Measuring school leadership and climate in efforts to determine their relationship to one another as well as to student outcomes enables decision makers to understand better how to prepare, nurture, and support school principals.

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Background

The Ozarks Educational Research Initiative (OERI) was founded during the summer 2006 by Dr. David Hough, Dean, College of Education, Missouri State University and ten southwest Missouri school superintendents, as a collaborative effort among southwest Missouri school districts and the university. The intent of the OERI partnership was to provide a network of educational researchers and educators interested in improving, promoting, and disseminating educational research by conducting studies and program evaluations. Throughout the 2007 academic year the OERI Advisory Board focused its research agenda on examining the psychometric properties of the Missouri School Improvement Program (MSIP) Advance Questionnaire. During the 2008 academic year, the OERI Advisory Board approved a research agenda intended to examine the relationships among school climate, school leadership, and student outcomes. Superintendents developed a set of ten leadership items to be included on the MSIP questionnaire to measure leadership. This consultant’s report summarizes findings based on the following four research questions:

1. How do climate and leadership factor scores of schools within the OERI consortium compare to one another based on school type such as level of instruction and grade configuration?

2. How do OERI consortium schools compare to a State sample with regard to climate and leadership?

3. What is the relationship between school climate, school leadership, and student outcomes (i.e. attendance, behavior, and achievement)?

4. What set of student and/or building-level variables most accurately predict MAP performance scores?

Supporting Literature

Examining relationships that exist between school climate and school leadership has been a focus for decades in educational research. There is a long held belief that the climate of a school is indelibly linked to improved student outcomes including achievement (Haynes, Emmons, & Ben Avie, 1997). Researchers also argue that, “educational leadership is possibly the most important single determinant of an effective learning environment” (Kelley, Thornton, & Daugherty, 2005). In a meta-analysis of more than three decades of research examining the topic, Walters, Marzano, and McNulty, (2003) offer yet another framework known as “balanced leadership” which offers a view of school leaders as change agents who are able to promote a positive school climate while effectively
implementing necessary changes. However, other variables that mediate relationships between school leadership and overall school climate continue to be difficult to discern. Responsibilities and practices are often associated with “balanced leadership” and may be related to student outcomes (Walters, et al, 2005), suggesting that the school principal may be the single the most important component of school reform. Of current interest is the examination of the principal’s contribution to school climate and the student outcomes affected by same.

While the study of school climate began almost a half century ago with Haplin and Croft (1963) often being cited as pioneers in the field, renewed interest has escalated since the mid 1990’s. School climate has been examined and redefined more recently by researchers who have found that school environments are influenced by a combination of many factors, including but not limited to a number of leadership traits. Interactions between adults and students are impacted by leadership and climate (Kuperminc, Leadbeater, & Blatt, 2001), and both of these unique, yet related, constructs are associated with academic achievement (Johnson & Johnson, 1993); feelings of safety, mediated by school size (Frieberg, 1998); mutual trust and respect among teachers and students (Manning & Saddlemire, 1996); and perceptions of the school environment (Johnson, Johnson & Zimmerman, 1996). Regardless of definition, school climate is generally defined as a measure of positive school characteristics deemed desirable by teachers, students, parents and/or policy makers (Greenberg, 2004). While the principal may set the tone for the school, there are other variables that must also be examined when determining relationships among school leadership, school climate, and student outcomes.

When examining perceptions of leadership and school climate, it is important to disaggregate data by sub-group, i.e., teachers, students, and parents. Researchers often report high positive leadership / climate correlations between and among the sub-groups. Generally, teachers who rate their school high in climate tend to teach students who also view the climate as high, and have parents who do likewise. Even so, some differences among these groups have been found to exist (Nusser & Haller, 1995). In an effort to better understand the level of school climate within and across a school / district, differences in the way in which a particular group or sub-group perceives school climate should be examined to determine the degree to which climate can be viewed as a single construct. Therefore, data must be collected from a variety of stakeholders in order to provide a more comprehensive understanding of school climate and its relationship to leadership and student outcomes.

While elements that constitute the leadership and overall climate of a school are complex, and while research continues to address its impact on a variety of outcomes, much attention has been given
to student achievement. In a review of the literature, Bulach, Malone, & Castelman (1995) cite seventeen references which support the hypothesis that school climate is related to student achievement. Their findings support the notion that there are “significant differences in student achievement between schools with good school climate and those with a poor school climate” (Bulach & Berry, 2002, p. 1). Others have reported perceived directional relationships that may indicate that a positive school climate directly contributes to higher academic achievement (e.g, Hirase, 2000; Erpelding, 1999).

Overall, research tends to support the argument that effective school leadership and positive school climate impacts children’s cognitive, social and psychological development (Haynes, et al, 1997) noting that the climate of the school is a crucial factor in promoting student success. “Students achieve academically and develop well in school communities in which collaborative interpersonal relations ensure the successful implementation of policies and programs that focus on the students’ academic and social growth” (p. 322). Given the age of accountability in which we now live, measuring leadership and climate and determining relationships continues to be of concern and interest to those who want to better understand how these factors influence student outcomes. Understanding differences that may exist among groups is important when developing a theoretical framework for understanding leadership and climate at the school level. Differences among teachers’, students’, and parents’ views of a school are vital components comprising an overall framework of school climate. Studies that include data collected from all of these sources have the potential to provide a better view of the way in which perceived climate impacts a variety of student outcomes.

**Methods**

To identify factors associated with school leadership and school climate, researchers worked collaboratively with nine school districts to secure data from their state’s CSIP as recorded in “Core Data,” files via *Advance Questionnaires* completed by teachers, parents and students in the fall 2007. It should be noted that nine of the ten school districts participated in this data collection effort. Of interest for the purposes of this study are teacher, parent and student perceptions as well as student outcome data across all respondent groups. These are the focus of both current and subsequent analyses.

Teacher data were factor analyzed using Principal Axis factoring with Varimax rotation. Estimates produced from this procedure yielded high reliability for both leadership and climate (α =
The resulting factors were utilized to examine relationships among leadership, climate, student achievement, attendance and behavior. School-level data were aggregated and used to examine 18 secondary schools, i.e., middle, junior, and high schools as well as 33 elementary schools.

After the items for each of the indices were selected, leadership and climate scores were calculated for each school. After the teacher data were factor analyzed, parent and student data followed the same procedures each producing reliable indices of climate and leadership.

Of the nine school districts participating in data collection, fifty-one schools provided information regarding climate and leadership at the building level. As expected, the correlation between leadership and climate is high ($r = .695; p < .01$) accounting for nearly 50% percent of the variance between the two, and when taken together account for 44% of the variance within the 96-item teacher questionnaire indicating that school leadership scores were strong predictors of school climate among teachers (see Figure 1). However, it should be noted that these data tend to be negatively skewed with only small differences noted among schools in the sample.

*Figure 1. Scatterplot showing the relationship between Leadership and Climate*
School level outcome data including attendance, behavior, and achievement were collected via the state’s Core Data system. Achievement is a marker of the percent of students scoring “proficient” and “advanced” on State Assessments, attendance is measured by end of year (2008) average daily attendance reports, and behavior is quantified as the number of “incidents” reported by schools to the State Department of Education. These data were used to address research questions outlined by the OERI Advisory Board (See “Background”).

Findings

- How do climate and leadership factor scores of schools within the OERI consortium compare to one another based on school type such as level of instruction and grade configuration?

Data were disaggregated based on school type (i.e. elementary, middle, high) and overall climate and leadership mean scores were calculated. Using a standard score method, climate and leadership quotients were also calculated for each school in an effort to identify the schools scoring highest on the climate and leadership factors across the OERI districts. Figures 2a-c below illustrate each district’s climate and leadership means scores for each of the school types. It should be noted that one school district elected not to collect leadership data.

![Figure 2a. Climate and Leadership mean scores for OERI Elementary Schools](image)
Figure 2b. Climate and Leadership mean scores for OERI Middle Schools

Figure 2c. Climate and Leadership mean scores for OERI High Schools
• How do OERI consortium schools compare to a State sample with regard to climate and leadership?

State comparison data was obtained from the Department of Elementary and Secondary Education (DESE) in an effort to address this question. With assistance from the OERI graduate student, these data were analyzed and compared to OERI district scores. Each school report was updated to include these data for teachers, parents, and student. During the April 2009 meeting, these data were to be shared with the advisory board. Figures 3a-f display mean scores for OERI districts compared to the state sample. These scores are based on the OSEDA scales contained in the MSIP Advance Questionnaire.

Figure 3a. Faculty MSIP Advance Questionnaire OSEDA Scale Faculty Means for State Compared to OERI Districts [Agreement Items Only]
Figure 3b. MSIP Advance Questionnaire OSEDA Scale Faculty Means for State Compared to OERI Districts [Agreement Items Only]

Figure 3c. MSIP Advance Questionnaire OSEDA Scale Means for all OERI Parents Compared to the State Average
Figure 3d. MSIP Advance Questionnaire OSEDA Scale Means for OERI High Schools Compared to the State Average

Figure 3e. MSIP Advance Questionnaire OSEDA Scale Means all OERI Middle School Compared to the State Average
What is the relationship between school climate, school leadership, and student outcomes (i.e. attendance, behavior, attendance)?

Data from the current study indicate that both climate and leadership are indirectly related to both average daily attendance and the number of discipline incidents that take place within the school setting. These relationships are significant and supported theoretically in the research literature. Using average daily attendance as the marker, data indicate the larger the school the lower the teacher perceptions of school leadership and school climate. As these perceptions of leadership and climate decrease, the number of discipline incidents increase. However, data do not support a direct relationship between school leadership and school climate to student achievement as measured by the percent of students scoring “proficient” and above on the state assessments. While the relationship tends to be positive in nature, it was not found to be significant for the schools examined. (Table 1 contains these data.)
Table 1. The Relationship of Leadership and Climate to Student Outcomes

<table>
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<th>ADA</th>
<th>Behavior</th>
<th>Achievement</th>
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<td>-0.330*</td>
<td>-0.058</td>
<td>0.119</td>
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<tr>
<td>Climate</td>
<td>-0.608**</td>
<td>-0.445**</td>
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</tbody>
</table>

Note: * p < .05; ** p < .01

- What set of student and/or building-level variables most accurately predict MAP performance scores?

Surprisingly, few statistically significant differences were found among the schools. At the school level, school climate was found to be a significant predictor of achievement along with attendance and behavior. The relationship of leadership to student achievement is actually mediated by the effects of school climate. Taken alone, one might conclude the leadership is a significant predictor of achievement. However, this relationship becomes non-significant when climate is entered into the model. This suggests that while leadership and climate are highly related to one another the impact on achievement is evidenced by the impact of the climate of the school. Little variance in demographic and student outcome data exist among the 51 schools studied, indicating that, while constituting a stable environment of study, the schools tend to be producing such similar outcomes (mostly positive) that they can for all practical intents and purposes be viewed collectively as a single unit of study. As such, this makes the nine districts an excellent laboratory for the study of leadership and climate and their relationship to one another and to school demographics, if not to student outcome measures.

To determine the relative strength of this relationship and its impact on student outcomes, a more robust examination using multiple analysis of co-variance (MANCOVA) techniques were employed. Data from these analyses indicate that the percent of students achieving at the highest levels on their state communication arts assessments were those attending schools with more positive climate mean factor scores, (p < .05) as perceived by teachers. Interestingly, no significant relationships were found between leadership and the student outcomes examined herein. For academic achievement, per communication arts scores on the Missouri Assessment Program (MAP), the partial Eta Squared statistic used to calculate an effect size was .065. However, school climate was found to have a marginally significant relationship to behavior (p = .0475) with an effect size of .095 and academic achievement (p =
.0491) with an effect size of .087, again with both effect sizes determined via partial Eta Squared statistics. While both effect sizes are low, school size and SES were added into the equation as covariates, and these relationships yielded similar, marginally-significant results, with school size being more strongly related (negatively) to climate and student outcomes than was SES. Again, because there is relatively little variance in terms of demographics across the schools and because the school was the unit of analysis, one should not be overly surprised by these findings. The more intriguing phenomenon is the strong correlation between leadership and climate that does not produce similarly strong relationships when compared separately to student academic achievement, attendance, and behavior.

**Policy Implications & Recommendations**

Measuring school leadership and climate in efforts to determine their relationship to one another as well as to student outcomes enables decision makers to understand better how to prepare, nurture, and support school principals. It also facilitates the work of schools and districts in their efforts to develop and implement professional development programs designed to achieve whole school reform initiatives. School improvement plans designed to improve student attendance, behavior, and academic achievement should include strategies that address improved school climate with the principal and other school leaders as participants.

Relationships among school leadership, climate, student achievement, attendance, and behavior may be met with mediating effects by other variables such as school size and grade span configurations. Additional variables such as these should be examined empirically in future research. While some relationships may be intuitive, it is important to note that the “direction” of the relationships should be the focus of follow-up research. It is reasonable to assume that because school leadership and climate can be impacted directly by educators and others, it should be addressed by schools and examined to determine the effect they have on improving student achievement, attendance and behavior. Schools are encouraged to focus their efforts on factors such as these over which they have influence. Schools are encouraged to develop policies and concentrate programs in areas that can lead to improved learning environments associated with positive student outcomes. These constructs can be examined, discussed, and addressed by schools / districts seeking to improve school leadership, climate, and student outcomes, thus enabling schools to determine where the greatest amount of human and fiscal resources might be directed to produce the most desirable outcomes.
References and Additional Resources


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[Note: This summary reflects the work of the consultant and is no way intended to reflect the views of the OERI consortium. Portions of this summary also appear in presentations made to American Educational Research Association (AERA), April 2009 and a manuscript currently under review by the Association for Supervision and Curriculum Development’s (ASCD) International Journal of Education Policy and Leadership (IJEPL).]