four response categories ("Strongly disagree," "Disagree," "Agree," and "Strongly agree"). The scale along the X axis of the graph represents the underlying latent construct θ_i. The Y axis is the probability of selecting a response category conditional on θ_i. Points a, b, and c are the step values.

Figure 1. Example Category Probability Curves for an item with four response categories



Point *a*: 'Disagree' becomes most likely response
Point *b*: 'Agree' becomes most likely response
Point *c*: 'Strongly Agree' becomes most likely response

Source: National Center for Education Statistics 2017.

For example, the most likely response for persons with a theta (θ_i) below point *a,* where the first category and the second category intersect, is "Strongly disagree" because the first category curve is above the other three curves in this range. For a value of θ_i between this intersection and point b, where the second category and the third category intersect, the most likely response is "Disagree." The most likely responses are "Agree" for a value of θ_i between points b and c and "Strongly agree" for a value of θ_i above point c.

2. **Calculate the Scale Characteristic Curve (SCC) for each response category for each domain.** The SCC is the sum of the CPCs across items within a domain. It represents the expected number of items within a domain for which a respondent will select a given response category.
3. **Identify the cut points based on the intersections between the SCC curves.** The intersection between two curves, which is the step value, indicates the point at which a respondent is likely to select an equal number of responses of each category type. For example, above the higher cut point, which is the intersection between the curves for "Agree" and "Strongly agree" (θ_H), a respondent is more likely to select "Strongly agree" across the items than to select "Agree."

   Based on the intersections of the curves and the distribution of the data, we will create different levels of school climate, separated by the cut points. Table 7 shows examples of the three-level benchmarks for the ED School Climate Survey benchmarking (National Center

for Education Statistics 2017). θ_L and θ_H are the estimates of the lower and higher cut points.

Table 7. Definition and interpretation of benchmarks

Description	Interpretation	Mathematical formulation
Level 3 (most favorable)	Most likely to select "Strongly agree" if a positively valenced question	$\theta > \theta_H$
Level 2 (favorable)	Most likely to select "Agree" if a positively valenced question	$\theta_L < \theta \leq \theta_H$
Level 1 (least favorable)	Most likely to select "Disagree/Strongly disagree" if a positively valenced question	$\theta \leq \theta_L$

Calculate climate scores for each respondent

Each school's overall school climate score will be the average of respondents' scores on each domain. We consider two different approaches to calculating the respondents' scores that have some trade-offs. One approach is based on Rasch scores. The other is based on calculating a simple average across items within a domain. We calculate the overall climate scores using both approaches.

- **Respondent score approach #1: Using Rasch scores.** As noted above, the Rasch model estimates Rasch scores on each domain for each individual, denoted by θ_i. The Rasch scores are convenient because they relate directly to the parameters of the Rasch model and the cut points described above. For respondents that complete all items within a domain, there is also a one-to-one mapping between Rasch scores and total scores (the sum of the numerical values that correspond to the item responses within a domain). The PDE school climate surveys were administered online in a way that respondents had to answer all the questions for the surveys to be submitted. Therefore, every respondent completed all items in the survey. In the case of the PDE school climate survey, the total scores are based on assigning scores to each response category with the following numerical values (assuming a positively valenced item): 1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Agree"; and 4 = "Strongly agree." For example, if a respondent selected "Strongly agree" on all items in a domain that has 10 items, that respondent would receive a total score of 40 using either approach. Winsteps outputs this mapping between Rasch scores and total scores for respondents who respond to all items.
- **Respondent score approach #2: Using mean scores.** Because calculating the Rasch scores for each respondent can be complex, we will also consider a simpler, alternative approach. This approach is to create a simple mean score by averaging the scores associated with each response category across all items within a domain, where the scores for each response category are the same as described under Respondent score approach #1. For example, if a respondent selected "Agree" on half of the items and "Strongly agree" on the other half of the items, his or her score

would be a 3.5. The cut points derived from the Rasch model can be converted from Rasch score units into the mean score units, using the mapping between total scores and Rasch scores. This approach is easier to implement but does not account for the fact that different items within a domain provide different amounts of information on school climate.

Convert the Rasch scores to scaled scores

The Rasch scores are in the log-odds units, which are hard to interpret. They are usually converted to a range consisting of positive scores. For example, the ED School Climate Survey benchmarking converted the Rasch scores into scale scores through a linear transformation using the cut points as anchors (National Center for Education Statistics 2017). In other words, the cut points will take the same value across all of the domain. Specifically, the anchors for the low and high cut points were set at 300 and 400, respectively, and the range of scores was set to 100 to 500. This rescaling means that, scale scores between 400 to 500 will fall into the "most favorable" category, as defined above. The scores can be transformed using a system of linear equations. The same approach can be used to convert the mean scores to scaled scores.

What would be the range of the scaled scores? PDE can decide on the range of the scaled scores that is most helpful for your purposes. For example, the Maryland Department of Education aligned the reporting of the school climate index with the reporting of accountability and scaled the scores on a 1- to 10-point scale.

Create the school climate index

We will first calculate each respondent's score for the domain and then create the school climate index within and across domains based on the scale scores in the following steps:

1. **Calculate each individual respondent's score for the domain.** For each respondent that has a valid score for a domain, we will calculate a scale score on the domain. To do so, we apply the steps outlined above. Let the scale score for person i in school j of respondent type r on domain d be given by SS_{ijrd}. Respondent types can either be s for student or e for educator.
2. **Calculate school-level scores on each domain for each respondent type.** We will take the average across individuals within a respondent type and domain for a given school to calculate school-level scores on each domain for each respondent type:

   $\overline{SS}_{jrd} = \sum_{i=1}^{N_{jrd}} w_{ijrd}^{indiv} SS_{ijrd}$,

   Where N_{jrd} could differ across domains for a given respondent type and school, and w_{ijrd} is the weight that each respondent receives and is constructed so that $\sum_{i=1}^{N_{jrd}} w_{ijrd}^{indiv} = 1$. If all respondents of a given type are weighted equally, then $w_{ijrd} = 1/N_{jrd}$.

These are sub-indices that can be used to identify strength and weakness of school climate for a specific school.

3. **Calculate the overall school-level index for each respondent type.** We will then average across each of the domains to create the school-level index for each respondent type:[34]

   $\overline{SS}_{jr} = \sum_{d=1}^{D_r} w_{dr}^{domain} \overline{SS}_{jrd}$,

   where w_{dr} is the weight that each domain receives, $\sum_{d=1}^{D_r} w_{dr}^{domain} = 1$, and D_r is the number of domains for each respondent type. If domains are weighted equally, then $w_{dr}^{domain} = 1/D_r$.

4. **Calculate the overall school-level index.** Finally, we will average the respondent-specific school-level index across the respondent types to form the school-level index:

   $\overline{SS}_{j} = \sum_{r=1}^{R_r} w_{r}^{resp} \overline{SS}_{jr}$,

   where w_r^{resp} is the weight that respondent type r receives, $\sum_{r=1}^{R_r} w_r^{resp} = 1$, and R_r is the types of respondents. If all types of respondents are weighted equally, then $w_r^{resp} = 1/R_r$.

We could also calculate the school-level sub-index for each domain, which is the average of the school-level domain scores across respondent types.

Aggregated index results must themselves be reliable and reflective of true school climate. We will conduct follow-up analysis during the construction of indices to assess the reliability of index measures and correlations of index measures across different respondent types.

CREATING THE SCHOOL CLIMATE INDEX NEXT STEPS: QUESTIONS FOR PDE

Before proceeding with creating the index, PDE need to make some decisions, as implied in the formula. The formula allows for the possibility of different weights for individual respondents, domains, and respondent types. Table 8 summarizes different options related to creating the school climate index. We can explore the sensitivity to the choices of weights in the analysis.

Table 8. Choices and decisions about weighting

Decisions to make	Options
How to weight individual respondents	Weight individual respondents equally
	Use nonresponse weights to adjust for nonresponse bias
How to weight domains	Equal weighting of domains
	Weight certain domains more strongly

[34] The elementary school survey items have fewer response categories and cannot be rescaled the same way as other surveys. Therefore, it will be excluded from the index calculation this round, but it can be included in the index for future surveys because of the revision to the elementary school survey.

Decisions to make	Options
What types of respondents to include	Include all respondent types
	Not include community members or parents
How to weight respondent types (students versus educators or parents)	Equal weighting of respondent types
	Weight students more strongly and down-weight parents
	Weight respondent types based on response rates
Which index to create	Create the overall index across domains only
	Create both the overall index and sub-index for each of the domains

1. **How to weight individual respondents?** One option is to weight individual respondents equally. However, if nonresponse patterns differ by school, then comparisons across schools might be misleading. To adjust for nonresponse, we can create nonresponse weights by estimating a person's probability of responding by using a two-step parametric approach in which we (1) use a probit model to estimate the probability of responding as a function of characteristics and (2) predict the probability of response for each person. This is impossible with the existing data, however, because they do not have identifiers that can link to administrative data that provide information about student and staff characteristics. It will be helpful for future surveys to create a linking ID so that nonresponse weights can be estimated.
2. **How to weight domains for each type of respondent's overall school-level index?** Does PDE have any theoretical basis or policy preferences for weighting certain domains more strongly than others?
3. **What types of respondents to include in the overall school-level index?** There are different types of respondents of the school climate surveys: students, instructional staff, non-instructional staff, parents, and community members. Because schools and districts did not report the number of community members they invited to participate in the community survey, it is not possible to define a potential respondent pool for the community survey to calculate the response rates. We did not have the information about who the respondents are, how well they know the schools, and how useful their perspectives are to inform efforts for improving school climate. We recommend not including community survey respondents in the overall index. Future surveys will add characteristics of community survey respondents, and we can consider including community survey in the overall index then.

   Given the low response rate for the parent survey, we also recommend excluding the parent survey from the index. We can conduct sensitivity analysis to show the results with and without parent survey in the index.
4. **How to weight different types of respondents across schools?** The proportion of each type of respondent (that is, students, educators, and parents) likely differs between schools. A

simple average (that is, equal weighting) of all types of respondents within a school could place greater weight on one type of respondent compared to other schools, which could lead to bias if responses differ across types. The index will account for this issue by determining the weights to apply to each respondent type. One option for weighting types of respondents would be to give a higher weight to students so that the index represents the students' voice more strongly. The response rates for parent survey were very low; therefore, we also suggest down-weighting the scores for parent survey in the index to reduce the importance of that group—if parent surveys are used at all.

Another option is to weight respondent types based on the response rates, giving more weight to those with higher response rates.

5. **What additional indices would be helpful for PDE?** In addition to the overall school climate across all domains, we could also create the school level index for each domain, which would be helpful for identifying the strengths and weaknesses of the school climate in each school.

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APPENDIX A. FINAL RECOMMENDATIONS OF ITEMS TO INCLUDE AND EXCLUDE FROM THE SURVEYS

Below, we denoted items that we recommend dropping, revising, or adding to a survey with italics and shading.

Parent survey items

Keep all original items

One School Climate factor (all original items)

Variable name	Item
	Please indicate how strongly you agree or disagree
Pq88sppd	At this school there are good supports for all children, including children with learning problems.
Pq92tchi	Teachers at my child's school are interested in what I have to say.
Pq84tchc	I am satisfied with communication with my child's teacher(s).
Pq87chdl	My child likes his/her teachers.
Pq94prnr	I would recommend my child's school to others.
Pq85gded	My child is getting a good education at this school.
Pq91hiex	Adults at this school have high expectations for all children.
Pq93prni	I feel like I am actively involved in my child's education.
Pq81spps	My child's school is a supportive and inviting place for students.
Pq82chds	My child is safe at school.
Pq83prnw	I feel welcome at this school.
Pq86chdf	My child is treated fairly at this school.
Pq89sptp	This is a supportive and inviting place for parents/guardians.
Pq90adtd	Adults at this school respect cultural diversity.

Note. All parent survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Staff survey items

Drop 3 items for classroom teachers and 1 item for non-instructional staff

Social-Emotional Learning (all original items)

Variable name	Item
	How much do you agree with the following statements about students in your school? *Students in my school…*
Sq27stpt	Stop and think before doing anything when they get angry.
Sq28grpp	Do their share of the work when doing group projects.
Sq29givu	Give up when they can't solve a problem easily.
Sq30argu	Get into arguments when they disagree with people.
Sq31dbst	Do their best, even when their school work is difficult.
Sq32okfg	Think it's OK to fight if someone insults them.
Sq33dohw	Do all their homework.
Sq34symn	Say mean things to other students when they think the other students deserve it.
Sq35wkot	Try to work out their disagreements with other students by talking to them.
Sq36okch	Think it's OK to cheat if other students are cheating.
Sq37dogd	Try to do a good job on school work even when it is not interesting.

Note. Items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Student Support (all original items; combined with High Expectations, Academic Rigor, and Challenge items)

Variable name	Item	Note
	How much do you agree with the following statements about your teaching? *I…*	
Sq43care	Really care about my students.	Classroom teacher only
Sq44mkup	Help my students make up work after an excused absence.	Classroom teacher only
Sq45fdbk	Give my students feedback on class assignments that helps improve their work.	Classroom teacher only
Sq46acom	Provide accommodations to students who need them.	Classroom teacher only
	How much do you agree with the following?	
Sq70asks	The principal asks students about their ideas.	
Sq71effc	Students and parents receive effective communication about academic progress.	
Sq72frtr	When students break rules, they are treated fairly.	

Note. Items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

High Expectations, Academic Rigor, and Challenge (combined with Student Support items; drop three items for classroom teachers and one item for non-instructional staff)

Variable name	Item	Note
	How much do you agree with the following statements about your teaching? *I…*	
Sq38cnct	*Work to connect what I am teaching to life outside the classroom.*	*Classroom teacher only, drop*
Sq40shid	Encourage students to share their ideas about things we are studying in class.	Classroom teacher only
Sq41expa	*Require my students to explain their answers.*	*Classroom teacher only, drop*
Sq42prep	Prepare all students for success in the next grade, in college, or in a job.	Classroom teacher only
Sq48chwk	Believe all students can do challenging school work.	Classroom teacher only
	How much do you agree with the following?	
Sq73hpwk	I am happy working at this school.	
Sq74schp	This school is making steady progress implementing rigorous academic standards.	

Variable name	Item	Note
Sq54advw	When students in this school already know the material that is being taught, they are given more advanced assignments.	
Sq76stfa	In this school, staff members have a "can do" attitude.	
Sq77cmpt	*Students have adequate access to computers at this school.*	*Low factor loading for classroom teacher, drop from other classroom teacher and non-instructional staff for consistency*
Sq78hnra	Students in this school are encouraged to take advanced classes, such as honors, Advanced Placement (AP), or International Baccalaureate (IB), or classes that lead to professional certification.	
Sq79poss	This school provides positive experiences for students.	

Note. Items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Safe and Respectful School Climate (all original items)

Variable name	Item
	Please indicate how strongly you agree or disagree
Sq7crime	This school is badly affected by crime and violence in the community.
Sq8posp	This school provides positive experiences for parents.
Sq9welcm	This school provides a welcoming environment.
Sq14thrn	Students at this school are often threatened.
Sq16blyc	Students at this school are often bullied because of certain characteristics (for example, their race, religion, weight, or sexual orientation)
Sq17sfen	This school provides a safe environment for teaching and learning.
	How safe do you feel
Sq19sfos	Outside around the school?[a]
Sq20sfhl	In the hallways and bathrooms of the school?[a]
Sq21sfcs	In your classroom or work area?[a]
	How much do you agree with the following statements about students in your school? ***Students in this school…***
Sq22dntc	Don't really care about each other.
Sq23ptth	Like to put others down.
Sq24dntg	Don't get along together very well.
Sq25lkot	Just look out for themselves.
Sq26trtr	Treat each other with respect.
	How much do you agree with the following?
Sq75stfi	School staff members have a lot of informal opportunities to influence what happens here.
Sq80stfs	School staff members are supported by administration.

Note. All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

[a] These items in the staff survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe.

Elementary school student survey items (Grade 3 to 5)

Drop 2 items, rephrase or reword some items, and/or add 1 – 3 new items

Social-Emotional Learning (all original items plus potential items)

Variable name	Item
	Please mark whether you agree with these statements about students in your school.
Eq27stpt	Most students in my school stop and think before they get too angry.
Eq28grpp	ORIGINAL: Most of the students in my school do their part when we work together on a group project. *POTENTIAL REVISION: Most students in my school get along well when we need to work together as a group or team.*
Eq31dbst	Most students in my school do their best, even when their school work is hard. *POTENTIAL REVISION: Most students in my school feel it is important to try to do their best, even when their school work is hard or not interesting.*
Eq30argu	Most students in my school get mad when they disagree with people.
Eq35wkot	ORIGINAL: Most students in my school try to talk to other students if they are having a problem with them. *POTENTIAL REVISION: Most students in my school try to work out their problems with other students by talking to them.*
POTENTIAL ITEM A	*In my school, we talk about how our actions make others feel*[6]
POTENTIAL ITEM B	*In my school, we talk about ways to be a good person*[6]
POTENTIAL ITEM C	*In my school, adults teach me how to show feelings in proper ways*[6]
POTENTIAL ITEM D	*Adults in my school are good examples of how to behave*[35]
POTENTIAL ITEM E	*Most students in my school will try to stop other students from saying mean things to others*[6]

Note. All items have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

Student Support (all original items; combined with High Expectations, Academic Rigor, and Challenge items)

Variable name	Item
	Please mark whether you agree with these statements about your school
Eq10fair	Teachers and other staff in this school are fair to all students.
Eq11givh	Teachers and other staff in this school are willing to give students help.
Eq51difs	I wish I went to a different school.
	Please mark whether you agree with these statements about your teachers.
Eq43care	My teachers really care about me.
Eq66trtd	My teachers treat some students better than others.
Eq64ntct	My teachers notice if I have trouble learning something.
Eq65hlpi	My teachers help me do better on my school work.

Note. All items have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

[35] Based on items in the National School Climate Center Comprehensive School Climate Inventory (Elementary Version)

High Expectations, Academic Rigor, and Challenge (combined with Student Support items; drop two items)

Variable name	Item	Note
	Please mark whether you agree with these statements about your school	
Eq69ubrd	I am bored in school.	
	Please mark whether you agree with these statements about your teachers.	
Eq39tlko	*My teachers want us to talk with others about things we are studying.*	*Drop*
Eq41expa	*My teachers ask me to explain my answers.*	*Drop*
Eq47hmwk	The homework I get from my teachers helps me learn.	
Eq67topc	My teachers give me work that is interesting.	

Note. All items have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

Safe and Respectful School Climate (all original items)

Variable name	Item
	Please mark whether you agree with these statements about your school
Eq19sfos	I feel safe outside around the school.
Eq20sfhl	I feel safe in the hallways and bathrooms of the school.
Eq21sfcs	I feel safe in my classroom.
	Please mark whether you agree with these statements about students in your school.
Eq26trtr	Most students in my school treat each other with respect.
Eq13blly	Students at my school are bullied.
Eq15tsed	Students at my school are teased, picked on, made fun of, or called names.

Note. All items have the following response categories: (1) No, (2) Sometimes, and (3) Yes.

Middle school student survey items (Grade 6 to 8)

Social-Emotional Learning (all original items)

Variable name	Item
	How much do you agree with the following statements about students in your school? *Students in my school…*
Mq27stpt	Stop and think before doing anything when they get angry.
Mq28grpp	Do their share of the work when we have group projects.
Mq29givu	Give up when they can't solve a problem easily.
Mq30argu	Get into arguments when they disagree with people.
Mq31dbst	Do their best, even when their school work is difficult.
Mq32okfg	Think it's OK to fight if someone insults them.
Mq33dohw	Do all their homework.
Mq34symn	Say mean things to other students when they think the other students deserve it.
Mq35wkot	Try to work out their disagreements with other students by talking to them.
Mq36okch	Think it's OK to cheat if other students are cheating.
Mq37dogd	Try to do a good job on school work even when it is not interesting.

Note. All items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Student Support (combined with High Expectations, Academic Rigor, and Challenge items; drop three items)

Variable name	Item	Note
	How much do you agree with the following statements about your teachers? *My teachers…*	
Mq43care	Really care about me.	
Mq44mkup	Help me make up work after an excused absence.	
	How much do you agree with the following:	
Mq49adtb	Adults in this school are often too busy to give students extra help.	
Mq50ruls	Adults in this school apply the same rules to all students equally.	
Mq51difs	I wish I went to a different school.	
Mq52exth	I can get extra help at school outside of my regular classes.	
Mq53cnsl	A counselor at this school has helped me plan for life after high school.	
Mq55extra	Adults in this school are usually willing to take the time to give students extra help.	
	Please indicate how often you have done the following this school year:	
Mq60tlkt	*Talked to a teacher about a problem you were having in class.*[a]	*Drop*
Mq61tlka	*Talked to an adult at school about something that was bothering you*[a]	*Drop*
Mq62tkou	*Talked to an adult at school about something outside of school that is important to you.*[a]	*Drop*
	How much do you agree with the following statements about your teachers? *My teachers…*	
Mq64ntct	Notice if I have trouble learning something.	
Mq65hlpi	Will help me improve my work if I do poorly on an assignment.	
Mq66trtd	Treats some students better than others.	

Note. All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.
[a] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

High Expectations, Academic Rigor, and Challenge (combined with Student Support items; drop seven items)

Variable name	Item	Note
	How much do you agree with the following statements about your teachers? *My teachers…*	
Mq38cnct	Often connect what I am learning to life outside the classroom.	
Mq40shid	Encourage students to share their ideas about things we are studying in class.	

Variable name	Item	Note
Mq41expa	*Often require me to explain my answers.*	*Drop*
Mq47hmwk	Often assign homework that helps me learn.	
Mq48chwk	*Think all students can do challenging school work.*	*Drop*
	How much do you agree with the following:	
Mq54advw	*When students in this school already know the material that is being taught, the teacher gives them more advanced assignments.*	*Drop*
Mq56chma	*Students at this school are expected to learn challenging math material to get them ready for high school.*	*Drop*
	Please indicate how often you have done the following this school year:	
Mq57rsch	*Wrote a research paper of two or more pages.*[a]	*Drop*
Mq58defn	*Wrote a paper in which you defended your own point of view or ideas.*[a]	*Drop*
Mq59fmpr	*Made a formal presentation to a class about something you read or researched.*[a]	*Drop*
	How much do you agree with the following statements about your classes?	
Mq67topc	The topics we are studying are interesting and challenging.	
Mq68mkth	This class really makes me think.	
Mq69ubrd	I am usually bored in this class.	

Note. All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.
[a] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

Safe and Respectful School Climate (drop one item)

Variable name	Item	Note
	How much do you agree with the following statements about your school?	
Mq12wory	*I worry about crime and violence in school.*	*Drop*
Mq13blly	Students at this school are often bullied.	
Mq14thrn	Students at this school are often threatened.	
Mq15tsed	Students at this school are often teased or picked on.	
Mq16blyc	Students at this school are often bullied because of certain characteristics (ex: race, religion, or weight)?	
Mq18sthm	I sometimes stay home because I don't feel safe at school.	
	How safe do you feel:	
Mq19sfos	Outside around the school?[a]	
Mq20sfhl	In the hallways and bathrooms of the school?[a]	
Mq21sfcs	In your classes?[a]	
	How much do you agree with the following statements about students in your school? *Students in my school…*	
Mq22dntc	Don't really care about each other.	
Mq23ptth	Like to put others down.	
Mq24dntg	Don't get along together well.	
Mq25lkot	Just look out for themselves.	
Mq26trtr	Treat each other with respect.	

Note. All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.
[a] These items in the middle school student survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe.

High school student survey items (Grade 9 to 12)

Social-Emotional Learning (all original items)

Variable name	Item
	How much do you agree with the following statements about students in your school? *Students in my school…*
Hq27stpt	Stop and think before doing anything when they get angry.
Hq28grpp	Do their share of the work when we have group projects.
Hq29givu	Give up when they can't solve a problem easily.
Hq30argu	Get into arguments when they disagree with people.
Hq31dbst	Do their best, even when their school work is difficult.
Hq32okfg	Think it's OK to fight if someone insults them.
Hq33dohw	Do all their homework.
Hq34symn	Say mean things to other students when they think the other students deserve it.
Hq35wkot	Try to work out their disagreements with other students by talking to them.
Hq36okch	Think it's OK to cheat if other students are cheating.
Hq37dogd	Try to do a good job on school work even when it is not interesting.

Note. All the items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Student Support (combined with High Expectations, Academic Rigor, and Challenge items; drop four items)

Variable name	Item	Note
	How much do you agree with the following statements about your teachers? *My teachers…*	
Hq43care	Really care about me.	
Hq44mkup	Help me make up work after an excused absence.	
	How much do you agree with the following:	
Hq49adtb	Adults in this school are often too busy to give students extra help.	
Hq50ruls	Adults in this school apply the same rules to all students equally.	
Hq51difs	I wish I went to a different school.	
Hq52exth	I can get extra help at school outside of my regular classes.	
Hq53cnsl	A counselor at this school has helped me plan for life after high school.	
Hq55extra	Adults in this school are usually willing to take the time to give students extra help.	
	Please indicate how often you have done the following this school year:	
Hq60tlkt	*Talked to a teacher about a problem you were having in class.*[a]	*Drop*
Hq61tlka	*Talked to an adult at school about something that was bothering you.*[a]	*Drop*
Hq62tkou	*Talked to an adult at school about something outside of school that is important to you.*[a]	*Drop*
Hq63tkcn	*Talked to a counselor at school in depth about planning for college.*[a]	*Drop*
	How much do you agree with the following statements about your teachers? *My teachers…*	
Hq64ntct	Notice if I have trouble learning something.	
Hq65hlpi	Will help me improve my work if I do poorly on an assignment.	

Note. All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.
[a] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

High Expectations, Academic Rigor, and Challenge (combined with Student Support items; drop six items)

Variable name	Item	Note
	How much do you agree with the following statements about your teachers? *My teachers…*	
Hq38cnct	Often connect what I am learning to life outside the classroom.	
Hq40shid	Encourage students to share their ideas about things we are studying in class.	

Variable name	Item	Note
Hq41expa	*Often require me to explain my answers.*	*Drop*
Hq47hmwk	Often assign homework that helps me learn.	
Hq48chwk	*Think all students can do challenging school work.*	*Drop*
	How much do you agree with the following?	
Hq54advw	When students in this school already know the material that is being taught, the teacher gives them more advanced assignments.	
Hq56chma	*Students at this school are expected to learn challenging math material to get them ready for graduation.*	*Drop*
	Please indicate how often you have done the following this school year:	
Hq57rsch	*Write a research paper of 5 or more pages.*[a]	*Drop*
Hq58defn	*Write a paper in which you defended your own point of view or ideas.*[a]	*Drop*
Hq59fmpr	*Make a formal presentation to a class about something you read or researched.*[a]	*Drop*
	How much do you agree with the following statements about your classes?	
Hq67topc	The topics we are studying are interesting and challenging.	
Hq68mkth	This class really makes me think.	
Hq69ubrd	I am usually bored in this class.	

Note. All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.
[a] These items in the middle school student survey have the following response categories: (1) Never, (2) 1 or 2 times, (3) 3 or 4 times, and (4) 5 or more times.

Safe and Respectful School Climate (drop one item)

Variable name	Item	Note
	How much do you agree with the following statements about your school?	
Hq12wory	*I worry about crime and violence in school.*	*Drop*
Hq13blly	Students at this school are often bullied.	
Hq14thrn	Students at this school are often threatened.	
Hq15tsed	Students at this school are often teased or picked on.	
Hq16blyc	Students at this school are often bullied because of certain characteristics (ex: race, religion, or weight)?	
Hq18sthm	I sometimes stay home because I don't feel safe at school.	
	How safe do you feel:	
Hq19sfos	Outside around the school?[a]	
Hq20sfhl	In the hallways and bathrooms of the school?[a]	
Hq21sfcs	In your classes?[a]	
	How much do you agree with the following statements about students in your school? *Students in my school…*	
Hq22dntc	Don't really care about each other.	
Hq23ptth	Like to put others down.	
Hq24dntg	Don't get along together well.	
Hq25lkot	Just look out for themselves.	
Hq26trtr	Treat each other with respect.	

Note. All the items except those noted below have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.
[a] These items in the high school student survey have the following response categories: (1) Not safe, (2) Somewhat safe, (3) Mostly safe, and (4) Very safe.

Community survey items

Social-Emotional Learning (all original items)

Variable name	Item	Note
	How much do you agree with the following statements about students in your community? *Students in my community…*	
Cq97comh	Help others in the community in times of need.	
Cq98comp	Respect community property.	
	How much do you agree with the following:	
Cq99volw	Community volunteers are welcome in this district.	
Cq100inp	Input from community members is welcomed by our district.	
Cq102sts	Students in this school are encouraged to be successful.	
Cq79poss	This district provides positive experiences for students.	
	How much do you agree with the following statements about students in your community? *Students in my community…*	
Cq96comc	**Care about others in the community.**	This item was moved from the Safe and Respectful School Climate to the Social-Emotional Learning domain.

Note. All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Student Support (combined with High Expectations, Academic Rigor, and Challenge items)

Variable name	Item
	How much do you agree with the following statements about educators in your district? *Educators in my district…*
Cq43care	Care about their students.
	How much do you agree with the following?
Cq71effc	Parents and community members receive effective communication about progress in our schools.
Cq72frtr	All students in our district are treated fairly.

Note. All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

High Expectations, Academic Rigor, and Challenge (combined with Student Support items)

Variable name	Item
	How much do you agree with the following statements about educators in your district? *Educations in my district…*
Cq48chwk	Believe all students can do challenging school work.
Cq42prep	Prepare all students for success in the next grade, in college, or in a job.
	How much do you agree with the following?
Cq74schp	This district is making steady academic progress.
Cq101acs	Students have adequate access to technology in this district.

Note. All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.

Safe and Respectful School Climate (drop one item)

Variable name	Item	Note
	Please indicate how strongly you agree or disagree	
Cq8posp	The schools provide positive experiences for parents and community members.	
Cq9welcm	The schools provide a welcoming environment.	
Cq95comr	The schools have a good relationship with the community.	
Cq17sfen	The schools provide a safe environment for teaching and learning.	
	How much do you agree with the following statements about students in your community? *Students in my community…*	
Cq22dntc	*Don't really care about each other.*	*Drop*
Cq26trtr	Treat each other with respect.	

Note. All community survey items have the following response categories: (1) Strongly disagree, (2) Disagree, (3) Agree, and (4) Strongly agree.