THE RELATIONSHIP BETWEEN SCHOOL CLIMATE AND MATH AND READING ACHIEVEMENT

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Character education programs, at their best, positively influence school climate, thereby enhancing learning and academic performance. This study reports the relationship between aspects of school climate as reported on student, teacher/staff, and parent surveys and third and fourth grader's scores on the state standardized tests of reading and mathematics. Results indicate that school climate, as represented in students' perceptions of the classroom community, their sense of well being, and their concern for others, are strongly related to mathematics and reading proficiency. Teacher and staff feelings of belonging, and of leadership support, and a common assessment of school climate as positive, and having a spirit of collaboration, all show strong associations to proficiency in either math or reading. This is support for investing in school climate as an additional way of optimizing student academic performance.

Enhancing student academic performance is a concern for school administrators, educators, parents, students, school systems, and the larger community in which the schools exist. Ironically, focusing exclusively on academics is not necessarily the best way to improve academic performance. Schools can be thought of as living organizations, defined as much by the people who work and participate within them, as by a curriculum and set of policies to be fine-tuned for optimal performance. One of the most promising recent developments regarding improving school-based standardized test scores is the accumulating evidence that char-

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acteristics associated with character education can play a productive role in improving academic scores.

Character education has been defined in many different ways, but definitions often include elements supportive of successful participation in the school community: capacities of social-emotional learning, abilities for democratic participation, and adoption of a morally salient group identification (Berkowitz & Bier, 2005). Another area of broad agreement in character education is the idea that children's social environment, that is, the social relationships in which they engage daily at school, provide a vital medium in which individual character can be supported (McClellan, 1999). In this sense, character education programs can be said to affect students, in part, by influencing their surrounding environment, through the psychological and sociological characteristics of the school's climate and culture. The present study examines the relationship between school climate, as defined by participants' own sense of these psychological and sociological characteristics, and students' academic achievement on standardized tests in a sample of 40 schools.

SCHOOL CULTURE AND CLIMATE

School culture is a large and complex concept that has been variously articulated, as is the related concept *school climate*. For the purpose of this paper they can be thought of as two parts of an interactive whole. School culture is said to represent the values, norms, professional structures and orientations that give a school a distinctive identity and ideology (Anderson, 1982; Creemers & Reezigt, 1999; Hoy, 1990; Hoy & Feldman, 1999). School culture is partly the "pattern of shared basic assumptions … that has worked well enough to be considered valid and… the correct way to perceive, think, and feel" (Schein, 1992, p. 12). Sergiovanni (2000, p. 1) calls school culture the "normative glue that holds a particular school together" and argues that a strong school culture leads to a sense of individual and community commitment, which, in turn, can foster personal and communal achievement. A school's culture is claimed to be a key factor in the success of a school and its students (Fullan, 2001a). Students in a school with a strong positive culture have been shown to have a greater chance of success and achievement (Fullan, 2001b; Sergiovanni, 2000). Sergiovanni argues that "shared commitments pull people together and create tighter connections among them and between them and the school…. These factors count in helping students learn at higher levels" (p. 23). Negative school cultures that foster destructive attitudes and mistrust, on the other hand, can prevent schools from making the most of their potential, and can create barriers to growth and change (Fullan, 2001a; Sarason, 1995).

In these definitions school culture is talked about as an underlying and guiding philosophy and organization-wide interactional pattern. Character education programs do seek to influence and enhance a positive and caring school culture, but the data being analyzed here reflect the beliefs and perceptions of the students, teachers, and parents, which is more accurately categorized as an aspect of school climate.

School climate is described as the lived embodiment and experience of how a school is organized, how people relate to one another, and the kinds of relationships that are institutionally supported (Creemers & Reezigt, 1999; Fleming & Bay, 2004). Berkowitz, Sherblom, Bier, and Battistich (2006), Hansen and Childs (1998) and Lightfoot (1983), describe a positive school climate as an environment of support, encouragement, warmth, and acceptance; where students are valued and have a sense of safety and belongingness; and where teachers and students can form relationships of trust, respect, caring, and appreciation. Crowd, Hausman, and Scribner (2002) describe the characteristics of a positive, effective school climate as a shared commitment to student achievement, collaboration between and among the professional staff, constructive dia-

logue among the teachers and between the teachers and the principal, and a school organization that brings teachers together in their daily work. A positive climate is an open climate, with opportunities for teachers and students to interact cooperatively and respectfully, and a sense of openness among the faculty and between the faculty and the principal (Hoy, Tarter, & Kottkamp, 1991; Lieberman, 1995). This respect is embodied in students being included in decision making in the classroom and teachers being included in decision making at the school level. Additionally, positive school environments are characterized by principals who communicate a strong, clear vision that can be understood and shared by the faculty. There is a broad consensus that our schools need a climate characterized by this openness and inclusivity, and that this requires school leadership committed to this vision (Bryk & Schneider, 2003; Mendel, Watson, & MacGregor, 2002; Sebring & Bryk, 2000).

In the broader educational scope, Marshall, Pritchard, and Gunderson (2004) assert that healthy schools are generally supported by healthy school districts and central administrations, and frequently undermined by unhealthy ones. Healthy districts are defined by their climate, especially the degree of commitment of teachers and administrators to growth and change, evidence of strategic planning that ensures district focus on learning processes, and the attitudes of students (Pritchard & Marshall, 2002). For schools to develop and maintain a distinctive culture and climate they may need to insist on the importance of their positive ways of relating and ask others to take on those values as well. For example, Hansen and Childs (1998) report that a high school, recognizing the importance of long-term interpersonal relationships within the school, negotiated with a local university for student teachers to be placed at the school for a longer period of time. The expectation was that they would become involved in the school community and not remain transient outsiders who unintentionally undermined a sense of community. Sustaining a positive, healthy school climate is also an ongoing endeavor because a school community is not a static entity. New students, new teachers, and changes in administrators, all influence the climate and maintaining a positive school climate demands a continuous renewal of the school community's sense of identity and collective purpose.

School Climate and Student Achievement

A growing body of evidence suggests that a positive school climate may enhance student academic performance in significant ways (Benninga, Berkowitz, Kuehn, & Smith, 2003; Berkowitz & Bier, 2005). However, developing a positive school climate in the first place requires a panoply of supporting elements, many of which also contribute directly to academic success. Teacher warmth and supportiveness and classroom practices that teach cooperation are strongly related to students' sense of positive community (Zins, Weissberg, Wang, & Wahlberg, 2004). Teacher expectations for student performance also influence student achievement by influencing the student's own perceptions of their capability (Brookover, Beady, Flood, Schweitzer, & Weisenbaker, 1979; Brookover et al., 1982).

In a review of social-emotional learning and its relation to building academic success, Walberg, Zins, and Weissberg (2004) conclude that supporting children's emotional intelligence contributes to safe, caring, and orderly environments that are themselves conducive to learning. Additionally, caring relations between teachers and students foster a desire to learn and a connection to the school (Berkowitz & Bier, 2005). Past research supports a direct relationship between student time on task and student academic achievement. The elimination of disruptive behavior allows a greater educational focus and fosters academic achievement (McEvoy & Walker, 2000). Zins, Bloodworth, Weissberg, and Wahlberg (2004) report that prosocial behavior, itself associated with good school climate,

is linked with positive academic and intellectual outcomes and is predictive of standardized achievement test scores. The proposed dynamic is that students who develop a positive sense of school community will enjoy being at school, become more task oriented, adopt the school community's emphasis on learning and educational aspirations, and be motivated to do well (Berkowitz & Bier, 2005; Schaps, Battistich, & Solomon, 2004).

Programs that improve students' interpersonal capacities, whether through developing social-emotional awareness and self-reflection, practicing perspective taking, promoting empathy and compassion, or teaching conflict resolution skills, all foster an ability to get along with others and to be a responsible member of a group, whether a family, a classroom, or a school (Berkowitz, Sherblom, Bier, & Battistich, 2006; Collaborative for Academic, Social, and Emotional Learning, 2003; Zins, Weissberg, Wang, & Wahlberg, 2004). Marshall, Pritchard, and Gunderson (2004) support this link between the environment and learning, at the district level, with their finding of higher levels of achievement in writing at both the 8th and 11th grades for students in schools in healthy school districts. These enhanced communication skills, in turn, provide students with the emotional and relational vocabulary needed to identify and communicate their feelings and needs to others. Having this avenue of self-expression should allow them to deal more productively with events that otherwise might have resulted in aggression and conflict (McEvoy & Walker, 2000), thereby linking district climate and student behavior problems.

McEvoy and Walker (2000) suggest that the success of prevention and intervention programs often hinges on their ability to identify and modify school climates in which academic failure and antisocial behavior occur. Lee and Smith (1999) argue, however, that without a clear school-wide cultural emphasis on academic excellence among school staff, fostering a sense of community in itself is not enough to produce academic achievement gains among students. Parental and community involvement have also consistently been found to positively influence school climate and academic achievement (Stevens & Sanchez, 1999).

The Present Study

The question remains, however, as to whether there is a direct relationship between the school's climate as defined through participant perceptions or only an indirect one linked through the focus on time and energy spent on academic tasks and educational aspirations. The present study investigates the relationship of school climate to student achievement by examining student, teacher, staff, and parental perceptions of social dynamics regarding inclusion, concern, respect, collaboration, and belonging, and articulating their relationship to student proficiency in math and reading achievement. This current examination uses the baseline data collected at the beginning of an experimental 4-year study. This federally-funded community-based project is designed to support elementary schools in implementing the Caring School Community (CSC) program, a character education intervention. As part of its over-all data collection this program surveys stakeholders (students, teachers and staff, and parents) on a yearly basis. This analysis is based on the first year's baseline data collection. The present study examines the relationship between elements measured by these surveys and the math and reading achievement scores of third and fourth grade students in the target schools. The study establishes a baseline relationship between factors that programs like Caring School Community intentionally support (positive school climate) and students' scores on standardized tests in reading and math, and asks the following research question.

Research Question: Is there a relationship between school climate and students' proficiency in math and reading achievement? This research question has two aspects:

1a: Are fourth grade students' math scores related to the students,' teachers'/staffs', and parents' perceptions of school climate?

1b: Are third grade students' reading scores related to the students', teachers'/staffs', and parents' perception of school climate

METHOD

Sample

Forty schools were randomly selected for participation in the project from a stratified sample. The population consisted of 36 school districts that were members of Cooperating School Districts of St. Louis, Missouri, USA and participated in the CHARACTER*plus* character education program during 2002-2003 (Cooperating School Districts, 2005). Twenty-three districts with a minimum of four elementary schools were identified and then seven were randomly selected for inclusion in the study. With three smaller districts (four to seven elementary schools), four schools each were randomly placed in the selected sample from each. With three larger districts (eight or more elementary schools), eight schools in each district were randomly placed in the sample. An additional four schools were randomly selected from the Saint Louis Public Schools, representing a seventh district. Schools ranged from being inner city schools with 80-90% free and reduced lunch, to wealthy suburban schools with little free and reduced lunch; and from being situated in densely populated urban areas to rural schools well outside the metropolitan area.

MAP Scores

Student achievement data were drawn from the 2003 Missouri Assessment Program (MAP) in reading and math. The achievement scores are generated from the communication arts test administered at the third grade and the mathematics test administered at the fourth grade, and these assessment scores are aggregate to the school level. MAP tests are administered each March as state sponsored standardized measures of student achievement in several academic areas. The scores, broken down by school, are subsequently posted on the Missouri Department of Elementary and Secondary Education Web site. The reading and math achievement scores were obtained from the web site for each of the schools in the sample. Students are assigned to one of five MAP categories, depending on how closely they met or exceeded the expectation for their grade level. In 2003, among third graders in Missouri taking the MAP communication arts test, 7.1% were at *step 1*, showing little competence; 19.3% were graded as *progressing*, showing some competence; 39.5% were *near proficient*, or almost at grade level; 32.7% were *proficient*, at grade level; and 1.4% were *advanced*, that is, above grade level. Because we are exploring how school climate elements might relate to academic achievement we included in our analysis only those students exhibiting academic achievement at grade level or above. This includes the top 34% of the third graders. Similarly, 37% of the fourth graders taking the mathematics test scored at proficient or advanced.

Surveys

Data from the student, teacher-staff, parent, and implementation surveys were collected during February and early March 2003. Student and teacher-staff surveys were administered by project trained data collectors. The parent survey was mailed in school envelopes to random samples of 100 parents of third and fourth grade students from each of the 40 selected schools. The data-producing sample consisted of 5,750 students in third and fourth grades who completed the CSC student survey; 1,567 teachers and staff who completed the teacher-staff survey; 1,543 teachers and staff who completed the CSC implementation

survey; and 1,955 parents who completed the parent survey. The student, teacher-staff, and implementation surveys had nearly a 100% response rate. The parent survey had a 48% response rate.

The Caring School Community student survey is a modification of the survey used by the Developmental Studies Center in the Child Development Project (Solomon, Battistich, Watson, Schaps, & Lewis, 2000). The Student Survey uses 77 questions to measure students' perceptions of nine elements of school climate: altruistic behavior, autonomy, classroom community, concern for others, democratic values, affective liking for school, parent involvement, trust and respect of teachers, and well-being at school. The items on this instrument produced acceptable reliabilities, in the range of .70s and .80s (Baxter & Babbie, 2004). The first 31 questions on this survey used a 5-point response scale: disagree a lot; disagree some; don't know; agree some; agree a lot. The next 26 questions used a 4-point response scale: never, once, a few times, many times. The final 18 questions used a 3-point response range: not at all true; sort of true; very true.

The Staff Survey, developed and piloted in earlier state and privately funded projects, uses 40 questions to measure five elements of school climate: feelings of belonging, school expectations, school leadership, staff culture, parent-teacher relations. Reliabilities for items on these scales were acceptable, in the range between the high .80s and .90s. This survey used a 5 point response scale throughout: strongly disagree; disagree; don't know; agree; strongly agree.

The CSC Implementation Survey, developed as a part of this research project, uses 40 questions to measure the Caring School Community curriculum, data utilization, leadership support, learning community, resources, school climate, staff collaboration, and student skills. The item reliabilities for this instrument were also acceptable, in the range between .70 and .89. This survey used a 5 point response scale: not evident; low; middle; high; and exemplary.

The Parent Survey uses 32 questions to measure aspects of school climate: student's feelings of belonging, school expectations, parent and staff relations, school quality, and parent involvement. The item reliabilities for these scales were above .90, with the exception of parent involvement which was .64 suggesting the need for caution in the interpretation of this scale result. Like the staff survey, the parent survey used a 5-point response scale throughout: strongly disagree; disagree; don't know; agree; strongly agree. Together these surveys generate 27 indices which constitute a comprehensive portrait of the school climate of each school from the perspective of multiple stakeholders.

Analysis

The percentage for each school's 27 indices of climate were correlated with the achievement scores obtained from each of the schools' MAP scores for reading and mathematics. Students in the two highest MAP score categories were included in the correlation analysis as a single category: proficient and advanced. Then backward stepwise regression analyses were run using the 27 climate indices as predictors and the achievement scores as the criterion variables. Correlation and regression models assume that the joint distribution of variables is normal and that the variance of errors is the same across levels of the variables (Pedhazur, 1982). These assumptions are justified in the present study by the size and random selection of the sample. Also, correlation and regression analysis are generally robust in the presence of departures from these assumptions, making them appropriate statistical tools for the present analyses (Pedhazur, 1982).

Stepwise regression is used to isolate a subset of predictor variables that yield an optimal prediction equation with as few predictors as possible. Backward stepwise regression proceeds by initially entering all of the potential predictor variables into the regression equation and then eliminating variables one at a time to produce the most parsimonious set of predictor

variables that accounts for the largest amount of explained variance. Each of the regression analyses performed in the present study entered the set of 27 climate indices as predictors of either the math or the reading achievement score, and eliminated them through the iterative process of backward stepwise regression. These 27 measures, being multiple indices of climate obtained from the varying perspectives of students, parents, teachers and staff, are likely to be correlated with each other and to be collinear in the variance that they account for in the math and reading achievement scores. However, for the purposes of the present study these multiple indices are important as a group, rather than as individual indices in themselves, in representing an overall predictable relationship of a school's climate to its achievement scores.

RESULTS

To test the research question that school climate is correlated with academic achievement, the survey results are analyzed with regard to MAP scores for the same schools.

Table 1 shows the correlations between the school climate indices and the math and reading achievement scores and reveals that 44 of the 54 indices of school climate are significantly correlated ($p < .05$) with the achievement scores. Using Lutz's (1983) guidelines for interpreting the magnitudes of correlations, 22 of these significant correlations show strong relationships between the indices of climate and either the math or reading achievement scores. This pattern of correlations indicates an overall strong relationship between school climate, as measured by these indices, and student achievement in these schools.

From the student survey, students' sense of well-being at school is strongly correlated to both math and reading proficiency, while positive classroom community, affective liking of school, trust/respect for teachers, and concern for others are strongly correlated only to reading scores. In all, five of nine indices were strongly correlated with one area of achievement or the other. On the teacher-staff survey, feelings of belonging is strongly correlated with both math and reading, while school leadership, parent-teacher relations, and school expectations are strongly correlated only with reading. In all, four of five indices are strongly correlated to achievement.

The staff implementation survey does not measure school climate per se, but rather a school's readiness to engage in this kind of reform effort. As a baseline measure it shows the existing relationship between the staff's evaluation of the school's abilities in this area and student achievement. The staff's evaluation of implementation readiness is strongly related to both math and reading test scores. Leadership support, their sense of a learning community, positive school climate, and their assessment of student skills are strongly correlated with both reading and math. These assets are probably predictive of a school's ability to effectively implement almost any program. Faithful implementation of the Caring School Curriculum was also strongly correlated with both math and reading achievement. Additionally, availability of resources is strongly correlated with reading achievement but not with math scores. In all, seven of eight indices are strongly correlated with achievement, five of them strongly correlated with both math and reading achievement. None of the parent survey results are strongly correlated with student achievement, although a few show moderate significant relationships.

In order to determine which set of school climate variables together is most significant regarding mathematics performance, a regression analysis was performed using the school climate indices as predictors of student math achievement scores at proficient and advanced (see Table 2). Table 2 shows that, with regard to the school climate indices, both student and staff perceptions are predictive of mathematics achievement. Student perceptions, particularly experiences of classroom community, concern for others, and sense of well being at school,

TABLE 1
Correlations of School Climate Measures With Math and Reading Proficient and Advanced Achievement Scores

Respondent Group–Scale Response	*Math Proficient*	*Reading Proficient*
Student─Altruistic behavior	–.10	.16
Student–Autonomy–Influence	.41**	.49**
Student–Classroom community	.47**	**.66****
Student–Concern for others	.44**	**.63****
Student–Democratic values	.41**	.54**
Student–Affective liking for the school	.46**	**.70****
Student–Parent involvement	.20	.16*
Student–Trust–Respect teachers	.46**	**.69****
Student–Well being at school	**.56****	**.70****
Teacher–Staff–Feelings of belonging	**.69****	**.75****
Teacher–Staff–School expectations	.50**	**.56****
Teacher–Staff–School leadership	.49**	**.65****
Teacher–Staff–Staff culture	.35*	.45**
Teacher–Staff–Parent–Teacher relations	.48**	**.57****
Staff implementation–CSC curriculum	**.58****	**.56****
Staff implementation–Data utilization	.39*	.50**
Staff implementation–Leadership support	**.65****	**.63****
Staff implementation–Learning community	**.64****	**.73****
Staff implementation resources	.49**	**.57****
Staff implementation–School climate	**.61****	**.68****
Staff implementation–Staff collaboration	.30	.48**
Staff implementation–Student skills	**.59****	**.62****
Parent–Feelings of belonging	.46**	.47**
Parent–Parent involvement	.01	–.07
Parent–School expectations	.46**	.33*
Parent–School quality	.25	.38*
Parent–Staff–Parent	.31	.30
Math proficient		**.73****

** Correlation is significant at $p < 0.01$
* Correlation is significant at $p < 0.05$
Using Lutz's (1983) practical guidelines for interpreting magnitudes of correlation:
.0 – .25 Weak relationship
.26 – .55 Moderate relationship
.56 – .75 Strong relationship
.76 – .99 Very Strong relationship

and staff perceptions of leadership support, positive school climate, and a sense of collaboration among students comprise the set of variables most associated with math achievement.

Table 3 shows the results of the regression analysis predicting proficient and above student reading achievement scores from the same set of indices of school climate. Several of the school climate indices are strongly related to reading achievement. Student perceptions of the classroom environment as characterized by concern for others, the exercise of democratic values, and a sense of well-being at school, and teacher-staff feelings of belonging and sense of school leadership are all strongly

TABLE 2
Regression Results of Climate Effects on Student Achievement Scores in Math

Student Proficient and Advanced Scores in Math				
Survey Response–Climate Variable	*Unstandardized Coefficient*	*B*	*t*	*p*
(Constant)	–142.31		–2.89	.007
Student─Classroom community	–1.14	–.43	–2.47	.02
Student–Concern for others	.88	.29	1.85	.07
Student–Well being at school	1.89	.28	2.49	.02
Teacher–Staff–School leadership	–.62	–.39	–1.93	.06
Staff implementation–Leadership support	1.22	.82	4.60	.001
Staff implementation–Positive school climate	1.99	1.10	4.64	.001
Staff implementation–Collaboration	–1.65	–.99	–5.48	.001

$R = .89$, $R^2 = .80$, $F(7,32) = 17.86$, $p < .001$

TABLE 3
Regression Results of Climate Effects on Student Achievement Scores in Reading

Student Proficient and Advanced Scores in Reading				
Survey Response–Climate Variable	*Unstandardized Coefficient*	*B*	*t*	*p*
(Constant)	–17.58		–.35	.73
Student–Concern for others	.61	.28	2.21	.04
Student–Democratic values	–1.18	–.48	–3.43	.002
Student–Well being at school	2.93	.61	5.41	.001
Teacher–Staff–Feelings belonging	.66	.53	3.49	.002
Teacher–Staff–School leadership	.38	.33	1.94	.06
Staff implementation–Resources provided	–.50	–.42	–2.14	.04
Parent–Feelings belonging	–1.55	–.51	–3.79	.001
Parent–Parent involvement	–1.72	–.32	–3.17	.004
Parent–School quality	.82	.68	3.89	.001
Parent–Staff–Parent	.66	.38	2.43	.02

$R = .93$, $R^2 = .86$, $F(10, 29) = 18.36$, $p < .001$

related to reading achievement. Taken together, these results demonstrate a clear strong relationship between school climate and student achievement.

DISCUSSION

The study's research question was: Is there a relationship between school climate and students' proficiency in math and reading achievement? The answer is yes, several aspects of school climate have a strong relationship with reading and math achievement. The research subquestions (1a) "Are 4th grade students' math scores related to the students,' teachers'/staffs', and parents' perceptions of school climate?" and (1b) "Are 3rd grade students' reading scores related to the students', teachers'/staffs', and parents' perception of

school climate?" can also be answered in the affirmative.

The staff implementation survey had the largest set of indices (five of eight) strongly correlated with both math and reading proficiency, and an additional indice significant for reading proficiency only. These results can be explained in the following way. Although the survey is designed to measure the implementation effort of a school community with regard to a particular character education program, the survey basically measures how well the school leadership and staff functions collaboratively for an agreed upon goal. This survey measures perceptions of effectiveness issues: leadership, data utilization, collaboration, access to needed resources, and over-all school climate. It should not be surprising then that this is a relatively good predictor of how prepared the school is to handle the basic educational effort. It is helpful to further document the importance of these factors, but they are not new. Additionally, they predictably require a well coordinated, resource rich, and comprehensive approach, depending on a cast of talented and dedicated professionals to get to that point of collaborative efficiency (Berkowitz & Bier, 2005). While this is the ideal, ideals are often not helpful as suggestions.

Fortunately, the student and staff surveys provide a smaller set of guidelines for our improvement efforts. The student survey had one aspect of school climate (well being) strongly correlated on both math and reading achievement, and four others correlated with reading proficiency (classroom community, concern for others, trust/respect for teachers, and liking for school). While liking for school is probably an outcome of experiencing the others, all of these others are positive relational qualities. This is the overriding message from the student surveys regarding proficiency—students' sense of relationships is strongly correlated with their academic success. Likewise, the teacher-staff survey had one aspect of school climate strongly related to both math and reading (feelings of belonging), and three others strongly related to reading proficiency alone (school expectations, school leadership, and parent-teacher relations). The staffs' feelings of belonging are similar to the student's sense of well-being, in that both reflect a positive psycho-social experience characterized by enjoying the relationships they have with the people in school, leading to them wanting to be in school. The other three aspects of school climate strongly correlated with reading achievement also have relational aspects (school experience, school leadership, and parent-teacher relations) especially between parents and staff, and between principal and staff. The parent survey was not strongly related to proficiency of any kind.

One of the limitations of the present study is that, as an exploratory investigation of these multiple indices of climate, the present results are, no doubt, affected by the multiple interrelationships among the indices of school climate themselves. This likely multicollinearity among the indices of climate leads to an imprecise estimation of the individual regression coefficients in the model (Pedhazur, 1982). Their collinearity may mask some effects and correlations among the residuals, and produce negative coefficients such as appear in Tables 2 and 3. As a consequence, the present study can not demonstrate with any specificity how individual aspects of school climate are related to the achievement scores. The present study does, however, provide strong evidence that, as a group, perceptions of school climate as embodied in these character education based measures are strongly correlated with student achievement in math and reading.

Effective schools have been defined, as reviewed above, as having a climate and culture of high academic expectation, effective administrative support, a shared mission among teachers and staff, a commitment to appropriate assessments, a sense of efficacy among students with respect to their learning, and the perception of a safe environment in which to learn (McEvoy & Walker, 2000). The present study's findings suggest adding to that definition of school effectiveness the highlighted dimensions of school climate: a sense

of classroom community, a sense of well being, and a concern for others among the students, and collaboration, democratic values, and feelings of belonging among the staff.

This preliminary investigation into the pattern of relationships between character education's aspects of school climate and student achievement scores in math and reading indicates a set of surprisingly strong relationships; but it also suggests the need for further research. Given this preliminary demonstration of a pattern of relationships among these indices of school climate and the math and reading achievement scores it should prove fruitful for future research to investigate different aspects of this overall set of relationships.

The present findings indicate that the development of a school-wide caring community that enhances the relational and social interaction and relationships within a school, and that improves a school's climate through changes in the communication and in the relationships among school staff, students, and families, can have a direct effect on student achievement scores. Changes in these relationships can improve the school community and change the experience of students, teachers, and parents, creating a school that not only has a more positive climate, but one in which the students are more successful in their academic achievements.

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