EIA Program Report for Fiscal Year 2011-12

Coversheet

EIA-Funded Program Name: **SC Educational Policy Center**

Current Fiscal Year: **2011-12**

Current EIA Appropriation: **$75,008**

Name of Person Completing Survey and to whom EOC members may request additional information:

Dr. Diane M. Monrad

Telephone Number:

803-777-8244

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Question 1: History of the program: Please mark the appropriate response (choose one):

This program:

___was an original initiative of the Education Improvement Act of 1984

___was created or implemented as part of the Education Accountability Act of 1998

___ has been operational for less than five years

___was funded last fiscal year by general or other funds

___ is a new program implemented for the first time in the current fiscal year

_**X**_ other

Question 2: What SC laws, including provisos in the current year's general appropriation act, govern the implementation of this program? Please complete citations from the SC Code of Laws including, Title, Chapter, and Section numbers.

Code of Laws:

Proviso(s): (If applicable. Please make references to the 2011-12 General Appropriation Act as ratified. www.XXXXX)

Proviso IA.9

Regulation(s):

Do guidelines that have been approved by the State Board of Education, the Commission on Higher Education or other governor board exist that govern the implementation of this program?

____Yes

_**X**__No

Question 3: What are the primary objective(s) or goals of this program? Please distinguish between the long-term mission of the program and the current annual objectives of the program. (The goals or objectives should be in terms that can be quantified, evaluated, and assessed.)

Not applicable. The research services provided by the South Carolina Educational Policy Center are determined each year in collaboration with staff from the EOC and the South Carolina Department of Education. The purpose of the current research was to analyze the 2010 teacher, parent, and student school climate surveys and develop four-year school climate profiles for the the Palmetto Priority schools to use in their school improvement initiatives.

Question 4: In the prior fiscal year, 2010-11, what primary program activities or processes were conducted to facilitate the program's performance in reaching the objective(s) as provided in Question 3? What, if any, change in processes or activities are planned for the current year?

Examples of program processes would be: training provided, recruiting efforts made, technical assistance services, monitoring services, etc.

Answers should be specific to the process undertaken at the state level to support the objectives of the program and should be quantifiable. Please include any professional development services provided.

IF the funds are allocated directly to school districts, please indicate any data collected at the state level to monitor how the funds are expended at the local level?

The South Carolina Educational Policy (SCEPC) has collaborated with EOC and SCDE staff for several years on an analysis of the state's school climate surveys that are completed each year by teachers, parents, and students at every school. Data from selected items on these surveys are included on school report cards, but the majority of the existing survey data was not subjected to state-wide analysis until 2007. Initial work focused on school climate in elementary schools that were successful in closing the achievement gap, and then the work expanded to encompass all schools in the state. A variety of analytic procedures were used to identify important climate factors and to explore the relationships between school climate and student achievement.

The 2006-2010 school climate survey data for all schools in the state were analyzed to identify factors underlying the school climate surveys for teachers, students, and parents. The six climate factors for teachers included: *Working conditions/ Principal leadership*, *Home-school relationship*, *Instructional focus*, *Resources*, *Physical environment*, and *Safety*. Items in the student survey described four climate factors: *Learning environment*, *Social-physical environment*, *Home-school relationship*, and *Safety*. Similarly, parent survey items measured four climate dimensions: *Learning environment*, *Social-physical environment*, *Teacher care and support*, and *Home-school relationship*. School scores on these factors were used to create clusters of schools for all organizational levels (elementary, middle, and high) that reflected most positive to least positive school climate. Positive school climate was associated with a variety of student and school outcomes such as higher student achievement, lower dropout rates, higher teacher retention, and higher teacher and student attendance.

For 2010-2011, SCEPC staff analyzed 2010 school climate surveys so that four-year climate profiles could be developed for the state's Palmetto Priority schools. The purpose was to provide technical assistance personnel with school climate information for use in developing cost-effective, targeted school improvement strategies. Information on the school climate research was shared with staff from the Palmetto Priority schools and each school's Leadership Team at two regional collaborative meetings in February 2011. After the four-year profiles were developed for the Palmetto Priority schools, SCEPC staff met with the technical assistance staff from the SCDE to discuss the individual school profiles and school improvement needs.

For 2011-2012, SCEPC staff are analyzing the 2011 teacher, parent, and students survey data so that the four-year school climate profiles for the Palmetto Priority schools can be updated with the most recent data. Training will be provided to SCDE personnel assigned to the Priority schools on how to interpret and utilize the four-year school climate profiles in assessing school needs for improvement. In addition, focus groups will be held with a variety of district and school personnel to facilitate the development of user-friendly climate profiles that can be easily shared with school personnel and the community.

Question 5: In the prior fiscal year, 2010-11, and using the most recent data available, what were the direct products and services (outputs) delivered by this Program?

Examples of program outputs would be: number of teachers attending professional development seminars, number of and passage rates on AP exams, number of students served in the program, improvements in student achievement, retention and graduation.

The most significant product developed from this research was four-year school climate profiles for the Palmetto Priority schools. The profiles contain the following four resources that can be used for determining school climate strengths and areas that may need improvement:

- Resource 1. A graphical representation of the school's 2007-2010 teacher, parent, and student factor scores shows the mean teacher, student, and parent factor scores for all climate factors in all four years included in the analyses. This resource provides information on climate changes across years and climate strengths and weaknesses for the school when compared with all other schools in the state at the same organizational level (elementary, middle, or high schools).

- Resource 2. Percentile rank tables were created to show how individual schools compare with other state schools at the same organization level for each of the fourteen climate dimensions. The percentile ranks are calculated for each year covered by the four-year climate profile.

- Resource 3. Item scale percentage tables show the percentage of responses for each response category by item. Common types of responses are *Disagree*, *Mostly disagree*, *Mostly agree*, *Agree*, and *Not applicable.* There are separate tables for each of the teacher, parent, and student climate dimensions with all of the items included in each dimension. The item percentage tables allow technical assistance or school personnel to examine the pattern of item responses within each factor and identify strengths as well as potential areas of needed improvement.

- Resource 4. Item percentage box plots show the distribution of school item agreement percentages for the school compared with all other schools in the state at the same organizational level (elementary, middle, or high school). The box plots assist technical assistance or school personnel to identify individual items that have responses differing significantly from the responses of teachers, parents, and students at other schools.

Examples of these four resources are shown in an attachment to this report titled "School Climate and the Palmetto Priority Schools."

Additional products of this school climate research were two presentations to national research conventions. Papers detailing the use of school climate data for school improvement were presented at the American Evaluation Association meeting in November 2010 and the American Educational Research Association (AERA) in April 2011. The AERA paper is attached to this report. Both of these conferences require that papers be reviewed for technical quality and significance before the papers are accepted for presentation.

Question 6: What are the outcomes or results of this program?

Outcome can be both quantitative and qualitative and should address the program's objectives. Please use the most recent data available:

Examples of outcomes would be: results of surveys, student achievement results, increases in participation, reduction in achievement gaps, loans awarded, textbooks purchased, etc.

SCEPC has found numerous relationships between school climate indicators and student achievement and other school performance measures. Schools with positive school climate, as defined by positive, above average factor scores, did better on achievement outcomes; schools with a less positive climate did progressively worse on achievement outcomes. This pattern was observed for the mean percentage of AYP objectives met, the absolute report card ratings by school level, the mean percentage of students performing basic and above or proficient and advanced on state proficiency exams in ELA and Math, the High School Assessment Program, the high school end-of-course exams, the dropout rate, and the high school graduation rate. Statistical comparisons between groups of schools with the most positive climate and schools with poor climate revealed that these differences were significant ($p<.0001$).

The observed relationship between school climate indicators and student performance measures led to an interest in developing climate profiles for low-performing schools so that improvement initiatives could target areas of need. Initial two-year school climate profiles of the Palmetto Priority Schools showed that there was variation across the schools in the quality of their school climate. Some of the priority schools tended to have positive climate, while others showed evidence of poor climate that might be amenable to technical assistance.

As described in the previous section, four-year school climate profiles for the Palmetto Priority Schools were developed for the period 2007-2010. Graphical illustration of elementary, middle, and high school climate factor score means revealed that climate profiles differed across organizational levels. Elementary schools had the highest factor scores, followed by middle

schools and high schools. While differences across organizational levels were evident, the climate profiles of each organizational level were quite consistent across years.

The school climate profiles for the Palmetto Priority schools provide state technical assistance personnel and school personnel with data to use for school improvement. For the first time, existing data from years of administration of the teacher, parent, and student school climate surveys are available in an organized format that can be clearly understood and utilized.

Compared with other barriers which are not within the control of schools, such as high child poverty, negative school climate factors can be improved. The current school climate research provides a starting point to begin narrowing the gap between research, policy, and practice involving school climate as an important facet of school improvement. In particular, the four-year school-climate profiles provide low-performing schools with a practical, low-cost tool to use in identifying critical areas for school improvement.

Question 7: Program Evaluations

What was the date of the last external or internal evaluation of this program?

Not applicable.

Has an evaluation ever been conducted?

_____Yes

__X_ No

If an evaluation was conducted, what were the results and primary recommendations of the most recent evaluation?

Not applicable.

Can you provide a URL link, electronic version, or hard copy of this evaluation to the EOC?

_____Yes

__X_No

If yes, please provide URL link here.

If no, why not?

Not applicable.

Question 8:

While EIA revenues increased in 2010-11 over the prior fiscal year and no mid-year cuts were made to any EIA programs, programs and agencies continue to implement conservative budget practices.

Please describe how the program and/or organization would absorb or offset potential EIA reductions totaling 5%, and 10% in the current fiscal year, Fiscal Year 2011-12?

Since the majority of project costs are personnel, we would have to reduce the level of effort for the individuals working on this research.

Question 9:

If no additional EIA revenues were appropriated to this program in Fiscal Year 2012-13 above the current year's appropriation level, how would the objectives, activities and priorities of this program change?

Please be specific to address the impact to students, teachers or schools. Are there regulatory or statutory changes that you would recommend to the legislature that would assist this program/organization in meeting its objectives?

We would not be able to continue the analysis of the state's school climate data and the yearly development of four-year school climate profiles without external funding. We are also pursuing external funding for this research because we believe that school climate plays an important role in student achievement and school performance.

If you want to provide supporting documents or evaluation reports, either reference a website below or email the report directly to mbarton@eoc.sc.gov.

Questions 10 and 11 Apply only to programs NOT administered by the South Carolina State Department of Education.

Question 10: Fiscal Year 2012-13

The total amount of EIA funds requested for this program for the next fiscal year will be:

__X_ The same as appropriated in the current fiscal year's appropriation

____ An increase over the current fiscal year's appropriation

____ A decrease over the current fiscal year's appropriation

If you indicated an increase or decrease in funding for the next fiscal year, what is the total amount requested for this program for the next fiscal year?

Not applicable.

If you indicated an increase or decrease, please describe the reasons for the increase or decrease. How will the increase or decrease impact the objective of the program?

SCEPC provides research services in collaboration with the EOC and the South Carolina Department of Education. The SCEPC would welcome the opportunity to continue the collaborative work of this project and to share our work with the EIA Subcommittee or the entire EOC.

Question 11: Fiscal Years 2010-11 and 2011-12

Please fill in the attached charts to reflect the budget for this program in the prior fiscal year (2010-11) and the budget for this program in the current fiscal year (2011-12).

If the program was not funded in the prior fiscal year, please fill out information for the current fiscal year only.

Funding Source	Prior FY Actual	Current FY Estimated
EIA	75,008	75,008
General Fund	0	0
Lottery	0	0
Fees	0	0
Other Sources	0	0
Grant	0	0
Contributions, Foundation	0	0
Other (Specify)	0	0
Carry Forward from Prior Yr	0	0
TOTAL	75,008	75,008

Other: Please specify here.

Expenditures	Prior FY Actual	Current FY Estimated
Personal Service	60,329	63,340
Contractual Services		
Supplies and Materials	0	245
Fixed Charges		
Travel	1,107	1,000
Equipment		
Employer Contributions		
Allocations to Districts/Schools/Agencies		
Other: Please explain	10,757	10,423
Balance Remaining	2,815*	0
TOTAL	75,008	75,008
#FTES	NA	NA

Other: Please explain here.

Fringe charged on salary.

*Planned meetings with the Palmetto Priority School Liaisons were rescheduled to the current fiscal year, so funds budgeted for these activities last year were not spent.

South Carolina Educational Policy Center
College of Education, University of South Carolina

School Climate and the Palmetto Priority Schools

February 14, 2011

Diane M. Monrad, Tomonori Ishikawa, John May, Christine DiStefano
Diana Mîndril! , Heather Bennett, Mihaela Ene

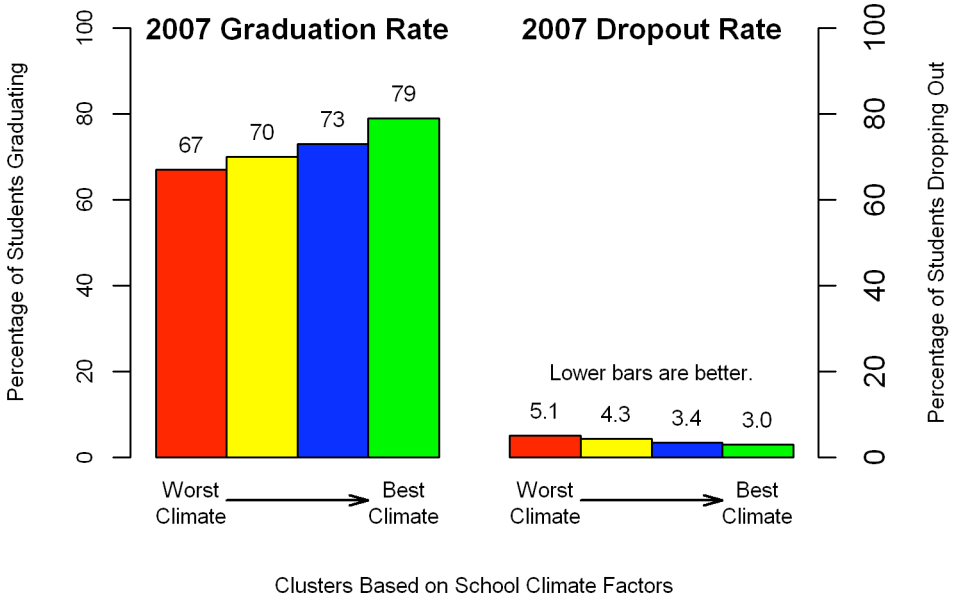
Purpose

We are developing school climate profiles to aid in cost-effective reform and continuous improvement efforts.

Findings

Schools with better school climate are associated with better school report card measures. Based on the report card surveys of student teachers and parents, we created mean latent factor scores for each school. Then, we grouped the schools into four school climate clusters from worst to best.

On average, high schools in clusters with better school climate have more students graduating and fewer students dropping out.



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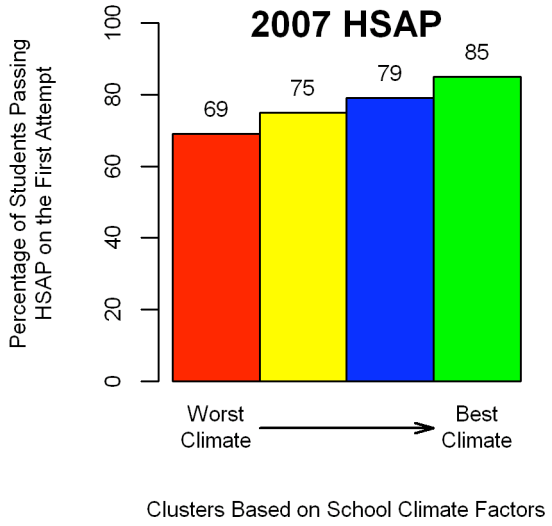
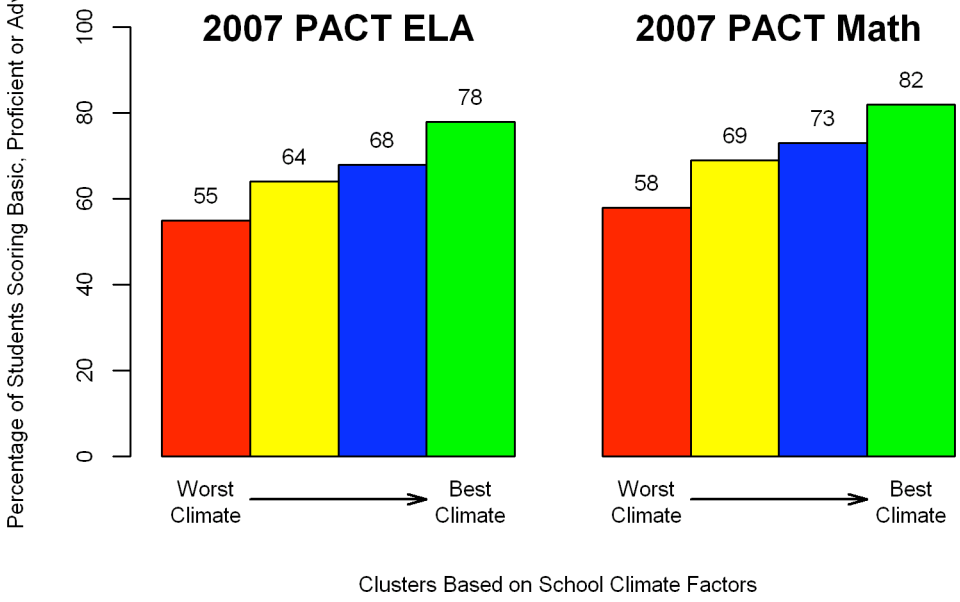


On average, high schools with better climate have more students who pass the HSAP on the first attempt.

On average, middle schools in clusters with better school climate have a greater percentage of students achieving at or above expectations.



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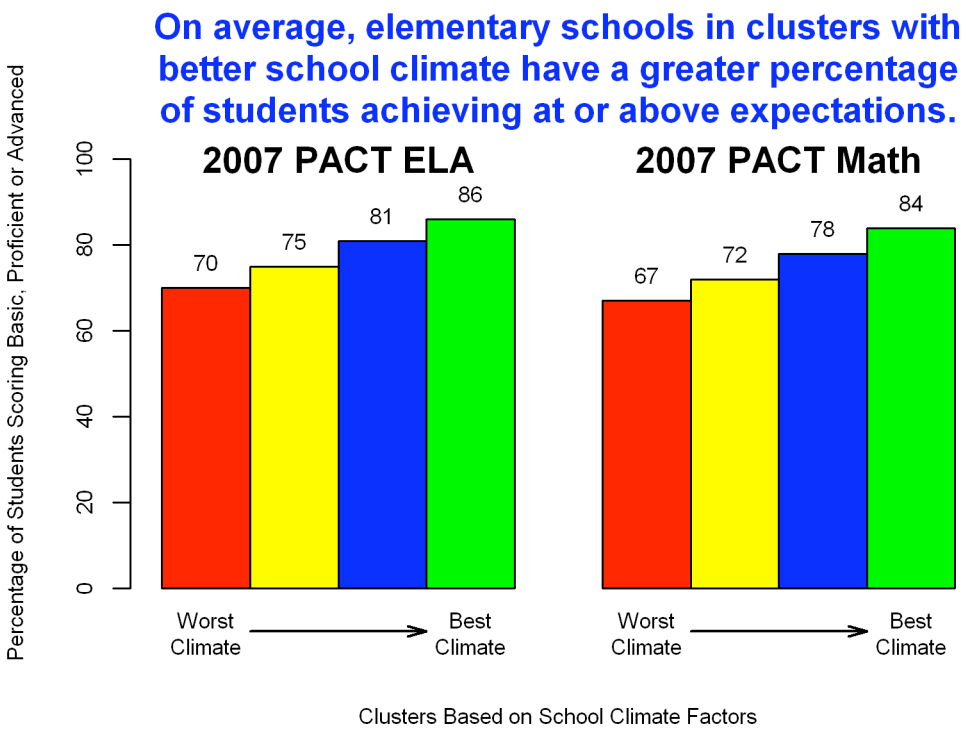

Background / Timeline of Research Program into School Climate

2006-2007
Studied 32 elementary schools designated by the EOC as gap-closing schools based upon a 4-year history of high performance by historically underachieving students at the identified schools. Identified school climate factors underlying the 2005 elementary school climate surveys for teachers, students, and parents using Exploratory Factor Analysis (EFA) and computed mean school climate factor scores for each school.

- Generally, gap-closing elementary schools displayed better key climate indicators than elementary schools on as measured by the state's school climate surveys in 2005, particularly in the area of home-school relationship for teachers.
- Students in gap-closing schools were more satisfied with the social-physical environment than students in the other schools.
- Parents in gap-closing schools tended to be more active in the schools as volunteers and rated the schools as higher for their efforts to engage parents.

Using factor scores, created groups of elementary schools within the state that varied by school climate; identified four clusters ranging from cluster 1 = most positive climate to cluster 4 = least positive school climate

2007-2008
Performed EFA on the 2006 surveys, computed mean factor scores for each school and clustered schools by organizational level (elementary, middle, high) based on those school climate factor scores.

- The 2006 EFA and clustering results showed similarities to the 2005 results in the school climate factors identified,
- EFA revealed six teacher climate factors, four student climate factors, and four parent climate factors.

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Investigated the relationship between school cluster membership and outcomes such as student test scores, growth in achievement, and attainment of No Child Left Behind student progress goals through correlations and regression analyses

- Moderate relationships between the school climate factors and achievement outcomes existed, even after accounting for poverty. Schools with poorest climate (defined by negative, below average factor scores) did worst on achievement outcomes; schools with a more favorable climate performed progressively better on achievement outcomes.

2008-2009

Analyzed 2007 state-wide school climate surveys to validate 2006 survey results; calculated the reliability of each of the teacher, student, and parent EFA factors

- 2007 EFA results replicated the 2006 survey findings, providing support to validate the existence of the underlying constructs. Standardized coefficient alphas ranged from 0.82 (2008 student home-school partnership) to 0.96 (2007 administrative support of teachers) illustrating high internal consistency.

Analyzed differences between groups of schools identified with most positive school climate and least positive school climate using t-tests

- Comparisons between cluster 1 and cluster 4 revealed that differences were significant ($p<.0001$) with cluster 1 scores reporting higher levels for outcome variables.

Investigated the relationship between teacher retention and school climate factors

- A positive, moderate relationship existed between teacher retention and a number of school climate factors.

Created school climate profiles charting longitudinal mean factor scores for 2006 and 2007 for the Palmetto Priority Schools

- The school climate profiles provided an initial way to summarize school-level climate data for school improvement planning.

2009-2010

Analyzed the 2008 and 2009 school climate surveys and developed 4-year school climate profiles (2006-2009) focused on low-performing schools.

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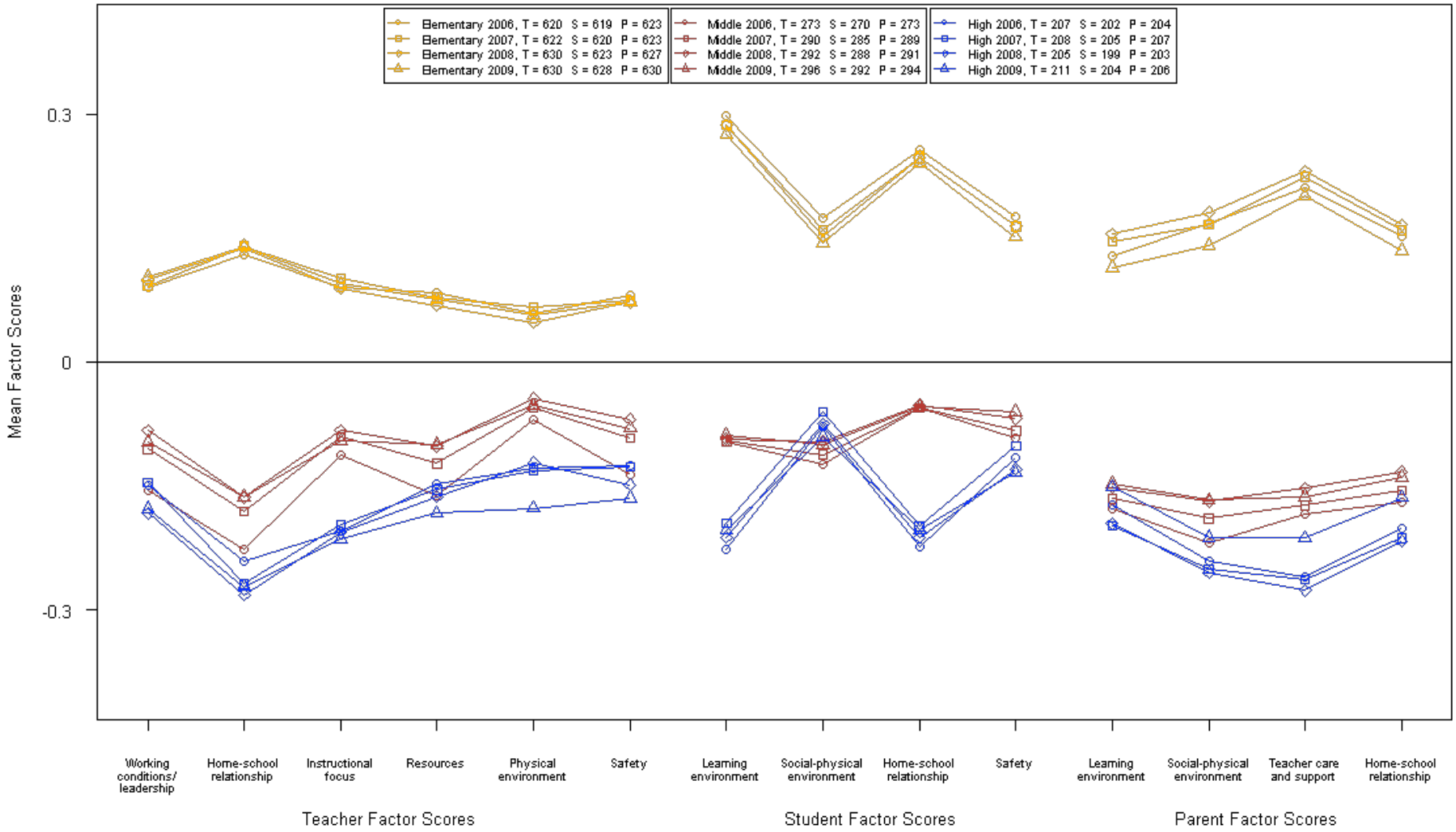
2006–2009 Mean Factor Scores by Organizational Level



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Methodology

[Heavily edit, but re-use from spring 2010 (2010-03-24) client presentation to EOC and SCDE.]

Data Preparation

- Examined data for duplicate cases and removed cases scanned twice
- Deleted cases if more than 25% of the responses were missing within each scale
- Imputed scores for cases with 25% or less missing data on each scale; replaced missing data with an average of the individual's responses for other items on the same scale
- Maximized sample size for analyses in order to retain more schools
- Developed school inclusion/exclusion rules; determined minimum number of surveys necessary: 10 teachers, 15 students, and 10 parents
- Created 2006-2009 gradespan files using the poverty file
- Explored assignment type by school
- Updated files to reflect grade organizational changes from year to year using the most recent SCDE finance dataset

Data Analysis: Confirmatory Factor Analysis (CFA)

- Conducted separately for teachers, parents, and students
- Compared the equivalence of the EFA and CFA solutions using item analysis
- Independently verified solutions using 2006-2009 datasets
- Examined pre-imputation, post-imputation, and CFA score frequency counts for three schools for three years to verify n counts
- Aggregated standardized factor scores to school level for comparisons
- Standardized teacher, student, and parent 2006-2009 factor scores by organizational level
- Examined the distribution of standardized and unstandardized factors scores
- Graphed factor means by organizational level
- Created a template to graph standardized 2006-2009 factor scores for each of the Palmetto Priority Schools

Data Analysis: Factor Percentile Ranks

- Calculated percentile ranks by organizational level
- Created 4-year percentile ranks for all of the Palmetto Priority schools within organizational level
- Verified results by comparing a sample of profile graphs to percentile ranks
- Created percentile rank tables for the Palmetto Priority Schools grouped by organizational level
- Created individual percentile rank tables for each Palmetto Priority School

Data Analysis: Item Agreement Percentages

- Set guidelines for creating percentages (e.g., non-integers and rounding)
- Calculated 2006-2009 teacher, student, and parent item scale percentages for each
- Palmetto Priority School and for state
- Graphed each Palmetto Priority School's item scale percentages
- Created item scale percentage box plots to allow for comparison within organizational level and by referent group

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School Climate Factors with Sample Items

Teacher Factors

Working Conditions/Leadership
- I feel supported by administrators at my school.
- The school administration provides effective instructional leadership.

Home-School Relationship
- Parents attend school meetings and other events.
- Parents at my school are interested in their children's schoolwork.

Instructional Focus
- Teachers at my school focus instruction on understanding, not just memorizing facts.
- Teachers at my school effectively implement the State Curriculum Standards.

Resources
- Our school has sufficient computers for instructional use.
- There is sufficient space for instructional programs at my school.

Physical Environment
- The hallways of my school are kept clean
- The grounds around my school are kept clean.

Safety
- I feel safe at my school during the school day.
- I feel safe at my school before and after school hours.

Student Factors

Learning Environment
- My teachers help students when they do not understand something.
- My teachers spend enough time helping me learn.

Social-Physical Environment
- Students at my school behave well in the hallways, in the lunchroom, and on school grounds.
- The bathrooms at my school are kept clean.

Home-School Relationship
- My parents know what I am expected to learn in school.
- My parent knows how well I am doing in school.

Safety
- I feel safe at my school during the school day.
- I feel safe at my school before and after school hours.

Parent Factors

Learning Environment
- My child's teachers encourage my child to learn.
- My child's school has high expectations for student learning.

Social-Physical Environment
- My child feels safe at school.
- My child's school is kept neat and clean.

Home-School Relationship
- My child's school considers changes based on what parents say.
- The principal at my school is available and welcoming.

Teacher Care and Support
- My child's teachers tell me how I can help my child learn.
- My child's teachers contact me to say good things about my child.

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School Climate Profile for a Sample Elementary School

[Space saved for possible intro text on profiles. Maybe cobble together from SCEPUR 2010 Post-Hoc Notes.]

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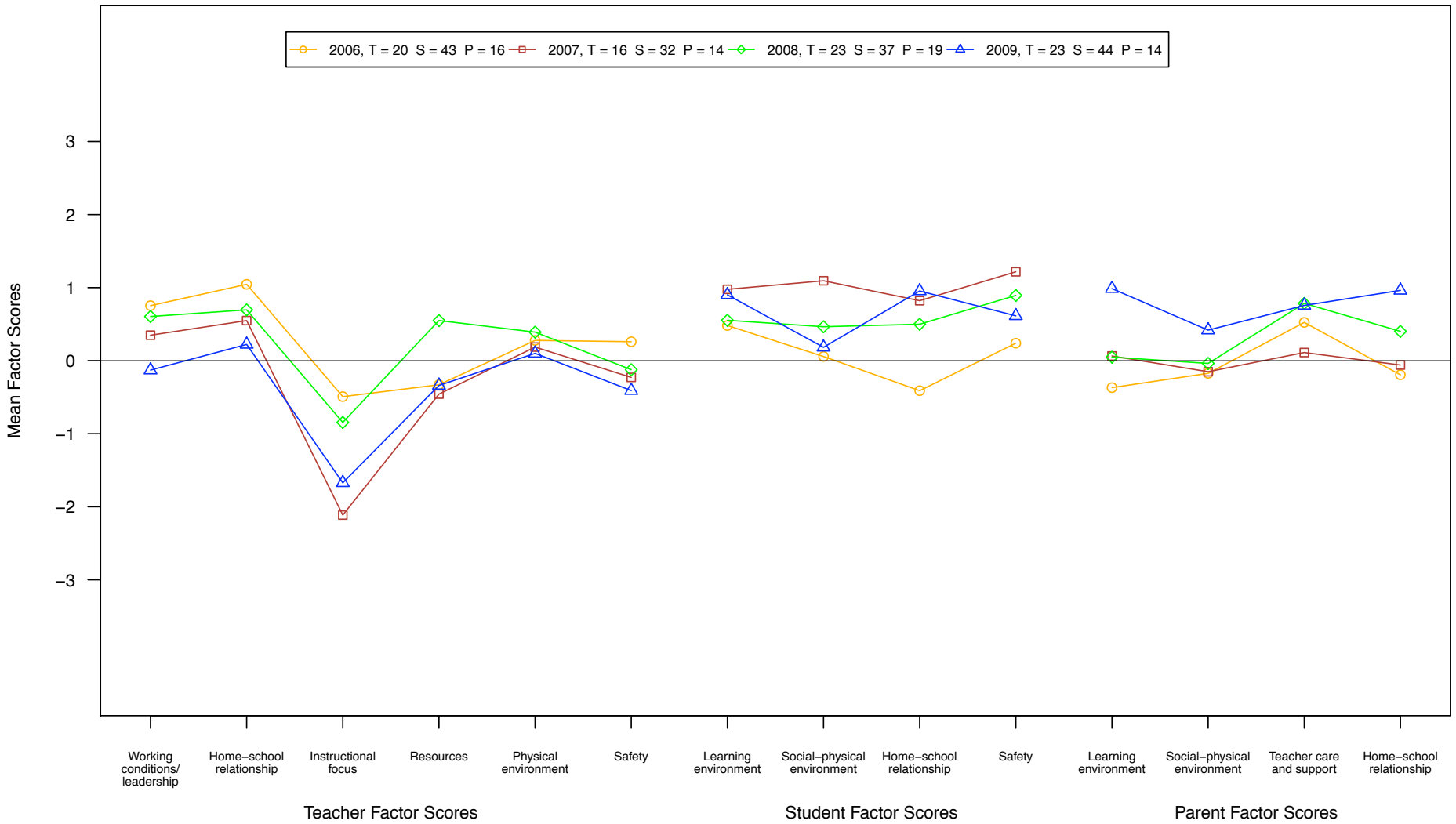
Sample School C—Standardized Mean Factor Scores



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Sample School C—Factor Percentile Ranks

Sample School C
Factor Percentile Ranks

Percentile Rank Among Elementary Schools				
	Percentile			
	2006	2007	2008	2009
Teacher Factors	n = 20	n = 16	n = 23	n = 23
Working Conditions/Leadership	74	58	66	38
Instructional Focus	25	4	17	7
Resources	30	28	67	30
Physical Environment	52	47	55	44
Safety	48	30	33	24
Home-School Relationship	85	64	71	55
Student Factors	n = 43	n = 32	n = 37	n = 44
Learning Environment	70	84	72	83
Social-Physical Environment	51	86	67	54
Safety	57	88	83	71
Home-School Relationship	30	80	69	83
Parent Factors	n = 16	n = 14	n = 19	n = 14
Learning Environment	32	51	50	84
Social-Physical Environment	39	40	45	65
Teacher Care and Support	69	53	78	78
Home-School Relationship	40	44	63	83

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24 Lower Lee Elementary School (3101011)

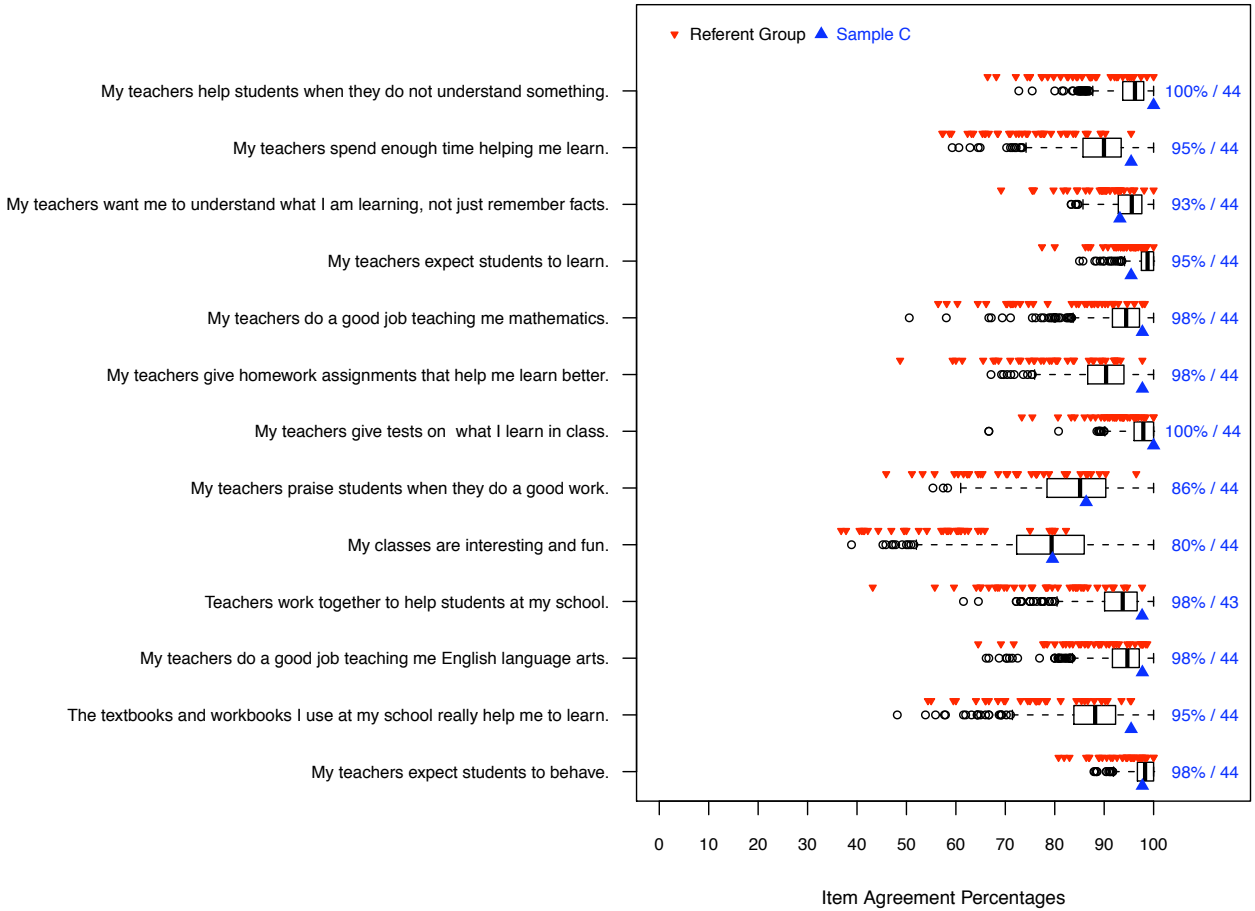
Student School Climate Dimensions for Lower Lee Elementary School

Item Text	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	No Response or Multiple Marks	N
Student Learning Environment Items							
My teachers help students when they do not understand something.	0.0	0.0	20.5	79.5	0.0	0.0	44
My teachers spend enough time helping me learn.	2.3	2.3	29.5	65.9	0.0	0.0	44
My teachers want me to understand what I am learning, not just remember facts.	4.5	2.3	20.5	72.7	0.0	0.0	44
My teachers expect students to learn.	2.3	2.3	18.2	77.3	0.0	0.0	44
My teachers do a good job teaching me mathematics.	0.0	2.3	27.3	70.5	0.0	0.0	44
My teachers give homework assignments that help me learn better.	0.0	2.3	22.7	75.0	0.0	0.0	44
My teachers give tests on what I learn in class.	0.0	0.0	27.3	72.7	0.0	0.0	44
My teachers praise students when they do a good work.	6.8	6.8	20.5	65.9	0.0	0.0	44
My classes are interesting and fun.	9.1	11.4	27.3	52.3	0.0	0.0	44
Teachers work together to help students at my school.	0.0	2.3	18.2	77.3	0.0	2.3	44
My teachers do a good job teaching me English language arts.	0.0	2.3	15.9	81.8	0.0	0.0	44
The textbooks and workbooks I use at my school really help me to learn.	4.5	0.0	22.7	72.7	0.0	0.0	44
My teachers expect students to behave.	0.0	2.3	18.2	79.5	0.0	0.0	44
Student Social-Physical Environment Items							
Students at my school behave well in the hallways, in the lunchroom, and on school grounds.	43.2	20.5	29.5	4.5	0.0	2.3	44
Students at my school behave well in class.	36.4	27.3	31.8	4.5	0.0	0.0	44
The bathrooms at my school are kept clean.	20.5	15.9	38.6	22.7	0.0	2.3	44
The grounds around my school are kept clean.	13.6	13.6	29.5	43.2	0.0	0.0	44
The hallways at my school are kept clean.	9.1	9.1	20.5	59.1	0.0	2.3	44
Students from different backgrounds get along well at my school.	15.9	9.1	40.9	34.1	0.0	0.0	44
Teachers and students get along well with each other at my school.	4.5	11.4	25.0	56.8	0.0	2.3	44
Broken things at my school get fixed.	2.3	2.3	20.5	72.7	0.0	2.3	44
Students at my school believe they can do a good work.	2.3	2.3	31.8	63.6	0.0	0.0	44
Student Home-School Relationship Items							
My parent knows what I am expected to learn in school.	0.0	4.5	11.4	84.1	0.0	0.0	44
My parent helps me with my homework when I need it.	2.3	2.3	20.5	72.7	0.0	2.3	44
My parent knows how well I am doing in school.	6.8	0.0	13.6	79.5	0.0	0.0	44
Parents at my school know their children's homework assignments.	2.3	4.5	20.5	72.7	0.0	0.0	44
My school informs parents about school programs and activities.	2.3	0.0	15.9	81.8	0.0	0.0	44
Parents volunteer and participate in activities at my school.	6.8	0.0	27.3	65.9	0.0	0.0	44
I am satisfied with home-school relations.	0.0	2.3	22.7	75.0	0.0	0.0	44
Parents are welcomed at my school.	0.0	2.3	9.1	88.6	0.0	0.0	44

Sample School C—Item Box Plots

2009 Student Survey, Learning Environment Factor Items
Distribution of Item Agreement Percentages Among Elementary Schools

Comparative Results for Sample C



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What's Next?

- Draft school climate profiles based on the 2010 report card surveys (in progress)
- Share school climate profiles with staff from the Office of Special Programs and the Palmetto Priority Schools
- Work with state and local school reform stakeholders to develop a user-friendly format for sharing school climate profile information.

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The Use of School Climate Data for School Improvement

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In response to declining achievement test results during the 1970s and 1980s, United States legislators enacted far-reaching educational accountability measures. While the merits of high stakes accountability systems have been argued, there is no doubt that there has been an increased focus on academic improvement. However, the importance of school climate as a critical contextual factor in which teachers teach and students learn has received little attention. Yet, among the preconditions for school success, the motivation to teach and to learn often hinges on the levels of support, challenge, and collaboration provided to teachers and students by the school – its climate.

A favorable school climate provides the structure within which students, teachers, administrators, and parents function cooperatively and constructively. Compared with other barriers which cannot be controlled by schools, such as high child poverty, negative school climate factors can be improved. Although there is a growing literature dealing with the assessment of school climate and its relationship to key indicators of school success, efforts to systematically improve it have been limited. Changing school climate "requires explicit, targeted, and aligned change efforts at the leverage points" (McGuigan, 2008, p. 112). South Carolina is one of only a few states to include climate data from surveys of students, teachers, and/or parents on their school report cards. Since the Education Accountability Act of 1998, students and parents at selected grades along with teachers at every public school within the state have completed an annual survey to assess the school's learning environment, home-school partnership, and social and physical factors.

The purpose of the current work is to both provide a framework for evaluating school climate data as well as provide direction for the potential application of individual school climate

profiles for use in school improvement. In a previous study, 4-year school climate profiles were created using the 2006-2009 teacher, student, and parent data (Mîndrilă, May, Ishikawa, Monrad, DiStefano, Gareau, Price, 2010). The current work includes the most recent survey data (2010), and provides up-to-date information on school climate for the schools of interest. Results will also inform on the consistency of our findings across years.

The process of developing 4-year school climate profiles (2007-2010) has included factor analyses of each of the surveys and calculation of norm-referenced school comparisons and measures of item agreement. The results of these analyses have been used to create a user-friendly graphical representation of 4-year comparisons of standardized mean factor scores and percentile ranks of survey factor scores by organizational level for each school. Additionally, item agreement percentage box-plots have been developed to allow for comparison within school grade configuration and by referent group.

Sections of a sample school profile are provided, along with interpretations and descriptions of its potential uses in school improvement. By providing a practical application of school climate data, we seek to create tools for stakeholders to use in the identification of areas for potential focus for school improvement. The quality of the evaluation process will be improved when schools are able to identify school climate needs and begin implementing targeted strategies designed to improve climate and achievement outcomes.

Theoretical Framework

School climate is the learning environment created through the interaction of human relationships, physical setting, and psychological atmosphere (Perkins, 2006). Together, students, teachers, administration, parents, and the broader community all contribute to the school climate (National School Climate Center [NSCC], Center for Social and Emotional

Education [CSEE], & National Center for Learning and Citizenship at Education Commission of the States, 2008). The construct of school climate is generally characterized as multidimensional and representative of shared perceptions of behavior including customs, goals, values, relationships, teaching practices, and structures within the school (Ashforth, 1985; Cohen, 2009; CSEE, 2010; Hoy, 1990; Van Houtte, 2005). Most studies include four primary components when measuring school climate: (1) safety of students and staff, (2) school culture and relationships, (3) elements of teaching and learning, and (4) the institutional environment (Cohen, 2009; CSEE, 2010; Tagiuri, 1968). Demographic variables such as ethnicity and socioeconomic status of students are other components that influence school climate and achievement (Chen & Weikart, 2008).

A favorable school climate provides the structure within which students, teachers, administrators, and parents function cooperatively and constructively. Several researchers have linked school climate and effectiveness. Specifically, positive school climate has been found to correlate with higher rates of academic achievement including standardized test scores, as well as increased classroom engagement, student participation, and motivation to learn (CSEE, 2010; Chen & Weikart, 2008; DiStefano, et al., 2007; Edmunds; 1982; Greenberg, 2004; Lee & Burkham, 1996; Lezotte, 1990; NSCC et al., 2008; Roney, Coleman, & Schlictin, 2007; Sebring, Allensworth, Bryk, Easton, Luppescu, 2006; Stewart, 2007). Positive school climate has also been linked to indicators of school success reported for accountability purposes including annual yearly progress (AYP) measures and school report card information (Greenberg, 2004; Macneil, Prater, & Busch, 2009; DiStefano, et al., 2007; Monrad et al., 2008; Tubbs & Garner, 2008).

In addition to impacting learning outcomes, a supportive school climate is also related to positive psychological and behavioral student outcomes. Supportive school climate has been

linked to reductions in behavioral conduct problems, instances of bullying, rates of depression and substance use, self-esteem, absenteeism, and dropout rates (Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Bryk & Thum, 1989; Christle, Jolivette, & Nelson, 2007; CSEE, 2010; Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Loukas & Murphy, 2007; NCSS et al., 2008; Rumberger, 1995; Way, Reddy, and Rhodes, 2007). Fostering a positive school climate provides students a behavioral model for how society operates and provides examples of appropriate conduct outside of the school walls (NCSS et al., 2008).

Patterns of climate variables have also been related to trust (Hoy, Tarter, & Kottkamp, 1991). When trust is high, educators are more likely to experiment with new practices and work together with parents to advance improvements (Bryk & Schneider, 2002). Trust matters because effective school leadership depends upon the competence and cooperation of a school team; important school goals cannot be developed and accomplished by a single person (Tschannen-Moran, 2004). Trust levels between students and staff also influence student behavior and educational outcomes (Virtanen, Kivimaki, Luopa, Vahtera, Elovainio, Jokela, & Pietikainen, 2009).

Research indicates that, for teachers, some of the most important aspects of the school climate include the freedom to disclose stress to administrators, student behavior, and collaborative relationships with parents (Grayson & Alvarez, 2008). Teacher benefits of a positive working environment include increased job satisfaction (Grayson & Alvarez, 2008; Ma & MacMillan, 1999; Tubbs & Garner, 2008), increased retention and attendance, and better home-school relationships (Brown & Medway, 2007). Teacher and staff perceptions were pivotal in measuring school climate in early research, however, there has been an increasing

interest in examining students' perceptions of school climate (e.g., Koth, Bradshaw, & Leaf, 2008; Way, Reddy, & Rhodes, 2007).

Background

A study of 32 elementary achievement gap-closing schools showed that these schools differed from other elementary schools on key climate indicators as measured by the state's school climate surveys in 2005 (DiStefano, Monrad, May, McGuiness, & Dickenson, 2007). Consequently, university faculty and staff in collaboration with the state's Department of Education and Education Oversight Committee, pursued a state-wide research focused on school climate's relationship with school performance and school improvement.

The 2006 and 2007 school climate survey data for all schools in the state were analyzed to identify factors underlying the school climate surveys for teachers, students, and parents (Monrad, May, DiStefano, Smith, Gay, Mîndrilă, Gareau, & Rawls, 2008). These factor structures were used to create clustered groups of schools for all organizational levels (elementary, middle, and high schools) using identified dimensions of school climate. The 2008-2009 study included an additional year of data (2008) with two broad goals in mind: to validate prior work and to investigate the relationship between school climate (climate factors and cluster membership) and other educational outcomes. An additional study, conducted over the course of years 2009 and 2010, analyzed the 2009 survey data and developed 4-year school climate profiles (2006-2009) focused on low-performing schools (Mîndrilă et al., 2010).

Data Sources

Students and parents at selected grades (typically grades 5, 8, and 11) along with teachers at every public school within the state complete an annual survey to assess several dimensions of school climate. The teacher, student, and parent surveys include approximately 47 items, and

responses are measured on a Likert-scale indicating the degree of agreement with each item. The resulting data set provides a unique opportunity to examine the characteristics of school climate on a state-wide basis. Moreover, the data set includes four consecutive years (2007-2010) of teacher, student, and parent responses, thus allowing comparisons across time, as well as across the three samples. Table 1 provides number of elementary, middle, and high schools included in the study each year.

Table 1

2007-2010 Number of Schools by Organizational Level

	Number of schools		
Year	Elementary schools	Middle schools	High schools
2007	623	290	208
2008	630	292	205
2009	630	296	211
2010	629	288	209

Before analyses, each dataset was examined. Duplicate cases were removed from each dataset, as well as cases having more than 25% of the responses missing within each scale. For cases with 25% or less missing data on each section of the survey, missing item responses were imputed. Missing item data were replaced with the average of the individual's responses for other items on the same section, thereby maximizing sample sizes for analyses. Table 2 provides the number of observations in each data set at the end of the data cleaning process. These samples were further used for statistical analyses.

Table 2

2007-2010 Sample Sizes of the Teacher, Student, and Parent Data Sets

	Sample size		
Year	Teachers	Students	Parents
2007	36,537	132,476	34,260
2008	36,445	135,808	35,884
2009	35,963	137,520	35,856
2010	38,159	137,501	36,887

Methods

Confirmatory Factor Analysis (CFA)

Statistical analyses of the teacher, student, and parent data sets began with CFA. This procedure helps determine how well the survey items measure the climate constructs, and is appropriate to use when researchers have prior knowledge of the underlying latent structure of an instrument (Benson & Nasser, 1998; Byrne, 1998). The measurement models were derived from exploratory factor analysis (EFA), which yielded the same factor structures across two consecutive years (2006, 2007) (DiStefano et al. 2007, Monrad et al., 2008). Although CFA and EFA are similar techniques, there are some key differences between them. Results from exploratory procedures inform the researcher on the optimal number of factors required to represent the data, and all the observed variables are related to all the latent variables. In contrast, CFA requires the researcher to specify a priori the number of factors underlying the data, as well as the construct to which each observed variable is related. Therefore, the purpose of CFA is to confirm or reject a measurement theory, rather than discover underlying dimensions.

CFA of the teacher, student, and parent data sets were conducted separately, by form. CALIS via the SAS 9.2 statistical software package was used for all analyses. Model parameters were estimated using the Maximum Likelihood estimator. This method determines model parameters that maximize the likelihood of observing the available data if one were to collect data from the same population again, and is frequently used with categorical data that represents underlying continuous constructs (Finney & DiStefano, 2006).

To assess the goodness-of-fit of the teacher, student, and parent measurement models, the following indices were recorded for the 2007-2010 data sets: (1) Chi-square statistic divided by the degrees of freedom; (2) goodness-of-fit index (GFI); (3) non-normed fit index (NNFI); (4) root mean square error of approximation (RMSEA); and (5) the root mean residual (RMR).

Although the chi-square fit statistic is widely used as an index of how well the model fits a set of data (Jöreskog & Sörbom, 1993), it is sensitive to both sample and model size. Therefore, chi-square divided by the degrees of freedom was used as an index of fit. Generally, values lower than 3 indicate a good model fit.

The GFI (Tanaka & Huba, 1984 as cited in Bollen, 1989), which is commonly used in CFA studies, provides a measure of the amount of variance/covariance in the sample matrix that is predicted by the implied variance/covariance matrix. Values of GFI range from 0 to 1.00, and values exceeding 0.90 are considered to be indicative of appropriate fit (Jöreskog & Sörbom, 1993).

The NNFI developed by Tucker and Lewis (1973) compares the hypothesized (target) model to a null model, providing a comparison between the target model and the observed data in the absence of a model. Unlike the GFI, NNFI values can exceed 1.00. Values exceeding 0.90

are indicative of minimally acceptable fit (Bentler & Bonett, 1980); while values exceeding 0.95 provide evidence for good model-data fit (Hu & Bentler, 1999).

The root mean square error of approximation (RMSEA) does not require comparison to a baseline model. The RMSEA index is based on the premise that a model will never exactly fit a sample of data, and the best a researcher can hope for is a close approximation of the model to reality (Browne & Cudeck, 1993). RMSEA values of 0.05 or less indicate close fit between the model and the sample data; values of 0.08 or less indicate a reasonable error of approximation; while values greater than 0.10 indicate unacceptable fit.

The root mean square residual (RMR) is the average absolute value of the covariance residuals between the specified and obtained variance-covariance matrices. Its values start at 0 and have no upper bound. When the variance-covariance residuals are small, the RMR takes values that are closer to 0, which indicate good model fit. Because RMR has no upper limit, higher values do not necessarily imply poor fit. However, researchers typically use .08 as a threshold for good fit (Tanaka, 1993).

CFA Factor Scores. Each CFA run was followed by the computation of factor scores using a least squares regression approach (Thurstone, 1935). Regression factor scores predict the location of each survey participant on the distribution of each of the climate factors, and may be used for subsequent statistical analysis. They are standardized scale scores developed from the factor structure and based upon the weights assigned to individual items. Values generally range from a low of -3 to a high of 3, representing three standard deviations from the mean, where values near zero represent an average performance. With respect to climate, positive factor scores depict above average ratings whereas negative scores describe a climate rating that is below average.

This study sought to identify climate characteristics within each school, as well as to compare these characteristics across schools. Thus factor scores were aggregated at the school level. Resulting coefficients represented parents', students', and teachers' perceptions of their school's climate across multiple domains. This procedure provided a school average estimate for each climate dimension, and it allowed researchers to determine where each school is located on every teacher, student, and parent climate factor.

Comparison of Mean Factor Scores by Organizational Level

Results from prior work (DiStefano et al. 2007; Monrad et al., 2008) showed that the teacher, student, and parent factor structures do not vary by school organizational level. Therefore, CFA included observations from all the participating schools. However, the extent to which these schools display the different dimensions of school climate varies considerably across organizational levels (Monrad et al., 2008). To further investigate these differences, mean factor scores were compared for elementary, middle, and high schools across the four years.

Subsequent statistical analyses using factor scores took into account the organizational level differences and were conducted separately for elementary schools, middle schools, and high schools. Furthermore, factor scores were standardized within each organizational level to have a mean of zero and a standard deviation of one. This procedure facilitates interpretation when factor scores are compared across samples or years.

School Profiles

CFA factor scores and the distribution of item responses were used to create user-friendly graphical representations of four-year comparisons of standardized mean factor scores, percentile ranks of survey factor scores by organizational level, item response percentage tables, and item agreement box plots. While all schools were included in the factor analytic procedures, to avoid

biased interpretations, only schools with at least 10 teacher factor scores, 10 parent factor scores, or 15 student factor scores were selected for school profiles.

School climate factor scores. To identify the climate characteristics of each school, as well as to compare these characteristics to the organizational level mean and across schools, individual factor scores were aggregated at the school level. A graphical representation of these estimates displays the mean teacher, student, and parent factor scores for all climate factors in all four years included in the analyses. These scores are compared with the organizational level mean values, which were standardized to zero for all three samples. This procedure allows users to determine where each school is located on every teacher, student, and parent climate factor with respect to the schools sampled within the same organizational level, to analyze changes across years, and to examine differences across respondent groups.

Percentile ranks. To gain information on how individual schools compared with other schools in the state with regards to climate dimensions, school-level standardized mean factor scores were ranked within each organizational level. Percentile ranks were computed using the ranking procedure provided in the SAS 9.2 statistical software. The percentile rank is a value that ranges from 1 to 99 and represents the percentage of the scores in the distribution below or at the same level as the value in question. A score at the 50th percentile rank means that the value – in this case the mean factor score for the school – is the same as or higher than the scores of 50% of all other schools at the same organizational level (elementary, middle, or high). The 50th percentile is the median and represents the middle score of the distribution. A score at the 75th percentile rank means that 75% of the factor scores in the distribution are at the same level or lower than the observed score. Percentile ranks have the advantage of being easily understood and can be very useful when communicating data to a general audience. Ranks are determined

by the comparison of the performance of the school relative to all other schools in the organizational level rather than performance relative to an absolute standard. When conducting comparisons, there will always be (at least) one school which has a lower value than the others, even if that value is relatively high when evaluated individually against specific performance criteria or standards. Similarly, a high percentile rank may represent a value which is low when compared to some external performance standard.

Distribution of item response percentages. To provide schools with more specific information on their school climate and how it relates to a specific performance standard or objective, the school profile also includes tables summarizing the distribution of responses for every item in the teacher, student, and parent surveys (item response tables). Furthermore, the school climate profile provides a box-plot comparing the percentage of respondents at the school who voice any degree of agreement on a four-point Likert scale item with other schools' agreement percentage in the same grade organizational level (item agreement percentage box-plots). Percentages of agreement on particular items can be compared, for example, with a school objective measured by the item. In addition, through the use of a box-plot, the item agreement for the school can be compared with other schools in the same grade organization.

The box-plot (Tukey, 1977) graphically provides the 25th percentile, the 50th percentile, and the 75th percentile values as well as extreme values. Thus, with one figure, a school team can observe the school's percentage agreement for an item, as well as the distribution of values for that item for all schools in the state within the same organizational level. In the profiles, one figure contains multiple horizontally-oriented box-plots for individual survey items grouped by school climate factor. Additionally, special markers can indicate the location of other schools of interest on the distribution of item agreement percentages.

Limitations. In terms of the number of observations, the large statewide sample is a unique characteristic of this study since most investigations do not have access to such a large sample across organizational levels. However, the outcomes of the study are specific to South Carolina schools and may or may not generalize to educational systems in other locations.

Another caveat is related to the interpretation of results from different sections of a school profile. For practitioners, the ability to "drill down" by examining the individual items included in each factor is desirable, but it should be noted that this more detailed view comes at a cost in consistency with the other items included in the same factors. Each factor can be thought of as a broad theme that its items have in common, and they only reflect the communality (the proportion of variance in each item that is explained by the common factors) of their items. In contrast, individual items include both the variance shared with the factors, as well as unique variances that can be attributed to other sources.

Results

Confirmatory Factor Analysis

Investigation of CFA parameter estimates and fit indices indicated that the teacher, student, and parent factor structures derived from EFA were adequate representations of the data sets. Results were consistent across the four years of analysis, thus providing evidence of the relationship between the observed variables and their underlying latent climate dimensions. The teacher measurement model includes six climate factors: Working conditions/ leadership, Home-school relationship, Instructional focus, Resources, Physical environment, and Safety. Items for the student survey describe four climate constructs: Learning environment, Social-physical environment, Home-school relationship, and Safety. Similarly, parent survey items measure four climate dimensions: Learning environment, Social-physical environment, Teacher

care and support, and Home-school relationship. Although some of the climate dimensions that underlie the teacher, student, and parent data sets are very similar (e.g. Home-school relationship), these constructs are not equivalent, because they are based on responses from different raters and include non-parallel items.

Comparison of Mean Factor Scores by Organizational Level

The computation of aggregated factor scores indicated the location of every school on all teacher, student, and parent climate factors. As illustrated in Figure 1, elementary, middle, and high school factor score means differ across organizational levels. Elementary schools had the highest factor scores, followed by middle schools and high schools. While differences in mean factor scores across organizational levels were evident, the climate profiles of each organizational level were very consistent across years.

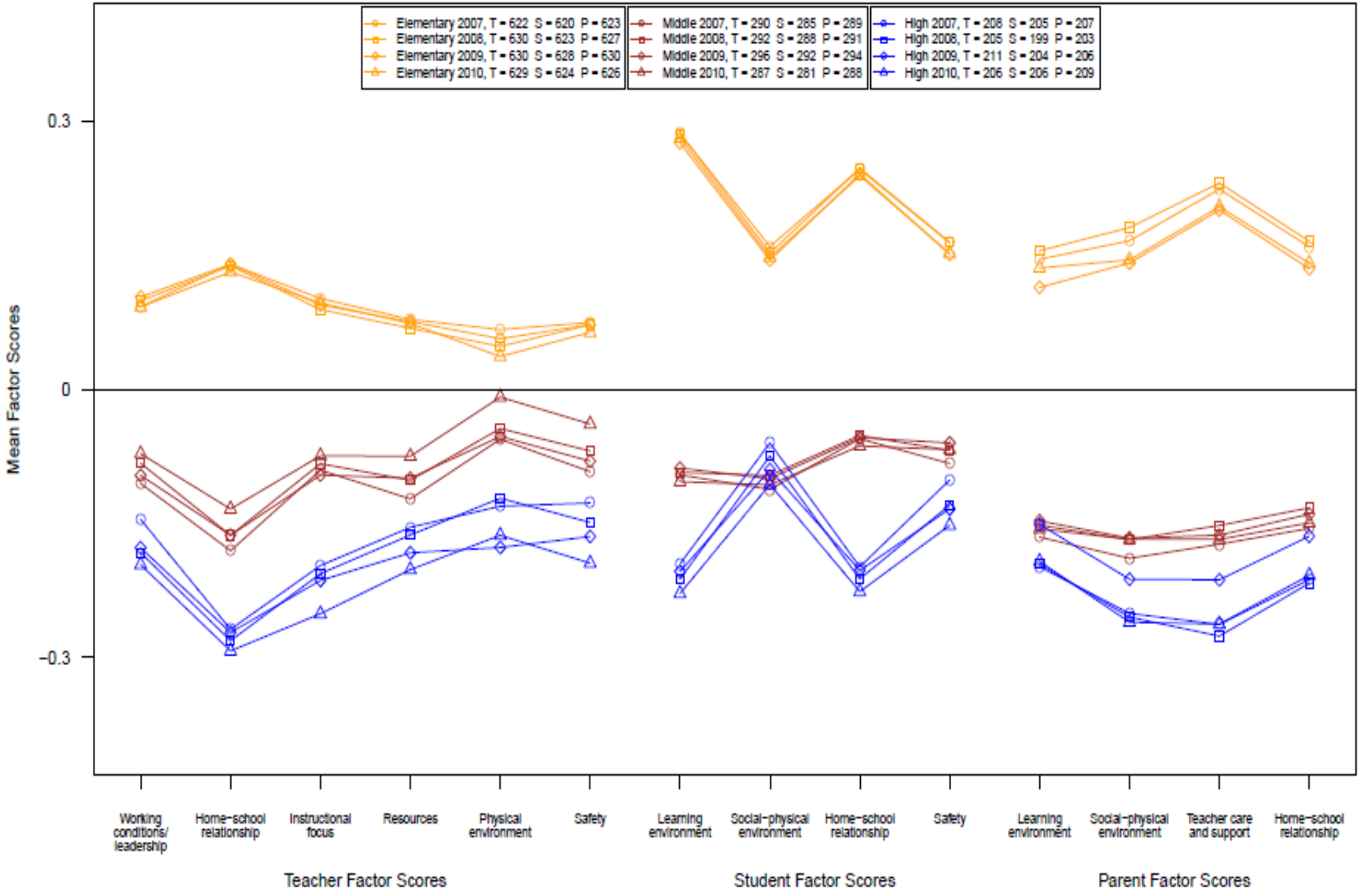

Figure 1. 2007-2010 Mean factor scores by organizational level

School Profiles

School profiles provide potential users with school-level data that lends itself to practical applications for school improvement. While all schools were included in the statistical analyses, profiles were generated for designated low-performing schools in need of intervention. To illustrate our findings, sections of an actual elementary school profile are included in this section.

Mean standardized school climate factor scores. The graphical representation of the 2007-2010 standardized mean factor scores compares the school climate profile with the organizational level mean, which was standardized to zero for all samples. This component of the school climate profile has important applications at the school level. It provides information on (a) climate strengths and weaknesses for the school when compared to the organizational level means, and (b) climate changes across years.

An example of a graphical representation of standardized teacher, student, and parent climate factor scores is provided in Figure 2. This elementary school profile indicates, that teacher perceptions of Working conditions/ leadership and Safety improved over a 3-year period, from 2007 (in yellow) to 2009 (in green), but decreased rather dramatically in 2010 (in blue). Similarly, the teacher perceptions of Home-school relationship, Instructional focus, and Resources, tend to decline or level off across years.

The decrease observed for teacher perceptions of the Home-school relationship is particularly concerning, given the strong relationship between the teachers' perceptions of Home school relationships and overall school achievement level (DiStefano, et al., 2007). The school leadership team may wish to further examine item agreement percentages and the box-plots for items measuring Home-school relationship in order to set goals and examine possible strategies for improvement.

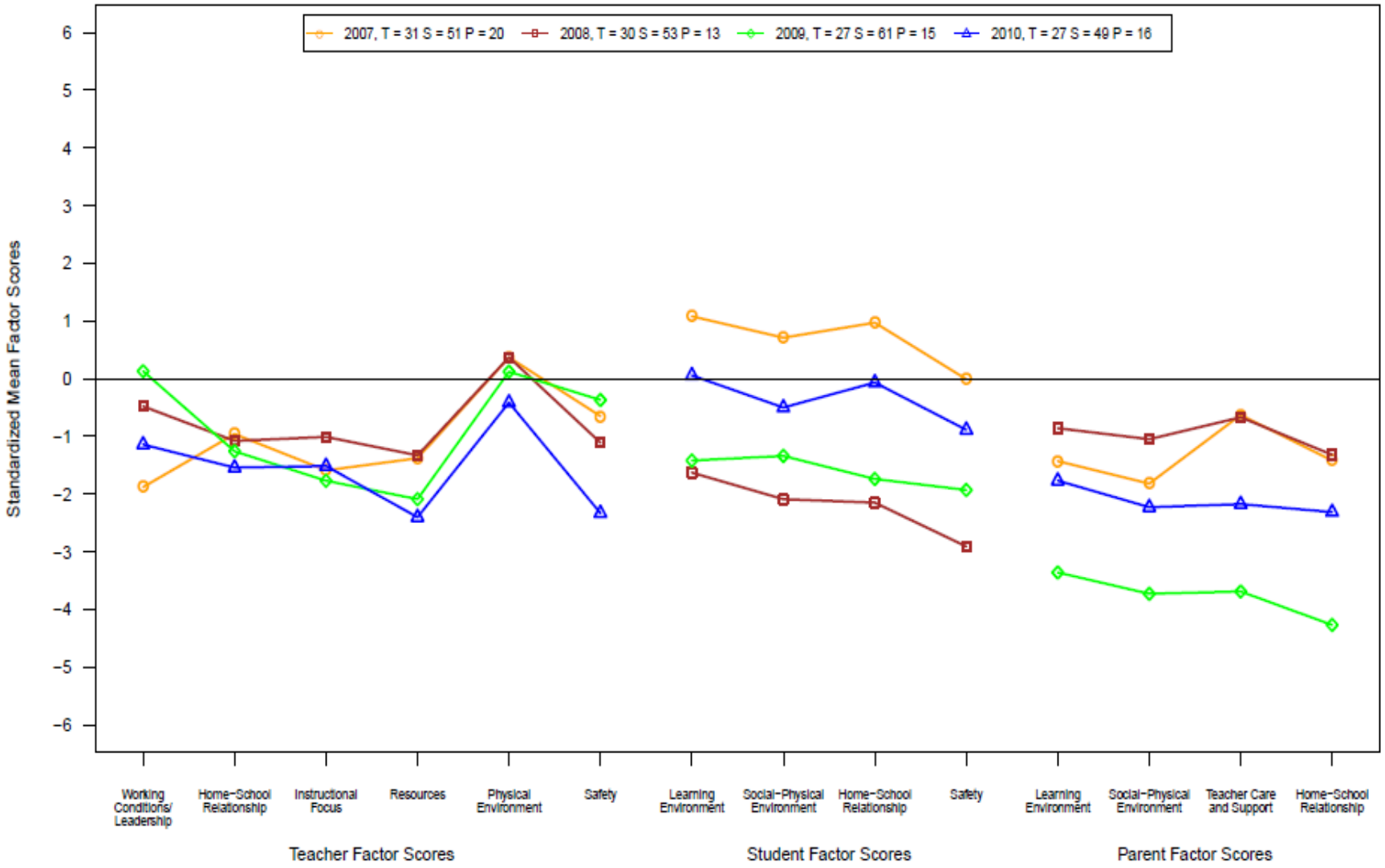

Figure 2. Mean factor scores standardized by organizational level for a sample elementary school.

Percentile ranks. Another application of CFA factor scores is the computation of school percentile ranks within organizational level. Results inform users of how their school compares with other schools in the state on each one of the climate dimensions, by indicating the percentage of schools below or at the same level. As indicated in Table 3, for the sample elementary school, the 2007 percentile ranks for the teacher factors ranged from 5 (for Working conditions/ leadership) to 54 (for Physical environment). For 2010, percentile ranks ranged from 3 (for both Resources and Safety) to 26 (for Physical environment). The percentile rank of the teacher Home-school relationship factor was 8 in 2010, and had consistently declined across the four years. In contrast, the student Home-school relationship percentile rank recorded a major decrease from 2007 to 2008, but improved significantly from 2008 to 2010. Although only one teacher factor (Instructional focus) had a higher percentile rank in 2010, all student and parent factor percentile ranks have increased from 2009 to 2010.

A limitation of the percentile rank unit is that it is not an equal interval measure. Glass and Hopkins (1984) point out that percentile ranks are ordinal measures in which the amount of the trait measured represented by each one point increase in rank varies at each point on the percentile scale. A difference of 5 percentile points between two values, for example, can have a different meaning depending on the positions of the values on the percentile scale. Because they are not equal interval measures, percentile ranks cannot be averaged nor treated in any other way mathematically.

Table 3.

2007-2010 Factor Score Percentile Ranking among Elementary Schools for a Sample School.

School Climate Factors		Percentile Rank			
		2007	2008	2009	2010
Teacher factors		N=31	N=30	N=27	N=27
	Working conditions/ leadership	5	27	45	12
	Instructional focus	7	14	6	9
	Resources	9	9	3	3
	Physical environment	54	54	45	26
	Safety	19	10	26	3
	Home-school relationship	19	13	11	8
Student factors		N=51	N=53	N=61	N=49
	Learning environment	87	5	7	51
	Social-physical environment	76	2	9	31
	Safety	47	1	4	17
	Home-school relationship	83	3	4	45
Parent factors		N=20	N=13	N=15	N=16
	Learning environment	9	18	1	5
	Social-physical environment	5	14	1	2
	Teacher care and support	25	24	1	2
	Home-school relationship	8	9	1	2

Distribution of item response percentages. As previously discussed, the item response percentage tables and item agreement percentage box-plots provide schools with more detailed information on their climate strengths and weaknesses. Table 4 summarizes the distribution of responses for Teacher home-school relationship items for the year 2010. Two items stand out as negatives from the teachers' point of view at this school:

1. "Parents participate as volunteer helpers in the school or classroom." received a response of either "disagree" or "mostly disagree" from 72.4% (N=21) of the 29 teachers.
2. "Parents attend school meetings and other school events." received a response of either "disagree" or "mostly disagree" from 51.7% (N=15) of the 29 teachers.

In contrast, the majority of the teachers agreed or mostly agreed that parents were aware of school policies (96.6%, N=29), knew about school activities (96.5%, N=29), and understood the school's instructional programs (89.7%, N=29). Therefore, most of the teachers in the sample school believed that although parents were well informed, their participation in school activities was insufficient.

Table 4

2010 Teacher Home-school Relationship Item Response Percentages for a Sample Elementary School

Item text for Home-school relationship items	Percentage "Disagree"	Percentage "Mostly Disagree"	Percentage "Mostly Agree"	Percentage "Agree"	Percentage "Don't know"	Percentage no response/ multiple responses	N
Parents attend school meetings and other school events.	20.7	31.0	31.0	17.2	0.0	0.0	29
Parents at my school are interested in their children's schoolwork.	13.8	17.2	44.8	24.1	0.0	0.0	29
Parents attend conferences requested by teachers at my school.	20.7	13.8	31.0	27.6	3.4	3.4	29
I am satisfied with the home and school relations.	20.7	17.2	41.4	20.7	0.0	0.0	29
Parents participate as volunteer helpers in the school or classroom.	31.0	41.4	13.8	13.8	0.0	0.0	29

Table 4

(Continued)

Item text for Home-school relationship items	Percentage "Disagree"	Percentage "Mostly Disagree"	Percentage "Mostly Agree"	Percentage "Agree"	Percentage "Don't know"	Percentage no response/ multiple responses	N
Parents at my schools support instructional decisions regarding their children.	10.3	13.8	44.8	31.0	0.0	0.0	29
Parents at my school cooperate regarding discipline problems.	20.7	10.3	44.8	24.1	0.0	0.0	29
Parents are involved in school decisions through advisory committees.	3.4	20.7	17.2	34.5	3.4	20.7	29
Parents at my school understand the school's instructional programs.	3.4	6.9	48.3	41.4	0.0	0.0	29
Students at my school behave well in class.	17.2	17.2	51.7	13.8	0.0	0.0	29

Table 4

(Continued)

Item text for Home-school relationship items	Percentage "Disagree"	Percentage "Mostly Disagree"	Percentage "Mostly Agree"	Percentage "Agree"	Percentage "Don't know"	Percentage no response/ multiple responses	N
Students at my school behave well in the hallways, in the lunchroom, and on school grounds.	17.2	13.8	48.3	20.7	0.0	0.0	29
Students at my school are motivated and interested in learning.	10.3	20.7	34.5	34.5	0.0	0.0	29
Parents at my school are aware of school policies.	0.0	3.4	13.8	82.8	0.0	0.0	29
Parents at my school know about school activities.	0.0	3.4	17.2	79.3	0.0	0.0	29

Box Plots. Figure 3 shows a collection of box-plots for the Home-school relationship item agreement percentages (the percentage of respondents indicating that they agree or strongly agree with this item) recorded in 2010. Each item has its own horizontally-oriented box-plot which displays the distribution of item agreement percentages among all elementary schools. Below each item box-plot, the large blue upright triangle (▲) indicates the location of the sample school in the distributions of item-agreement percentages. Its numerical value is printed in blue in the right margin of the plot. The values for similar elementary schools (in terms of student achievement) are located above the box-plot as smaller inverted red triangles (▼).

Inspection of Figure 3 reveals that the item agreement percentages for the sample school range from 28% ("Parents participate as volunteer helpers in the school or classroom") to 97% ("Parents at my school know about school activities" and "Parents at my school are aware of school policies"). Note that the 28% agreement value is well to the left of the box depicting the 25th to the 75th percentiles, and, therefore, is in the lowest quarter of item agreement values for elementary schools in the state. Further examination of Figure 3 indicates that the upright blue triangles for almost all Home-school relationship items for the sample school are to the left of the box depicting the 25th to the 75th percentiles, indicating agreement percentages in the bottom quarter of all elementary school values.

The school planning team may use item-level information to identify goals and methods for targeting increases in areas with low percentage agreement. The school may also wish to conduct focus groups with teachers to gain a better understanding of the issues reflected in the item-level data.

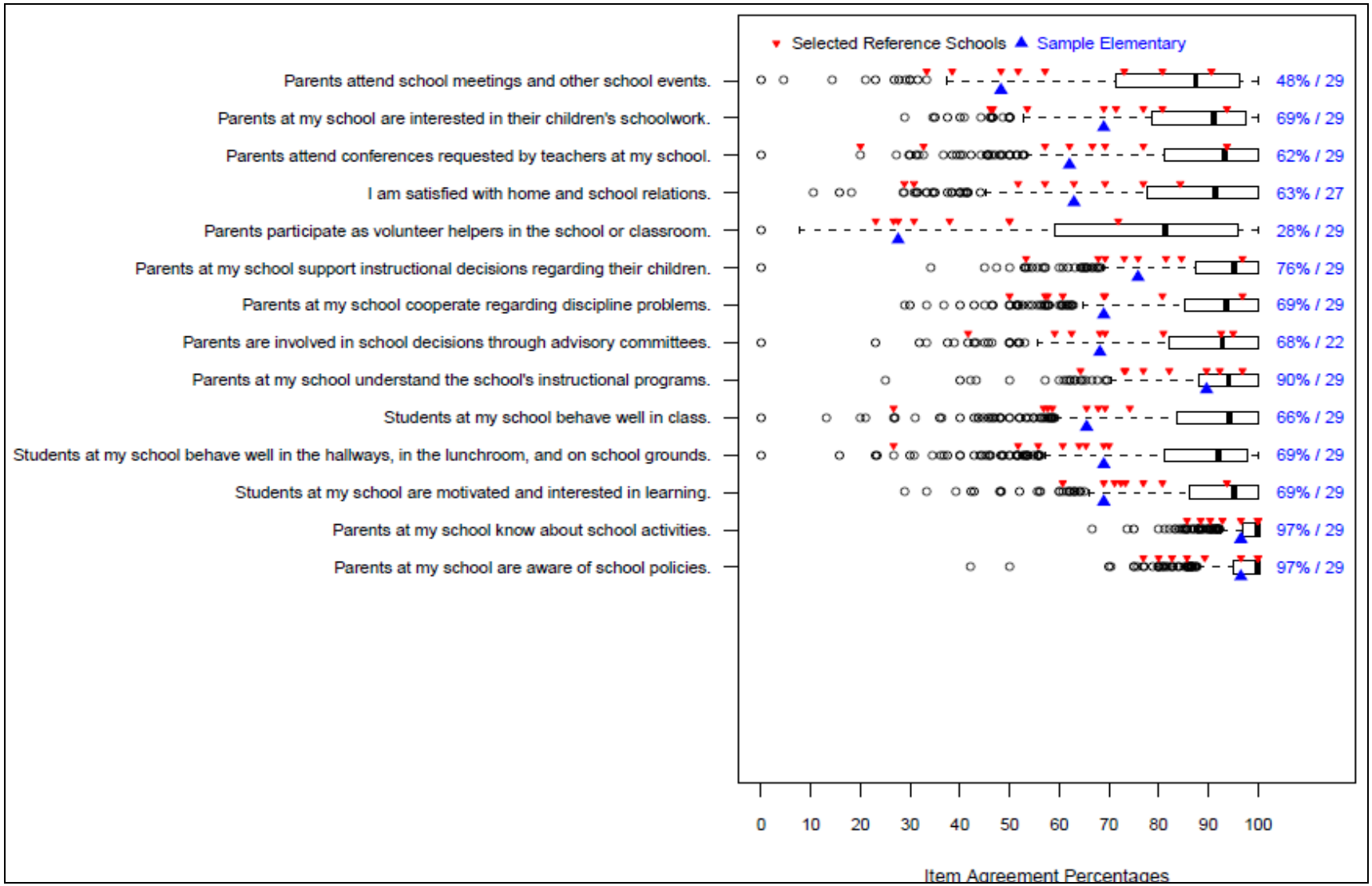

Figure 3. Distribution of item agreement percentages among elementary schools and comparative results for a sample school.

Contributions/Practical Applications

The current work provides a framework for evaluating school climate data as well as providing direction for the potential application of school climate data for use in school improvement. The multi-year school climate profiles provide low-performing schools with a practical tool to use in indentifying critical areas for school improvement. The current school climate research provides a starting point to begin narrowing the gap between research, policy, and the practice of implementing and evaluating approaches that includes school climate as one important facet of school improvement.

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