Climate for High Achievement:

A Study of Gap-closing Schools in South Carolina

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EXECUTIVE SUMMARY

Examining schools that have been successful in closing the achievement gap can provide important information on the characteristics of these schools that can be shared with less successful schools to foster improvement efforts. The EOC contracted with the South Carolina Policy Center (SCEPC) to study the characteristics of 32 schools designated as gap-closing schools based upon a 4-year history of high performance by historically underachieving students at the identified schools. The following research questions were the focus of the study:

- What are the differences between gap-closing schools and other schools on characteristics from the SC report cards?
- Can dimensions of school climate be identified from the student, parent, and teacher climate surveys that differentiate between gap-closing schools and other schools?
- Can school climate dimensions describe important differences between schools that relate to report card indicators including student achievement?

The study analyzed report card indicators and school climate survey data gathered from students, parents, and teachers for gap-closing elementary schools and other schools in an effort to ascertain how the two groups of schools differed. The analyses included contextual measures and outcome measures aggregated at the school-level for the 2004-2005 school year. The resulting dataset included more than 500 schools with exit grades of four, five, or six and 26 of the gap-closing schools with the same grade organizations.

Our analyses found that the gap-closing schools tended to serve more middle-income students, more gifted students, and fewer overage students. The gap-closing schools were not uniform on these measures, however, and three of the 26 gap-closing schools actually had poverty indexes higher than 70%, the average for the 500 schools included in the study.

The study found systematic differences between gap-closing and all other schools on key climate-culture indicators measured by the surveys. Teachers in gap-closing schools expressed more favorable opinions of the schools, especially in the area of home-school relationships. For the item “I am satisfied with the home-school relations,” for example, 96% of the teachers in gap-closing schools, versus 79% of teachers in other schools, agreed. For the item “Parents participate as volunteer helpers in the school or classroom,” the values were 94% and 71% - a 23 percentage point discrepancy favoring gap-closing schools. Teachers in the gap-closing schools were also more likely than the teachers in other schools to view teacher and staff morale as positive.

Students in gap-closing schools were more satisfied with the social-physical environment than were students in the other schools. There was a discrepancy of 15 percentage points for the item “Students at my school behave well in class,” and 13 percentage points on the items “The bathrooms at my school are kept clean.” Five of the six items measuring social-physical environment had double digit differences favoring gap-closing schools.

Parent survey differences, though less striking than for students and teachers, indicated that parents in gap-closing schools tended to be more active in the schools as volunteers, to indicate that teachers contacted them regarding their child more often, and to rate the schools higher for their efforts to engage parents. They saw fewer obstacles, like transportation, to their active participation. Parents of children in gap-closing schools also tended to view students as better behaved.

The study found moderate to strong relationships between a variety of achievement indicators and school climate, as measured by the surveys of teachers, students, and parents. The strongest of these were between those items measuring home-school relationship on the teacher survey and absolute rating. The second strongest relationship was between social-physical environment on the parent survey and school absolute rating.

It was also found that achievement indicators were more positive in gap-closing schools than in the other schools in the analyses. For example, 38% of gap-closing schools had excellent absolute ratings on their report cards but only 9% of all other schools did so. Conversely, while none of the gap-closers had below average or unsatisfactory absolute ratings, 20% of other schools received these ratings.

Similarly, more AYP objectives were met by schools with the most favorable school climates. Schools with more positive climates met 84.4 % of their AYP objectives, while schools with the lowest climate ratings met only 31% of their AYP objectives. The relationship between student PACT performance and school climate followed a similar pattern. Students performed at higher levels in schools with more positive climate, and students' performance was lowest in schools with the least favorable climate ratings. The gap-closing schools were included in the groups of schools with the most positive school climate.

The results of this study of gap-closing schools are consistent with other research, particularly the recent school climate research from the Consortium on Chicago School Research (CCSR). CCSR used information from principals, teachers, and students from over 200 schools to identify crucial factors supporting school improvement. These factors were leadership, professional capacity, parent-community ties, climate, and instruction. They also discovered that schools with high levels of trust at the beginning of reform efforts had a 1 in 2 chance of making significant improvements in reading and math achievement, while schools with low levels of trust had a 1 in 7 chance of making achievement gains. The findings from Chicago are consistent with those from the present study in illustrating that climate factors are potentially changeable and can positively impact student achievement.

Our study of elementary schools in the state that have consistently been recognized for the high achievement of their historically underachieving students highlighted the important role of school climate. Gap-closing schools were found to have positive school climates on a variety of dimensions, including student academic performance, when compared with other schools. Not only do gap-closing schools maintain an instructional environment that supports high achievement, but these schools also create a positive school climate that fosters the attainment of high student performance.

The authors offer the following recommendations based on the results of this study:

- The present study has demonstrated a strong association between positive school climate and student achievement, as illustrated by the analysis of the gap-closing schools. *District administrators, school administrators, teachers, school improvement council members, and external review team members should carefully review school climate data as part of a comprehensive school improvement process.*

- *The development of a school-climate report, designed expressly for school administrators and school improvement councils, should be considered.* Such a report, with greater detail than provided currently, would group items into their relevant

dimensions and could be used to identify needed professional development and programmatic initiatives to improve school climate.

- The 26 gap-closing schools in this study were located in only 15 of the 85 school districts, and five districts had more than one school to achieve gap closing status. Fourteen of the gap-closing schools were located in only four districts. *The role of district characteristics and support in improving school outcomes and achieving gap-closing status should be further explored. Survey items designed to address this dimension could be added to the current survey instrumentation.*

- The survey data provide a window to aid in understanding how school achievement is related to school climate factors and to other contextual variables at the elementary level. *Similar follow-up studies should be conducted with data for middle and high schools to examine relationships between school climate dimensions and student achievement, attendance, and graduation rate.*

- Though the sample sizes were large, the analyses in this study were limited to data from a single school year, 2004-2005. *Analyses should be conducted with more recent data in order to determine whether there is consistency in the trends identified for 2004-2005.*

INTRODUCTION

The reporting requirements of No Child Left Behind (2001) have focused attention on the academic achievement of all students in our nation's schools. Students from different demographic groups are expected to make adequate yearly progress (AYP) on measures of student achievement every year. Individual schools are designated as achieving AYP only if all groups of students in the school are making expected academic performance.

Even prior to the passage of No Child Left Behind (NCLB), differences in the performance of groups of students were extensively studied and have long been a concern to education policymakers and those in the education community. Research has demonstrated that there are significant differences, or achievement gaps, between the performance of minority students when compared with white students and between the performance of students in poverty when compared with students from higher socioeconomic levels. The performance of white students has been found to exceed the performance of African-American and Hispanic students, and the performance of students at higher socioeconomic levels exceeds the performance of students receiving free or reduced-price lunch (CCSSO, 2006; Jencks & Phillips, 1998). To close these identified achievement gaps, schools must raise the achievement levels of historically low-performing students at a higher rate than the rate of improvement among higher performing students.

The Education Oversight Committee (EOC) has issued annual reports since 2003 that identify elementary and middle schools in South Carolina that have been closing the achievement gap for one or more groups of historically underachieving students. Using scores from the state's Palmetto Achievement Challenge Tests (PACT) in English-language arts (ELA) and math, the EOC compares the achievement levels of historically underachieving groups of students (African American, Hispanic, and free or reduced-priced lunch) with the state-wide achievement levels of students in the appropriate comparison group (white or full-paid lunch students). Schools are eligible for the EOC's study if they have PACT test results from at least one historically underachieving group and the identified group has at least 30 students with valid test scores. In addition, the identified group and the "all students" group in the school must meet AYP objectives under NCLB. Eighty-seven elementary schools were recognized for closing the achievement gap in 2003, 110 schools were identified in 2004, and 132 schools were cited for closing the gap in 2005.

In 2006 the EOC identified 138 schools with one or more groups of historically underachieving students who were closing the achievement gap in PACT ELA, math, or both subtests. The EOC's report particularly noted 32 of these 138 schools that had been recognized for closing the achievement gap for four consecutive years (2003, 2004, 2005, and 2006). The 32 schools recognized for the sustained high performance of their historically underachieving student groups are listed in the Appendix.

Examining schools that have been successful in closing the achievement gap can provide important information on the characteristics of these schools that can be shared with less successful schools to foster improvement efforts. The EOC contracted with the South Carolina Educational Policy Center (SCEPC) to study the characteristics of these 32 schools that continued to make progress every year from 2002-2006 in supporting the high achievement of their historically underachieving students. The following research questions were the focus of the study:

- What are the differences between gap-closing schools and other schools on characteristics from the SC report cards?
- Can dimensions of school climate be identified from the student, parent, and teacher climate surveys that differentiate between gap-closing schools and other schools?
- Can school climate dimensions describe important differences between schools that relate to report card indicators including student achievement?

Subsequent sections of this report present the methodology, results, summary, and recommendations of the study.

METHODOLOGY

Selection of Variables and Literature Review

In consultation with EOC staff, it was decided that the study should examine school report card ratings and other indicators from the state report card to provide a description of any differences between gap-closing schools and other schools. To assist in selecting additional variables for this study, SCEPC staff conducted a literature review to determine variables that had been found to characterize schools with high performing students from historically underachieving groups. Table 1 summarizes the results of a review of eight major studies that have been published in the past 7 years. The following variables were most commonly cited as being associated with high student performance:

- High expectations (of students and teachers)
- Caring relationships (between faculty and with students)

- Positive school climate/caring environment
- Academic/instructional focus
- Use of student assessment for making instructional decisions
- Strong leadership
- Faculty work ethic/teamwork/morale
- Teacher recruitment/hiring/assignment
- Professional development
- Curriculum alignment/focus on standards
- Extended learning opportunities
- Efficient use of resources
- Community/parent support

Table 1

Variables Found to Be Important in the Research on Gap-closing Schools

Variable	Research Study							
	Inside the Black Box of High-Performing High-Poverty Schools (2005)	Closing the Achievement Gap: Lessons from Successful Schools (2005)	Sustaining improvement in schools in challenging circumstances: a study of successful practice (2005)	Closing the Achievement Gap: How Schools are Making it Happen (2001)	All Students Reaching the Top: Strategies for Closing Academic Achievement Gaps (2004)	Similar Students, Different Results: Why do some schools do better? (2005)	Closing the Achievement Gap: Keys to Success (2004)	Portrait of Six Benchmark Schools: Diverse Approaches to Improving Student Achievement (1999)
High expectations (of students and teachers)	√	√	√	√	√	√	√	√
Caring relationships (between faculty and with students)	√		√					
Positive school climate/ caring environment	√		√	√	√			
Academic/instructional focus	√	√	√	√	√	√	√	√
Use of student assessment for instructional decision	√	√	√	√		√	√	√
Strong leadership (decision making)	√	√	√			√	√	√
Faculty work ethic/morale/teamwork	√	√	√			√		√
Teacher recruitment/hiring/assignment	√		√	√	√		√	
Professional development	√	√	√		√		√	
Curriculum alignment (focus on standards)	√	√			√	√	√	√
Extended learning opportunities	√	√	√	√	√		√	
Efficient use of resources	√	√				√		
Community/parent support	√	√			√			√

In examining the variables associated with successful schools that had been identified in these research studies, we were particularly interested in variables that could be changed or improved at the local level. For example, parent and community support, if not already present in an individual school, could be incorporated into the school's culture as a school improvement strategy. We also noted that several variables such as caring relationships, school climate, faculty morale, and strong leadership, generally classified as school climate indicators, were associated with successful schools.

A favorable school climate provides the structure within which students, teachers, administrators, and parents function cooperatively and constructively. Hoy and Miskel (1982) defined a school climate as a school's personality, and its importance has intrigued researchers for approximately 50 years (Anderson, 1982). School climate includes the physical and material features of schools (such as age of the building, cleanliness, and safety), school personnel (e.g. administrators, teachers, parents, staff, students), and the patterns of interaction between school personnel. Edmunds (1982) and Lezotte (1990) were prominent in linking climate directly to school effectiveness more than 35 years ago. School climate has been found to positively affect academic achievement (Greenberg, 2004; Lee & Burkham, 1996) and to influence a student's decision to remain in school (Bryk & Thum, 1989; Rumberger, 1995).

School climate, as a factor to increase student achievement, has been receiving increased attention in the school improvement literature. The Consortium on Chicago School Research (CCSR) used information from principals, teachers, and students across over 200 schools to identify "five essential supports for school improvement" (Sebring, Allensworth, Bryk, Easton, Luppescu, 2006). The CCSR found the important factors to be: leadership, professional capacity (e.g., knowledge, skills, and disposition of faculty), parent-community ties, climate, and instruction.

To gain a greater understanding of the impact of the five supports on school achievement, the CCSR examined the relationship between the five factors and student achievement as measured by a standardized test. The findings showed that schools strong in most (i.e., 3 to 5) essential areas were up to 10 times more likely than schools with fewer supports to make gains in both reading and mathematics standardized test scores on the Iowa Test of Basic Skills (grades 3-8). Sebring et al. (2006) also found that improvements in the essential supports led to improved achievement.

An earlier study of elementary schools in Chicago also highlighted the importance of positive school climate characterized by mutual trust and respect. According to Bryk and Schneider (2002), schools with a high degree of "relational trust" between administrators,

teachers, and parents are far more likely to make the kinds of changes needed to improve student achievement than schools where relationships are poor. Bryk and Schneider compared 100 schools that made the greatest improvement on achievement tests (reading and math) between 1991 and 1996 with 100 schools that made little or no improvement. They discovered that schools with high levels of trust at the beginning of reform efforts had a 1 in 2 chance of making significant improvements in reading and math achievement, while schools with low levels of trust had a 1 in 7 chance of making achievement gains. Among the schools with initially low levels of trust, only those schools where trust was strengthened over the course of reform efforts showed achievement gains. No school that continued to have low levels of relational trust improved student achievement levels to any appreciable degree.

Trust in leadership has also emerged as a central research theme in the business management and public administration literatures. In a meta-analysis of relevant research, Dirks and Ferrin (2002) quoted Kramer (1999), who noted that trust is moving from "bit player to center stage in contemporary organizational theory and research (1999: 594)." Dirks and Ferrin not only found significant relationships between trust and job performance, but their study suggested that trust in leadership is also related to attitudinal measures, such as job satisfaction and organizational commitment. More recently, Covey (2006), in *The Speed of Trust: The One Thing that Changes Everything,* asserted that trust is the key leadership competency of the global economy and acts as an "accelerator" to performance for business, education, governments, and numerous other enterprises.

South Carolina is one of three states, along with Hawaii and Rhode Island, to include school climate data from surveys of students, teachers, and/or parents on their school report cards. South Carolina's report card was developed in response to requirements of the state's Education Accountability Act of 1998. The act called for the inclusion of school climate data from "evaluations of the school by parents, teachers, and students." School climate data in South Carolina is collected annually from questionnaires administered to parents, teachers, and students. The resulting data set provides a unique opportunity to examine the school climate data for gap-closing schools compared with other schools that have not demonstrated similar sustained high performance for historically underachieving students.

Instrumentation

State Report Card Variables

Each year South Carolina's public schools are evaluated using the state report card to provide information about how our public schools are performing. The report card provides school level information for a variety of variables, including characteristics about the school and its programs (e.g., student enrollment, number of art opportunities, percentage of students in gifted programs), faculty (teacher and principal experience, percentage of teacher vacancies, number of professional development days, average salary), and student achievement (standardized test scores from the Palmetto Achievement Challenge Test (PACT), annual yearly progress).

One focus of this study was to examine report card variables for gap-closing schools as compared with other schools. The following variables were extracted from the Department of Education's 2005 report card file and used in subsequent analyses:

- Percentage of students in poverty (combination of free/reduced lunch status and eligibility for Medicaid services)
- Student enrollment
- Average daily attendance for kindergarten students
- Percentage of students retained
- Average daily student attendance rate
- Percentage of students served by gifted and talented programs
- Percentage of non-speech disabled students
- Percentage of students overage for grade (by more than 2 years)
- Percentage of students with out-of-school suspensions or expulsions
- Number of teachers
- Percentage of teachers with advanced degrees
- Percentage of teachers on continuing contracts
- Percentage of highly qualified teachers
- Percentage of teachers on provisional or emergency certificates
- Percentage of teachers returning from the previous school year
- Average daily teacher attendance rate
- Average teacher salary
- Average number of teachers' paid professional development days
- Principal's years at the school

- Student-teacher ratio
- Percentage of prime instructional time
- Average dollars spent per pupil
- Percentage of expenditures spent on teacher salaries
- Number of art opportunities
- Percentage of students whose parents attend conferences
- Southern Association of Colleges and Schools (SACS) accreditation
- Percentage of non-speech disabled students taking PACT English language arts off grade level
- Percentage of non-speech disabled students taking PACT math off grade level
- Percentage of teacher vacancies unfilled for more than 9 weeks
- Rating of character development program
- PACT English language arts and math scores for grades 4-5
- Absolute school rating (excellent, good, average, below average, or unsatisfactory)
- Percentage of adequate yearly progress objectives met

School Climate Survey

Students and parents at selected grades (typically grades 5, 8 and 11) as well as teachers at each school complete a survey each year to assess characteristics about a school's learning environment, parent-school relationships, and social and physical factors related to the school. Three items from each survey are included on the report card. However, the surveys consist of many items, and relationships among these items may illuminate differences between gap-closing and other schools. The full versions of the 2005 student, parent, and teacher school climate surveys were used in subsequent analyses and are briefly described in the following sections.

Student survey. The 43-item 2005 student survey includes questions from three areas:

- *Learning Environment*, measuring students' perceptions about the learning context (18 items).
- *Social and Physical Environment* measuring students' thoughts about building cleanliness, appearance of the grounds, classroom management/ behavior, school safety, and relationships with other teachers/students (17 items).
- *Home and School Relations* measures the relationship between schools and parents (8 items).

Students respond to each item using a 4-point Likert scale where 1=Disagree, 2=Mostly Disagree, 3=Mostly Agree, and 4=Agree.

Teacher survey. There are 53 items on the 2005 teacher survey. While the items differ, the three scales hypothesized for the students are also hypothesized for teachers. There are 26 items included on the *Learning Environment* scale, 16 items on the *Social and Physical Environment* scale; and 11 items on the *Home and School Relations* scale. Teachers responded to each item using the same 4-point Likert scale: 1=Disagree, 2=Mostly Disagree, 3=Mostly Agree, and 4=Agree.

Parent survey. The 2005 Parent Survey consists of 54 items arranged into different sections with varying formats. The survey includes 21 Likert scale questions on three scales (*Learning Environment, Home-School Relations, Social and Physical Environment*). Parents responded to each item using a 5-point Likert scale: 1=Disagree, 2=Mostly Disagree, 3=Mostly Agree, 4=Agree, and 5 = Don't Know. In the analyses, the "don't know" option was recoded as missing.

The remaining 33 items are organized into four sections. For eight items, parents are asked about the extent to which they volunteer or attend school-based events. This scale is labeled *Parent Participation*. Parents responded to these items using a 4-point Likert scale: 1=I do this, 2=I don't do this but I would like to, 3=I don't do this and I don't care to, and 4=The school doesn't offer this activity/event. The "*Parent Responsibilities*" section asks parents the extent to which they were active in assisting their child or assisting in their child's classroom (5 items). Parents responded to the child assistance scale using a 3-point scale: 1=I do this; 2=I don't do this but I would like to; 3=I don't do this and I don't care to. For both the *Parent Responsibilities* and the *Parent Participation* sections, the responses were recoded into a dichotomous scale where a rating of "1" (I do this) was noted; other responses were coded as "0." The results report the percentage of parents who do take part in the stated activity.

The two final sections of items are *Parent Obstacles to Involvement* and overall S*chool Ratings*. Parents are asked to rate seven statements about potential obstacles to school involvement such a lack of transportation or family health problems by responding true or false to each issue. Information on this scale was recoded as 1=True, 0=False to report the percentage of parents who agreed that a particular issue was an obstacle to school involvement. For the overall ratings, parents are asked to rate the school's "friendliness," and characterize the level of input the school seeks from parents. For these questions, parents responded using a 5 point Likert scale: ranging from 1=Very Good, 2=Good, 3=Okay, 4=Bad, or 5=Very Bad. For these items, the responses were recoded into a dichotomous scale where a

rating of “1” measured a positive rating and a code of “0” noted a negative rating (okay, bad, or very bad). The results report the percentage of parents who positively endorsed an item (very good or good).

Schools and Participants

In 2005, the EOC identified 32 schools that had closed the achievement gap during 2002, 2003, 2004, and 2005. This report focuses on 26 gap-closing elementary schools from 19 districts with fourth, fifth, or sixth grade as the exit grade in the school, in order to have comparable data from report cards and the climate surveys (see Appendix for school names). This criterion resulted in the following grade organizational patterns for the gap-closing schools being retained in the analyses.

- K-4, PK-4, and 1-4
- K-5, PK-5, 1-5, 2-5, 3-5, and 4-5
- K-6, PK-6, and 1-6, 4-6, and 5-6

Six gap-closing schools were not included because they did not fall within these guidelines.

For consistency, survey responses were limited to students in grades 4, 5, or 6, parents with students in grades 4-6, and teachers teaching in elementary schools where the highest level taught in the school was 4, 5, or 6. The overall sample included 30,713 parent survey responses, 44,055 student survey responses, and 19,121 teacher survey responses. While individual-level responses were used for the initial factor analyses, results were ultimately aggregated to the school level. This was done in order to remain consistent with the report card information and also to provide school-level information about characteristics that were important in distinguishing between gap-closing and other schools.

Data Analyses

Several types of data analysis were performed to investigate differences between the gap-closing schools and other schools included in the study. First, gap-closing schools were compared with other all other schools in the study on a variety of contextual and programmatic measures (e.g., poverty, enrollment, percentages of students designated as gifted) provided on South Carolina's school report cards. Second, the responses of teachers, students, and parents to the state's annual school climate surveys were analyzed to identify the factors, or latent dimensions, measured by the survey items. Factor scores for each school were derived, and the factor scores were compared for gap-closing schools and other schools. Third, schools were placed into "climate clusters" based on their teacher and student climate factor scores.

Finally, the contextual and programmatic measures on the report card and student achievement data were summarized for each cluster of schools. Details of these analyses are provided in the following sections of the report.

Analysis of Report Card Variables

To gain a greater understanding of how the gap-closing schools were performing relative to other elementary schools across the state, information from the SC school report cards was examined. Average values for the report card indicators and report card ratings were calculated separately for the gap-closing and other schools. This descriptive information allowed for an examination of variables on which the gap-closing schools were out-performing other schools. Additionally, the descriptive information showed how the two sets of schools compare across the set of report card variables.

Analysis of School Climate Surveys

Statistical procedures followed two analytic strategies: exploratory factor analysis and cluster analysis. Each of these procedures is described in subsequent sections.

Factor analysis. Exploratory factor analysis was conducted separately for student, teacher and parent datasets. The goal of this procedure was to organize the individual survey items into "like" subsets of items, called factors. Factor analysis is often considered a data reduction technique. Once the factors are identified, the set of survey items can be discussed in terms of factors that underlie the dataset, rather than by individual items.

To form the factors, items are grouped together based upon the strength of their interrelationships. For example, two survey items which both measure school leadership should have a stronger relationship with each other than two items where one item measures school leadership and a second item measures home-school relations. The numeric value that shows the strength of the relationship between an item and the factor is called a *loading value* and can range between -1 and 1. Values closer to 1 or -1 show a stronger association between a selected item and the underlying factor. In factor analysis, items with strong associations (e.g., >.40) are desired. The set of items which strongly associate with a factor are examined to determine what theme is common in the wording of the set. Factors are then "named" by using the item definitions. Optimally, items associate with only one factor. This requirement, called simple structure, helps to simplify the interpretation of the factors.

After the factor solution is identified, the factor information can be used in subsequent analyses. The factor solution allows for the creation of "factor scores," which provide an

individual's placement on the factor distribution. The factor score values can range from a low of -3 to a high of 3. Values close to 0 show an average or typical level of performance. As values move away from zero, regardless of direction, the magnitude of the relationship increases. The sign of the factor score (positive or negative) shows how the school's performance deviates from average; positive factor scores describe above average performance and negative factor scores describe a below average performance.

Cluster analysis. Using the average factor scores for each of the 521 elementary schools, a second statistical procedure, cluster analysis, was conducted. Cluster analysis grouped together sets of schools that were similar relative to their factor scores. The interpretation of the cluster analysis solution involved evaluation of a cluster's centroid, which is the arithmetic mean across the set of teacher and student factor scores. An acceptable cluster solution should have a centroid value that can be interpreted to represent a distinct group. The clusters are then "named" to label the set of schools whose survey respondents have similar perceptions of their school's climate.

To support an identified cluster solution, external validation was conducted to examine differences between clusters on important variables that were not used to group cases into clusters. For the present study, external indicators from SC report card and parent survey were used to support the usefulness of the cluster solution. If the solution does identify unique patterns of schools differentiated by climate, external indicators should yield key differences. Once the final solution was determined, the cluster groupings were used in validation procedures. The objective was to identify differences between the schools relative to climate, school report card information, and parent survey information. Additionally, the gap-closing schools were identified to determine their placement in the cluster typology relative to the 521 schools in the state.

RESULTS AND DISCUSSION

Included in the analyses in this section of the report is information from surveys of parents, teachers, and students and various school-level indicators present on South Carolina's school report cards. These indicators encompass contextual information (see Table 2) and achievement outcomes, such as school ratings, the percentage of AYP objectives met, and various PACT measures of reading and mathematics success. For all analyses, indicator data have been aggregated to and are presented at the school level. A total of 562 elementary schools were included in the study, including the 26 gap-closing schools. Data were not

available for every indicator for every school because certain report card variables had missing data for one or more schools. Typically, the analyses reflect data for more than 500 schools.

Table 2 shows the means and the differences between the means of gap-closing and other schools for 30 report card variables. Since the values presented represent a broad range of variables with widely different ranges and means, those differences which were greater than half of a standard deviation (for the entire sample of over 500 schools) are denoted with an asterisk. Inspection of Table 2 reveals that for most of the variables, the differences between the groups were small, and represented less than a half standard deviation unit. For the percentages of students in poverty, the percentages of students participating in gifted and talented programs, the percentages of students overage in the grade, and the student-teacher ratios for the school, the differences between gap-closing and other schools exceeded the half standard deviation threshold. As a group, the gap-closing schools were more middle-income, served more gifted students, had higher student-teacher ratios, and had fewer overage students. While the differences were not large enough to reach the half-standard deviation threshold, gap-closing schools also tended to be larger, have better student attendance, serve fewer non-speech disabled students, have more teachers with a continuing contract, spend fewer dollars per pupil, be more likely to be accredited by the Southern Association of Colleges and Schools (SACS), and be more likely to have a higher principal's rating on their character development program. In these latter instances, the gap-closing schools means exceeded the other school means by at least one-third of a standard deviation. In fairness, however, it should be noted that the gap-closing schools were not uniform on these measures. For example, 3 of the 26 gap-closing schools had poverty percentages higher than 70%, the average for the more than 500 schools included in the study.

Table 2

Comparisons between Gap Closing and Other Schools for Report Card Indicators

Variable	Gap-cl school means	Other school means	Differences between means
% Poverty	52.6	71.2	-18.6 *
Student enrollment	577.7	491.8	85.9
% Average kindergarten attendance	96.7	96.9	-0.2
% Student retention	2.6	3.3	-0.7
% Average student attendance	96.5	96.2	0.3
% Students gifted and talented	21.1	14.0	7.1 *
% Non-speech disabled	7.2	8.7	-1.5
% Student overage for grade	0.6	1.4	-0.8 *
% Student OS suspension/expulsion	0.1	0.4	-0.3
Number of teachers	38.5	36.4	2.1
% Teachers with advanced degrees	52.6	52.4	0.2
% Teachers on continuing contract	85.4	81.2	4.2
% Teachers highly qualified	92.5	92.4	0.1
% Teachers on provisional contracts	1.3	2.3	-1.0
% Teachers returning	87.5	85.7	1.8
% Teacher attendance	94.7	94.8	-0.1
Average teacher salary	42294.7	41776.6	518.1
Average # teacher professional development days	13.2	13.8	-0.6
Principal's years at school	7.0	5.9	1.1
Student-Teacher ratio	20.2	18.4	1.8 *
% Prime instructional time	89.8	89.5	0.3
Average dollars per pupil	5943.0	6522.3	-579.3
% Expenditures for teacher salaries	64.9	65.4	-0.5
Number of art opportunities	3.0	3.0	0.0
% Students with parents at conference	98.4	96.7	1.7
% SACS accreditation	100.0	80.0	20.0 *
% Non-speech disabled students taking PACT ELA off grade level	4.0	4.7	-0.7
% Non-speech disabled students taking PACT math off grade level	3.4	3.9	-0.5
% Teacher vacancies greater than 9 weeks	0.3	0.5	-0.2
Rating on character development program	3.7	3.3	0.4

* Differences between the means are greater than half of a standard deviation (for the entire sample of over 500 schools).

Figure 1 shows the 2005 absolute school report card ratings for gap-closing schools compared with other elementary schools. A school's absolute rating can be excellent, good, average, below average, or unsatisfactory. Gap-closing schools were rated as excellent or good more frequently than other schools. About 39% of the gap-closing schools were rated excellent in 2005 compared with about 9% of other schools. Good ratings were achieved by almost 54% of the gap-closing schools and just over 31% of other schools. Slightly less than 8% of the gap-closing schools were rated as average, and none were rated below average or unsatisfactory.

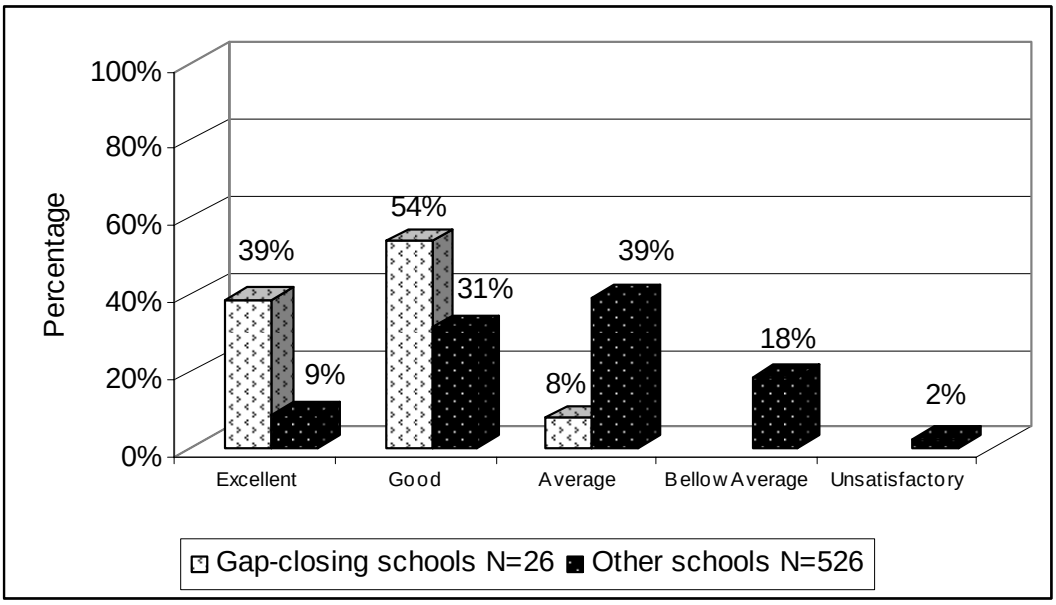

Figure 1: 2005 absolute school ratings for gap-closing schools and other schools

Factor Analyses of the Survey Items

As described in the Methodology section, iterative maximum likelihood exploratory factor analyses were conducted for all items on the teacher and student surveys and for the first 21 items on the parent survey. Factor analysis is a statistical procedure designed to identify latent dimensions underlying a large number of variables, in this case survey items. There were no apriori hypotheses about how the items were related to underlying dimensions, and, therefore, the factor analyses were exploratory in nature.

In a series of iterations (four rounds for both the student and teacher instruments and one round for the parent survey), the items on each survey were factor analyzed and factors extracted. In determining the number of factors to be retained, both scree plots and eigenvalues were examined. The Kaiser-Guttman criterion, which states that the number of

factors is equal to the number of eigenvalues greater than 1.0, was observed. Following extraction, the factors were rotated using a promax oblique rotation procedure. Using an oblique rotation procedure allowed the factors to be intercorrelated and aided in the interpretation and subsequent naming of the factors. Following each round, cross-loading and low-loading items were identified and eliminated from the analyses. This process resulted in the elimination of 11 items from the teacher survey, from 53 to 42 items and also 11 on the student survey, from 43 to 32 items. The results from the final round of the analyses will be presented in this section.

For the teacher survey, a five-factor solution was determined to be the most interpretable solution, and the names of the factors extracted and the factor loadings are presented in Table 3. The factor loadings are numbers which indicate how well an item is measuring the factor. The higher the number, the more closely that item is related to the underlying hypothesized latent dimension. Thus, for teachers, the first factor, *Home-School Relationship*, was measured most effectively by the item, "I am satisfied with the home-school relations" (.89) and "Parents attend school meetings and other school events" (.89). For the *Leadership and Climate* factor, the item "The school administration provides effective instructional leadership" had a factor loading of .93, and "The school administration communicates clear instructional goals for the school" a loading of .89. Items such as these, with very high loadings, are so called "marker items," and are nearly pure measures of the factor. In this instance the factor clearly reflects administrative leadership. For Instructional Focus, three items with loadings of .80 to .84 indicate a focus on an understanding of instructional standards and high expectations for students to meet those standards. Teachers' views of the social-physical environment of the schools were closely associated with building cleanliness and maintenance, having three marker items with factor loadings of .80 or higher. Finally, the Table 3 shows that teacher perceptions of *Safety* were highly related to their perceived safety at school during the day (.89), and going to and coming from school (.89).

Table 3

Factor Analysis of the 2005 Teacher Survey

	Factor and Items (n = 42)	Factor and Factor Scores				
		Home-School Relationship	Leadership and Climate	Instructional Focus	Social-Physical Environment	Safety
Items	*Home-School Relationship*					
	I am satisfied with the home-school relations.	.89				
	Parents attend school meetings and other school events.	.86				
	Parents participate as volunteer helpers in the school or classroom.	.84				
	Parents at my school are interested in their children's schoolwork.	.83				
	Parents attend conferences requested by teachers at my school.	.81				
	Parents at my school cooperate regarding discipline problems.	.76				
	Parents at my school support instructional decisions regarding their children.	.72				
	Parents are involved in school decisions through advisory committees.	.61				
	Students at my school behave well in class.	.55				
	Students at my school behave well in the hallways, in the lunchroom, and on school grounds.	.51				
	Parents at my school understand the school's instructional program.	.48				
	Students at my school are motivated and interested in learning.	.45				
Items	*Leadership and Climate*					
	The school administration provides effective instructional leadership.		.93			
	The school administration communicates clear instructional goals for the school.		.89			
	School administration arranges for collaborative planning and decision making.		.74			
	The school administration sets high standards for students.		.73			
	Teacher evaluation at my school focuses on instructional improvement.		.70			
	Teachers at my school are recognized and appreciated for good work.		.68			
	The school administration has high expectations for teacher performance.		.62			
	I am satisfied with the learning environment in my school.		.59			
	The level of teacher and staff morale is high at my school.		.58			
	Students' assessment information is used to set goals and plan programs for my school.		.55			
	There are relevant professional development opportunities offered to teachers at my school.		.50			
	Teachers at my school collaborate for instructional planning.		.36			
	Rules and consequences for behavior are clear to students.		.32			
Items	*Instructional Focus*					
	Teachers at my school focus instruction on understanding, not just memorizing facts.			.84		
	Teachers at my school effectively implement the State Curriculum Standards.			.83		
	Teachers at my school have high expectations for students' learning.			.80		
	My school provides challenging instructional programs for students.			.66		
	Students' assessment information is effectively used by teachers to plan instruction.			.61		
	Effective instructional strategies are used to meet the needs of low achieving students.			.58		
	Instructional strategies are used to meet the needs of academically gifted			.42		
	There is sufficient amount of classroom time allocated to instruction in essential skills.			.37		
	My school offers effective programs for students with disabilities.			.32		
Items	*Social-Physical Environment*					
	The hallways at my school are kept clean.				.88	
	The bathrooms at my school are kept clean.				.82	
	The grounds around my school are kept clean.				.81	
	The school building is maintained well and repaired when needed.				.76	
	There is sufficient space for instructional programs at my school.				.36	
Items	*Safety*					
	I feel safe at my school during the school day.					.89
	I feel safe going to or coming from my school.					.89
	I feel safe at my school before and after school hours.					.68

Table 4 indicates that the analyses for students yielded a four-factor solution. These factors have been named:

- *Learning Environment*
- *Expectations of Others*
- *Social-Physical Environment*
- *Safety*

A number of the student items loaded to a moderate degree (factor loadings from .30 to .60) on *Learning Environment*, with "My classes are interesting and fun" (.60), "My teachers spend enough time helping me learn" (.59), and "I am satisfied with the learning environment in my school" (.58) being the highest. Positive student responses to these items suggest the existence of a nurturing learning environment in which the student feels supported by teachers and engaged in learning. The second factor, *Expectations of Others*, also is characterized by a number of items with only moderate loadings. The central theme among the items is the notion of high expectations for student behavior and student learning coupled with a close monitoring of those behaviors by teachers and by parents. The third dimension, *Social-Physical Environment*, is primarily associated with student behavior in the school – in classrooms and other areas of the school and its grounds (both with loadings above .80). Secondarily, it seems to reflect student concerns about building cleanliness and maintenance (loadings generally in the .40s). Thus, the emphasis for student perceptions of the social-physical environment has a somewhat different emphasis than that dimension for teachers. The *Safety* factor for students is comparable to that outlined for teachers: the perception of security both at school and coming to and going from school are central and strong (with factor loadings of about .80).

Table 4

Factor Analysis of the 2005 Student Survey

	Factor and Items (n = 32)	Factor and Factor Scores			
		Learning Environment	Expectations of Others	Social-Physical Environment	Safety
Items	*Learning Environment*				
	My classes are interesting and fun.	.60			
	My teachers spend enough time helping me learn.	.59			
	I am satisfied with the learning environment in my school.	.58			
	My teachers give homework assignments that help me learn better.	.57			
	The textbooks and workbooks I use at my school really help me to learn.	.56			
	My teachers praise students when they do good work.	.51			
	My teachers help students when they do not understand something.	.51			
	Teachers work together to help students at my school.	.45			
	My teachers do a good job teaching me mathematics.	.43			
	My teachers do a good job teaching me English language arts.	.39			
	The rules about how students should behave in my school are fair.	.39			
	I use computers and other technology at my school to help me learn.	.36			
	The media center at my school has a good selection of books.	.32			
	There is enough room for students to learn at my school.	.30			
Items	*Expectations of Others*				
	My parent knows how well I am doing in school.		.57		
	My teachers expect students to learn.		.56		
	Parents are welcomed at my school.		.55		
	My teachers expect students to behave.		.54		
	My parent knows what I am expected to learn in school.		.50		
	My parent helps me with my homework when I need it.		.48		
	My teachers give tests on what I learn in class.		.45		
	My school informs parents about school programs and activities.		.41		
	Parents volunteer and participate in activities at my school.		.32		
Items	*Social-Physical Environment*				
	Students at my school behave well in the hallways, in the lunchroom, and on school grounds.			.82	
	Students at my school behave well in class.			.80	
	The bathrooms at my school are kept clean.			.48	
	The grounds around my school are kept clean.			.45	
	Students from different backgrounds get along well at my school.			.44	
	The hallways at my school are kept clean.			.33	
Items	*Safety*				
	I feel safe at my school during the school day.				.80
	I feel safe at my school before and after school hours.				.78
	I feel safe going to or coming from my school.				.58

A four-factor solution for the parent data is presented in Table 5. It reveals that parents view the *Home-School Relationship* dimension as most closely associated with how well the school listens to their issues and concerns. The two items loading most strongly on this factor are "My child's school considers changes based on what parents say" (.73) and "My child's school includes me in decision-making" (.62). The second factor, *Social-Physical Environment*, is a combination the perceived safety of their child at school (with a loading of .85), school appearance and cleanliness (.68), and overall satisfaction with social and physical environment (.67) of the school. Parents regard a positive *Learning Environment* in much the same way as their children, characterized by a nurturing, supportive atmosphere ("My child's teachers encourage my child to learn" (.84) in which expectations are high (.75). The final factor (*Teacher-Parent Relationship*) involves the interactions between the teachers and parents. Teachers telling parents how they can help their child learn was most closely associated with this factor (.78). This loading was closely followed by the item "My child's teachers contact me to say good things about my child" (.75).

Table 5
Factor Analysis of the 2005 Parent Survey

	Factor and Items (n = 21)	Factor and Factor Scores			
		Home-School Relationship	Social-Physical Environment	Learning Environment	Teacher-Parent Relationship
Items	*Home-School Relationship*				
	My child's school considers changes based on what parents say.	.73			
	My child's school includes me in decision-making.	.62			
	My child's school treats all students fairly.	.53			
	The principal at my school is available and welcoming.	.52			
	I am satisfied with the home-school relations at my child's school.	.51			
	My child's school schedules activities at times that I can attend.	.49			
	My child's school gives me information about what my child should be learning in school.	.45			
	My child's school returns my phone calls or e-mails promptly.	.36			
Items	*Social-Physical Environment*				
	My child feels safe at school.		.85		
	My child's school is kept neat and clean.		.68		
	I am satisfied with the social and physical environment at my child's school.		.67		
	Students at my child's school are well behaved.		.56		
	My child's teachers care about my child as an individual.		.45		
Items	*Learning Environment*				
	My child's teachers encourage my child to learn.			.84	
	My child's school has high expectation for student learning.			.75	
	My child's teachers give homework that helps my child learn.			.74	
	I am satisfied with the learning environment at my child's school.			.54	
	My child's teachers provide extra help when my child needs it.			.52	
Items	*Teacher-Parent Relationship*				
	My child's teachers tell me how I can help my child learn.				.78
	My child's teachers contact me to say good things about my child.				.75
	My child's teachers invite me to visit my child's classroom during the school day.				.63

Correlations among contextual variables and achievement

An important purpose of this study was to examine the relationships between the school-level contextual variables and school-level achievement outcomes. The contextual measures included the report card indicators presented in Table 2 and the survey data found in Tables 3-

5. For the surveys, scores for each factor for each school were created by aggregating the individual survey responses to the items included in each factor. These factor scores are standardized scales developed from the factor structure and based upon the weights assigned to individual items.

The school's absolute rating, reflecting student performance on the Palmetto Achievement Challenge Tests (PACT), and the percentage of AYP objectives met were two key outcome indicators. The Pearson correlations between each of the context indicators and the two outcome measures are presented in Table 6. Correlation coefficients can range from -1 to +1. The closer the number is to 1, regardless of sign, the stronger the relationship is between the two variables. Values of .90 or greater indicate a near linear relationship between the two while values near zero suggest no relationship.

The strongest positive correlation, .70, is found between the percentage of students in the school served by gifted and talented programs and the absolute rating of the school. This association is not unexpected since participation in academically gifted programs is predicated upon strong academic performance. Schools with higher numbers of students participating in gifted programs would be expected to demonstrate higher overall achievement levels. Correlation is often confused with causation. A strong relationship between two variables may indicate causation, but it also can simply indicate a mere association. There is a strong relationship, for example, between the number of firemen at the scene of a fire and the size of the fire. However, the firemen did not cause the fire. In the case of gifted program participation, the relationship underlying the correlation is less clear. While programmatic efforts to improve achievement can certainly be effective in improving student achievement, the requirement that students be high achievers as a prerequisite to participation in the gifted program confuses cause and effect. A sophisticated study of program effectiveness would be necessary to establish cause and effect.

A similar caveat holds for the strong negative relationship (-.76) found between the percentage of students in the school in poverty and the school's absolute rating. As the percentage of students in poverty in the school increases, there is a tendency for the absolute rating of the school to be lower and vice versa. However, it is generally agreed that it is not family income level per se that poses a challenge to high achievement but rather the constellation of circumstances associated with poverty (e.g., lower parent education levels and a less educationally rich home environment) that result in lower achievement. Also, there are many examples of children from impoverished backgrounds who reach the highest levels of academic performance. Once again, correlation does not assure causation.

It is particularly intriguing that there are a large number of survey factors with moderate correlations with absolute rating. The *Home-School Relationship* factor from the teacher survey and the *Social-Physical Environment* factor from the parent survey have correlations with absolute school rating of .68 and .59, respectively, almost as high as percentage of gifted students and the percentage of students in poverty. These findings suggest that the surveys can be very helpful in understanding the complex dynamics of the relationships between school-level contexts and school achievement.

Table 6 also reveals that, in general, the correlations between the percentages of AYP objectives met and the contextual measures are lower than between the contextual measures and absolute rating. The highest correlation (.46) is with average student attendance, closely followed by three survey factors, *Home-School Relationship* from the teacher survey (.44), *Social-Physical Environment* from the parent survey (.43), and *Safety* (.41) from the teacher survey.

Table 6

Correlations of Factor Scores and Report Card Variables with Achievement Outcomes

Variables	Absolute rating	% Adequate yearly progress objectives met
% Students gifted and talented	0.70	0.32
Home-School relationship (Teacher Factor)	0.68	0.44
Social-Physical environment (Parent Factor)	0.59	0.43
Safety (Teacher Factor)	0.51	0.41
Instructional focus (Teacher Factor)	0.49	0.37
Social-Physical environment (Student Factor)	0.48	0.32
Safety (Student Factor)	0.45	0.33
Home-School relationship (Parent Factor)	0.44	0.34
Learning Environment (Parent Factor)	0.42	0.26
Leadership and climate (Teacher Factor)	0.36	0.28
% Prime instructional time	0.35	0.30
Average teacher salary	0.34	0.25
Student enrollment	0.32	0.02
% Average student attendance	0.32	0.46
Student-Teacher ratio	0.31	0.16
Expectations of others (Student Factor)	0.27	0.24
% Teachers returning	0.27	0.17
Rating on character development program	0.26	0.15
% Teachers continuing contract	0.24	0.15
Physical environment (Teacher Factor)	0.23	0.28
Number of teachers	0.22	-0.02
% Teachers advanced degree	0.18	0.15
Teacher-Parent relationship (Parent Factor)	0.18	0.14
Number of art opportunities	0.16	0.09
Learning environment (Student Factor)	0.15	0.15
% Expenditures for teacher salaries	0.14	0.10
% Teacher attendance	0.12	0.07
SACS accreditation	0.12	0.11
Principal's years at school	0.11	0.09
% Students with parents at conference	0.07	0.01
% Teacher vacancy greater than 9 Weeks	-0.09	-0.04
% Average kindergarten attendance	-0.09	0.02
% Student OS suspension/expulsion	-0.13	-0.07
Average # teacher paid professional development days	-0.15	-0.01
% Non-speech disabled	-0.18	-0.17
% Non-speech disabled students taking PACT ELA off grade level	-0.19	-0.09
% Non-speech disabled students taking PACT math off grade level	-0.20	-0.09
% Teachers provisional contract	-0.20	-0.21
Average dollars per pupil	-0.24	-0.10
% Student retention	-0.29	-0.15
% Student overage for grade	-0.35	-0.27
% Poverty	-0.76	-0.34

Differences Between Gap-closing and Other Schools on Survey Item Data

Item data for gap-closing and for all other schools are provided in Tables 7-9. Differences in the percentages of respondents agreeing with the item are also presented. For teachers (Table 7), the levels of agreement in gap-closing schools were more favorable across all items, but most appreciably on items reflecting *Home-School Relationship*. Parent participation as volunteers in the school or classroom was 23% points higher in gap-closing schools than in the other schools. Double digit differences were also found for 8 items measuring *Home-School Relationship* and one item measuring *Climate and Leadership*: These items and the differences between the means of the groups of schools are as follows:

- I am satisfied with the home-school relations. (17%)
- Parents attend school meetings and other school events. (16%)
- Parents at my school are interested in their children's schoolwork. (13%)
- The level of teacher and staff morale is high at my school. (12%)
- Parents attend conferences requested by teachers at my school. (11%)
- Parents are involved in school decisions through advisory committees. (11%)
- Students at my school behave well in class. (11%)
- Parents at my school cooperate regarding discipline problems. (10%)

It seems clear that teachers in gap-closing schools see parents as active, interested, and cooperative. These teachers are also more likely than the teachers in other schools to view teacher and staff morale as positive.

Differences in student perspectives in gap-closing versus other schools are presented in Table 8. While all but three items favored the gap-closing schools, the most striking differences were for items measuring the *Social-Physical Environment* factor. Student behavior ("Students at my school behave well in class," with a 15 percentage point discrepancy,) and building maintenance ("The bathrooms at my school are kept clean" with a 13 percentage point discrepancy) were the areas of the largest differences. Five of the six items measuring this factor had double digit differences favoring gap-closing schools.

The item differences between gap-closing schools and the other schools were smaller for parents. As Table 9 shows, for none of the items included in the factor analysis did the difference reach 10 or more percentage points, and for four of the items the discrepancy was zero or negative. The largest difference was nine points for the item "Students at my child's school are well behaved."

Table 7

Teacher Factor Differences by Item for Gap-closing Schools and Other Schools

	Factor	Gap-closing Schools % Agree	Other Schools % Agree	Difference % Agree
Items	*Home-School Relationship*			
	I am satisfied with the home-school relations.	96%	79%	17%
	Parents attend school meetings and other school events.	93%	77%	16%
	Parents participate as volunteer helpers in the school or classroom.	94%	71%	23%
	Parents at my school are interested in their children's schoolwork.	96%	83%	13%
	Parents attend conferences requested by teachers at my school.	98%	87%	11%
	Parents at my school cooperate regarding discipline problems.	97%	87%	10%
	Parents at my school support instructional decisions regarding their children.	97%	89%	8%
	Parents are involved in school decisions through advisory committees.	97%	86%	11%
	Students at my school behave well in class.	97%	86%	11%
	Students at my school behave well in the hallways, in the lunchroom, and on school grounds.	93%	84%	9%
	Parents at my school understand the school's instructional program.	97%	90%	7%
	Students at my school are motivated and interested in learning.	99%	90%	9%
Items	*Leadership and Climate*			
	The school administration provides effective instructional leadership.	95%	91%	4%
	The school administration communicates clear instructional goals for the school.	98%	94%	4%
	School administration arranges for collaborative planning and decision making.	97%	92%	5%
	The school administration sets high standards for students.	99%	96%	3%
	Teacher evaluation at my school focuses on instructional improvement.	97%	95%	2%
	Teachers at my school are recognized and appreciated for good work.	94%	88%	6%
	The school administration has high expectations for teacher performance.	99%	98%	1%
	I am satisfied with the learning environment in my school.	98%	92%	6%
	The level of teacher and staff morale is high at my school.	92%	80%	12%
	Students' assessment information is used to set goals and plan programs for my school.	99%	97%	2%
	There are relevant professional development opportunities offered to teachers at my school.	97%	93%	4%
	Teachers at my school collaborate for instructional planning.	98%	95%	3%
	Rules and consequences for behavior are clear to students.	97%	92%	5%
Items	*Instructional Focus*			
	Teachers at my school focus instruction on understanding, not just memorizing facts.	99%	98%	1%
	Teachers at my school effectively implement the State Curriculum Standards.	100%	99%	1%
	Teachers at my school have high expectations for students' learning.	100%	98%	2%
	My school provides challenging instructional programs for students.	100%	98%	2%
	Students' assessment information is effectively used by teachers to plan instruction.	99%	97%	2%
	Effective instructional strategies are used to meet the needs of low achieving students.	98%	95%	3%
	Instructional strategies are used to meet the needs of academically gifted students.	99%	95%	4%
	There is sufficient amount of classroom time allocated to instruction in essential skills.	96%	93%	3%
	My school offers effective programs for students with disabilities.	96%	93%	3%
Items	*Physical Environment*			
	The hallways at my school are kept clean.	97%	95%	2%
	The bathrooms at my school are kept clean.	92%	86%	6%
	The grounds around my school are kept clean.	97%	94%	3%
	The school building is maintained well and repaired when needed.	93%	90%	3%
	There is sufficient space for instructional programs at my school.	86%	84%	2%
Items	*Safety*			
	I feel safe at my school during the school day.	100%	99%	1%
	I feel safe going to or coming from my school.	100%	99%	1%
	I feel safe at my school before and after school hours.	99%	97%	2%

Table 8

Student Factor Differences by Item for Gap-closing Schools and Other Schools

	Factor	Gap-closing Schools % Agree	Other Schools % Agree	Difference % Agree
Items	*Learning Environment*			
	My classes are interesting and fun.	80%	76%	*4%*
	My teachers spend enough time helping me learn.	91%	89%	*2%*
	I am satisfied with the learning environment in my school.	90%	86%	*4%*
	My teachers give homework assignments that help me learn better.	90%	90%	*0%*
	The textbooks and workbooks I use at my school really help me to learn.	90%	87%	*3%*
	My teachers praise students when they do good work.	86%	85%	*1%*
	My teachers help students when they do not understand something.	96%	95%	*1%*
	Teachers work together to help students at my school.	94%	92%	*2%*
	My teachers do a good job teaching me mathematics.	96%	94%	*2%*
	My teachers do a good job teaching me English language arts.	95%	93%	*2%*
	The rules about how students should behave in my school are fair.	88%	83%	*5%*
	I use computers and other technology at my school to help me learn.	89%	84%	*5%*
	The media center at my school has a good selection of books.	85%	84%	*1%*
	There is enough room for students to learn at my school.	91%	90%	*1%*
Items	*Expectations of Others*			
	My parent knows how well I am doing in school.	97%	96%	*1%*
	My teachers expect students to learn.	99%	98%	*1%*
	Parents are welcomed at my school.	97%	97%	*0%*
	My teachers expect students to behave.	99%	98%	*1%*
	My parent knows what I am expected to learn in school.	95%	94%	*1%*
	My parent helps me with my homework when I need it.	94%	94%	*0%*
	My teachers give tests on what I learn in class.	98%	97%	*1%*
	My school informs parents abut school programs and activities.	95%	94%	*1%*
	Parents volunteer and participate in activities at my school.	93%	89%	*4%*
Items	*Social -Physical Environment*			
	Students at my school behave well in the hallways, in the lunchroom, and on the grounds.	62%	50%	*12%*
	Students at my school behave well in class.	66%	51%	*15%*
	The bathrooms at my school are kept clean.	64%	51%	*13%*
	The grounds around my school are kept clean.	84%	73%	*11%*
	Students from different backgrounds get along well at my school.	80%	69%	*11%*
	The hallways at my school are kept clean.	94%	87%	*7%*
Items	*Safety*			
	I feel safe at my school during the school day.	95%	90%	*5%*
	I feel safe at my school before and after school hours.	93%	86%	*7%*
	I feel safe going to or coming from school.	93%	89%	*4%*

Table 9

Parent Factor Differences by Item for Gap-closing Schools and Other Schools

	Factor	Gap-closing Schools % Agree	Other Schools % Agree	Difference % Agree
Items	*Home-school Relationship*			
	My child's school considers changes based on what parents say.	78%	76%	*2%*
	My child's school includes me in decision-making.	80%	78%	*2%*
	My child's school treats all students fairly.	86%	83%	*3%*
	The principal at my school is available and welcoming.	91%	90%	*1%*
	I am satisfied with the home-school relations at my child's school.	89%	87%	*2%*
	My child's school schedules activities at times that I can attend.	85%	83%	*2%*
	My child's school gives me information about what my child should be learning in school.	87%	85%	*2%*
	My child's school returns my phone calls or e-mails promptly.	91%	87%	*4%*
Items	*Social-Physical Environment*			
	My child feels safe at school.	96%	94%	*2%*
	My child's school is kept neat and clean.	96%	96%	*0%*
	I am satisfied with the social and physical environment at my child's school.	93%	89%	*4%*
	Students at my child's school are well behaved.	86%	77%	*9%*
	My child's teachers care about my child as an individual.	94%	92%	*2%*
Items	*Learning Environment*			
	My child's teachers encourage my child to learn.	96%	95%	*1%*
	My child's school has high expectation for student learning.	96%	93%	*3%*
	My child's teachers give homework that helps my child learn.	94%	94%	*0%*
	I am satisfied with the learning environment at my child's school.	92%	88%	*4%*
	My child's teachers provide extra help when my child needs it.	89%	87%	*2%*
Items	*Teacher-Parent Relationship*			
	My child's teachers tell me how I can help my child learn.	79%	77%	*2%*
	My child's teachers contact me to say good things about my child.	66%	66%	*0%*
	My child's teachers invite me to visit my child's classroom during the school day.	70%	74%	*-4%*

Table 10 includes items from the parent survey that were not included in the factor analysis. These items had a variety of response scales measuring parent participation level at school (on both four and three-point scales), obstacles to parental involvement (a 2-point true false scale), and ratings by parents of overall school efforts to involve parents (a 5-point scale ranging from very bad to very good). In general, Table 10 suggests that parents in gap-closing schools reported fewer obstacles to participation, as indicated by negative differences on these

items, greater levels of participation in school programs and activities, and higher ratings of the schools. The largest difference (12 points) was for an item reflecting parent volunteerism at the school. It is noteworthy that all of the differences (between 4 and 8 percentage points) for the parent ratings of school's interest in getting them involved favored the gap-closing schools.

Table 10

Parent Survey Differences by Non-Factor Items for Gap-closing Schools and Other Schools.

	Non-Factor Items	Gap-closing Schools % Endorsing	Other Schools % Endorsing	Difference % Endorsing
Items	*Parent Participation*			
	Attend Open Houses or parent-teacher conferences.	93%	84%	9%
	Attend student programs or performances.	89%	82%	7%
	Volunteer for the school (bake cookies, help in office, help with school fund raising, etc.)	63%	51%	12%
	Go on trips with my child's school (out of town band contest, field trip to the museum, etc.)	52%	43%	9%
	Participate in School Improvement Council meetings.	14%	17%	-3%
	Participate in Parent-Teacher-Student Organizations (PTA, PTO, etc.)	48%	44%	4%
	Participate in school committees (textbook committee, spring carnival committee, etc.)	28%	25%	3%
	Attend parent workshops (how to help my child with school work, how to talk to my child about drugs, effective discipline, etc.)	30%	31%	-1%
Items	*Parent Responsibilities*			
	Visit my child's classrooms during the school day.	50%	52%	-2%
	Contact my child's teachers about my child's school work.	89%	82%	7%
	Limit the amount of time my child watches TV, plays video games, surfs the Internet, etc.	93%	90%	3%
	Make sure my child does his/her homework.	99%	98%	1%
	Help my child with homework when he/she needs it.	99%	98%	1%
Items	*Parent Obstacles to Involvement*			
	Lack of transportation reduces my involvement.	7%	13%	-6%
	Family health problems reduce my involvement.	12%	15%	-3%
	Lack of available care for my children or other family members reduces my involvement.	17%	17%	0%
	My work schedule makes it hard for me to be involved.	52%	55%	-3%
	The school does not encourage my involvement.	10%	13%	-3%
	Information about how to be involved either comes too late or not at all.	16%	21%	-5%
	I don't feel like it is appreciated when I try to be involved.	9%	11%	-2%
Items	The school's overall friendliness.	87%	81%	6%
	The school's interest in parents' ideas and opinions.	71%	67%	4%
	The school's efforts to get important information from parents.	79%	72%	7%
	The school's efforts to give important information to parents.	83%	77%	6%
	How the school is doing overall.	86%	78%	8%

Clustering Schools

As described in the methodology section of this paper, cluster analysis is a statistical tool designed to partition observations, in this case schools, into mutually exclusive groupings based upon the similarity of the characteristics that they have in common. The goal of cluster analysis is to create smaller subgroups of schools that are similar to members within a cluster while distinct from members of other clusters. Through this process, the clustering technique maximizes the variance between groups and minimizes it within groups.

Because of the apparent strength of the relationship between school survey factor scores and school outcomes, the data suggested that schools could be assigned to clusters based upon the factor scores from the student and teacher surveys. The cluster membership of gap-closing schools could then be investigated. Given the varying scales and formats used on the parent survey, the large number of parents marking the "don't know" option, and the low return rates from some schools, it was decided that the data from the parent survey would not be employed in the clustering analyses. Clustering was conducted using nine factor scores (five teacher factors and four student factors) that were obtained from the final solutions for the teacher and student surveys. The factor scores are standard scores with a mean of zero and a standard deviation of 1.00. The scores range from a low of –3 to a high of +3, with scores of 0 denoting an average or typical school. Positive values denote that a school has a "better than average" climate, while negative values show a climate that is less positive than the average school.

The interpretation of the cluster analysis solutions involved two main components. First, the centroid information for each of the clusters was examined. The centroid is the arithmetic mean for the set of variables used in the clustering process. The centroids were evaluated to determine if the clusters' pattern of mean values identified subgroups of schools. Second, supporting information about each cluster's characteristics, such as average school size, percentage of gifted students, and school poverty levels, and cluster size relative to the total sample were examined.

Table 11 shows factor score means for a four-cluster solution. Schools in Cluster 1 had scores that illustrated positive, above average, teacher and student perceptions of climate. Cluster 2 schools had scores that were at the average for all schools in the state. The schools in Cluster 3 had student and teacher climate scores below the average and the fourth cluster had the lowest average factor scores for the teacher factors. School climate, as measured by the student and teacher factor scores, was most positive in Cluster 1 schools and least positive in Cluster 4 schools.

A key finding of this study was that all of the gap-closing schools were in clusters 1 and 2. Specifically, 69% (n=18) of the gap-closing schools were in Cluster 1, and 31% (n=8) of the gap-closing schools were in Cluster 1. None of the gap-closing schools were members of Clusters 3 or 4, the clusters of schools with less favorable school climates.

Cluster 1, comprising 173 schools, had mean factor scores ranging from .13 (*Expectations of Others* for students) to .54 (*Home-School Relationship* for teachers) while Cluster 4 had factor scores between -.20 (*Learning Environment* for students) and -1.00 (*Home-School Relationship* for teachers). It is interesting that the teacher factor for *Home-School Relationship* showed the highest value in Cluster 1 of all factor scores (.54), and the lowest of all factor scores (-1.00) in Cluster 4 schools. The other factor score with large variation from Cluster 1 to Cluster 4 was the teachers' *Physical Environment* factor which ranged from .37 (Cluster 1) to -.88 (Cluster 4).

When the report card indicators were averaged by cluster, consistent relationships were found between cluster membership and the indicators. Schools in Cluster 1 had, on average, 56% of the students in poverty. The comparable percentage for Cluster 4 was just over 89%. Changes in the other variable values across clusters (shown in the lower portion of Table 11) tended to be consistent with the changes observed for the poverty variable. For example, schools in Cluster 1 tended to have higher student enrollments, higher attendance for students and teachers, higher percentages of gifted students, more experienced principals and teachers, etc. Cluster 4 schools tended to have greater poverty, a larger percentage of retained students, a greater percentage of overage students, more teachers on provisional or emergency certificates, etc.

Table 11

School Means for Factor Scores and Report Card Variables by School Clusters 1-4

Factors	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Learning Environment (Student)	0.15	0.08	-0.22	-0.20
Expectations of Others (Student)	0.13	0.05	-0.21	-0.21
Social-Physical Environment (Student)	0.34	0.05	-0.36	-0.45
Safety (Student)	0.21	0.06	-0.28	-0.31
Home-School Relationship (Teacher)	0.54	0.01	-0.44	-1.00
Leadership (Teacher)	0.34	0.03	-0.22	-0.61
Instructional Focus (Teacher)	0.25	0.00	-0.15	-0.52
Physical Environment (Teacher)	0.37	-0.01	-0.08	-0.88
Safety (Teacher)	0.26	0.04	-0.14	-0.70

Indicators	Cluster 1	Cluster 2	Cluster 3	Cluster 4
% Poverty	55.82	70.74	80.81	89.41
Student enrollment	515.24	507.88	490.23	439.05
% Average kindergarten attendance	97.03	96.60	97.34	96.13
% Student retention	2.50	3.42	3.48	4.31
% Average student attendance	96.53	96.24	96.02	95.93
% Students gifted and talented	20.01	14.19	10.47	6.57
% Non-speech disabled	7.93	8.65	9.20	9.82
% Student overage for grade	0.80	1.34	1.67	2.16
% Student OS suspension/expulsion	0.08	0.26	0.57	0.77
Number of teachers	36.78	36.93	37.24	34.54
% Teachers advanced degree	55.90	53.18	49.74	47.41
% Teachers continuing contract	83.50	82.05	80.62	76.55
% Teachers highly qualified	91.92	92.84	93.06	90.87
% Teachers provisional contract	1.64	2.27	2.61	3.42
% Teachers returning	87.27	86.07	85.04	82.22
% Teacher attendance	95.15	94.71	94.79	94.02
Average teacher salary	42685.30	41876.75	41191.17	40461.97
Average # teacher paid professional development days	13.57	13.90	13.73	14.18
Principal's years at school	6.50	5.96	5.98	4.18
Student-Teacher ratio	19.27	18.25	18.11	17.50
% Prime instructional time	90.35	89.41	89.17	87.98
Average dollars per pupil	6253.98	6469.02	6701.02	6846.05
% Expenditures for teacher salaries	66.36	65.57	64.60	64.78
Number of art opportunities	3.07	3.02	2.98	2.82
% Students with parents at conference	97.94	96.61	96.88	94.35
SACS accreditation	0.84	0.83	0.86	0.67
% Non-speech disabled students taking PACT ELA off grade level	3.89	4.51	5.37	6.27
% Non-speech disabled student taking PACT math off grade level	3.14	3.90	4.32	5.46
% Teacher vacancy greater than 9 Weeks	0.20	0.32	0.94	1.12
Rating character development program	3.47	3.29	3.18	2.80

The strong relationship between overall school climate, as indicated by cluster location, and student achievement, as measured by PACT is depicted in Figure 2. For two PACT performance levels (basic and above as well as proficient and above), the scores of 4th and 5th grade students for English language arts and math are shown by cluster. The relationship between school climate and student PACT performance is evident across all skill areas, grade levels, and criteria for performance (basic and above versus proficient and above). Students perform at higher levels in schools with more positive school climate, and the schools with the least favorable climate (Cluster4) have students with the lowest PACT performance.

The stair-step effect depicted in Figure 2 is also present when the criterion is the percentage of schools meeting AYP standards. Figure 3 shows that schools with the most favorable ratings of school climate met 84.4% of their AYP objectives, while schools with the lowest school climate scores met only 31.2% of their AYP objectives. Comparable figures for Clusters 2 and 3 were 71% and 53% respectively.

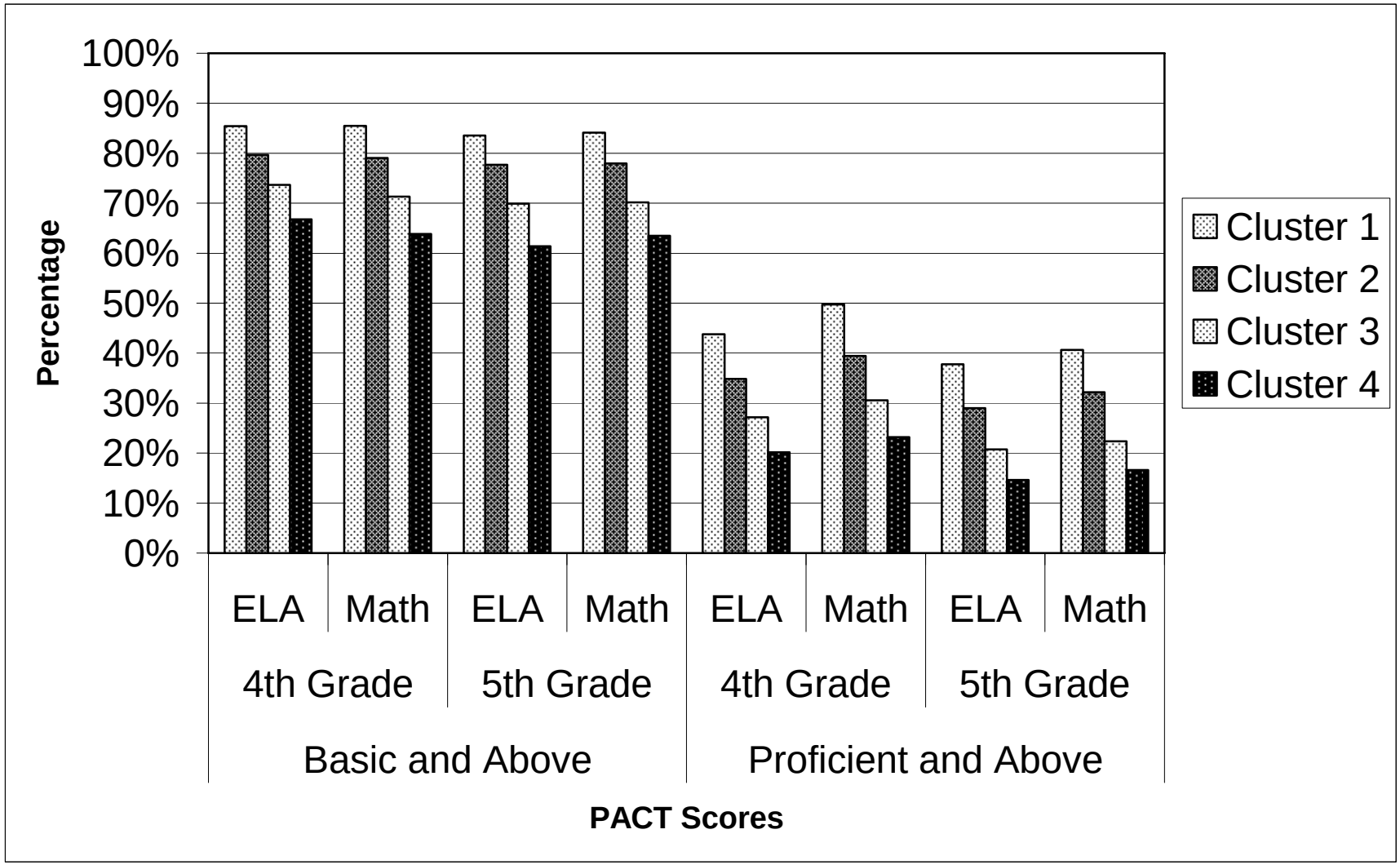

Figure 2. 2005 PACT scores for fourth and fifth graders by school clusters 1-4

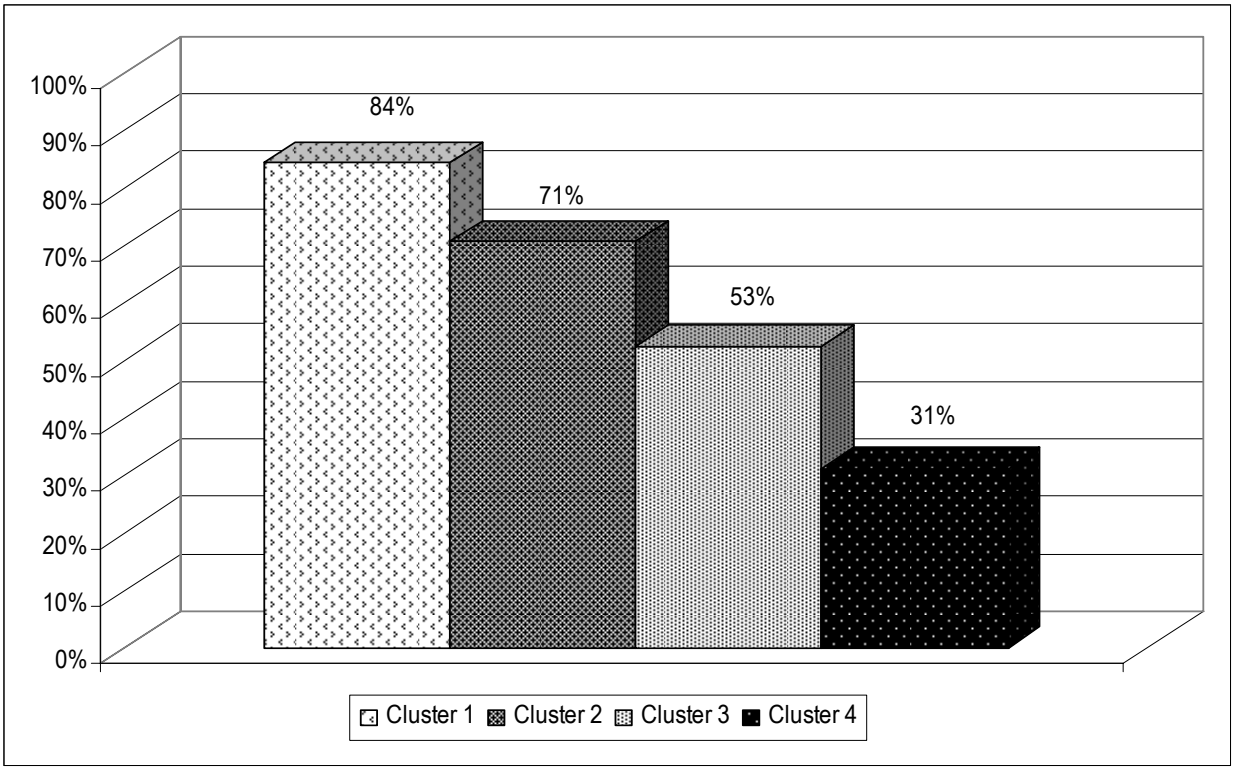

Figure 3. Percentage of schools meeting 2005 Adequate Yearly Progress (AYP) by school clusters 1-4.

Figure 4 shows a similar relationship between cluster membership and the annual school ratings from South Carolina's 2005 school report cards. Schools can earn an absolute rating of *excellent, good, average, below average, or unsatisfactory* based on student achievement and other factors. Schools rated *excellent* most frequently occur in Cluster 1 schools with positive school climate, and the highest percentages of schools rated *below average* or *unsatisfactory* are in schools with the lowest ratings of school climate.

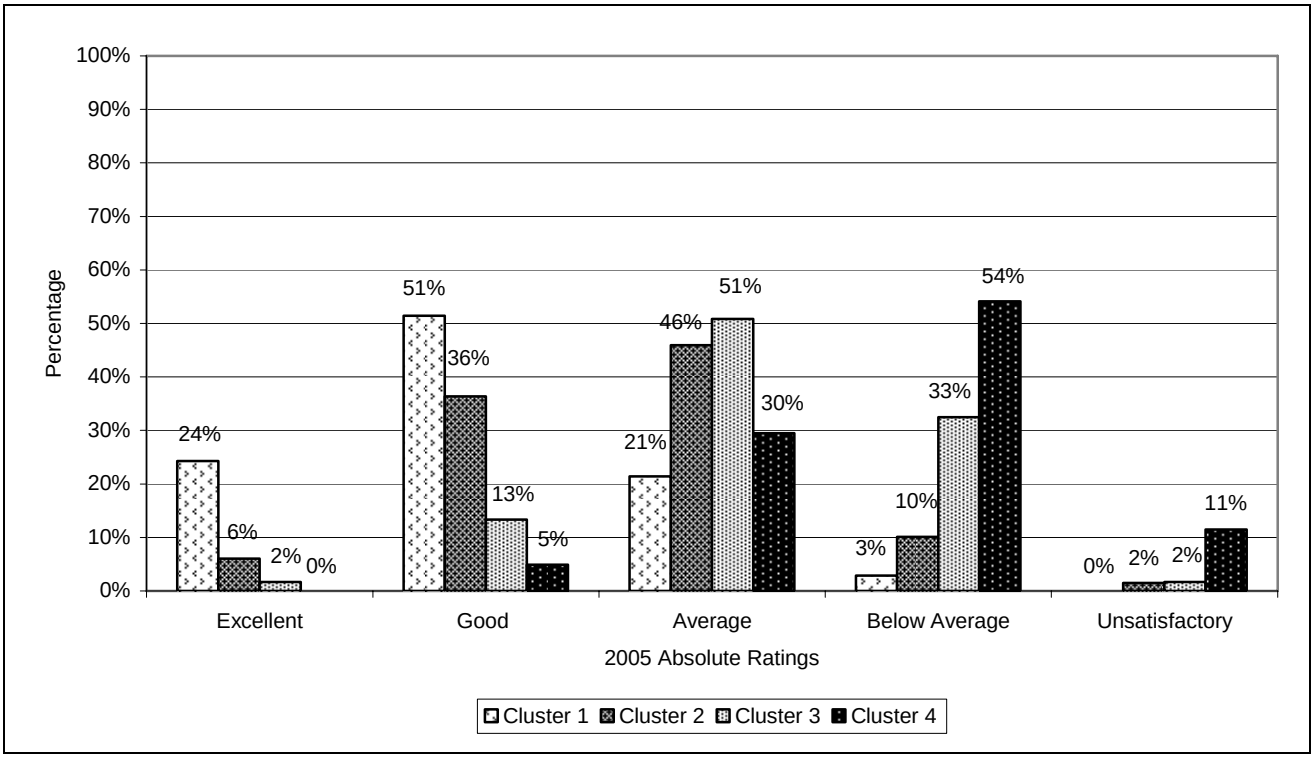

Figure 4. Absolute school ratings by cluster for 2005.

SUMMARY AND RECOMMENDATIONS

The primary goal of this study was to examine report card indicators and school climate survey data gathered from students, parents, and teachers for elementary-level gap-closing and other schools in an effort to ascertain how the two groups of schools differed. The analyses included contextual measures and outcome measures aggregated at the school-level for the 2004-2005 school year. The resulting dataset included more than 500 schools with exit grades of four, five, or six. Twenty-six of the schools had been designated as gap-closing schools by the EOC based upon a 4-year history of high performance by historically underachieving students at the identified schools. The 26 schools were located in 15 of the 85 school districts, with five districts including more than one gap-closing school.

For about two-thirds of the 30 contextual indicators presented on the school report card, the differences between the gap-closing schools and other schools were small. However, for the percentages of students in poverty, the percentages of students participating in gifted programs, the percentages of students over age in the grade, and the student-teacher ratios for the school, the differences between the means of the gap-closing and the other schools were substantial, exceeding a half standard deviation. As a group, the gap-closing schools tended to serve more middle-income students, more gifted students, and fewer overage students. The gap-closing schools were not uniform on these measures, and three of the 26 gap-closing schools had poverty indexes higher than 70%, the average for the 500 schools included in the study.

Using both factor analysis and cluster analysis procedures, the study found that there were systematic differences between gap-closing and all other schools on key climate indicators measured by the surveys. Teachers in gap-closing schools expressed more favorable opinions of the schools, especially in the area of home-school relationships. For the item “I am satisfied with the home-school relations,” 96% of the teachers in gap-closing schools, versus 79% of teachers in other schools, agreed. For the item “Parents attend school meetings and other events,” the comparable numbers for gap-closing and other schools were 93% and 77%. For “Parents participate as volunteer helpers in the school or classroom,” the values were 94% and 71% - a 23% discrepancy favoring gap-closing schools. Teachers in the gap-closing schools were also more likely than the teachers in other schools to view teacher and staff morale as positive.

Students in gap-closing schools were more satisfied with the social-physical environment than were students in the other schools. There was a discrepancy of 15

percentage points for the item “Students at my school behave well in class,” and 13 percentage points on the item “The bathrooms at my school are kept clean.” Five of the six items measuring social-physical environment had double digit differences favoring gap-closing schools.

Parent survey differences, though less striking than for students and teachers, indicated that parents in gap-closing schools tended to be more active in the schools as volunteers, were contacted by teachers regarding their child more often, and rated the schools higher for their efforts to engage parents. They saw fewer obstacles, like transportation, to their active participation. Parents of children in gap-closing schools also tended to view students as better behaved.

The study found moderate to strong relationships between a variety of achievement indicators and school climate, as measured by the surveys of teachers, students, and parents. The strongest of these were between those items measuring home-school relationship on the teacher survey and the absolute rating. The second strongest relationship was between social-physical environment on the parent survey and school absolute rating. It was also found that achievement indicators were more positive in gap-closing schools than in the other schools in the analyses. For example, 38% of gap-closing schools had excellent absolute ratings on their report cards but only 9% of all other schools did so. Conversely, while none of the gap-closers had below average or unsatisfactory absolute ratings, 20% of other schools received these ratings.

Similarly, more AYP objectives were met by schools with the most favorable school climates. Schools with more positive climates met 84.4 % of their AYP objectives, while schools with the lowest climate ratings met only 31% of their AYP objectives. The relationship between student PACT performance and school climate followed a similar pattern. Students performed at higher levels in schools with more positive climate, and students’ performance was lowest in schools with the least favorable climate ratings. The gap-closing schools were included in the groups of schools with the most positive school climate. The complex inter-relationship among the contextual indicators and outcome measures was discussed.

The results of this study of gap-closing schools are consistent with other research, particularly school climate research from the Consortium on Chicago School Research (CCSR). CCSR used information from principals, teachers, and students across over 200 schools to identify “five essential supports for school improvement” (Sebring, Allensworth, Bryk, Easton, Luppescu, 2006). The CCSR found the important supports to be: leadership, professional capacity (e.g., knowledge, skills, and disposition of faculty), parent-community ties, climate, and

instruction. The five supports identified by the CCSR mirror findings from Bryk and Schneider (2002) who compared 100 schools in Chicago that made the greatest improvement on achievement tests (reading and math) between 1991 and 1996 with 100 schools that made little or no improvement. They discovered that schools with high levels of trust at the beginning of reform efforts had a 1 in 2 chance of making significant improvements in reading and math achievement, while schools with low levels of trust had a 1 in 7 chance of making achievement gains. The findings from Chicago are important, illustrating that climate factors are potentially changeable and positively impacting these factors can lead to school level increases in student achievement. Thus, the information gained from the analysis of the SC survey data could be used to provide direction for schools currently lower on the parent, teacher, and student climate factors to make positive changes. These changes may impact both school climate and also student achievement, and assist a greater number of SC schools to close the achievement gap.

Our study of elementary schools in the state that have consistently been recognized for the high achievement of their historically underachieving students highlighted the important role of school climate. Gap-closing schools were consistently found to have positive school climates on a variety of dimensions, including student academic performance, when compared with other schools. Not only do gap-closing schools maintain an instructional environment that supports high achievement, but these schools also create a positive school climate that fosters the attainment of high student performance.

RECOMMENDATIONS

- The present study has demonstrated a strong association between positive school climate and student achievement, as illustrated by the analysis of the gap-closing schools. *District administrators, school administrators, teachers, school improvement council members, and external review team members should carefully review school climate data as part of a comprehensive school improvement process.*

- *The development of a school-climate report, designed expressly for school administrators and school improvement councils, should be considered.* Such a report, with greater detail than provided currently, would group items into their relevant dimensions and could be used to identify needed professional development and programmatic initiatives to improve school climate.

- The 26 gap-closing schools in this study were located in only 15 of the 85 school districts, and five districts had more than one school to achieve gap closing status. Fourteen of the gap-closing schools were located in only four districts. *The role of district characteristics and support in improving school outcomes and achieving gap-closing status should be further explored. Survey items designed to address this dimension could be added to the current survey instrumentation.*

- The survey data provide a window to aid in understanding how school achievement is related to school climate factors and to other contextual variables at the elementary level. *Similar follow-up studies should be conducted with data for middle and high schools to examine relationships between school climate dimensions and student achievement, attendance, and graduation rate.*

- Though the sample sizes were large, the analyses in this study were limited to data from a single school year, 2004-2005. *Analyses should be conducted with more recent data in order to determine whether there is consistency in the trends identified for 2004-2005.*

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APPENDIX

Schools Recognized for Closing the Achievement Gap for Four Consecutive Years

District	School
Anderson One	Cedar Grove Elementary*
	West Pelzer Elementary*
	Wren Elementary*
	Hunt Meadows Elementary*
Anderson Two	Honea Path Elementary*
Berkeley	Marrington Elementary
Charleston	Stono Park Elementary*
	Buist Academy
Cherokee	Goucher Elementary*
Darlington	Pate Elementary
Dillon Two	East Elementary
Dorchester Two	R.H. Rollins Middle School of the Arts
Edgefield	Merriwether Elementary*
Greenville	Oakview Elementary*
Horry	Lakewood Elementary*
	Forestbrook Elementary*
	Carolina Forest Elementary*
	Seaside Elementary*
Kershaw	Lugoff Elementary*

Lexington Five	Dutch Fork Elementary*
	River Springs Elementary*
Oconee	Westminster Elementary*
Pickens	East End Elementary*
	Holly Springs Elementary*
	Liberty Elementary*
Richland Two	North Springs Elementary*
	Rice Creek Elementary*
	Bookman Road Elementary*
Spartanburg One	New Prospect Elementary*
Williamsburg	W.M. Anderson Primary
	St. Mark Elementary*
York	Bethany Elementary*

(Schools included in the sample for the current report are indicated with an asterisk.)