ABSTRACT

Mark Ellsworth Bulris. A META-ANALYSIS OF RESEARCH ON THE MEDIATED EFFECTS OF PRINCIPAL LEADERSHIP ON STUDENT ACHIEVEMENT: EXAMINING THE EFFECT SIZE OF SCHOOL CULTURE ON STUDENT ACHIEVEMENT AS AN INDICATOR OF TEACHER EFFECTIVENESS (Under the directions of Dr. James McDowelle) Department of Educational Leadership, November, 2009.

The leadership of the school principal has long been associated with teacher effectiveness and student achievement. Research on the topic of principal leadership supports this association (Hallinger, Bickman, & Davis, 1996; Hallinger & Heck, 1996, 1997; Leithwood, Louis, Anderson, & Wahlstrom, 2004; Walters, Marzano, & McNulty, 2003). Research indicates that this association is indirect and occurs through mediating factors (Hallinger et al., 1996; Hallinger & Heck, 1996, 1997; Leithwood, Louis et al., 2004; Robinson, 2007). These factors include intervening variables such as a school's vision and mission, teacher's pedagogical and content knowledge, teacher instructional practices, and school culture. A review of the literature on mediating variables reveals school culture as a mediating variable that may have a significant relationship with improved teacher effectiveness.

Schoen and Teddlie's (2008) model of school culture was selected as the operational definition of school culture for the present study. The review of literature leads to multiple models of teacher effectiveness and provides justification for using student achievement as a proxy measure of teacher

effectiveness. Using Schoen and Teddlie's model of school culture and student achievement as a proxy measure for teacher effectiveness, the study uses meta-analysis techniques to examine the effect size of school culture on student achievement in K-12 schools in the United States.

The study synthesizes correlational study findings between school culture and student achievement since the signing of Goals 2000 in 1994. Studies included in the meta-analysis were conducted in U.S. public schools and included correlations in the form of a Pearson r between one or more of the dimensions of school culture and student achievement. The review of literature produced 30 studies meeting all established criteria for inclusion, provided a total of 152 correlations, and included 3,378 schools. The results of the study indicate that a strong moderate effect exists between school culture and student achievement in K-12 schools in the United States. The results indicate that school culture is a significant mediating variable of principal leadership and student achievement.

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A META-ANALYSIS OF RESEARCH ON THE MEDIATED EFFECTS OF PRINCIPAL LEADERSHIP ON STUDENT ACHIEVEMENT: EXAMINING THE EFFECT SIZE OF SCHOOL CULTURE ON STUDENT ACHIEVEMENT AS AN INDICATOR OF TEACHER EFFECTIVENESS

by

Mark Ellsworth Bulris

APPROVED BY:

DIRECTOR OF DISSERTATION: _____
James McDowelle

COMMITTEE MEMBER: _____
Lane Mills

COMMITTEE MEMBER: _____
William Rouse, Jr.

COMMITTEE MEMBER: _____
Kathy Spencer

COMMITTEE MEMBER: _____
Cathy Jo Korenek

INTERIM CHAIR OF THE DEPARTMENT OF EDUCATIONAL LEADERSHIP:

_____
William Rouse, Jr.

ACTING DEAN OF THE GRADUATE SCHOOL:

_____
Paul Gemperline

DEDICATION

This dissertation is dedicated to my family who has been so supportive throughout this long and arduous process. To my wife, Teah, who provided me with support and encouragement needed to keep going and complete the dissertation process. To my children, Maddox and McKenzie, for somehow understanding that sometimes I needed to work on my dissertation instead of playing or spending time with them. Without the loving support, kindness, and understanding of my family, the completion of this dissertation would not have been possible.

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Finally, I would also like to acknowledge Dr. Mills, for assisting me with designing the methodology for this dissertation. The use of a meta-analysis is a difficult task for amateur researchers. The completion of this meta-analysis would

not have been possible without the assistance of Dr. Mills in the design, implementation, and the analysis of the findings.

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CHAPTER 1: INTRODUCTION

The current state of education in America calls for improved student achievement and has created a focus on the need for improved instruction (National Association of Elementary School Principals, 2001). This call for higher levels of student achievement and the current standards-based accountability movement gained national acceptance with the signing of Goals 2000 by President Clinton in 1994 (Kessinger, 2007). Goals 2000 attempted to define quality education and promote educational reform at the national level (Superfine, 2005; Weiss, 1994). It also established much of the framework for No Child Left Behind (Schmidt, 2008), which requires all students to be functioning at grade level by the 2013-2014 school year (U.S. Department of Education, 2004). As a result of the federal call for accountability through Goals 2000 and No Child Left Behind (NCLB), “it is no longer enough for school leaders to implement promising reform efforts; they must demonstrate improved academic performance for all students in their schools” (Gentilucci & Muto, 2007, p. 219)

Principals are often the first to be held accountable for a school that fails to meet state and/or federal accountability standards and find themselves at the center of the accountability movement. No Child Left Behind clearly places the responsibility of improved student performance on the building level principals and makes it necessary for principals to focus on raising student performance as indicated on standardized tests (Gentilucci & Muto).

As Flowers and Hancock (2003) indicate:

> Linking teacher and school evaluation to student achievement seems to have strong public and political appeal. Inferences regarding the quality of teachers, schools, and administrators are often based on how well students perform on tests. As a result, teachers and administrators are under a great deal of pressure to improve student standardized test score. (Flowers & Hancock, p. 161)

It is essential that principals discover and implement processes and practices that facilitate improved teacher effectiveness and improved student achievement by recognizing the importance of improving the teaching methods and effectiveness of the current teaching force (Willis, 2002).

Research illustrates that the effects of both good and bad teachers linger on students and continue to impact the success of students for years to come (Geringer, 2003; Miller, 2003; Tucker & Stronge, 2005). A student who has effective teachers three years in a row significantly outperforms comparable students who have low-performing teachers for three consecutive years (Tucker & Stronge). Tucker and Stronge's research suggests that students who experienced effective teachers will continue to benefit from that experience in future years. They also note that the opposite is true; when a student experiences a poor teacher, they will not outgrow the lost educational opportunities for several years. When a student gets behind or fails to acquire

key skills due to poor teaching, he or she will not have the necessary skills to be successful at the next grade level or with more advanced concepts. It takes several years of good teaching to effectively overcome the gaps in learning created by time spent with a poor teacher. There is no doubt that a significant relationship exists between teacher quality and student achievement (Sakarneh, 2004). Tucker and Stronge summarize these effects best when they state, "…not only does teacher quality matter when it comes to how much students learn, but also that, for better or worse, a teacher's *effectiveness* stays with students for years to come" (p. 5). Marzano, Waters, and McNulty (2003) found that approximately 20% of the variance in student achievement is accounted for by teacher and school-level factors. Based on Marzano, Waters, and McNulty's work, Miller illustrates this finding with the following example:

> …a student scoring at the 50th percentile, who spends two years in an average school, with an average teacher, is likely to continue scoring at the 50th achievement percentile. That same student, having spent two years in a "most effective" school with a "most effective" teacher, rockets to the 96th achievement percentile. The converse also holds: If this same student spends two years in a "least effective" school with a "least effective" teacher, that student's achievement level plunges to the third percentile. (p. 2)

A good teacher is the most important factor that affects student learning and progress (Geringer, 2003). However, “most children are taught by an average teacher, implementing the average method” (Willis, 2002, p. 11). Lewis (2002) argues that “American education tolerates a level of variability in teacher performance that no other country allows” (p. 1). Given these findings, it is imperative that principals focus reform efforts on the current teaching force in order to improve the quality of instruction and enhance student performance. “A key task for leadership, if it is to influence pupil learning and achievement, is to improve staff performance” (Leithwood, Day, Sammons, Harris, & Hopkins, 2006, p. 10).

Research on educational leadership has, “generated few robust claims.” (Leithwood et al., 2006, p. 15) Examination of the literature on the impact of principal leadership yields varying findings. For example, Vecchio (1987) and Northouse (2004) state that principal leadership style has little effect on the performance of experienced or mature teachers. Although this statement relates to the specific styles of Hersey and Blanchard’s (1982) Situational Leadership Model, it raises questions about the effectiveness of all leadership practices and their impact on teacher effectiveness and student achievement. Other studies have found that principal leadership impacts student achievement through *mediating factors*, many of which are related to teacher effectiveness (Hallinger et al., 1996; Hallinger & Heck, 1996, 1997; Leithwood et al., 2004; Robinson, 2007). Mediating factors are defined by Hallinger and Heck (1996) as the

features of an organization that can be manipulated by the leader and, in turn influence student achievement. Mediating factors include things such as vision and mission, teacher content knowledge, instructional practices, and school culture. If principals impact student learning by improving teacher effectiveness, it is essential for educational researchers and practicing administrators to identify the significant mediating factors correlated with improved teacher effectiveness and student achievement.

The literature reviewed in chapter 2 reveals several school level factors that impact teacher effectiveness as measured by student achievement. Among the factors noted in the literature to be positively associated with student achievement are: (a) school's vision and mission, (b) teacher's pedagogical and content knowledge, (c) teacher instructional practices, and (d) school culture. Although each of these factors are associated with improved teacher and student performance, school culture emerges in the literature as a significant mediating factor of principal leadership that is associated with improved teacher effectiveness. Houtte (2004) describes the importance of studying the effects of school culture on teacher effectiveness as follows:

> Since culture can be so easily connected with structural and compositional school features on the one hand, and with behavior of individual members of the organization on the other hand, it becomes the most obvious mediating variable to

> explain the effect of school features on the behavior of members of the organization. (p. 82)

Given the importance of school culture as a mediating variable, this meta-analysis examines the effect size of school culture on teacher effectiveness.

However, establishing correlations between specific mediating factors and improved teacher effectiveness has provided researchers with several challenges. Among the challenges identified by researchers are: (a) the lack of a consistent method for defining teacher effectiveness, (b) the cumulative effects of past teachers on student achievement, (c) the situational nature of teaching, (d) the impact of antecedent variables on student achievement, and (e) the many mediating factors or intervening variables which impact student achievement (Cheng & Tsui, 1999; Duttweiler, 1988; Hallinger & Heck, 1996).

Measuring teacher effectiveness presents many challenges, especially since research does not provide a clear definition of teacher effectiveness. The literature review in chapter 2 examines multiple definitions used by researchers to define teacher effectiveness and validates the lack of a consistent definition for teacher effectiveness. The literature also provides the justification for using student achievement as a proxy measure of teacher effectiveness. In addition, Strong, Ward, Tucker, and Hindman (2008) provide evidence that teachers achieving high student growth also demonstrate teacher effectiveness using other definitions of effectiveness. Therefore, for the purposes of this analysis,

student achievement is used as the quantitative proxy measure representing teacher effectiveness.

Theoretical Framework

The research and literature on principal leadership and teacher effectiveness leads to two basic findings pertaining to measuring the impact of leadership on teacher effectiveness. The first of these findings reveals that there is no clear, quantitatively measurable definition of teacher effectiveness. However, research indicates that student achievement is a commonly used and justifiable proxy measure of teacher effectiveness. Student achievement data provides a quantifiable measure of teacher effectiveness that can be correlated with quantitative measures of school culture. Therefore, for the purposes of this study, teacher effectiveness is synonymous with student achievement.

The second of these findings is almost counterintuitive. Although research shows that principal leadership is correlated with student achievement (Hallinger et al., 1996; Hallinger & Heck, 1996, 1997; Leithwood et al., 2004; Waters et al., 2003), research has found few direct impacts of principal leadership on student achievement. Rather, the majority of research reveals that principal leadership impacts student achievement through indirect or mediating factors (Hallinger et al.; Hallinger & Heck, 1996, 1997; Leithwood et al., 2004; Robinson, 2007). Upon an examination of the literature on mediating factors, school culture quickly emerges as a key mediating variable of school leadership impacting student achievement.

These two findings provide the theoretical framework upon which the current meta-analysis is based. The relationship between school leadership, school culture as a mediating variable, and student achievement as the measure of teacher effectiveness is outlined in Figure 1. Given the indirect influence of principal leadership on student achievement, the current meta-analysis will examine the mediating factor of school culture to determine its impact on student achievement.

Statement of Problem

If research on the principals' effects on student achievement is to provide useful information to practicing principals, studies must be conducted which take into account both the mediating variables, as well as the *antecedent* and *exogenous* variables specific to each school. Antecedent variables include the variables which may influence student achievement that occur prior to the principal's actions to influence variables within the organization. Exogenous variables are those variables introduced outside of the organization that impact teacher effectiveness and student outcomes over which the principal has little to no control. Given the enormity of the task of considering all antecedent variables, Hallinger and Heck (1996) suggest that, "researchers should focus greater attention on uncovering the relationship between principal leadership and those mediating variables that we now believe influence student achievement" (p. 35-36).

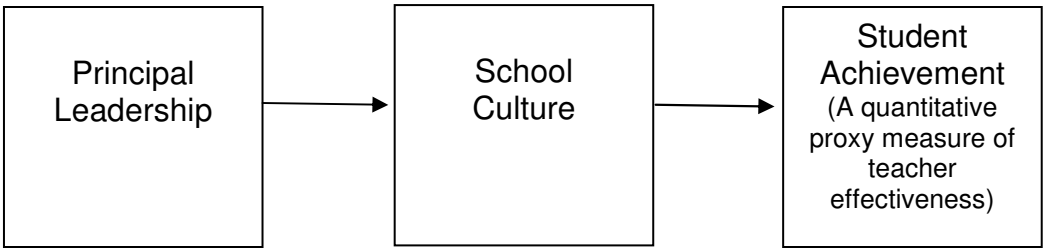

Figure 1. A model of relationship between principal leadership and student achievement as mediated through school culture.

Mediating variables found in research to have positive influences on student achievement are the school's vision and mission, teacher's pedagogical and content knowledge, and teacher instructional practices. Each of these factors contributes to or is influenced by the overarching factor identified in the literature as school culture. Therefore, the problem presented for study in this meta-analysis is to establish an effect size between school culture and student achievement. According to Lipsey and Wilson (2001), the effect size statistic will provide:

> "a statistical standardization of study findings such that the resulting numerical values are interpretable in a consistent fashion across all the variables and measures involved." (p. 4)

This will allow school leaders to examine the relative strength of school culture in determining the level of student achievement and may provide principals with an area of focus that will lead to improved teacher effectiveness and higher levels of student achievement.

Purpose of the Study

This study examines the relationship between principal leadership practices as mediated through school culture and improved teacher effectiveness as measured by student achievement. More specifically, the study seeks to establish an effect size of school culture on student achievement at the kindergarten through twelfth grade level in public schools in the United States. Through a synthesis of existing research, this study examines the mediating

effects of culture as identified in the review of literature to determine the overall effect on student achievement based on relevant student accountability results. Results from the study will be discussed in relation to the elements of school culture gleaned from previous research studies included in the review of literature.

The impact and influence of principal leadership on student achievement has been a focus of researchers for many years, leading to numerous studies seeking to establish correlations between leadership and student achievement. These studies provide existing data related to leadership and the identified cultural elements. Through the use of appropriate meta-analysis techniques, this study will synthesize the findings of researchers in the 15 years since the signing of Goals 2000, relative to the impact of school culture on student achievement as measured by standardized achievement testing.

Research Questions

This meta-analysis will address the following question:

1. What is the effect size of school culture on student achievement in K – 12 schools in the United States?

Pending the availability of adequate samples sizes by dimension, the study will also address a second research question as follows:

2. Are there dimensions of school culture that have larger effect sizes than others on student achievement at the K-12 level?

Significance of the Study

Principals are under a great deal of pressure to improve student performance, with the goal of having all children on grade level by the year 2013-2014 (U.S. Department of Education, 2004). A good teacher has been said to be the most important factor that affects student learning and progress (Geringer, 2003). Research indicates that school leadership, although indirect, is second only to teaching in its impact on student performance (Larry, 2006; Leithwood et al., 2004; Leithwood et al., 2006). This study examines the relationship between school culture as a mediating factor of principal leadership and student achievement in United States public schools at the kindergarten through twelfth grade level. The findings of this study are significant for several reasons.

First, the study furthers the research on the relationships between principal leadership as mediated through school culture and student achievement. By appropriately synthesizing existing research on school culture, the findings provide additional data to clarify, support, and strengthen findings of earlier research showing the effects of school culture on student achievement.

Secondly, this study establishes an effect size between school culture and student achievement. The findings can be used to help practicing administrators determine possible areas of focus for improving teacher effectiveness and student achievement. These findings may be particularly relevant for practicing educational leaders in schools identified as low performing, priority schools, in need of improvement, etc. under state and/or federal accountability models.

Additionally, the findings of this study may be used by state educational leaders and policy making officials to evaluate current systems of evaluation for principals and other school level executives. Findings from this study may provide additional validation for the inclusion of certain leadership practices, especially those related to school culture, in the evaluation instrument of school level administrators. Conversely, if findings indicate the lack of a correlation between school culture and student achievement, it may indicate the need to exclude specific items not related to improved student performance from evaluation instruments.

Hypothesis

Using appropriate meta-analysis techniques, this study will establish an effect size of school culture student achievement. As a standard of practice, the null hypothesis established assumes that there will be no correlation between school culture student achievement. The research hypothesis states that the synthesis of research will show a significant effect size between school culture and student achievement data.

Limitations of Study

This study provides a synthesis of existing research relating to school culture as a mediating factor of principal leadership and its effect size on student achievement. Although a comprehensive search of existing quantitative studies was conducted and all efforts were made to adhere to appropriate protocol and methodology for conducting a meta-analysis, there are still several limitations of

this study which must be noted. Many of these limitations are typically associated with the use of meta-analysis techniques and should be considered when interpreting any finding and conclusions of this meta-analysis.

The analysis was conducted using the terms as defined in the following section. Many researchers define leadership and associated practices in a variety of ways. School culture is defined based on the review of literature in chapter 2. Various researches have defined school culture differently. Attention was paid to definitions in each of the studies identified for inclusion in the meta-analysis to ensure the proper coding of variables, but due to the lack of consistent definitions and the ambiguous nature of many of the definitions, there was some uncertainty as to which element or elements of school culture the studies address. In order to ensure the comparison of like findings, this may have lead to the elimination of certain studies from the analysis which may have otherwise been included.

A second limitation is related to the studies found for inclusion in the meta-analysis. Although an extensive search was conducted with the use of electronic databases through East Carolina University's Joyner Library, it is likely that there are additional studies, especially unpublished studies, which meet the identified criteria that were not discovered or that could not be obtained during the search. Inclusion of additional studies could possibly have influenced the effect sizes found in the meta-analysis pertaining to school culture. In addition, the meta-analysis did not allow for the inclusion of qualitative studies. Consideration was

also given to the research methodologies, reliability, and validity of the studies included. The varying data collection methods and measurement instruments used within the identified studies impacted the reliability and validity of the studies and could have possibly influenced the overall effect size calculated when completing the meta-analysis.

An additional limitation that was considered is that the use of school accountability data as the measure for student achievement presents only a partial view of overall student achievement. Other studies may use a more comprehensive definition of student achievement and teacher effectiveness as illustrated in the literature review. However, in the current age of accountability, the focus on student achievement is consistent with the expectations placed on principals and teachers as a measure of effectiveness.

Another limitation related to accountability data is the fact that each state uses its own tests and sets its own proficiency levels. This created difficulty in making comparisons between states. By focusing on correlations found in existing research, the meta-analysis did not examine the differences between state accountability models. Additionally, this synthesis focused on accountability data for K-12 schools in the United States. This focus may have resulted in the elimination of some meaningful studies focusing on schools in other countries. However, the focus of this study is to examine leadership in United States schools since the beginning of the modern accountability movement ushered in

by Goals 2000. Inclusion of studies from other countries could have introduced factors not present in American schools.

Finally, the focus on school culture produced some limitations for the study. By limiting the studies to the elements of school culture identified in the selected framework, other important leadership factors may have been excluded from the findings. It is not the intent of this study to analyze all leadership practices and mediating factors related to improved student achievement, but rather to determine the effect size of school culture and each identified dimension of school culture and student achievement.

Definition of Terms

For the purpose of this study, the following operational definitions have been established:

Teacher effectiveness – no clear, quantitatively measurable definition of teacher effectiveness is agreed upon by researchers. Therefore, teacher effectiveness will be measured and equated with student/school achievement for the purposes of this study.

Student achievement – student performance outcomes as measured and reported on standardized test and/or state accountability assessments in accordance with state and federal accountability models. Student achievement serves as the quantitative proxy measure of teacher effectiveness for the present study.

Leadership styles – general categories of leadership based on specific leadership practices, personal characteristics, and interactions between the principal and school staff. Leadership styles included in the review of literature focus mainly on situational, contextual, and transformational leadership.

Mediating factor – those variables through which principals impact student achievement. Hallinger and Heck (1996) describe a mediated effects model which assumes that some or all of a principal's impact on student learning and other school outcomes occur through the manipulation and interaction of the leader with the features of the school organization. This study examined elements of school culture and the influence of school culture on teacher effectiveness as measured through student achievement.

Vision and mission – clear, well articulated, and shared beliefs of the purpose and desired future state of the school which serve as the driving force for decision making within the school.

Teacher pedagogical and content knowledge – the knowledge the teacher has of the teaching and learning process and the specific content area(s) taught. Essentially, this refers the teachers' understanding of how and what to teach.

School culture – the Center for Improving School Culture (2004) summarizes school culture as defined by Deal and Peterson in 1993 and Robbins and Harvey 1995 as the, "inner reality" that, "reflects what

organizational members care about, what they are willing to spend time doing, what and how they celebrate, and what they talk about" (p. 1). Within the study, Schoen and Teddlie's (2008) *Dimensions of Culture* will serve as the framework for the analysis of school culture and its effect size on student achievement. These four dimensions include: (a) professional orientation, (b) organizational structure, (c) quality of the learning environment, and (d) student-centered focus.

Organization of the Study

The remainder of this study is organized in a standard five chapter format. Chapter 2 provides a review of relevant literature on teacher effectiveness, the indirect influence of principal leadership, mediating factors influencing student achievement, school leadership issues, and school culture. Chapter 3 provides a description of the research methodology used to identify studies for inclusion in the meta-analysis, identify and describe the previous studies selected for inclusion, and describe the meta-analysis techniques used in conducting the analysis. Chapter 4 provides and discusses the findings of the study for each of the identified research questions and identified mediating factors. The acceptance or rejection of the null hypothesis is then discussed based on the findings of the study and other descriptive findings are also presented. Chapter 5 consists of all resulting conclusions of the study, along with a discussion of the implications of the findings, recommendations for further research, resulting conclusions based on the findings. The study report then provides a list of

references of all citations for the studies used in the process of completing the meta-analysis. Finally, the appendices conclude the report by providing additional information relevant to the study not contained within the body of dissertation.

Summary

The accountability movement in the United States has increasingly placed school leadership in the forefront of the accountability movement. Principals are the first to be held accountable for the failure of a school to meet state or federal accountability standards. With this in mind, it is essential that we seek to find the most effective leadership practices and focus on the mediating factors which have the greatest impact on teacher effectiveness and on student achievement. This study will use meta-analysis techniques to establish the effect size of school culture and related dimensions of school culture on student achievement.

CHAPTER 2: LITERATURE REVIEW

This chapter begins with a summary of literature reviewed in order to provide the background and framework for the current meta-analysis. This includes a review of literature related to defining teacher effectiveness and is followed by a discussion of literature relevant to the indirect influence of principal leadership on student achievement. This discussion leads to a summary of the literature associated with the mediating factors related to principal leadership that impact student achievement. The chapter then discusses literature related to school leadership issues. The literature in this section is subdivided into the following areas: (a) situational and contextual leadership, (b) transformational leadership, (c) professional development practices, and (d) coaching.

A review of literature pertinent to school culture is discussed in the second half of the chapter. The discussion of school culture includes a review of literature identifying school culture as a mediating factor of principal leadership, the nature of school culture, defining school culture, and the relationship between school culture and climate. The chapter concludes with a summary of relevant meta-analysis conducted by previous researchers followed by a brief synopsis of each of the studies selected for inclusion in the meta-analysis.

Defining Teacher Effectiveness

The natural tendency in the current age of accountability is to think of teacher effectiveness only in terms of standardized test scores. However, “traditional thinking that focuses only at the classroom level is not sufficient to

understand teacher effectiveness in such a complicated context" (Cheng & Tsui, 1999, p. 150). Duttweiler (1988) notes several problems in determining teacher effectiveness. Her research suggests (a) learning is cumulative and isolating the effects of one teacher is difficult, (b) teacher effectiveness is situational, (c) effectiveness varies depending on class and student goals, (d) different practices work for different teachers and the problems they face in their classroom, and (e) any practice may be effective with moderate use (p. 186).

Based on school effectiveness literature, Chen and Tsui (1999) identified the following seven models for defining teacher effectiveness:

1. The *goal and task model* defines teacher effectiveness based on the achievement of planned goals and assigned tasks aligned with school goals. This model of effectiveness is useful when tasks and goals are "clear, consensual, time-bound, and measurable" (p. 142) and when sufficient resources are present.
2. The *resource utilization model* defines teacher effectiveness in terms of the teachers' use of allocated resources. It is most appropriately applied when a clear relationship exists between resources, work process, and output exists yet the resources for achieving goals and outcomes are limited.
3. The *working process model* defines teacher effectiveness in terms of smooth teaching and working processes. This model is most

useful when relationships, teaching processes, and goals or outcomes are clear.

4. The *school constituencies' satisfaction model* defines teacher effectiveness in terms of how constituencies' expectations and demands are satisfied. This model is most appropriate when conditions demand customer satisfaction.
5. The *accountability model* defines teacher effectiveness by their ability to demonstrate accountability to the school and its constituencies. The accountability model is most useful under conditions that demand both external and internal accountability.
6. The *absence of problems model* defines teacher effectiveness in terms of the lack of problems or defects in teaching. This model is most useful when strategies for improvement are needed but no "consensual criteria of teacher effectiveness exists" (p. 150).
7. The *continuous learning model* defines teacher effectiveness by the teacher's ability to adapt to the challenges presented from a changing external environment. This model is most useful when the educational environment is changing quickly and teachers need to respond to these changes.

Sakarneh (2004) and Tucker and Stronge (2005) provide additional characteristics and qualities for defining effective teaching. Sakarneh describes an effective teacher as having the following characteristics: (a) lesson clarity, (b)

instructional variety, (c) teacher task orientation, (d) engagement in the learning process, and (e) student success rate. Tucker and Stronge suggest a far more comprehensive list of qualities to describe an effective teacher. These key qualities include:

1. Have formal teacher preparation training.
2. Hold certification of some kind and are certified within their fields.
3. Have taught for at least three years.
4. Are caring, fair, and respectful.
5. Hold high expectations for themselves and their students.
6. Dedicate extra time to instructional preparation and reflection.
7. Maximize instructional time via effective classroom management and organization.
8. Enhance instruction by varying instructional strategies, activities, and assignments.
9. Present content to students in a meaningful way that fosters understanding.
10. Monitors students' learning by utilizing pre- and post-assessments, providing timely and informative feedback, and re-teaching material to students who did not achieve mastery.
11. Demonstrate effectiveness with the full range of students' abilities in their classrooms, regardless of the academic diversity of the students. (pp. 2-3)

Although there are multiple factors to consider in defining teacher effectiveness as indicated by Chen and Tsui (1999), Sakarneh (2004), and Tucker and Stronge (2005), the lack of a consistent definition makes it difficult to accurately measure teacher effectiveness. Chen and Tsui suggest that thinking of teacher effectiveness in terms of student achievement is not a complete measure of the effectiveness of teachers. However, in the current era of high stakes testing and accountability, student achievement is viewed as ultimate measure of teacher effectiveness and provides quantitative data upon which teacher effectiveness and the impact of principal leadership can be measured. The connection between teacher and school effectiveness with student achievement has strong public and political appeal (Flowers & Hancock, 2003). Teachers have always played a central role in effective schools (Strong et al., 2008); “connecting teacher performance and student performance is a natural extension of the educational reform agenda” (p. 181).

Additional validation of the use of student achievement data as a measure of teacher effectiveness is provided by Strong, Ward, Tucker, and Hindman in their 2008 cross-case study on teacher effectiveness and evaluation in Virginia schools. Strong et al. identified effective and ineffective teachers in selected schools based on student performance data from Virginia’s Standards of Learning assessments. Teachers were then evaluated using an effectiveness model that included multiple measures in the areas of instruction, classroom

management, student assessment, and personal qualities. As a result of the study, Strong et al. (2008) made the following conclusion:

> …the purposes of accountability and professional growth in a teacher evaluation system can be met by examining effects on student achievement and behaviors of those teachers for whom students experience high than expected learning gains. (p. 179)

The Nature of Principal Leadership

During the last two decades much attention has been given to the impact of educational leadership on student outcomes (Kruger, Witziers, & Sleegers, 2007; Witziers, Bosker, & Kruger, 2003). The public, as well as, politicians believe that the quality of principals substantially impacts student progress (Robinson, 2007). However, most quantitative studies have historically concluded that principals and other schools leaders have, “small and indirect effects on student outcomes that are essentially mediated by teachers” (Robinson, 2007, p. 5). Leithwood et al. (2004) conducted a review of research on how leadership influences student learning. Their review of literature was organized around a framework developed in previous research by Rowan which includes ten interdependent variables. These variables include: (a) state leadership, policies, and practices, (b) district leadership, policy, and practices, (c) student/family background, (d) school leadership, (e) other stakeholders, (f) school conditions, (g) teachers, (h) classroom conditions, (i) leader’s professional learning experiences, and (j) student learning. Their research led them to some basic

observations about educational leadership. Among these are that leadership is most effective in situations where it is needed the most and that all leadership is contingent on the situation.

Leithwood et al. (2004) assert that leadership is second only to classroom instruction in its contribution to student learning. Their analysis of research led them to three conclusions about successful leadership. First, it is indirect and is achieved through influence on other people or features of the organizations. Therefore, in order to begin to understand how leadership impacts student achievement, it is necessary to view leadership through the chain of variables by which it influences student learning. Secondly, leaders should know who or what to pay attention. They conclude that teachers are the key and their pedagogical content knowledge is essential for effectiveness. Finally, Leithwood et al. indicate that we still need to know more about what to do to further develop high priority parts of the organization. Research into leadership practices has not yet found a way a school could be, "systematically improved through planned intervention on the part of someone in a leadership role" (p. 14).

Leithwood et al. (2006) propose the following seven strong claims about successful school leadership based on their research:

1. School leadership is second only to classroom teaching as an influence on pupil learning.
2. Almost all successful leaders draw on the same repertoire of basic leadership practices.

3. The ways in which leaders apply these basic leadership practices – not the practices themselves – demonstrate responsiveness to, rather than dictation by, the contexts in which they work.
4. School leaders improve teaching and learning indirectly and most powerfully through their influence on staff motivation, commitment, and working conditions.
5. School leadership has a great influence on schools and students when it is widely distributed.
6. Some patterns of distribution are more effective that others.
7. A small handful of personal traits explain a high proportion of the variation in leadership effectiveness. (p. 3)

Hallinger and Heck (1996), examined research focusing on the principal's role in school effectiveness in a comprehensive review of empirical research conducted from 1980 to 1995. They contend that the principal is a key educational input in determining student outcomes. They are quick to point out, however, that the relationship between principal leadership and school effectiveness is complex and not easily subjected to empirical research. The role of the principal in determining school effectiveness is best understood as part of a "web of environmental, personal, and in-school relationships that combine to influence organizational outcomes" (Hallinger & Heck, 1996, p. 6).

Hallinger and Heck propose several different models through which to study the impacts of principal leadership on school outcomes, including student achievement. These models include:

1. *Direct-effects model*, which assumes that a leader's effects on school outcomes is direct and takes place in the absence of intervening variables.
2. *Mediated-effects model*, which assumes that some or all of a principal's impact on student learning and other school outcomes occurs through the manipulation and interaction of the leader with the features of the school organization.
3. *Antecedent-effects model*, which assumes that the principal is both a dependent and independent variable. The administrator is subject to the effects of other variables within the school environment. As the independent variable, the principal affects teachers, processes, and ultimately, student learning.
4. *Reciprocal-effects model*, which assumes that the relationship between the principal's leadership and the environment are interactive.

Using this framework, the studies included in their research were classified into the following models: (a) Model A: Direct effects without antecedent variables, (b) Model A_1: Direct effects with antecedent variables, (c) Model B: Mediated effects without antecedent variables, (d) Model B_1: Mediated

effects with antecedent variables, and (e) Model C: Reciprocal-effects studies. After categorizing each of the research studies into one of these 5 models, Hallinger and Heck (1996) conclude that the most progress in understanding the principal's role in determining school outcomes and improving student achievement will come from research that "places the principal in the context of the school and its environment" (p. 34). Therefore, the most benefit will be gained from studies focusing on mediated effects with antecedent behavior.

Hallinger and Heck (1996) also conclude that little empirical evidence exists to support the direct impact of the principal on school effectiveness. The influence of principal leadership is by indirect or mediated means through the culture and climate of the school. In order to understand how a principal influences the effectiveness of a school, we must understand how a principal can shape the mediating factors such as school climate, culture, and instructional organization, ranging from school policies and norms, to the practices of teachers.

Their findings are further supported in the work of Witziers et al. (2003) when they assert that that it is no longer proposed that educational leaders have a direct impact on student achievement, but rather have an indirect impact. They also note that research based on the indirect effects model is hard to find in peer reviewed journals. However, in recent years, more researchers have used a mediated effects model (Kruger et al., 2007). Kruger et al. suggest that

educational leaders impact the instructional organization and culture of the school, which then impacts student achievement.

Hallinger et al. (1996) studied the effects of principals on reading achievement in a sample of 87 elementary schools in Tennessee. In their study, they sought to assess both direct and indirect effects of principals on student reading achievement. Effects were studied in relation to a four part model that includes: (a) personal and contextual variables, (b) principal leadership constructs, (c) in-school factors related to teaching and learning, and (d) student achievement outcomes.

In the study, they found a statistically significant relationship at the $p<.01$ level, between principal leadership and school climate variables. Additionally, their research showed a significant relationship at the $p<.05$ level between instructional climate and student reading achievement. They conclude that principals do ultimately contribute to student learning outcomes, although it is through indirect or mediated factors. In their study, there was no style of leadership that was shown to have a greater influence than another style on climate or to have any direct effects on student achievement.

The literature reviewed pertaining to the nature of principal leadership indicates that the principal's influence on student outcomes is indirect (Hallinger et al., 1996; Hallinger & Heck, 1996; Leithwood et al., 2004; Witziers et al., 2003). Principals' influence on student outcomes is mediated through intervening variables which impact teacher effectiveness and therefore, student

achievement. The remainder of this section reviews literature relevant to the mediating factors that influence student achievement.

In their 2004 review of research, Leithwood et al. found that most leaders contribute to student learning indirectly, by their influence on other people in the school, which include setting directions and developing people. Other factors relating to student performance identified in their research include a professional teaching community, the instructional practices of teachers, and the monitoring of student progress. A significant amount of the variation in student learning is accounted for by teacher capacities, which include the teachers' basic skills, content knowledge, pedagogical knowledge, and classroom experience.

Hallinger and Heck (1996), found that principal leadership is shown to make a difference when it is focused on influencing internal school processes, such as school policies and the practices of teachers that are linked directly to student learning. Therefore, research should be focused of studying the impact of principal leadership on those mediating factors which are known to influence student achievement.

Hallinger et al. (1996) concluded that a principal can have an indirect effect on student achievement by shaping the school's learning climate and that no single style of leadership is appropriate for all situations. A principal must find the most appropriate style in the given context of each individual school. The relation between school effectiveness and principal leadership can be best understood though models with take into account the effects of school context.

They contend that the effects of principal leadership on student learning should be evaluated and analyzed using relevant intervening variables.

In an extension their 1996 study, Hallinger and Heck (1997), analyzed the influence of principal leadership on the organizational system of the school through a framework which includes: (a) purposes and goals, (b) structure and social networks, (c) people, and (d) organizational culture. In this study, they found that mediated-effects studies yielded more consistent findings than direct-effect studies. Using this approach they found a chi square of .34 between fourth grade student reading scores and teacher instructional practices. Along with this, a significant relationship was found between principal supervision and the teacher instructional practices. Hallinger and Heck (1997) also found that through the mediated-effects of teacher practice, leaders had an indirect influence on student outcomes through the supervision of teachers with a chi square of .23. Additionally, they found that the study revealed pathways to help to begin describing the means through which principal leadership influences student learning. Some of these include school goals, school structure, social networks, people, and organizational climate.

School Leadership Issues, Styles, and Practices

Bulach, Lunenburg, and McCallon (1994), conducted a study of the influence of principal leadership style on school climate and student achievement which included 506 teachers, 20 schools, and 20 principals in Kentucky. Leadership styles were defined in the study as promoter, supporter, controller, and analyzer. Using analysis of variance techniques, their research revealed a statistically significant difference between leadership style and parent and community involvement on one subscale of the school climate survey with an F value of 5.556 at $p<.008$. However, Bulach et al. (1994) found no significant differences between school climate or student achievement due to leadership style. The highest correlation coefficients were on promoters and analyzers, but neither was statistically significant. As a result, they concluded that the links between principal leadership and student achievement are inconsistent and found no significant differences in school climate as a function of principal leadership traits or style.

Brock and Groth (2003) conducted a longitudinal case study of 54 low-income and racial, ethnic, or language minority schools. They utilized a conceptual framework consisting of (a) ongoing professional development, (b) high degree of staff involvement, (c) a strong focus on a vision based on improving student learning, (d) continuous monitoring and evaluation, (e) reallocation of resources, and (f) strong principal leadership. By applying this framework to their study, they found a clear and observable difference between

schools that perceived real opportunities to improve and those who did not. Along with this, they found that the level of involvement of the principal in the school improvement process was a differentiating factor in school improvement and improving the academic circumstances of the students.

Leithwood et al. (2004) identified three basic practices which were found to be present in most successful leaders. The first of these practices involves setting directions, which accounts for the largest portion of a leader's impact. This includes the development of shared understandings of the organization and the development of a shared vision. The second is to develop the people within the organization. The leader's effect on developing people within the organization is substantial. Practices within this domain include things such as: (a) offering intellectual stimulation, (b) providing individualized support, and (c) providing models of best practices and beliefs fundamental to the organization.

The final practice that Leithwood et al. (2004) found to be present in successful leaders is redesigning the organization. Specific practices identified within redesigning the organization include: (a) strengthening school cultures, (b) modifying organizational structures, and (c) building collaborative processes among the staff; all of which must support the shared understandings and vision of the organization.

Waters et al. (2003) conducted a meta-analysis of 30 years of research on the effects of leadership practices on student achievement. Based on study design, control, data analysis, and rigor, 70 of the 5,000 studies reviewed were

selected for inclusion in the study. The Balanced Leadership framework of 21 principal leadership responsibilities was used as the basis for analysis for the study. The study design used student achievement as the dependent variable and teacher perceptions of principal leadership as the independent variable. The average effect size and 95% confidence interval was calculated for each of the 21 leadership responsibilities. The average effect size between principal leadership and student achievement was determined to be .25. Thereby, they conclude that a one standard deviation improvement in principal leadership will lead to a ten percentile gain in student achievement.

The study also revealed that a principal's effect on student achievement can be positive or negative. Two variables were identified as crucial for leaders to have a positive effect on student achievement. The first is a focus on change. This involves identifying the correct practices on which to focus and that are the most likely to have an impact. The second factor is the leader's understanding of the magnitude of the change required.

Leadership Styles

Research from Blasé and Blasé (1999) suggest that the characteristics of the instructional leader of a school impact the behaviors of the teacher in the classroom and, "…lead to powerful cognitive, affective, and behavioral effects on teachers" (p. 7). There is a definite correlation between the way a principal works with teachers and teacher-student interactions (Drago-Severson, 2000). Much of the literature reviewed discusses leadership styles, theories and leadership

behaviors and their effect on teacher morale, motivation, and satisfaction. Each of these focuses on the development and improvement of the school as an organization by focusing on teachers as a whole group. Beyond beginning teacher and mentoring programs, little attention and research has focused on the effectiveness of leadership styles on improving the performance of experienced or mature teachers or supporting teacher adult development (Drago-Severson). In fact, minimal empirical research exists to support the effectiveness of leadership styles and behaviors on improving teacher performance of experienced teachers or overall school effectiveness (Harris & Chapman, 2002; Stein & Spillane, 2003). The literature reviewed focuses around the following leadership theories and behaviors: (a) situational and contextual leadership, (b) transformational leadership, (c) professional development practices, and (d) coaching.

Situational and Contextual Leadership

Hersey and Blanchard's (1969, 1982, 1993) Situational Leadership Theory suggests that for leaders to be effective, they must vary their leadership style based on subordinates' levels of job and relationship maturity (Lunenburg & Ornstein, 1991; Northouse, 2004; Taylor, 1994; Vecchio, 1987). Hersey and Blanchard (1982) specifically discuss the "Administrator-Faculty Relationship" (p. 167) as it pertains to leadership style and follower maturity. This description remains intact in their 1993 work as well. Hersey and Blanchard explain that when working with an experienced faculty, a low relationship/low task style of

leadership may be appropriate. This style of leadership is characterized by decentralized organizational structure and delegation of responsibility. Hersey and Blanchard (1993) contend that experienced faculties resent a lot of structure. Also sited is the need of new, inexperienced teachers for a higher level of direction and support from school leaders. Hersey and Blanchard (1982) also recognize that certain deviations from this strategy are also necessary.

> For example, during the early stages of a school year or curriculum change, a certain amount of structure as to the specific areas to be taught, by whom, when, and where must be established. Once these requirements and limitations are understood by the faculty, the administrator may move rapidly back to low relationship/low task style appropriate for working with mature, responsible, self-motivated personnel (p. 167).

Hersey and Blanchard (1982) suggest a method for attempting to improve individual or group maturity pertaining to a specific task. These steps include (a) tell and show the follower(s) what to do, (b) delegate some responsibility, and (c) reward the desired behavior as soon as possible. This three step process was reduced to a two step process by Hersey and Blanchard (1993) in their sixth edition by eliminating the first step of telling and showing the follower what to do.

Vecchio (1987) attempts to analyze the effect of Situational Leadership Theory on subgroups of teachers in 14 high schools. The study revealed that for moderate and high maturity teachers, the style of situational leadership applied

was not associated with improved performance (Vecchio). Vecchio supports the Situational Leadership Theory's effectiveness for low maturity teachers. It is important to note that within the study, teacher experience was associated with maturity. Vecchio acknowledges that that job-relevant maturity of experienced employees varies from employee to employee and from task to task. Therefore, the results for moderate and high maturity teachers should be interpreted with caution.

The idea of situational leadership is currently being supplemented by the concept of *contextual leadership,* which attempts to integrate more than a hundred years of theory and practice related to leadership (Zigarmi, Lyles, & Fowler, 2005). Zigarmi et al. (2005) discuss contextual leadership in terms of five different contexts, which include: (a) leading oneself, (b) leading others one-on-one, (c) leading teams, (d) leading the organization, and (e) leading alliances with other organizations.

According to Zigarmi et al. (2005), leadership should vary according to each of these context. In addition, leadership should also vary within each of these context according to the followers' *phase of performance* relative to each context. These phases of performance include: (a) the curious phase, (b) the confronting phase, (c) the cautious phase, (d) the achieving phase, and (d) the discerning phase. With the necessity to differentiate leadership according to the context and the corresponding phase of performance, Zigarmi et al. indicate that, "no leader can succeed using only one style of leadership" (p. 42).

Transformational Leadership

Taylor (1994) describes transformational leadership as a “mixture of older and newer ideas” (p. 4) of leadership. Transformational leadership moves followers to achieve more than would usually be expected of them (Northouse, 2004; Thomas, 1997). “It is concerned with emotions, values, ethics, standards, and long-term goals, and includes assessing followers’ motives, satisfying their needs, and treating them as human beings” (Northouse, 2004, p. 169). According to Northouse, transformational leadership is concerned with follower performance and developing them to their fullest potential and forsaking their own interest for the sake of the organization. Northouse also suggests that transformational leadership is positively related to follower satisfaction, motivation, and performance.

Transformational leaders initiate change and support innovations (Chen & Addi, 1995; Davidson & Dell, 1996). Within the context of transformational leadership, the principal is viewed as a *team player* and a *catalyst for change* and demonstrates a trust in teachers (Davidson & Dell). Liontos (1992) describes the goals of transformational leaders as (a) helping staff develop and maintain a collaborative, professional school culture, (b) fostering teacher development, (c) helping teachers solve problems more effectively. Transformational leadership has been shown to positively change teachers’ attitudes toward school improvement as well as instructional behavior (Liontos).

Evans (1996) describes transformational leadership as a, “creative process of engagement between at least two individuals who raise one another to higher levels of motivation, morality, and human potential through successful completion of organizational tasks” (p. 5). According to Evans, the mission of an educational leader is to create better schools characterized by *learning communities*. Transformational leaders try to affect teachers’ higher order needs and motivation (Evans; Johnson, 2005). As an effective transformational supervisor, principals “…enable teachers to vision alternative methods for delivering instruction, thereby transforming less effective instructional experiences for students into richer learning opportunities” (Evans, p. 15-16). As a result, Johnson suggest that organizations that are led by transformational leaders often achieve better results. In describing effective transformational leadership, Johnson provides the following list of characteristics of transformational leaders:

1. *Idealized influence* – Transformational leaders put the needs of the followers ahead of their own and become role models for their followers. They model the expected behavior, values, and principles of the group.
2. *Inspirational motivation* – Leadership is motivation by providing the followers with tasks that provide challenges and meaning. This creates team spirit, enthusiasm, and optimism, which helps develop visions of the future.

3. *Intellectual stimulation* – Innovation and creativity are created by encouraging followers to "question assumptions, reframe situations, and approach old problems from new perspectives." (p. 160) Leaders seek solutions from followers to solve problems instead of criticizing mistakes.
4. *Individual consideration* – Leaders provide a climate that is supportive of growth and provide learning opportunities. Leaders serve as coaches and mentors who foster personal development designed to meet the followers' individual needs and desires.

In situational, contextual, and transformational leadership styles, it is essential to recognize the need for change, as well as the type of change necessary to improve teacher effectiveness and student achievement. Transformational leadership, with its focus on long-term goals, collaboration, follower needs, and developing a culture of professional growth and continuous learning, aligns more closely with the research reviewed in the following sections on professional development practices and school climate and culture.

Professional Development Practices

Teacher professional development should focus on educating teachers and establishing a professional knowledge base on which teachers can draw in order to raise their knowledge and skills to the highest possible level (Southern Regional Education Board [SREB], 2002; Willis, 2002). The best long-term improvements will come only by having teachers become life-long learners

(Blasé & Blasé 1999; Duttweiler, 1988; McCall, 1994). In other words, teachers require continual education. According to Rebore (1995), education is the "process of helping an individual understand and interpret knowledge. Education emphasizes acquiring sound reasoning processes rather than a body of serial facts" (p. 160).

"Most veteran teachers do not get the support they need to stay up-to-date on the content they teach or the strategies that are most effective in teaching various contents" (SREB, 2002). Providing teachers with support throughout a teacher's career will ensure a pool of effective teachers for all students (Holloway, 2003). Teacher learning and student learning are strongly related; teachers, and therefore students, will thrive when they are challenged to grow through staff development practices (Drago-Severson, 2000). The development of collaborative communities of teachers has the potential to produce improvements in teaching and student learning (Supovitz & Christman, 2005).

Blasé and Blasé (1999) present six elements of "effective staff development that has a powerful impact on teachers" (p. 3). The six elements for effective staff development describe by Blasé and Blasé are" (a) the study of teaching and learning, (b) building a culture of collaboration, (c) promoting coaching, (d) using inquiry to drive staff development, (e) providing resources to promote growth and development, and (f) applying the principles of adult development to staff development efforts. Blasé and Blasé conclude that the

challenge for instructional leaders in improving the quality of teaching is to build cultures of life-long learning through inquiry and collaboration.

Teacher Morale, Motivation, and Satisfaction

Factors such as teacher morale, motivation, and satisfaction have a direct impact on the quality of instruction provided to students. Teacher morale has been identified as one of the most important factors affecting student achievement (Bhella, 2001). Bhella indicates that teachers' job satisfaction depends on the quality of relationships and leadership provided by the administration. In his research he concluded that teachers' rapport with the principal is not dependent on the leadership style, democratic vs. autocratic. He also found that teacher satisfaction was not related to either of these leadership styles, rather on what occurs in the classroom between the teachers and the students.

Thomas (1997) indicates that teacher morale is related to principal leadership style. The style of leadership identified by Thomas as having the greatest impact on teacher moral was collaborative. An important factor in successful school improvement is creating a collaborative culture in which teachers are motivated to work and learn together, and feel affirmed, validated, and appreciated (Hollas, 2001). Norris (1991) also notes the importance of principal role in motivating teachers and indicates that a principal's supervisory style can either promote or stifle teacher motivation. He concludes that "a

principal must be concerned whether or not their supervisory behavior succeeds in motivating teachers" (p. 91).

School Culture

The research on school leadership, improved teacher effectiveness, and improved student performance discussed heretofore was derived from several areas of research on educational leadership. However, throughout the research, a common theme has emerged. School culture/climate and related elements of culture have been described by several researchers and authors as an important factor in improving student performance (Blasé & Blasé, 1999; Brock & Groth, 2003; Evans, 1996; Fowler, 2006; Hallinger & Heck, 1997; Hollas, 2001; Leithwood et al., 2004; Leithwood et al., 2006; Liontos, 1992; Marzano et al., 2005; Waters et al., 2003; Supovitz & Christman, 2005; Zigarmi et al., 2005). In addition, research has found a correlation between principals' behavior and the positive perceptions of school culture (Fiore & Whitaker, 2005). Fiore and Whitaker indicate that strong school cultures within schools create more highly motivated teachers. They also contend that by improving the culture of schools, "…principals can make the greatest impact in improving environmental factors for teachers" (Fiore & Whitaker, p. 39).

Fiore and Whitaker (2005) describe three general groups of teachers: (a) *the irreplaceables*, (b) *the solids*, and (c) *replacement level*. Fiore and Whitaker state that 80–90% of all teachers fall into the solids category. This group represents those teachers that have skills and qualities necessary to become

irreplaceables but just need additional development. According to Fiore and Whitaker, the best way to improve the performance of the solid teachers and develop them into irreplaceables, is by improving the culture of the school. Therefore, school culture emerges as a potentially significant mediating factor which needs further study. Houtte (2004) affirms the importance of school culture when he describes it as, “the most obvious mediating variable,” explaining the impact of the school and teacher and staff behavior (p. 82).

Hargreaves (1995) also describes the importance of school culture in determining school effectiveness when he states:

> School culture may be a cause, an object or an effect of school improvement: indeed, all three are possible. It is said that school culture should be a target for change, on the grounds that in due course it will exercise an improving causal influence on other variables, and eventually on student outcomes, which in turn reinforce the culture. (p. 41)

Campo (1993) states that collaborative school cultures contribute to school improvement and effectiveness. Hallinger and Heck (1996) conclude that the culture of the school, along with the school mission and teacher expectations, act as mediating factors of leadership and impact student achievement. Kruger et al. (2007) argue that the quality of school culture as perceived by teachers may have an impact on teacher commitment, which might affect student outcomes.

Despite the fact that the importance of school culture has been recognized by researchers since the 1930s and recent research has begun to solidify the importance of school culture, “it is possibly the least discussed element in practical conversations about how to improve student achievement” (Jerald, 2006, p. 1). Hargreaves (1995) indicates the necessity for additional studies to examine the relationship between school culture and student outcomes. However, before the relationship between school culture and student achievement can be further explored, it is necessary to examine the nature of school culture, clarify the relationship between school culture and climate, establish an operational definition of school culture, and identify the elements of school culture.

The Nature of School Culture

Every school has a culture (Marzano et al., 2005; Peterson & Deal, 2002; Wiles & Bondi, 2004) and “culture influences everything that happens in a school” (Center for Improving School Culture, 2004, p. 1). The concept of school culture dates back to Waller in the early 1930s in who argued that every school has a culture of its own (Hargreaves, 1995; Peterson & Deal, 2002; Schoen & Teddlie, 2008). With this long history, it would seem that school culture would be a well defined and consistently used construct in educational research. However, this has not been the case. Researchers such as Angelides and Ainscow (2000) in their study of workplace culture in the United Kingdom, claim that much of the research on school improvement has been misleading because it has not taken

into account the influence of school culture on the implementation reform efforts. However, in recent times the discussion of school climate and culture has become and should continue to be a regular part of discussions on school improvement and effectiveness (Hoy, 1990). Schoen and Teddlie quote Halsall when they state, “one of the most consistent messages from school improvement literature is that school culture has a powerful impact on any change effort” (p. 148). In fact, school culture, “is more powerful than any formal aspect of leadership” (Goldring, 2002, p. 33). In order to improve schools, culture cannot be ignored (Campo, 1993). According to Campo, school culture affects the how teachers view professional development and how and if the teachers talk about instructional practices. This, in turn, has a significant impact on the degree to which the, “the principal is allowed to influence curriculum and instruction” (p. 120).

School culture naturally results as people work close together in schools and it can have a positive or negative impact on the effectiveness of the school (Marzano et al., 2005). “Evidence suggests that differences in the culture of schools affect student learning, teacher productivity and well-being” (Campo, 1993). School culture has a significant influence on the quality of teaching occurring in schools and impacts the ways teachers think and act (Angelides & Ainscow, 2000; Campo; Peterson & Deal, 2002). The current demands for school improvement placed upon schools by state and federal accountability models do not compare to the “power of cultural expectations, motivation, and values”

(Peterson & Deal, 2002, p. 9). Peterson and Deal provide a list of four ways in which culture influences school effectiveness. Effective professional school cultures (a) sharpen the focus, (b) build commitment, (c) amplify motivation, and (d) foster greater productivity from faculty and staff.

Much of the literature on school culture has focused on school improvement and change and assumes that an understanding of culture is, “a prerequisite to making schools more effective” (Hoy, 1990). However, much of this literature deals with culture in a very general manner (Angelides & Ainscow, 2000). Perhaps this is because school culture is difficult to define. Complicating the quest for a clear definition, the nature of school culture itself adds to the difficulty in developing a clear definition. “One of the most important aspects of culture is that, over time, its influence over every aspect of a school becomes invisible and taken for granted” (Goldring, 2002, p. 32). In fact, there are many definitions of school culture and researchers often describe different elements as the components of school culture (Angelides & Ainscow; Hoy; Owens, 2001; Peterson & Deal, 1998). Hoy states that there is no single definition of culture from anthropology or sociology that can easily be applied to culture as an organizational construct. Hoy, along with Schoen and Teddlie (2008) assert that attempts to define culture brings with it conceptual complexity and confusion (p. 156). The following section outlines various definitions of culture that have been used by researchers in the study of education. Consideration to each of these

definitions must be given in order to establish an operational definition of school culture.

Defining School Culture

There is no universally agreed upon definition of school culture (Angelides & Ainscow, 2000; Hoy, 1990; Owens, 2001; Peterson & Deal, 1998; Schoen & Teddlie, 2008). Researchers and authors have provided a myriad of definitions which are worthy of further examination. The following list outlines many of the definitions provided in a review of the past 25 years of literature:

1. The underground stream of norms, values, beliefs, traditions, and rituals that has built up over time as people work together, solve problems, and confront challenges. (Peterson & Deal, 1998, p. 28)
2. Organizational culture is a system of shared orientations that hold the unit together. … Culture is manifest in norms, shared values, and basic assumptions, each occurring at a different level of abstraction. (Hoy, p. 157)
3. “A way of working that results from the interaction of the parts and perceptions of members that drive such interaction.” (Wiles & Bondi, 2004)
4. “Cultures consist of the shared values and beliefs in the organization. … Culture refers to the things that people ‘agree are true’ and ‘agree are right’.” (Fullan, 2005, p. 57)

5. “The values, belief systems, norms, and ways of thinking that are characteristic of the people in the organization.” (Owens, 2001, p. 141)
6. “The way we do things around here.” (Deal & Kennedy, 1983, p. 14)
7. The deeper level of basic assumptions and beliefs that are shared by members of an organization, that operate unconsciously, and that define a basic ‘taken-for-granted’ fashion of an organization’s view of itself and its environment. (Angelides & Ainscow, 2000, p. 147)
8. Culture exists in the deeper elements of the school: the unwritten rules and assumptions, the combination of rituals and traditions, the array of symbols and artifacts, the special language and phrasing that staff and students use, the expectations for change and learning that saturate the school’s world. (Peterson & Deal, 2002, p. 9)
9. The “inner reality that reflects what organizational members care about, what they are willing to spend time doing, what and how they celebrate, and what they talk about.” (Center for Improving School Culture, 2004, p. 1)
10. The beliefs, attitudes, and behaviors that characterize a school in terms of how people treat and feel about each other, the extent to

> which people feel included and appreciated, and rituals and traditions reflecting collaboration and collegiality. (Center for Improving School Culture, p. 1)

In addition to the variety of definitions, researchers have also provided varying lists of elements which make up effective school cultures. Hoy (1990) outlines Terrence Deal's elements of a strong culture. These elements include: (a) shared values and consensus on how things get done, (b) the principal as hero or heroine who embodies core values, (c) distinctive rituals that embody widely shared beliefs, (d) employees as situational heroes or heroines, (e) rituals of acculturation and cultural renewal, (f) potent rituals to celebrate and transform core values, (g) balance between innovations and tradition and autonomy and control, and (h) widespread participation in cultural rituals. (p. 159)

Peterson and Deal (1998) describe schools that have positive cultures as schools where:

1. staff have a shared sense of purpose and they pour their hearts into teaching.
2. the underlying norms are of collegiality, improvement, and hard work.
3. rituals and traditions celebrate student accomplishment, teacher innovation, and parental commitment.
4. the informal network of storytellers, heroes, and heroines provides a social web of information, support and history.

5. success, joy, and humor abound. (p. 29)

Angelides and Ainscow (2000) list six dimensions of culture as defined by previous researchers. These dimensions include:

1. observed behavioral regularities when teachers interact in a staff-room – the language they use and the rituals they establish;
2. the norms that evolve in working groups of teachers in terms of lesson planning or monitoring the progress of students;
3. the dominant values espoused by a school, its aims or 'mission statement';
4. the philosophy that, for example, guides the dominant approach to teaching and learning of particular subjects in a school;
5. the rules of the game the new teachers have to learn in order to get along in the school or their department;
6. the feeling or climate that is conveyed by the entrance hall to a school, or the way in which students' work is or is not displayed. (pp. 147-148)

Goldring (2002) defines the construct of school culture as containing the following six traits:

1. Shared Vision
2. Traditions
3. Collaboration
4. Shared Decision-Making

5. Innovation
6. Communication

Marzano et al. (2005) found the following behaviors to be associated with developing an effective culture within a school:

1. promoting cohesion among the staff;
2. promoting a sense of well-being among the staff'
3. developing an understanding of purpose among the staff;
4. developing a shared vision of what the school could be like. (p. 48)

Hargreaves (1995) presents two typologies of school culture. In the first model, school cultures are classified based on the level of social control and social cohesion, where social cohesion is placed from low to high on the vertical axis and social control is place from high to low on the horizontal axis. School culture is then classified by where it falls within graph. Each corresponding area of the graph represents specific characteristics of school culture.

In his second typology, school cultures are classified as either traditional or collegial. In this model, school culture is examined based on five underlying social structures: (a) political, (b) micropolitical, (c) maintenance, (d) development, and (e) service. The political structure refers to the distribution of power and authority. Micropolitical has to do with the informal groups and individuals who act to further their own interests. Maintenance and development structures deal with, "the school's dual need for stability and change"

(Hargreaves, 1995, p. 31). These structures are things that must persist over time. “They become the taken-for-granted routines of social life which provide order and continuity for the community” (Hargreaves, p. 31). Finally, the service structure deals with the relationships between teachers, students, families, and governing organizations. Hargreaves second typology is outlined in Table 1.

Hargreaves (1995) concludes that collaboration is possible in both traditional and collegial school cultures. However, collegial schools have structures in place that foster collaboration. In addition to collaboration, collegial cultures also contain other structural elements which are hypothesized to support school improvement. According to Hargreaves, collegial cultures often:

1. demonstrate a commitment to a shared vision for the school.
2. have a consistent environment and expectations for both teachers and students.
3. implement, “methods for improving curriculum continuity and progression for students.” (p. 42)
4. implement practices that encourage classroom observation and the discussion of teaching and learning among the teachers.
5. provide “a means of reconciling the demands of professional development with those of school development.” (p. 42)

Provided that collegial schools are more likely to have each of these elements, Hargreaves suggests that it would be reasonable to hypothesize that, “collegial cultures will be more supportive of school improvements” than traditional school

Table 1

A Secondary Typology of School Cultures

	Traditional School	Collegial School
Political Structure	Feudal-consultative	Egalitarian-participative
Micropolitical Structure	Fissile-integrative	Integrative-exclusive
Maintenance Structure	Bureaucratic-positional	Delagative-rotational
Development Structure	Individualist-hierarchical	Institutional-collaborative
Service Structure	Autocratic-deferential	Contractual-accountable

cultures (p. 42). Hargreaves summarizes the importance of a collegial culture as follows:

> Whether the collegial, improving school will be more effective in terms of the quality of teaching and student achievement has yet to be firmly established, but the factors highlighted in the previous paragraph contain what might be key structural links between teacher cultures and student outcomes. (p. 43)

Added to the complexity of the many different definitions and descriptions of the elements of school culture is the fact that for decades, the terms school climate and ethos have also been used to describe the culture of schools and have often been used interchangeably with school culture (Hoy, 1990; Peterson & Deal, 1998; Schoen & Teddlie, 2008). Therefore, before an operational definition for school culture can be established, it is necessary to examine how researchers have defined climate and determine the relationship between the school climate and school culture.

The Relationship Between School Culture and School Climate

The concepts of school culture and school climate are both used to describe the character of a school (Houtte, 2004). Additionally, both school culture and climate have been researched as a mediating factor that impacts student achievement (Schoen & Teddlie, 2008). Hoy (1990) argues that school culture and climate are two different constructs and should be studied as such. He defines school climate as follows:

> … school climate is a broad term that refers to teachers' perceptions of their general work environment; it is influenced by the formal organization, informal organization, personalities of participants, and the leadership of the school." (p. 151)

The key to his argument is that although school climate and culture appear to measure the same things, the study of climate is the study of the perceptions of participants within the school on the perceived behavior in schools. In his conclusion, Hoy (1990) goes on to define climate as an "umbrella term under which the notions of climate, culture, and characteristics of effective schools are freely mixed" (p. 163).

Owens (2001) also distinguishes between the terms school climate and school culture. He defines school climate in general terms as, "the characteristics of the total environment in a school building" (p. 139). Owens provides a description of four dimensions or organizational climate as provided by Renato Tagiuri. These dimensions include:

1. *Ecology* – the physical and material factors in the organization: for example, the size, age, design, facilities, and condition of the building or buildings.
2. *Milieu* – the social dimensions of the organization.
3. *Social System* – refers to the organizational and administrative structure of the organization.

4. *Culture* – refers to the values belief systems, norms, and ways of thinking that are characteristic of the people in the organization. (pp. 140-141)

In this sense, climate is defined in broad terms and school culture is an element of the overall school climate.

Kelly, Thornton, and Daugherty (2005) studied the relationship between leadership and school climate. In their study, they provided a variety of definitions used by other researchers in previous studies. Among these were definitions of school climate as “the set of internal characteristics that distinguish one school from another and influence the behaviors of each school’s members” (p. 19). An additional definition defined climate as consisting of, “shared values, interpretations of social activities, and commonly held definitions of purpose” (Kelly et al., 2005, p. 19). The study then used teacher and principal perception survey items based on selected dimensions of leadership and concluded that teacher’s perceptions of principal leadership impact the climate of the school.

Houtte (2004), in his review of research, seeks to provide clarity between school culture and climate and argues that culture and climate are not interchangeable terms. Houtte states that in recent years, school culture has become increasingly more important and has replaced climate as the term used by researchers to describe schools. Houtte concludes that today, school climate is viewed as an organizational feature and is measured perceptually. Culture, he

concludes, is defined in terms of shared assumptions, meanings, and beliefs and is often measured qualitatively

In response to Houtte's (2004) call for conceptual clarity in defining school culture and climate, Schoen and Teddlie (2008) make the argument that school climate and school culture represent different levels of the same construct and go on to propose that it may be more appropriate to think of school climate as a subset of school culture. This is contrary to the thinking of previous researchers who view school culture as a component of school climate. Schoen and Teddlie state that although many researchers have defined school climate differently, these definitions frequently use a survey to measure a given set of school attributes. In their research, they concluded that climate definitions are typically viewed from a psychological perspective and have been more specific than definitions of culture, which are typically viewed from an anthropological perspective and defined in a more general and holistic manner. Given these definitions of school climate and culture, research on school climate has tended to involve more quantitative methods, while research on school culture tended to focus on qualitative studies (Schoen & Teddlie). However, the findings from both the climate and cultural perspectives tend to be similar. Schoen and Teddlie provide the following explanation for this similarity:

> One possibility that might explain the similarity in between writings about these concepts and consequently lead to their confusion was that climate and culture were not actually

> separate constructs, but components of one broader construct that had been explored separately, in different research communities. The more we explored the literature on culture and climate, the more this possibility seemed a plausible explanation for the seeming overlap or blurring of these terms. (p. 133-134)

Schoen and Teddlie ultimately conclude that most of the studies involving school climate fit inside the larger construct of culture.

Schoen and Teddlie (2008) provide the following framework to describe their *new model* of school culture. They describe *The Dimensions of Culture* as follows:

1. Dimension I: Professional Orientation – This includes "the activities and attitudes that characterize the degree of professionalism present in the faculty." (p. 140) This dimension incorporates the concepts of: (a) professionalism, (b) professional learning communities, (c) norms of collegiality, (d) teacher professionalism, (e) collaborative cultures, (f) organizational learning, and (g) learning organizations.
2. Dimension II: Organizational Structure – This dimension includes "the style of leadership and communication and processes that characterize the way the school conducts its business." (p.140) This includes not only the style of leadership that exists in the

school, but also things such as who is involved in leadership activities, the development of vision and mission statements, the formulation of goals and action plans, and the degree of consensus and commitment of the staff.

3. Dimension III: Quality of the Learning Environment – This third dimension includes, “the intellectual merit of the activities which students are typically engaged.” (p. 140) This has to do with the level of rigor expected from the students as they utilize and construct knowledge.
4. Dimension IV: Student-Centered Focus – This dimension deals with, “the collective efforts and programs offered to support student achievement.” (p. 140) This dimension deals with the level to which individual student needs are met and examines such things as: (a) parent involvement, (b) student support services, (c) differentiated instructional strategies, (d) the disaggregation and analysis of individual student achievement data, and (e) the use of student data to make decisions about instruction.

According to Schoen and Teddlie (2008), “…these dimensions embody the essence of school culture, they should have predictive validity for determining the effectiveness of school improvement efforts” (p. 142-143). “Unfortunately, there is not much research empirically and quantitatively relating organizational culture to the outcomes of the organization” (Houtte, p. 83).

Still, other researchers tend to view school culture and climate as synonymous terms. Peterson and Deal (1998) explain that the term climate has been used for decades to, “capture this pervasive, yet elusive, element we call culture” (p. 28). This theme is also apparent in Peterson and Deal (2002) when they again suggest that the terms climate and ethos have been used to describe the organizational phenomenon of culture. They state that, “climate emphasizes the feeling and contemporary tone of the school, the feeling of the relationships, and the morale of the place” (Peterson & Deal, p. 9).

In sum, one body of researchers assert that climate and culture measure two different constructs (Hoy, 1990; Kelly et al., 2005; Owens, 2001), while other researchers have defined school climate in more broad terms than school culture and include school culture is an element of climate (Owens). Other researchers refer to school climate as a measure of perceptions and feelings and as separate from the actual culture of the school (Hoy; Kelly et al.). A final group of researchers indicate that the terms school climate and school culture have often been used interchangeably by researchers (Peterson & Deal, 1998, 2002).

In all the complexity and confusion surrounding developing a working definition of school climate and culture, there is some agreement in the literature of how culture is defined (Owens, 2001). The majority of the definitions of culture can be related back to the shared philosophies, ideologies, values, assumptions, beliefs, expectations, and norms of the school. However the disagreement in the literature over the relationship between school culture and climate provides

another obstacle which must be addressed in the study of school culture. The recent study by Schoen and Teddlie (2008) provides a framework from which to examine school culture and provides a clear relationship between school culture and climate by placing climate within the larger construct of school culture. Their four dimensions of culture appear to capture each of the main elements of school climate and culture provided by previous researchers and provides a framework from which to examine the impact of school culture on student achievement.

Meta-Analysis Studies

A total of five meta-analyses were found which explored the relationships between elements of school leadership, school culture, and student achievement. While each of these contain specific elements that fit into one or more of Schoen and Teddlie's dimensions of culture, each used different frameworks in their analysis. Also, studies included in each of these meta-analyses do not meet the criteria for inclusion used for conducting this meta-analysis, with many studies included being published prior to 1994 and many studies from other countries were included. The findings of these studies form a collective body of research on the relationships between school leadership, school culture, and student achievement.

Witziers et al. (2003) conducted a meta-analysis of 37 studies to continue the search for an association between educational leadership and student achievement. In conducting their analysis, they provided effect sizes on eight different components of leadership: (a) defining and communicating mission, (b)

supervising and evaluating curriculum, (c) monitoring student progress, (d) coordinating and managing curriculum, (e) visibility, (f) promoting, (g) achievement orientation, and (h) advice and support. The results of the meta-analysis provided and overall effect size of .02 and an effect size of .19 for defining and communicating the mission.

Waters et al. (2003) published a working paper based on their meta-analysis of 30 years of research on leadership and student achievement. They developed a balanced leadership framework of 21 leadership responsibilities and computed the average r for each of the 21 responsibilities. Effect sizes ranged from .16 for visibility to .33 for situational awareness. The average effect size for all 21 responsibilities was computed as .25. Other leadership responsibilities with high r values are intellectual stimulation at .32, change agent at .30, input at .30, and culture at .29. They conclude that leaders can have a positive, marginal, or negative impact on student achievement and that the keys to successful school leadership involves determining the magnitude of the change needed and then identifying and focusing on the correct school and classroom practices most likely to positively impact student achievement. In a continuation of their work with McREL, Marzano et al. (2005) published *School Leadership That Works* in which they again reported results of their meta-analysis. The overall effect size and findings remained the same. The average effect size reported for school culture was calculated as r = .25.

Brown (2001) also conducted a meta-analysis of existing research to determine the influence of school leadership on student outcomes. Brown included 38 studies with a combined 339 effect sizes in her analysis. Calculating Cohen's d, effect sizes were computed for instructional organization of d = .66, climate of d = .29, defining the mission of d = .22, consideration of d = .36, and inspiration of d = .40. Based on her research findings, Brown concluded that there is a significant relationship between leadership and school effectiveness.

Robinson (2007) found 26 studies linking school leadership and student outcomes. In her meta-analysis, effect sizes were calculated in five leadership dimensions: (a) establishing goals and expectations, (b) strategic resourcing, (c) planning, coordinating, and evaluating teaching and the curriculum, (d) promoting and participating in teacher learning and development, and (e) ensuring an orderly and supportive environment. Each of these dimensions were used as the units of analysis for the study and produced average effect sizes ranging from .27 for ensuring an orderly and supportive environment to .84 for promoting and participating in teacher learning and development. Other effect sizes included strategic resources, .34; establishing goals and expectations, .35; and planning and evaluating teaching and the curriculum, .42.

The Impact of School Culture

Researchers have sought to establish correlations between school leadership and student achievement for many years. In the modern era of accountability that began the years following the development of Goals 2000 in

1994 (Kessinger, 2007) researchers have continued to seek empirical evidence to establish such correlations. Current research has identified school culture as a primary mediating variable through which leaders are able to influence student achievement. The following section provides an overview of the empirical studies reviewed relating to the four dimensions of school culture as described by Schoen and Teddlie (2008) and meeting all specified criteria for inclusion.

In the quest to establish correlations and relationships between culture and student achievement, researchers have used a variety of measures of school culture and climate variables. Among the quantitative studies selected for possible inclusion in the meta-analysis, six used a form of the Organizational Health Inventory, OHI, which included the OHI, the OHI-M, and the OHI-RM. These studies included: (a) McGuigan and Hoy (2006), (b) Roney, Coleman and Schlichting (2007), (c) Hoy and Hannum (1997), (d) Henderson, Buehler, Stein, Dalton, Robinson, and Anfara (2005), (e) Barth (2001), (f) Sweetland and Hoy (2000), and (g) Alig-Mielcarek (2003). Four additional studies utilized the School Culture Survey, SCS, to collect data for the purposed of analysis and comparison. These studies include: (a) Fraley (2007), (b) Herndon (2007), (c) Smith, A. (2008), and (d) Gruenert (2005).

In addition to the ten studies listed above, several other instruments were used to measure elements of culture within the school setting. These instruments include; (a) Leadership Practice Inventory (LPI); (Arnold, 2007; Soileau, 2007), (b) Organizational Curricular Leadership Inventory (OCLI); (Brown, Claudet, &

Olivarez, 2003), (c) Organizational Citizenship Behavior in School Scale (OCBSS); (DiPaola & Hoy, 2005), (d) School Culture Triage Survey (SCTS); (Dowis, 2005), (e) Teacher Work Conditions Survey (TWC); (Hirsch & Emerick, 2006a, 2006b), (f) Enabling School Structure Form (ESS); (McGuigan & Hoy, 2006), (g) Index of Perceived Organizational Effectiveness (IPOE) and Overall Job Satisfaction Questionnaire (OJSQ); (Pounder, Ogawa, & Adams, 1995), (h) Caring School Community (CSC) Survey; (Sherblom, Marshall, & Sherblom, (2006), (i) Profile for Assessment of Leadership (PAL); (Williams, 2006), and (j) School Climate Index (SCI); (Smith, A., 2008).

The remaining seven studies selected for inclusion in the meta-analysis used various leadership, cultural, and climate surveys and questionnaires to measure the elements of school culture. These studies include: (a) Demery (2000), (b) Erbe (2000), (c) Klinginsmith (2007), (d) Krawczyk (2007), (e) Solomon (2007), (f) Sweatt (2000), and (g) Leithwood and Mascall (2008).

Organizational Health Inventory Studies

The Organizational Health Inventory measures six dimensions that may be combined into a general index of school health (Hoy & Hannum, 1997) as a measure of school climate (Hoy, 1990). These six dimensions measure organizational health at the technical, managerial, and institutional level. The technical level of organizational health includes academic emphasis and teacher affiliation. Academic emphasis, “the extent to which the school is driven by a quest for academic excellence” (Hoy & Hannum, p. 294). Hoy and Hannum

define teacher affiliation in terms of friendliness and affiliation with the school. Teachers are committed to their students, their colleagues, and their jobs.

The managerial level consists of three dimensions, which include collegial leadership, resource support, and principal influence. Hoy and Hannum (1997) define collegial leadership as “principal behavior that is friendly, supportive and guided by norms of equality” (p. 294). Additionally, the principal establishes high expectations by letting the staff know what is expected of them. Resource support refers to the availability of necessary classroom supplies and materials needed for instruction. Principal influence has to do with the principal’s ability to influence superiors to get what is needed for the school.

The final level, the institutional level, consists of institutional integrity. This has to do with the ability of the school to cope environmental influences while maintaining the integrity of its programs.

In their 1997 study of 86 middle schools in New Jersey, Hoy and Hannum examined the correlations between each of the dimensions of organizational health and student achievement as well as between general school health as measured by the OHI and student achievement in math reading and writing. Among their findings is that general school health is positive associated with student achievement in math, reading, and writing. Zero-order correlations were calculated and reported as r=.61 for math, r=.58 for reading, and r=.55 for writing, all at $p < .01$. Significant correlations were also found for each of the dimensions of organizational health, except principal influence. The strongest correlation,

r=.73, was found for academic emphasis. Additionally, a significant negative correlation was found for institutional integrity. Hoy and Hannum conclude:

> Academic achievement in mathematics, reading, and writing is related to healthy interpersonal dynamics of schools. Although the socio-economic status (SES) of the community is important in predicting student achievement, so too are aspects of the organizational health of middle schools. Teacher affiliation, resource support, academic emphasis, and institutional integrity all make significant contributions to various aspects of student achievement independently of the wealth of the district. This finding is especially important because it seems easier to improve the health of middle schools than it is to change the socioeconomic character of a community. (pp. 307-308)

McGuigan and Hoy (2006) conducted a study of 40 schools in Ohio on the development of culture of academic optimism in order to improve student achievement. As part of this study, McGuigan and Hoy established correlations for several factors related to academic optimism. Among these factors was academic emphasis of the school. McGuigan and Hoy utilized the OHI in order to measure the level of academic emphasis and establish a correlation with math and reading performance. An r of .67 was computed for the correlation between academic emphasis and math performance and a r of .58 was computed for reading. McGuigan and Hoy also included collective efficacy and faculty trust in

students and parents as elements of academic optimism. As a result of their research, they concluded that academic optimism is associated with student academic achievement.

In 2007, Roney et al. examined the relationship between reading achievement and organizational health in five North Carolina middle schools. They administered the Organizational Health Inventory for Middle Schools to teachers in each of the schools and used the data to establish correlations between overall organizational health and student performance from both 2005 and 2006 student accountability data. A significant correlation was found between organizational health and student performance for the 2005 school year, $r = .20$. A correlation of $r = .17$ was calculated for the 2006 school year, but did not reach the required level of significance.

In addition to calculating correlations for overall school health, Roney et al. (2007) focused on three of the six dimensions of the OHI-M. Correlations were established for teacher affiliation, academic emphasis, and collegial leadership. A moderate correlation of $r = .550$ was found between academic emphasis and student achievement during the 2005 school year. No other positive significant correlations were found among these three dimensions. However, a weak negative correlation of $r = -.410$ was found between collegial leadership and student performance in 2005 and a strong negative relationship of $r = -.700$ was found for the 2006 school year.

Henderson et al. also used the Organizational Health Instrument in their 2005 study of organizational health and student achievement in ten middle schools in Tennessee. Like Roney et al., they calculated correlations for the schools' overall heath index and for three of the six dimensions of the OHI. However, they omitted collegial leadership and included the dimension of resource support instead. Correlations were calculated for reading, language arts, and math achievement. Their research revealed overall correlations of r = .168 for reading achievement, r = .384 for language arts, and r = .306 for math. Negative correlations were found between teacher affiliation and student performance in all three areas of student performance. Correlations for resource support were computed as r = .100 for reading, r = .231 for language arts, and r = .083 for math. In the area of academic emphasis, correlations were computed of r = .350 for reading, r = .614 for language arts, and r = .498 for math. As a result of their research, Henderson et al. concluded that a positive relationship exists between academic emphasis and student academic performance.

Sweetland and Hoy (2000) studied school characteristics and educational outcomes in 86 middle schools in New Jersey. Using the Organizational Health Inventory – Revised Middle and the Organizational Climate Description Questionnaire, Revised Middle, Sweetland and Hoy examined correlations between teacher empowerment, school climate dimensions, and student achievement. Sweetland and Hoy calculated correlations between teacher empowerment, collegial leadership, teacher professionalism, and academic

press with reading and math achievement. They study produced the following correlations with math achievement: (a) empowerment, r = .58, (b) collegial leadership, r = .48, (c) teacher professionalism, r = .48, and (d) academic press, r = .59. Correlations reported with student reading achievement were reported as follows: (a) empowerment, r = .58, (b) collegial leadership, r = .50, (c) teacher professionalism, r = .46, and (d) academic press, r = .57. All reported correlations were significant at $p<.01$.

Barth (2001) used the Organizational Health Inventory to conduct a study in 99 West Virginia middle schools in order to investigate relationships between organizational health, school size, and student achievement. Among the findings relevant to the present study, Barth calculated and reported correlations for high and low Socioeconomic Status Schools in the areas of Reading, Math, and Language. Significant correlations were found for low SES schools, r = .434 in reading, r = .463 in math, and r = .425 in language. Non-significant correlations of r = .214, r = .134, and r = .268 for high SES schools for reading, math, and language respectively.

Alig-Mielcarek (2003) conducted a study to develop a path model to, “explain the connections among key organizational variables and student achievement” (p. ii). Alig-Mielcarek proposed that principal instructional leadership and school academic press, defined as a school climate with high expectations, are two key organizational variables that contribute to student achievement. For the study, data was collected from 146 elementary schools in

Ohio. The Organizational Health Inventory (OHI) was used to measure academic press and a second instrument was used to measure the level of instructional leadership. The instructional leadership instrument was validated in a pilot study and consisted of three dimensions: (a) Promotes school wide professional development, (b) Develops and communicates shared school goals, and (c) Monitors and provides feedback on the teaching and learning process. Results from these two instruments were compared with achievement data from the state of Ohio's 4^{th} grade assessments in reading and mathematics.

As a result of the study, Alig-Mielcarek (2003) concluded that instructional leadership of the principal is not directly related to student achievement. However, principal instructional leadership was shown to have an indirect effect on student achievement through the variable of academic press. Two of the variables analyzed by Alig-Mielcarek, academic press and shared school goals, are applicable to the current meta-analysis. Alig-Mielcarek reported the following correlations for student achievement: (a) mathematics and academic press ($r = .49$, $p < .01$), (b) mathematics and shared school goals ($r = .26$, $p < .01$), (c) reading and academic press ($r = .45$, $p < .01$), and (d) reading and shared school goals ($r = .21$, $p < .05$).

School Culture Survey Studies

The school culture survey, SCS, was developed in 1998 by Gruenert to measure the collaborative nature of school cultures (Gruenert, 2005). The SCS consists of six factors collaborative leadership, teacher collaboration,

professional development, unity of purpose, collegial support, and learning partnership. The Middle Level Leadership Center Website defines each of these factors as follows:

1. Collaborative leadership “measures the degree to which school leaders establish and maintain collaborative relationships with school staff. The leader values teachers' ideas, seeks input, engages staff in decision-making, and trusts the professional judgment of the staff. Leaders support and reward risk-taking and innovative ideas designed to improve education for the students. Leaders reinforce the sharing of ideas and effective practices among all staff.” (Middle Level Leadership Center, 2008, p. 1)
2. Teacher collaboration “measures the degree to which teachers engage in constructive dialogue that furthers the educational vision of the school. Teachers across the school plan together, observe and discuss teaching practices, evaluate programs, and develop an awareness of the practices and programs of other teachers.” (Middle Level Leadership Center, p. 1)
3. Professional Development: Measures the degree to which teachers value continuous personal development and school-wide improvement. Teachers seek ideas from seminars, colleagues, organizations, and other professional sources to maintain current

knowledge, particularly current knowledge about instructional practices.

4. Collegial Support: Measures the degree to which teachers work together effectively. Teachers trust each other, value each other's ideas, and assist each other as they work to accomplish the tasks of the school organization.
5. Unity of Purpose: Measures the degree to which teachers work toward a common mission for the school. Teachers understand, support, and perform in accordance with that mission.
6. Learning Partnership: Measures the degree to which teachers, parents, and students work together for the common good of the student. Parents and teachers share common expectations and communicate frequently about student performance. Parents trust teachers and students generally accept responsibility for their schooling.

Using the school culture survey, Gruenert (2005) conducted a study in 81 schools in Indiana to examine the correlation between collaborative school cultures and student achievement. Data was collected using the SCS and student performance data in math and language arts at the elementary, middle, and high school levels. Based on his research, Gruenert found significant correlations between all six of the factors on the SCS and student math achievement. The highest correlations, $r = .471$ and $r = .455$ were found for

learning partnership and unity of purpose respectively. Significant correlations were also found for three of the six dimensions relating to student language arts performance. Significant correlations were found for professional development, unity of purpose, and learning partnerships. Just as with math performance, the largest correlations were found in the areas of learning partnerships, r = .506, and unity of purpose, r = .397. As a result of his research, Gruenert concluded that collaborative school cultures are the best setting for high levels of student achievement.

In 2007, Fraley published a study of 35 schools in Indiana. Like Gruenert, Fraley also administered the SCS and calculated correlations between each of the six dimensions and student achievement in math and language arts. Fraley's research produced significant correlations for the dimensions of collaborative leadership and learning partnerships for both math and language arts. A correlation of r = .358 was computed between collaborative leadership and math and of r = .340 between collaborative leadership and language arts. Correlations for learning partnerships of r = .468 were computed for math and of r = .427 for language arts.

Andrew Smith (2006) utilized the School Culture Survey to correlate the perceptions of school culture with standardized test scores in 17 elementary and secondary schools in southwestern Arizona. Based on reported findings, Smith (2006) concluded that, "a relationship does exist between perceptions of school culture and student achievement" (p. iii). Smith reported the following correlations

between the Stanford Achievement Test – 9 and mathematics, reading, and language arts: r = -.28, r = -.48, and r = -.67. An overall correlation between student achievement and perceptions of school culture was reported as r = -.52. All correlations were reported with p values less than .05. The r values within this study are reported as negative correlations, the scale used to measure perceptions of school culture was reverse scaled, with 1 representing strongly agree and 5 representing strongly disagree. So, although the correlations are reported as negative, they should be interpreted as positive correlations. The more positive the perceptions of school culture, the higher the students performed on the Stanford Achievement Test – 9.

Herndon (2007) studied the relationships between servant leadership, school culture, and student achievement in 62 elementary schools in Missouri. Herndon provided correlations for six factors of school culture based on the school culture survey. Bivariate and partial correlations were reported in the areas of collaborative leadership, teacher collaboration, professional development, unity of purpose, collegial support, and learning partnership. Five of these factors are relevant to the current study and fit the definition of culture based on Schoen and Teddlie's dimension of culture used as the framework for this study. Relevant bivariate correlations were reported for communication arts as follows: (a) collaborative leadership r = .243, (b) teacher collaboration r = .084, (c) unity of purpose r = .361, (d) collegial support r = .235, and (e) learning partnership r = .674. Reported correlations for mathematics were reported as

follows: (a) collaborative leadership r = .283, (b) teacher collaboration r = .139, (c) unity of purpose r = .364, (d) collegial support r = .308, and (e) learning partnership r = .602.

Correlations reported as significant at the $p<.05$ and $p<.01$ levels include: (a) unity of purpose and communication arts, (b) learning partnerships and communication arts, (c) collaborative leadership and mathematics, (d) unity of purpose and mathematics, and (e) learning partnerships and mathematics. Based on Herndon's (2007) findings, concluded that, "school culture has a significant influence on student achievement" (p. xvi).

Studies Using Other Measures of School Culture

Gazel (2001) conducted a study of school culture differences between average and effective secondary schools in Israel. The study included 20 schools of both religious and non-religious affiliations. Gazel utilized the Perceived School Culture Survey which measures perceptions in the areas of teamwork, orderliness, emphasis on academic achievement, continuous school improvement, encouraging student responsibility, adapting to customer demands, and valuing teacher and principal competency. Using ANOVA and regression analysis, Gazel found that 30% of the variance in school effectiveness is explained by academic emphasis and that 44% of the variance in school effectiveness is explained by the overall culture of the school.

Dowis (2005) used the School Culture Triage Survey in a mixed methods study to analyze the effects of school culture on student achievement in 18 Title I

schools in the upstate region of South Carolina. The quantitative portion of the study used the Pearson r to calculate correlations between three areas of school culture (professional collaboration, affiliative collegiality, and self-determination/efficacy) and student performance in English/Language Arts and Math. The Pearson correlation between overall school culture and school effectiveness was calculated as r = .21, (p=.413). Individual correlations for each of the subcomponents were also computed and reported as r = .14 for teacher collaboration, r = .26 for teacher collegiality, and r = .28 for teacher efficacy. None of these relationships were indicated as significant.

Brown (2005) conducted a mixed methods study to examine the relationship between school culture and student achievement in reading and math in 35 Ohio schools. Brown utilized the Organizational Culture Questionnaire to collect data on the nine factors contained in the OCQ. These factors include: (a) teamwork and cooperation, (b) decision-making, (c) trust and confidence, (d) responsibility and commitment, (e) communication, (f) general organizational practices, (g) vision and goals, (h) risk taking, and (i) change and innovation. Significant correlations ranging from .120 to .216 were found for each of the factors and school level test status. A correlation of -.036 was found between vision and goals and school level test status. The study also revealed significant correlations between school types, suburban and urban, with school level test status.

Teacher Working Conditions Studies

In 2006, the Teacher Working Conditions Survey (TWC) developed by the Center for Teaching Quality, was administered in North Carolina, Kansas, Nevada, Arizona, and Ohio. Two of these states, Arizona (Hirsch & Emerick, 2006a) and North Carolina (Hirsch & Emerick, 2006b), provided online reports of the findings of the Teacher Working Conditions Survey that included correlations between the four domains of working conditions measured in the TWC survey and student achievement on standardized test results. Teacher working conditions were broken down into the following five dimensions: (a) Professional Development, (b) Empowerment, (c) Leadership, (d) Facilities and Resources, and (e) Time.

Before analyzing the findings of these reports, it is important to note the number of schools represented in the survey report. Arizona was in the phase in stage for the TWC and results from Arizona represent 38 schools serving grades K-5, 18 schools serving grades 6-8, and 18 schools serving grades 9-12. Unlike Arizona, the TWC had already been established in North Carolina. Results from North Carolina represent 935 schools serving grades K-5, 370 schools serving grades 6-8, and 281 schools serving grades 9-12.

Results of the TWC in Arizona produced five general findings about teacher working conditions (Hirsch & Emerick, 2006a). These findings are outlined below:

1. Teacher Working Conditions are Correlated with Student Achievement – Evidence supports the notion that the working conditions of teachers impact student achievement and academic growth. “The analyses specifically point to the need to provide safe, trusting environments with sufficient instructional resources for all teachers to be successful.” (p. vii)
2. Teacher Working Conditions Influence Teacher Employment Plans – Significant correlations were found for all working conditions and teachers’ desire to stay in their current school. Correlations were the strongest in the areas of school leadership and empowerment.
3. Teachers and Administrators View Working Conditions Differently – The data collected reveals significant gaps in the way in which teachers and administrators perceive how administrators address the concerns of teachers.
4. Schools Vary in the Presence of Teacher Working Conditions – “The greatest differences in teacher perceptions of working conditions appear across schools.” (p. vii)
5. Arizona Teachers are More Negative about Working Conditions than Teachers in Other States – Of the states participating in the TWC, Arizona educators reported the most negative perceptions relating to the faculty being committed to every student learning.

Results from the North Carolina TWC produced similar findings. Hirsch and Emerick (2006b) report the following findings based on teacher and administrator responses on the 2006 TWC:

1. Teacher Working Conditions are Student Learning Conditions – Evidence supports the notion that the working conditions of teachers impact student achievement and academic growth. Evidence also suggest that school leaders, "can empower teachers, create safe school environments and develop supportive, trusting climates will be successful in promoting student learning." (p. vii)
2. Teacher Working Conditions Affect Teacher Retention - School leadership and teacher empowerment are found to be critical to retaining teachers.
3. Teachers and Administrators View Working Conditions Differently – As with the Arizona findings, this is particularly true in the area of administrators addressing teacher concerns.
4. Teacher Working Conditions in North Carolina Have Improved and Are Better Than in Other States – Results for the TWC have improved since the 2004 administration of the survey and teachers in North Carolina report more positive working conditions than teachers in the other participating states.
5. Working Conditions Results Were More Likely to Improve in Schools Where Teachers Indicated that they had used prior survey results – In

elementary and middle school that reported not using previous TWC data saw declines in the areas of leadership and empowerment conditions perceived to be in place.

6. Schools Vary in the Presence of Teacher Working Conditions – Differences were noted relative to the percentage of economically disadvantaged students. Schools with lower levels of economically disadvantaged students had more positive working conditions, particularly in the areas of trust and school safety. However, schools with high level of economically disadvantaged students reported sufficient class sizes and professional development resources.

In addition, Hirsch and Emerick (2006b) reported correlations between each of the five domains in the survey and student performance at the elementary, middle, and high school levels based on North Carolina Student Accountability data. The time domain produced only weak correlations at the elementary and middle school level and no correlation at the high school level. Additionally, the professional development domain was not correlated with student performance at any level. Facilities and resources, empowerment, and leadership produced significant correlations at the elementary, middle, and high school levels.

The dimensions of the TWC provide valuable data related to teacher perceptions of working conditions, and several of the dimensions contain elements that are related to overall school climate. However, after examining the questions with each domain, the domain of leadership appears to be the most

consistent with the dimensions of culture as identified by Schoen and Teddlie. Pertinent findings from each of the TWC reports are summarized in Tables 2 and 3 respectively.

In the years since 2006, the TWC was administered again in Arizona during the spring of 2007 and in North Carolina in the spring of 2008. Berry and Fuller (2007) provided a report of the data from the 2007 Arizona TWC. However, correlations between the teacher working conditions and student achievement were not reported. The final report from the 2008 North Carolina TWC was not available at the time studies were being selected for inclusion in this meta-analysis.

Miscellaneous Culture and Climate Studies

DiPaola and Hoy (2005) conducted a study on organizational citizenship and its relation to student achievement in 97 Ohio high schools. In their study organizational citizenship was defined as, “performance that supports the social and psychological environment in which task performance takes place” (p. 36). Organizational citizenship consists of the following elements: (a) Altruism – helping new teachers and giving time to others, (b) conscientiousness – making the most of time and going beyond basic expectations, (c) sportsmanship – does not complain or whine and increases time spent constructively, (d) courtesy – communicating appropriate information to others, and (e) civic virtue – serving on committees and attending functions to promote the interest of the organization.

Table 2

Correlations Between the Leadership Domain of the Arizona Teacher Working Conditions Survey and Student Achievement in Reading and Mathematics

AIMS Assessment	Leadership
5th Grade Math Meets Standard	.331*
5th Grade Math Exceeds Standard	.297
5th Grade Reading Meets Standard	.333*
5th Grade Reading Exceeds Standard	.477*
8th Grade Math Meets Standard	.102
8th Grade Math Exceeds Standard	.371
8th Grade Reading Meets Standard	-.007
8th Grade Reading Exceeds Standard	.299
10th Grade Math Meets Standard	.300
10th Grade Math Exceeds Standard	.345
10th Grade Reading Meets Standard	.499*
10th Grade Reading Exceeds Standard	.425

Note. *p<.05 (two-tailed)

Table 3

Correlations Between the Leadership Domain of the North Carolina Teacher Working Conditions Survey and Student Achievement Performance Composites

Grade Level	Leadership
Elementary Schools	.308**
Middle Schools	.179***
High Schools	.203***

Note. **p<.01 (two-tailed); ***p<.001 (two tailed).

Defined in this manner, organizational citizenship fits within the dimensions of culture as defined by Schoen and Teddlie.

In the study, organizational citizenship was measured using the Organizational Citizenship Behavior in School Scale (OCBSS). The study results were compared with student achievement on the Ohio 12th grade proficiency test. DiPaola and Hoy (2005) found a correlation of $r = .30$, $p < .01$ for reading and $r = .34$, $p < .01$ for mathematics and results of the OCBSS. DiPaola and Hoy concluded that a significant relationship exists between the level of organizational citizenship behavior and student achievement in the high schools studied.

Dowis (2005) studied the organizational culture in 18 elementary Title I schools in the upstate region of South Carolina. Using the School Culture Triage Survey (SCTS) and 2003-04 South Carolina School Report Card data, Pearson and Spearman correlations were established with each of the sub-components as measured by the SCTS. These sub-components include teacher collaboration, teacher collegiality, and teacher efficacy. Two of these three sub-components, teacher collaboration and teacher collegiality fit the constructs contained with the dimensions of culture as defined by Schoen and Teddlie.

Dowis (2005) reported a Pearson correlation of $r = .14$ between student achievement and the area of teacher collaboration. A correlation of $r = .26$ was reported between student achievement and teacher collegiality. Based on her findings, Dowis concluded that there is no significant relationship between school

culture as measured by the SCTS and school effectiveness or student achievement.

Sherblom et al. (2006) compared student, teacher/staff, and parent survey results with 3rd and 4th grade scores on Missouri Assessment Program to determine is 3rd and 4th grade mathematics and reading scores are related to student, teacher/staff, and parent perceptions of school climate. Using the Caring School Community survey, multiple correlations were calculated for each subgroups responses to the survey. Sherblom et al. concluded that school climate, as perceived by students perceptions are strongly related to student achievement, especially in the areas of classroom community, sense of well being, and concern for others. Teacher and staff responses indicated that feeling of belonging, leadership support, perception of positive school culture, and teacher and staff collaboration, are strongly associated with student proficiency in either mathematics or reading. Findings relevant to the current meta-analysis are outlined in Table 4.

Smith, K. (2008) examined the relationship between school district climate and school climate. She also examined the relationship of both district and school level climate on student achievement. Her study included 25 low-poverty and 44 high-poverty schools in 36 school districts in the state of Virginia. Smith utilized the District Climate Index and the School Climate Index to gain data at the district and school levels respectively. Results from these instruments were

Table 4

Sherblom, Marshall, and Sherblom (2006) Correlations of School Climate Measures and Math and Reading Proficient and Advanced Achievement Scores

Respondent Group-Scale Response	Math Proficiency	Reading Proficiency
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-Teacher relations	.48**	.57**
Staff implementation-Data utilization	.39*	.50**
Staff implementation-Leadership support	.65**	.63**
Staff implementation-Learning community	.64**	.73**
Staff implementation-School climate	.61**	.68**
Staff implementation-Staff collaboration	.30	.48**

Note. *p<.05.

compared with results from the 2007 Virginia Standards of Learning assessments for grades 3, 4, and 5 in the area of English (reading, research, and literature) and mathematics. Her findings revealed no significant relationships between district culture and student achievement. Significant correlations ($r = .505$, $p < .01$) and ($r = .462$, $p < .01$) were found between school climate and English achievement and mathematics achievement respectively.

Using results from district administered climate surveys and results from the 1997-98 North Carolina End-of-Grade tests in reading comprehension and mathematics, Demery (2000) studied the relationship between teachers' perceptions of school climate and student achievement. Demery's sample included 20 elementary and 10 middle schools from the second largest school district in North Carolina. The survey instrument measured three dimensions of school climate as defined in the study. These dimensions included academic emphasis, school discipline, and state policy influence. Findings of the study revealed many significant correlations related to each of the dimensions within the study and other variables such as socioeconomic status, racial compositions, and student achievement.

Reviewing each of the dimensions within the study, three of the survey questions from the dimension of academic emphasis were consistent with the framework of culture utilized within this study. Correlations relevant to the present meta-analysis include: (a) school provides a high quality education and student achievement in reading and mathematics ($r = -.16$ and $r = -.25$), (b) staff has high

expectations for all children and student achievement in reading and mathematics (r = -.25 and r = -.33), and (c) the climate promotes children's learning and student achievement in reading and mathematics (r = -.17 and r = -.25). Each of these correlations represents a negative correlation between the dimension of academic emphasis and student achievement. None of these correlations were significant at the $p < .05$ level.

Krawczyk (2007) found significant relationships between teacher and parent climate survey responses and schools Absolute Rating on their South Carolina State Report Card. The study included a total of 61 elementary Title I schools in South Carolina. Krawczyk analyzed the results of state developed school climate surveys for teachers, students, and parents and compared them with the schools' ratings on the South Carolina State Report Card. The climate survey measured perceptions in three areas: (a) learning environment, (b) social and physical environment, and (c) home-school relations. Two of these areas, learning environment and home-school relations, are pertinent to the current meta-analysis. In these areas, Krawczyk found a correlation of r = .486 between home-school relations and the Absolute Rating on the South Carolina State Report Card. A correlation of r = .417 was reported between the area of learning environment and the Absolute Rating on the South Carolina State Report Card.

The final study included in the current meta-analysis (Sweatt, 2000) also examines school climate. However, unlike the other studies which used surveys to measure perceptions of school culture or climate, Sweatt used surveys to

measure teacher expectations and attitudes. The study included a sample of 4th, 8th, and 10th grade teachers in 22 rural Texas mid-sized schools. Student accountability data was collected from the Texas Learning Inventory (TLI) and the Texas Assessment of Academic Skills (TAAS) and compared to survey results using Pearson Product Moment Correlations and ANOVA. Relevant findings in the study reveal a correlation of ($r = -.034$, $p < .88$) between teacher expectations scores and actual student performance on the TAAS and TLI assessments.

Miscellaneous Leadership Studies

The studies reviewed in the following section utilized various surveys and instruments to measure various elements of school and principal leadership that are consistent with the dimensions of school culture as defined by Schoen and Teddlie and analyzed in the current meta-analysis.

Arnold (2007) and Soileau (2007) conducted cohort studies to examine the leadership practices used by principals at the elementary and high school levels respectively. Using the Leadership Practices Inventory (LPI) developed by Kouzes and Posner in 2003, they evaluated the impact of the following five leadership practices on student performance: (a) Model the Way, (b) Inspire a Shared Vision, (c) Challenge the Process, (d) Enable others to Act, and (e) Encouraging the Heart. Student performance data was gathered from the Texas Education Agency Academic Excellence Indicator System database and student results on the Texas Assessment of Knowledge and Skills (TAKS). Both of their

studies found no linear relationship between the perceived practices of principals at the elementary or high school level and student achievement on the TAKS.

Two of the five leadership practices measured within their studies are consistent with the cultural dimension includes within the present study. These practices include enabling others to act and inspiring a shared vision. Arnold (2007) provides the following correlations between relevant practices of elementary school principals of the 102 schools included in the study and student achievement: (a) enabling others to act ($r = .141$) and (b) inspiring a shared vision ($r = .043$). Likewise, Soileau provides similar correlations between relevant practices of high school principals of the 26 schools included in the study and student achievement: (a) enabling others to act ($r = .128$) and (b) inspiring a shared vision ($r = .132$).

Brown et al. (2003) used the Organizational Curricular Leadership Inventory (OCLI) as they explored the organizational nature of curricular leadership in 38 middle/junior high schools in the state of Texas. As part of their study, they sought to examine the relationships between the dimensions of curricular leadership as an organizational phenomenon and middle school effectiveness as measured by the Texas Assessment of Academic Skills (TAAS) in mathematics, reading, and writing. The factors of curricular leadership included in their study included: (a) Principal Leadership/Support, (b) Organizational Citizenship (OCIT), (c) Collaboration (COL), (d) Curricular Organizational Structure (COS), and (e) Centralization (CEN).

Brown et al. (2003) report correlations for the three factors relevant to the current study as follows: (a) Organizational Citizenship and school effectiveness ($r = .65$, $p < .0001$), (b) Principal Leadership/Support ($r = .51$, $p < .0001$), and (c) Collaboration ($r = .51$, $p < .0001$). Brown et al. conclude that, "curricular leadership in middle schools and its connection to school effectiveness is complex and can be best understood through conceptualizing an array of professional leadership environment variables that mediate among personnel leadership behaviors and practices and school effectiveness" (p. 9).

Williams (2006) used the Profile for Assessment of Leadership (PAL) to measure teachers' perceptions of leadership behavior in 81 elementary schools in a metropolitan Atlanta school district. The PAL measures leadership competencies in six areas: (a) instructional leadership, (b) interpersonal skills, (c) making decisions, (d) facilities planning and student behavior, (e) teacher evaluation implementation, and (f) school climate. Results from the PAL were compared with 4th grade results on the 2004-05 and 2005-06 Georgia Criterion-Referenced Competency Test (CRCT). Williams found several significant relationships between the components of the PAL and student performance on the CRCT. Among the items found to be significantly correlated with student achievement were (a) the percentage of students on free and reduced lunch, (b) the number of discipline referrals, and (c) school climate.

Within the framework of his study, the school climate variable is relevant to the current meta-analysis. Williams reported a significant correlation of $r = .05$,

$p < .001$. A number of other factors were also shown to be significantly correlated with the area of school climate within the study. These include principals' instructional leadership, interpersonal skills, making decisions, facilities planning and setting student behavior expectations, evaluation implementation, number of discipline incidents, number of retained students, enrollment, and percentage of students on free and reduced lunch. A regression analysis was also conducted and revealed that student achievement was inversely explained by the number of discipline incidents.

Erbe (2000) analyzed survey and achievement data and reported correlations on 382 elementary schools in Chicago to identify correlates of student achievement. Using data collected by the Consortium on Chicago School Research on teacher and student achievement data from the Illinois State Board of Education as reported in the Illinois State Report Card. The survey included questions in several areas including school leadership, school governance, community relations, assessment of student ability to learn, and the professional learning community of the school.

The conclusion of Erbe's (2000) analysis indicated that school variables contribute significantly to student achievement in mathematics. Among the findings is that school climate variables account for about 19% of the variance in student achievement and teacher beliefs account for about 24% of the variance. Of the variables measured in each of these areas, correlations were reported for three variables relevant to the current meta-analysis: (a) focus on learning, (b)

inclusive leadership, and (c) parent involvement. Correlations were reported for each of these areas and student mathematics achievement in both 1994 and 1997. Correlations are as follows: (a) focus on learning, 1994 (r = .46) and 1997 (r = .54); (b) inclusive leadership, 1994 (r = .28) and 1997 (r = .31); and (c) parent involvement, 1994 (r = .66) and 1997 (r = .67).

Klinginsmith (2007) conducted a study in 133 middle schools in Missouri to examine the relationship of the managerial, instructional, and transformational factors of principal leadership. Klinginsmith used the Audit of Principal Effectiveness and the Principal Leadership Questionnaire in order to collect data regarding teachers' perceptions of principal leadership behavior. Data from these instruments were analyzed along with student achievement data form the 2006 Missouri Assessment Program (MAP) tests in mathematics and communication arts. The study used Pearson Product Moment correlations, ANOVA, and multiple regression to analyze the data. Klinginsmith found significant correlations in each of the nine factors analyzed: (a) interactive process, (b) instructional improvement, (c) curriculum improvement, (d) vision identification, (e) modeling, (f) goal acceptance, (g) individualized support, (h) intellectual stimulation, and (i) high performance expectations. Correlations were reported as follows for factors relevant to the current meta-analysis: (a) communication arts with vision identification, (r = .16, p = .065); goal acceptance, (r = .155, p = .076); and high performance expectations, (r = .121, p = .164) and (b) mathematics with

vision identification, (r = .189, p = .029); goal acceptance, (r = .169, p = .051); and high performance expectations, (r = .108, p = .215).

Solomon (2007) utilized the Principal Leadership (PLQ), Organizational Climate Description Survey (OCDQ), and Collective Efficacy Scale (CES) to collect data in the areas of leadership, teacher commitment, teacher collective efficacy, and student achievement in communication art and mathematics. The study involved 138 middle schools in Missouri and used student achievement data for grades 6, 7, and 8 in communication arts and mathematics from the Missouri Assessment Program (MAP). Among the purposes of the study, Solomon analyzed the data to determine, "if any correlational relationships existed among the factors of transformational leadership, teacher commitment, teacher collective efficacy, and student achievement in mathematics and communication arts" (p. v).

Solomon (2007) found correlational relationships among several of the variables when controlling for socioeconomic status. Correlations existed between: (a) transformational leadership and teacher commitment, (b) transformational leadership and teacher collective efficacy, (c) transformational leadership and student achievement in communication arts and mathematics, (d) teacher commitment and teacher collective efficacy, and (e) teacher commitment and student achievement in communication arts and mathematics. Findings relevant to the present meta-analysis were reported between student achievement in communication arts and vision identification (r = .154, p = .071),

goal acceptance (r = .148, p = .083), and high performance expectations (r = .154, p = .072). Similar zero order correlations were reported between mathematics achievement and vision identification (r = .153, p = .073), goal acceptance (r = .146, p = .088), and high performance expectations (r = .114, p = .185).

In a study of teacher survey responses from teachers in 90 elementary and secondary schools Leithwood and Mascall (2008) analyzed teacher perceptions to determine the impact of collective, or shared, leadership on student achievement as well as key teacher variables. Teacher perceptions were collected in the areas of collective leadership, teacher capacity, teacher motivation, and teacher work settings and conditions. Perception data was analyzed along with student achievement scores gathered from state web sites based on state-mandated tests in the areas of language arts and mathematics over a 3 year period from 2003 to 2005.

Leithwood and Mascall (2008) found that a significant amount of variation in student performance is explained by collective leadership. A significant correlation (r = .34, p < .01) was reported between collective leadership and student achievement.

Organizational Studies

The following section summarizes studies that evaluate the dimensions of school culture examined in the present analysis in terms of organizational characteristics of schools. These studies include McGuigan and Hoy (2006) and

Pounder et al. (1995). An overview of each of these studies and relevant findings are summarized below.

McGuigan (2005) conducted a study in 40 elementary schools in Ohio to evaluate the role of enabling bureaucracy and academic optimism in supporting student achievement. The construct of academic optimism included the concepts of collective teacher efficacy, faculty trust in students and parents, and academic emphasis. Enabling bureaucracy, "describes the extent to which the structures and processes of a school support teachers' work" (p. ii). Data was gathered in the area of enabling bureaucracy, academic emphasis, trust, and collective efficacy using portions from four previously validated survey, including the Omnibus Trust Scale and the Organizational Health Inventory. Using zero order correlations and regression analysis, these results were analyzed along with value added annual gain scores from the Ohio Proficiency Tests and the Terra NOVA.

The study did not show any significant correlations between academic optimism and student achievement based on value added gain scores. However, McGuigan did find a relationship between academic optimism and the percent of students scoring proficient on state mathematics and reading tests. The following relevant correlations were reported for academic optimism and reading ($r = .59$, $p < .01$) and mathematics ($r = .70$, $p < .01$).

Based on the same sample described above, McGuigan and Hoy (2006) reported additional correlations between student achievement and the major

variables associated with creating a culture of academic optimism. Significance correlations were reported for the variables of collective efficacy, academic emphasis, faculty trust, academic optimism, and socioeconomic status. Additional data relevant to the current meta-analysis was provided in the area of academic emphasis. McGuigan and Hoy report a significant correlation ($r = .67$, $p < .01$) between academic emphasis and student achievement in mathematics and a significant correlation ($r = .58$, $p < .05$) between academic emphasis and student achievement in mathematics.

Pounder et al. (1995) examined the, “relationships between the leadership exerted by principals, teachers, secretaries, and parents; four functions of effective organizations, and several measures of school effectiveness” (p. 564). The four functions of organizational leadership included adaptation, goal achievement, integration, and latency. Data was collected in these four areas using two survey instruments, the Organizational Control Questionnaire and the Index of Perceived Organizational Effectiveness. The final analysis used results reported from 57 schools at the elementary and secondary level in the intermountain west region of the United States. School effectiveness was measured in terms of perceived organizational effectiveness, student achievement, student absenteeism, and faculty/staff turnover rates.

Pounder et al. (1995) reported the following findings: (a) teacher and principal leadership were positively related to organizational latency (commitment), (b) organizational latency was positively associated with

perceived effectiveness, (c) organizational latency was negatively associated with teacher turnover, (d) parent leadership was positively associated with student achievement, and (e) school secretary influence was negatively associated with student achievement. Relevant correlations were reported in the areas of goal achievement and collective leadership with student achievement on the Stanford Achievement Test (SAT) averaged over a three year period. A correlation of .4940 with a p value of less than .01 was found between goal achievement and student achievement on the SAT and a correlation of .1778 was found between collective leadership and student achievement on the SAT.

Summary

This chapter has provided a review of the literature related to defining teacher effectiveness, the mediating factors related to principal leadership that influence student achievement, school leadership issues, and school culture. The literature strongly suggests that there is no direct effect of principal leadership on student achievement. However, there is an indirect effect. The majority of the research reviewed indicates that principals have a mediated effect on teacher effectiveness as measured by student achievement. Dimensions of school culture appears to be a consistent theme identified throughout each section of the literature review as a mediating factor that is related to improved student performance.

The Center for Improving School Culture (2004) summarizes school culture as defined by Deal and Peterson in 1993 and Robbins and Harvey 1995

as the, “inner reality” that, “reflects what organizational members care about, what they are willing to spend time doing, what and how they celebrate, and what they talk about” (p. 1). This definition provides a general understanding of the construct of school culture, but provides little in the way of defining culture in specific, measurable elements.

Schoen and Teddlie’s (2008) Dimensions of Culture provide a framework which provides a structure from which research on school culture can be based. The four dimensions outlined by Schoen and Teddlie will provide the framework for the selection and synthesis of research for this study. Although some of the dimensions are more readily aligned with empirical research studies than others, efforts will be made within the meta-analysis to locate studies which address each of the Schoen’s and Teddlie’s dimensions of school culture.

CHAPTER 3: METHODOLOGY

This chapter presents the research methodology used to conduct the meta-analysis of correlational research studies examining the relationship between school culture and student achievement. The study utilizes Schoen and Teddlie's Dimensions of Leadership as the framework for the coding and analysis of pertinent studies of leadership and school culture. The chapter begins with an overview of the meta-analysis process. This is followed by a description of the research questions and hypotheses for the study. The chapter then provides a thorough description of the research design, which includes: (a) the criteria used for study selection, (b) operational definitions of the constructs being studied, (c) a description of instruments used to measure the constructs in various studies, (d) the processes used to locate studies, and (e) a description and table of the studies identified. This is followed by a description of the coding processes used in recording pertinent data from the study. The chapter concludes with a description of the meta-analysis processes used in synthesizing the data and the processes used in the analysis statistics generated from the meta-analysis.

Overview of Meta-Analysis

The statistical principles behind a meta-analysis have been utilized for many years and the term meta-analysis was introduced by Gene Glass in 1976 (Bangert-Drowns & Rudner, 1991; Hedges, 1992; Kulik & Kulik, 1989). The meta-analysis is the use of quantitative methodology to synthesize the results of several empirical studies and is now widely used in the fields of medicine,

psychology, and the social sciences (Hedges; Hedges & Pigott, 2001). The meta-analysis “translates results from different studies to a common metric and statistically explores relations between study characteristics and findings” (Bangert-Drowns & Rudner, p. 1). This is typically done by using an estimate of the effect size, which may include the use of correlation coefficients, standardized mean differences, or odds ratios and combining the data across studies to provide a summary (Hedges & Pigott). The effect size statistic encodes relevant quantitative data from each study included in the analysis and allows for the standardization of study findings from multiple studies that can be interpreted across all variables and measures involved within the studies (Lipsey & Wilson, 2001).

Bangert-Drowns and Rudner (1991) describe the process of a meta-analysis in four basic steps. A meta-analysis first reviews the purpose of the study and following similar steps as when conducting primary research. Next, specified procedures and criteria are established for locating and collecting studies. Third, the data is collected from the studies are coded according to the objective of the meta-analysis. The identified study outcomes are converted to a common metric, typically an effect size or standardized mean difference. Finally, statistical procedures are used to analyze the findings across the identified studies.

DeCoster (2004) provides the following reasons for utilizing a meta-analysis to:

1. establish the presence of an effect
2. determine the magnitude of an effect
3. resolve differences in literature
4. determine important moderators of an effect.

Bangert-Drowns and Rudner (1991) suggest that the use of a meta-analysis in the educational field is appropriate for several reasons. Specifically, they note the following reasons for use:

1. Results from educational research often produce contradictory findings.
2. The different treatments, settings, measurement instruments, and methodology make different studies difficult to compare.
3. Replications of studies may still be inconclusive.
4. “Literature on a topic may be so extensive as to obscure trends with an overwhelming amount of information.” (p. 1)

The guidelines established by Bangert-Drowns and Rudner (1991) and DeCoster (2004) provide the rationale for use of meta-analysis to examine the research on educational leadership as it pertains to teacher effectiveness and student achievement. The amount of literature available on educational leadership is extensive. It is difficult to accurately determine the trends and effects of the principal in the cursory review of literature associated with many research projects. The meta-analysis allows for a systematic and purposeful review of research as related to principal leadership, teacher effectiveness, and

student achievement. Furthermore, although the research on educational leadership is extensive, the nature of leadership and the many mediating factors affecting the success of principals have produced inconclusive, if not contradictory findings. Finally, the meta-analysis will allow for the comparison of a variety of studies by calculating a common metric, the effect size. Given the multitude of educational settings, the variety of instruments utilized, and the varying research methodologies represented in the study of educational leadership, the use of meta-analysis is appropriate. The use of a common metric, effect size, for comparison and analysis is necessary to develop a more comprehensive understanding of the impact of school culture on teacher effectiveness.

Research Questions

This meta-analysis is designed to address the following questions:

1. What is the effect size of school culture on student achievement in K – 12 schools in the United States?

The second question to be addressed is pending the availability of sufficient data for each of the identified dimensions of school culture.

2. Are there dimensions of school culture that have larger effect sizes than others on student achievement at the K-12 level?

Hypothesis

The null hypothesis established in chapter 1 assumed that there would be no correlation between school culture and student achievement. The research

hypothesis purposed that the synthesis of research would show a significant effect size between school culture and student accountability data.

Research Design

Criteria for Selection

Previous meta-analyses conducted in the area of educational leadership have provided guidance in the development of criteria for the inclusion of studies for this research synthesis. Specifically, the works of Brown (2001), Marzano et al. (2005), and Martin (2008) have assisted in the establishment of the following criteria for the inclusion of studies in the meta-analysis. First, the study must examine one or more of the dimensions of school culture as defined by Schoen and Teddlie and use student achievement as the dependent variable.

Secondly, the study must be of a quantitative nature and provide a calculated effect size or supply sufficient data to calculate an effect size. This will eliminate all qualitative studies from the analysis of data. Given the nature of leadership and education, true random sampling is difficult to achieve therefore. It is likely that the majority of studies included will be either quasi-experimental or correlational in nature (Brown, 2001).

Next, the study must have been conducted in United States schools at the K-12 level, using appropriate student accountability data as the measurement of student achievement. Marzano et al. (2005) describe this criterion more precisely when they define one of their inclusion criteria as, “achievement was measured

by a standardized achievement test or a state test, or a composite index based on one or both of these" (p. 28).

Finally, the study must have been conducted during the past 15 years. Only studies with a publication date of 1994 to present will be included. This will limit the inclusion of studies to recent research that have been conducted during the years of increasing accountability at the school level following the signing of Goals 2000 by President Clinton in 1994.

Defining Constructs

One of the keys to conducting a successful meta-analysis and avoiding possible bias is to ensure that all constructs being analyzed are clearly defined (DeCoster, 2004; Martin, 2008). Researchers have used a variety of definitions and to define and measure the construct of school culture. To complicate the issue further, the terms school climate and school culture are often used interchangeably in the research community. Likewise, teacher effectiveness is also measured in a variety of manners in the literature discussed in chapter 2. Prior to conducting the analysis of research, these key constructs were defined through a review of literature and defined operationally.

Student and school achievement data obtained from standardized test results are used as the measure of teacher effectiveness in this analysis. The justification for the use of such data in measuring teacher effectiveness can be found in the work of Strong et al. (2008). Within the studies included in the meta-analysis, student/school achievement data are reported most often from various

state level standardized assessments as part of state and federal accountability models.

The defining of school culture in a concrete and descriptive manner was paramount to the success of this meta-analysis. After reviewing the multitude of definitions and elements of school culture and climate, Schoen and Teddlie's (2008) definition of culture was selected for use in this meta-analysis. Their four dimensions of culture provided the framework for the analysis and synthesis of research for inclusion in the meta-analysis. Schoen and Teddlie's definition eliminates the distinction between climate and culture by asserting that climate and culture represent different levels of the same construct and include climate as a subset of school culture within their dimensions of culture.

Schoen and Teddlie's dimensions of culture are described as follows:

1. Dimension I: Professional Orientation – This includes the, "activities and attitudes that characterize the degree of professionalism present in the faculty" (p. 140). This dimension incorporates the concepts of: (a) professionalism, (b) professional learning communities, (c) norms of collegiality, (d) teacher professionalism, (e) collaborative cultures, (f) organizational learning, and (g) learning organizations.
2. Dimension II: Organizational Structure – This dimension includes "the style of leadership and communication and processes that characterize the way the school conducts its business." (p. 140)

This includes not only the style of leadership that exist in the school, but also things such as who is involved in leadership activities, the development of vision and mission statements, the formulation of goals and action plans, and the degree of consensus and commitment of the staff.

3. Dimension III: Quality of the Learning Environment – This third dimension includes, “the intellectual merit of the activities which students are typically engaged.” (p. 140) This has to do with the level of rigor expected from the students as they utilize and construct knowledge.
4. Dimension IV: Student-Centered Focus – This dimension deals with, “the collective efforts and programs offered to support student achievement.” (p. 140) It has to do with the level to which individual student needs are met and examines such things as: (a) parent involvement, (b) student support services, (c) differentiated instructional strategies, (d) the disaggregation and analysis of individual student achievement data, and (e) the use of student data to make decisions about instruction.

After establishing the definitions of school culture and teacher effectiveness to be used in the study, the criterion for the selection of studies included in the meta-analysis were established and the coding protocol was developed.

Measures of School Culture and Student Achievement

School Culture has its background in both psychological and anthropological research communities (Schoen & Teddlie, 2008). A variety of instruments have been used to measure school culture. The two most frequently used measures of school culture within studies meeting the established criteria for inclusion were the School Culture Survey (SCS) and the Organizational Health Inventory (OHI). Nine of the studies selected for inclusion in the meta-analysis use a version or subset of the OHI or SCS as the measure of school culture within the study. Other studies included in the meta-analysis use various survey instruments including Teacher Working Conditions Surveys, the School Culture Triage Survey, and other school culture and climate surveys to provide quantitative measures of school culture.

Student Achievement is defined by student and school level accountability data obtained from standardized testing results at the K-12 level in public schools in the United States. Each study meeting the criteria for selection uses a form of state or federal accountability data as the dependent variable within the study. Examples of such data used in the selected studies include North Carolina End-of-Grade/End-of-Course results, Virginia's Standards of Learning assessment results, Terra Nova results, and various other applicable state accountability results.

Locating the Studies

A comprehensive search of research published since January 1, 1994 was conducted using electronic databases provided through Joyner Library at East Carolina University. In addition, popular internet search engines, such as Google and Google Scholar, were used to provide other possible studies and publications of relevance. Multiple key terms related to the principal leadership, student performance, and the identified mediating factors were utilized. Search terms utilized include: (a) principal and improved student achievement, (b) principal and school effectiveness, (c) principal and student performance, (d) principal and school improvement, (e) vision and student achievement, (f) vision and school effectiveness, (g) vision and student performance, (h) vision and school improvement, (i) leadership and student achievement, (j) leadership and school effectiveness, (k) leadership and student performance, (l) leadership and school improvement, (m) school culture, (n) school climate, (o) school culture and student achievement, (p) school culture and school effectiveness, (q) school culture and student performance, (r) school culture and school improvement, (s) school climate and student achievement, (t) school climate and school effectiveness, (u) school climate and student performance, (v) school climate and school improvement, and (w) organizational health. Using student achievement, school effectiveness, student performance, and school improvement as the common search terms, additional key word searches were also conducted to

include collegiality, professional learning communities/PLCs, academic emphasis, and professionalism.

Keyword and subject searches were also conducted using each of the key phrases contained in Schoen and Teddlie's dimensions of culture which had not already been conducted. In addition to electronic searches, reference list of relevant studies were reviewed to identify other potential studies for inclusion in the meta-analysis. Potential studies were recorded and an author and/or title search was conducted utilizing the databases indicated in following paragraph.

Utilizing Academic Search Premier, Education Research Complete, ERIC, Proquest, Web of Science, other electronic search engines available through East Carolina University, and Google Scholar, the search revealed in excess of 7,379 citations between all combined queries since the spring of 2008. The majority of the citations reviewed were anecdotal in nature and were eliminated from consideration for inclusion in the study. As the searched progressed, many of the citations revealed were duplicates and had already been reviewed during previous searches. The citations also provided many dissertations and research studies which were qualitative in nature and therefore, did not meet the criteria for inclusion in the study. Through a review of the abstracts, additional studies and citations were eliminated from consideration as they were also qualitative in nature, did not addressing the variables being considered, or were conducted outside the United States. A total of 90 quantitative studies were identified for possible inclusion in the study. Sixty of these studies were eliminated after a

further review. These studies were rejected for one or more of the following reasons:

1. the study fell outside the specified time frame
2. the study included schools outside the United States
3. the study used non-standardized methods to assess student achievement
4. the constructs within the study did not measure the dimensions of school culture as defined by Schoen and Teddlie
5. The study did not provide Pearson (r) Product Moment correlations.

A complete list of studies reviewed and eliminated from consideration for inclusion can be found in Appendix A. After the elimination of these studies, a total of 30 studies remained and are included in the present meta-analysis. Each of these 30 studies are summarized in the literature review in chapter 2. Table 5 also provides a list of the studies identified for inclusion in the meta-analysis.

Coding Procedures

A coding protocol was established according to the guidelines provided by Lipsey and Wilson (2001). The protocol consisted of a two part coding process which first encodes information about study characteristics and descriptors. Study characteristics are the independent variables in the meta-analysis and, “represent factors that may influence the nature and magnitude of the finding” (p. 73). Study characteristics include such things as the methods and measures used, the study sample, major constructs, etc. Lipsey and Wilson discuss the

Table 5

Studies Included in the Meta-Analysis

Study Name	Publication Type	Cultural Constructs Within Study	Cultural Dimension Addressed
Alig-Mielcarek (2003)	Dissertation	Goals Academic Press	Dimension II Dimension III
Arnold (2007)	Record of Study	Shared Vision Enabling Others to Act	Dimension II
Barth (2001)	Dissertation	Organizational Health	Dimension I Dimension II Dimension III Dimension IV
Brown, Claudet, & Olivarez (2003)	Online Journal	Organizational Citizenship Leadership/Support Collaboration	Dimension I Dimension II Dimension III
Demery (2000)	Dissertation	Academic Emphasis	Dimension III
DiPaola & Hoy (2005)	Project Muse	Organizational Citizenship	Dimension I Dimension III
Dowis (2005)	Dissertation	Collaboration Collegiality	Dimension I

Table 5

Studies Included in the Meta-Analysis (continued)

Study Name	Publication Type	Cultural Constructs Within Study	Cultural Dimension Addressed
Erbe (2000)	Presentation Paper	Focus on Learning	Dimension II
		Inclusive Leadership	Dimension III
		Parent Involvement	Dimension IV
Fraley (2007)	Dissertation	Collaboration	Dimension I
		Collegial Support	Dimension II
		Collaborative Leadership	Dimension III
		Unity of Purpose	Dimension IV
		Attitude toward School Improvement	
		Learning Partnership	
Gruenert (2005)	Journal	Collaboration	Dimension I
		Collegial Support	Dimension II
		Collaborative Leadership	Dimension III
		Unity of Purpose	Dimension IV
		Attitude toward School Improvement	
Henerson et al. (2005)	Journal	Teacher Affiliation	Dimension III
		Academic Emphasis	Dimension IV

Table 5

Studies Included in the Meta-Analysis (continued)

Study Name	Publication Type	Cultural Constructs Within Study	Cultural Dimension Addressed
Herndon (2007)	Dissertation	Collaborative Leadership Collaboration Unity of Purpose Collegial Support Learning Partnership	Dimension I Dimension II Dimension IV
Hirsch & emerick (2006a)	Online Report	Leadership (school)	Dimension II
Hirsch & Emerick (2006b)	Online Report	Leadership (school)	Dimension II
Hoy & Hannum (1997)	Journal	Collegial Leadership Academic Emphasis Teacher Affiliation	Dimension II Dimension III Dimension IV
Klinginsmith (2007)	Dissertation	Vision Identification Goal Acceptance High Performance Expectations	Dimension II Dimension III
Krawczyk (2007)	Dissertation	Learning Environment Home-school Relations	Dimension III

Table 5

Studies Included in the Meta-Analysis (continued)

Study Name	Publication Type	Cultural Constructs Within Study	Cultural Dimension Addressed
Leithwood & Mascall (2008)	Journal	Collective Leadership	Dimension II
McGuigan & Hoy (2008)	Journal	Academic Optimism	Dimension III
Pounder, Ogawa, & Adams (1995)	Journal	Goal Achievement Collective Leadership Teacher Affiliation Academic Emphasis Collective Leadership	Dimension II Dimension III Dimension IV
Sherblom, Marshall, & Sherblom (2006)	Journal	Belonging Expectations School Leadership Culture Relations Data Utilization Leader Support Learning Community Staff Climate Collaboration	Dimension I Dimension II Dimension III Dimension IV

Table 5

Studies Included in the Meta-Analysis (continued)

Study Name	Publication Type	Cultural Constructs Within Study	Cultural Dimension Addressed
Smith, A. (2006)	Dissertation	Culture	Dimension I Dimension II Dimension III Dimension IV
Smith, K. (2008)	Dissertation	Climate	Dimension I Dimension II Dimension III Dimension IV
Smith & Hoy (2007)	Journal	Academic Optimism	Dimension III
Soileau (2007)	Record of Study	Shared Vision Enabling Others to Act	Dimension II
Solomon (2007)	Dissertation	Vision Identification Goal Acceptance	Dimension II
Sweatt (2000)	Dissertation	Teacher Expectations	Dimension III
Sweetland & Hoy (2000)	Journal	Empowerment Collegial Support Teacher Professionalism Academic Press	Dimension I Dimension II Dimension III

Table 5

Studies Included in the Meta-Analysis (continued)

Study Name	Publication Type	Cultural Constructs Within Study	Cultural Dimension Addressed
Williams (2006)	Dissertation	Climate	Dimension I Dimension II Dimension III Dimension IV

second part of the coding process as the encoding of information about the empirical finding of the study, in particular, the effect sizes.

Studies included in the meta-analysis were coded for the following characteristics: (a) school level, (b) subject area, (c) measurement instruments, (d) sample size, (e) direction of correlation (f) cultural dimensions addressed, and (g) location of study. Subgroups coded within school level include elementary school, middle school, high school, and all levels. Elementary schools were coded for any or all grade configurations K–5. A code of middle school was entered for studies providing data for any and all grade 6–8. High school was coded for all studies utilizing data from any or all grades 9–12. Finally, all was coded for any studies that utilized data from any grade within all three levels of schooling.

Subject area represents the curricular areas which were used within the identified studies to establish correlations between school culture and student achievement outcomes. For the sake of this study, the subject areas coded were mathematics, language arts, or both. The subject area of mathematics was clearly indicated in all studies for which it was coded. The language arts code was used to represent studies which reported results in any area typically associated with language arts. This includes studies which report data in terms of language arts, reading, and/or writing achievement. The both code was used for studies that reported correlations for both language arts and mathematics.

The coding for measurement instruments is simply recorded as the instrument used to collect school culture data and the source of the student accountability data utilized in the study. Sample size is the coding of the number of schools represented in each study. The location of the study was also coded according to the state or area of the country in which the study was conducted.

The final study characteristic coded was the cultural dimension(s) represented by the study. Studies were coded in this area according to Schoen and Teddlie's four dimensions of culture. Studies were coded by number corresponding to the specific dimension or dimensions contained within the study being coded. Studies selected for the meta-analysis ranged from representing one dimension to representing all dimensions of culture as defined by Schoen and Teddlie.

Dimension I: Professional Orientation – was described by Schoen and Teddlie (2008) as, "the activities and attitudes that characterize the degree of professionalism present in the faculty" (p. 140). They provided the following examples of leadership practices and concepts that may be included in dimension I: (a) professionalism, (b) professional learning communities, (c) norms of collegiality, (d) teacher professionalism, (e) collaborative cultures, (f) organizational learning, and (g) learning organizations. The studies selected and coded for dimension I included at least one of these terms or a related term in the description of culture within the study. Additional terms found in research studies

that were coded as dimension I included: (a) organizational citizenship, (b) collaboration, (c) belonging, and (d) learning community.

Dimension II: Organizational Structure – Schoen and Teddlie (2008) define this dimension in terms of the style of leadership, communication, and processes that characterize how a school does business. Their discussion of dimension II includes descriptions of who is involved in leadership activities, the development of vision and mission statements, the formulation of goals and action plans, and the degree of consensus and commitment of the staff. Additional terminology from studies coded within dimension II include: (a) inclusive leadership, (b) unity of purpose, (c) collaborative leadership, (d) leadership, (e) collegial leadership, (f) vision identification, (g) goal acceptance, (h), collective leadership, (i) goal achievement, (j) leadership support, and (k) empowerment.

Dimension III: Quality of the Learning Environment – This dimension is defined by Schoen and Teddlie (2008) as, “the intellectual merit of the activities which students are typically engaged” (p. 140). Their description for this dimension focuses mainly on the level of rigor expected from the students on a day to day basis. Studies and correlations coded as dimension III typically described elements of academic rigor and/or high expectations. Studies coded as dimension III used the following terms and constructs: (a) academic press, (b) academic emphasis, (c) focus on learning, (d) attention to school improvement,

(e) high performance expectations, (f) academic optimism, (g) expectations, and (h) learning environment.

Dimension IV: Student-Centered Focus – This dimension is defined by Schoen and Teddlie (2008) as the collective efforts of the school to support student achievement and deals with the level to which individual student needs are met. Schoen and Teddlie provide the following examples of practices and factors that represent this dimension: (a) parent involvement, (b) student support services, (c) differentiated instructional strategies, (d) the disaggregation and analysis of individual student achievement data, and (e) the use of student data to make decisions about instruction. In addition, studies that included: (a) parent involvement, (b) learning partnership, (c) teacher affiliation, (d) relations, (e) data utilization, and (f) home-school relations were also coded as representing dimension IV.

Coding of Empirical Findings

The current meta-analysis seeks to establish an average effect size describing the correlation between school culture and student achievement. Lipsey and Wilson (2001) indicate that, the most persistent criticism of meta-analysis has to do with the mix of studies included" (p. 8). The problem comes in when, "different types of study findings are averaged together in a grand mean effect size" (p. 8). This study is designed to establish an average overall effect size based on Pearson Product Moment correlations. Therefore, in an attempt to minimize the problems and criticisms related to combing different types of studies

in a meta-analysis, correlations were coded only for those studies for which a correlation was provided or could easily be computed from the data provided.

Although it is possible to calculate approximate r statistics from t statistics, one and two-way ANOVA tables, Chi square statistics, etc., these statistics represent differences in means between groups and do not represent true measures of correlation between variables. These studies were therefore eliminated from inclusion in the analysis. Data was coded into the coding form based on the reported Pearson Product Moment Correlation(s) provided in the study. Only studies that are correlational in nature were included in the study.

It is also important to note as Lipsey and Wilson (2001) indicate, that there may be many different effect sizes coded from a single study. The studies meeting the criteria for inclusion in the current meta-analysis reported effect sizes ranging from one overall correlation to as many as 20 distinct correlations as found in Sherblom et al. (2006). Each of these correlations was recorded separately to maintain the integrity of the study from which it was obtained. After appropriately coding the reported correlation, the direction of the correlation was also coded as positive, negative, or unspecified.

Ensuring Coding Reliability

In order to ensure reliability in the coding process, all studies were coded twice by the researcher. After the second coding, an additional coder was trained by the researcher in the coding process and independently coded all studies for correlations and cultural dimension addressed. The results of the second coder

will be compared with results of the second coding by the researcher. For any discrepancies found in the coding, items were discussed, study data was reviewed, and a consensus was reached on cultural dimension(s) addressed by the study based on the definitions of each dimension.

Test of Homogeneity and Determination of Meta-Analytic Model

When conducting a meta-analysis, it is important to determine whether the effect sizes from the included studies all provide an estimate of the same population effect size (Lipsey & Wilson, 2001). If a distribution of effect sizes is homogeneous, individual study effect sizes should not vary from the mean effect size by more than would be expected from sampling error. When study effect sizes vary from the mean effect size by more than is expected by sampling error alone the distribution of effect sizes is determined to be heterogeneous.

The determination of homogeneity or heterogeneity of a meta-analysis also helps to determine the appropriate statistical model to use in the analysis of studies. A fixed-effects model is most appropriately utilized for homogeneous effect size distributions while a random-effects model is most appropriate for effect size distributions determined to be heterogeneous (Lipsey & Wilson, 2001). In order to assess the homogeneity of the effect size statistics, a Q statistic was computed to determine if the effect sizes of the included studies estimate the same population effect size. The Q statistic is the weighted variance of the effect size statistics and is compared to a critical value obtained for a chi-square distribution with k-1 degrees of freedom (where k is the number of studies in the

sample) at the alpha=0.05 level of significance in order to determine whether to accept of reject the null hypothesis of homogeneity. Acceptance of the null hypothesis will result in the use of a fixed-effect model, while rejection of the null hypothesis indicates the presence of a heterogeneous effect size distribution and calls for the use of the random-effects model.

Analysis of Effect Size

The current meta-analysis uses Biostat's *Comprehensive Meta-Analysis Software Version 2.0* (Borenstein, Hedges, Higgins, & Rothstein, 2005), to conduct all meta-analytic statistics. In order to compute the average effect size, all study effect sizes are converted into Fisher z scores, which were then converted back to correlations for presentation. The effect size z and its variance is used to yield a combined effect and confidence limits in the Fisher z metric (Borenstein, Hedges, Higgins, & Rothstein, 2007).

In order to ensure that studies are appropriately weighted within the meta-analysis, all correlations contained within individual studies were combined to compute one effect size per study. The studies were then weighted by the inverse of the sampling error variance in the calculation of the mean effect size. This ensured that studies with multiple correlations were not over represented in the analysis, while larger studies were represented appropriately in the calculation of the mean effect size. The calculated mean effect size was then compared to established criteria to determine the magnitude of the effect size. According to Lipsey and Wilson (2001), correlation effect size values are

considered small if less than or equal to .10, medium if equal to .25, and large if greater than or equal to .40.

Distribution of Effect Size and Publication Bias

In order to ensure the calculated mean effect size is a valid representation of the data, it is important to examine the distribution of effect size and to conduct tests to determine if publication bias is likely to exist within the meta-analysis. In order to examine the distribution of data, a funnel plot was created to display a visual representation of the distribution of effect sizes. In a funnel plot, the standard error is plotted on the vertical axis and the converted Fisher Z effect size on the horizontal axis. Large studies, in terms of sample size, appear toward the top of the graph and cluster near the mean effect size with a few studies positively skewed. Smaller studies tend to cluster toward the bottom of the funnel. In the absence of publication bias the studies would be distributed symmetrically about the combined effect size. By contrast, in the presence of bias, the bottom of the plot would show a higher concentration of studies on one side of the mean than the other. This would reflect the fact that smaller studies, which appear toward the bottom, are more likely to be published if they have larger than average effects, which makes them more likely to meet the criterion for statistical significance (Borenstein et al., 2007).

Since publication bias is a major threat to the validity of the results of a meta-analysis, it was necessary to further evaluate the included studies for the presence of publication bias. In order to do this, a fail safe N was calculated for

the study to estimate the number of unpublished studies with negative or non-significant correlations that would be needed to nullify a positive effect (Lipsey & Wilson, 2001).

Summary of Meta-Analysis

After conducting all appropriate test for homogeneity and publication bias, the results of the meta-analysis were summarized in a summary table that shows the subgroups measured, the correlation coefficient, the lower and upper limits, the z score, and the level of significance for each study in the meta-analysis as well as the overall effect size. In addition, a forest plot was generated to visually represent individual study effect sizes and their corresponding 95% confidence interval. The plot illustrates the dispersion of the effect sizes of the individual studies included in the meta-analysis and demonstrates the varying levels of precision of the included studies. The forest plot also displays the mean effect size and associated confidence interval and allows for a visual comparison between the individual study effect sizes and the overall mean effect size.

Summary

This chapter presented a description of the methodology used in conducting the current meta-analysis examining the effect of school culture on student achievement. The meta-analysis uses Biostat's *Comprehensive Meta-Analysis Software, Version 2* to conduct the synthesis and analysis of the included studies to produce a mean over effect size (Borenstein et al., 2005). Studies for the meta-analysis were found through a comprehensive search of

electronic databases available through East Carolina University's Joyner Library. Additional searches were made through the use of internet databases and bibliographies of other literature and studies.

Study selection was based on the selection criteria outlined in the chapter and selected studies were coded accorded to established protocol. A summary of included studies was included in the chapter. After all studies were selected and coded, coding reliability was assessed by using a second coded to ensure that all studies are appropriately coded. Results of the meta-analysis were evaluated for homogeneity, the distribution of effect sizes, and publication bias. The results of the analysis are displayed and summarized in a chart containing subgroups measured, the correlation coefficient, the lower and upper limits, the z score, and the level of significance for each study in the meta-analysis as well as the overall effect size. All the effect sizes and confidence intervals of all studies and the mean effect size are also be presented in forest plot to provide a visual representation of the data.

CHAPTER 4: RESULTS

This chapter provides the results of the meta-analysis examining the effect size of school culture on student achievement utilizing the methodology described in chapter 3. The chapter begins by presenting the characteristics of the studies selected for inclusion in the meta-analysis. This is followed by the presentation of findings relevant to the distribution of the effect sizes and the choice and usage of the random effects model to conduct the meta-analysis. The chapter continues with a discussion of the tests of homogeneity and publication bias. The chapter then provides a summary of the meta-analysis, including the effect sizes and confidence intervals of each study, as well as the overall effect size of school culture on student achievement. The chapter concludes with the presentation of results and findings relative to the primary research question purposed in the study - What is the effect size of school culture on student achievement in K – 12 schools in the United States? The comprehensive search for studies did not provide a large enough sample size to analyze the effect size of individual dimensions of culture on student achievement.

Study Characteristics

Tables 6, 7, 8, 9, and 10 provide summaries of encoded studies by identified characteristics. Table 6 presents data pertaining to the number of studies by grade level. Studies were classified by grade level as follows: (a) Elementary, grades K-5; (b) Middle, grades 6-8; (c) High, grades 9-12; (d) Elementary/Middle, grades K-8, or (e) K-12. Of the studies included in the meta-

Table 6

Number of Studies by Grade Level

School Level	N	Percentage
Elementary (Grades K-5)	11	36%
Middle (Grades 6-8)	8	27%
High (Grades 9-12)	2	7%
Elementary/Middle (Grades K-8)	1	3%
K-12	8	27%
Total	30	100%

Table 7

Number of Studies by State

State	N	Percent
Arizona	2	7%
Georgia	1	3%
Illinois	1	3%
Indiana	2	7%
Missouri	5	17%
New Jersey	2	7%
North Carolina	3	10%
Ohio	3	10%
South Carolina	2	7%
Tennessee	1	3%
Texas	4	13%
Virginia	1	3%
West Virginia	1	3%
US State Not Specified	2	7%
Total	30	100%

Table 8

Number of Studies by Student Achievement Measure

Student Achievement Measure	N
Reading/Communication Arts	18
Mathematics	20
Combined Achievement	12
Total	50*

Note. *Several studies reported separate achievement measures for reading/communication arts and for mathematics.

Table 9

Number of Studies in Meta-Analysis by Cultural Dimension

Cultural Dimension	Number of Studies
Dimension I: Professional Orientation	8
Dimension II: Organizational Structure	18
Dimension III: Quality of the Learning Environment	17
Dimension IV: Student-Centered Focus	9
Overall Culture: Includes all Dimensions	5
Total	57*

Note. *Studies may represent more that one cultural dimension.

Table 10

Number of Studies by Publication Type

Publication Type	N	Percentage
Published		
Journal	10	33%
Online Journal	1	3%
Online Report	2	7%
Subtotal	13	43%
Unpublished		
Dissertation	14	47%
Record of Study	2	7%
Presentation Paper	1	3%
Subtotal	17	57%
Total	30	100%

analysis, 67% of the data represented performance in elementary and middle schools. Studies involving high schools represent seven percent of the studies. Finally, studies examining student accountability data for grades K-12 make up 27% of the studies in the meta-analysis.

The distribution of studies by state is summarized in Table 7. The studies in the meta-analysis represent 13 states and also includes two regional studies for which the specific states were not specified. The number of studies per state varied from three in Georgia, Illinois, Tennessee, Virginia, and West Virginia to 17 in Missouri.

Table 8 illustrates the distribution of studies in the meta-analysis by the subject area assessment data utilized in each study in order to measure student achievement. The distribution of studies was relatively equal with 18 studies using Reading/Communication Arts assessment data as the accountability measure and 20 studies using mathematics data. Twelve studies used combined achievement, including reading and mathematics as the accountability measure.

The distribution of studies by cultural dimension is summarized in Table 9. Dimension I: Professional Orientation was represented by the fewest number of studies, 8; while Dimension II: Organizational Structure and Dimension III: Quality of the Learning Environment, were represented by the most studies with 18 and 17 studies respectively. Dimension IV: Student-Centered Focus was represented by nine studies and five studies contained elements that addressed all four dimension of culture.

Table 10 provides analysis of studies included in the meta-analysis by publication type. Over half of the studies (57%) included in the meta-analysis are unpublished studies, with fourteen studies in the form of unpublished doctoral dissertations. Published studies represent the remaining 43% of the studies in the meta-analysis. The majority of published studies (10) are from professional journals, with the remaining three studies representing online publications.

Coding Reliability

The accurate coding of data is essential to ensuring valid results when conducting a meta-analysis. Therefore it is important to utilize more than one coder when coding data for a meta-analysis. In the current study, a second coder was trained in the coding process and independently coded all studies for correlations and cultural dimensions. The analysis of the coding of studies by the researcher and the second coder revealed an overall inter-rater reliability of 93.4% for the coding of study correlations and cultural dimensions. The inter-rater reliability for correlations alone was 97.4%, with four differences reported between coder one and coder two. Discrepancies existed in four of the 152 reported correlations. Each correlation was checked by going back to the original study and locating the correlation. Three of the correlations, two from DiPaola and Hoy (2005) and one from Pounder et al. (1995), were confirmed as having been coded correctly and remained unchanged in the final coding. One correlation from Gruenert (2005) was determined to have been coded incorrectly and was appropriately changed to 0.397 in the final coding for the meta-analysis.

The comparison of cultural dimensions coded for each study produced 16 variations between coder one and coder two for an inter-rater reliability of 89.5%. Nine of these variations were accounted for by the researcher being more inclusive of cultural dimensions within the identified study than the second coder. Barth (2001) was coded by the researcher as representing all five cultural dimensions, while the second coder only coded the study as representing dimensions I and II. Likewise, the researcher included the key term *organizational citizenship* as used by Brown et al. (2003) and DiPaola and Hoy (2005) as representing both dimensions I and III while the second coded only coded them as representing dimension I. This accounted for a total of three variations in coding. The key term reported as *attitude toward school improvement* as included in Frayley (2007) and Gruenert (2005) was coded by the researcher as dimension III and by the second coder as dimension II, accounting for four additional variations in coding. Additionally, the terms *learning environment* and *home school relations* as used in Krawczyk (2007) were coded by the researcher as dimensions III and IV respectively. Coder two identified the same terms as representing dimensions IV and II.

In each of the above cases, the identified studies were reviewed by both coders and discussed in relation to the cultural dimensions in question. After careful consideration by both the researcher and coder two, a decision was made to maintain the original coding for each of the studies and the cultural dimensions in question. It was also determined that the remaining discrepancy in coding for

Roney et al. (2007) was coded incorrectly by the researcher. One of the reported correlations for academic emphasis within the study was originally coded by the researcher as dimension II. The second coder correctly coded academic emphasis as dimension III. Therefore, the cultural dimension was changed to dimension III in the final coding for the meta-analysis.

Tests of Homogeneity

When conducting a meta-analysis, it is important to determine whether the effect sizes from the included studies all provide an estimate of the same population effect size (Lipsey & Wilson, 2001). In a homogeneous distribution of effect sizes, the effect sizes of included studies should vary from the mean effect size by no more than would be expected by sampling error. If the individual study effect sizes vary from the mean effect size by more than would be expected by sampling error alone, the studies represent a heterogeneous distribution. In a heterogeneous distribution, it is assumed that random differences between studies account for variations in the means that go beyond sampling error. These may include variations in procedures, settings, etc. that are also assumed to account for the variation of the individual study effect size from the mean effect size. A heterogeneous distribution acknowledges the almost unlimited number of characteristics that can vary among studies (Huedo-Medina, Sanchez-Meca, Marin-Martinez, & Botella, 2006).

The determination of homogeneity or heterogeneity of a meta-analysis also helps to determine the appropriate statistical model to use in the analysis of

studies. Homogeneous effect size distributions are appropriately represented in a fixed effects model, while a heterogeneous distribution of effect size is best represented using a random effects model (Lipsey & Wilson, 2001). In order to assess the homogeneity of the effect size statistics, a Q statistic was computed to determine if the effect sizes of the included studies that are averaged into a mean value all estimate the same population effect size. The Q statistic is the weighted variance of the effect size statistics. The Q statistic was compared to a critical value obtained for a chi-square distribution with k-1 degrees of freedom (where k is the number of studies in the sample) at the alpha=0.05 level of significance.

Table 11 shows the Q statistic for the data set is 264.956 with 29 degrees of freedom and a p value of 0.000. Since the Q statistic exceeded the critical values for a chi-square of k – 1 degrees of freedom, the null hypothesis of homogeneity was rejected and the distribution of effect sizes was determined to heterogeneous. In other words, within-study error is not the only source of variance within this meta-analysis (Borenstien et al., 2007). Borenstein et al. (2007) caution the sole use of the Q significance test. According to Huedo-Medina et al. (2006), “A shortcoming of the Q statistic is that it has poor power to detect true heterogeneity among studies when the meta-analysis includes a small number of studies and excessive power to detect negligible variability with

Table 11

Q Statistic

Model	# of Studies (k)	Heterogeneity				Tau Squared			
		Q value	df(Q)	P-value	I-squared	Tau Squared	Std. Error	Variance	Tau
Random	30	264.956	29	0.000	89.055	0.032	0.033	0.000	0.179

a high number of studies" (p. 4). Borenstein et al. (2007) and Huedo-Medina et al. propose the I-squared statistic as a means to quantify the dispersion noted after a statistical significant Q test. For this study, the I-squared value is 89.055 which indicate that 89% of the observed variance is due to real differences in the effect size with only about 11% of the observed variance based on random error. The tau-squared value is 0.179. This represents the between-studies variance that was used in computing weights.

According to Huedo-Medina et al. (2006), the rejection of the null hypothesis of homogeneity leads the meta-analyst to either search for moderator variables until the null hypotheses of homogeneity is accepted or assume a random-effects model. Therefore, a random effects model was chosen for the current meta-analysis.

Random Effects Model

The calculated *Q* statistic of 264.956 exceeds the critical value and the null hypothesis of homogeneity was rejected. Therefore, it is assumed that random variations other than sampling error occur in the included studies. This led the researcher to select and use the random effects model for the present meta-analysis. "The random effects model assumes that to represent the variation among effect sizes another random component must be included in the statistical model in addition to subject-level sampling error" (Lipsey & Wilson, 2001, p. 116). In a random effects model, "the weight applied to each effect size in any analysis must represent both subject-level sampling error and the

additional random variance component assumed by the random effects model (p. 118).

The main difference in the random effects model and a fixed effects model is that in a random effects model the weights are calculated using a variance component that incorporated between-study variance in addition to the within-study variance used in the fixed-effect model (Field, 2001). There are essential random differences between studies that are associated with the dimensions of school culture, school level, student achievement measure, etc. In addition to the indications of between-studies variability, the random-effect model allows for the estimation of the mean of a distribution of effects. This prevents the underestimation of the weight of a small study or the overestimation of the weight of a large study (Borenstein et al., 2007).

Analysis of Effect Size

A total of 30 studies were included in this meta-analysis analyzing the effect of school culture as defined by Schoen and Teddlie and student achievement. These studies included a total of 152 correlations and included 3,378 schools. Using Biostat's *Comprehensive Meta-Analysis Software Version 2.0* (Borenstein et al., 2005), all correlations were converted into Fisher z scores which were then converted back to correlations for presentation. The effect size z and its variance is used to yield a combined effect and confidence limits in the Fisher z metric (Borenstein et al., 2007).

In the analysis, the studies included serve as the unit of analysis. However, many of these studies contain more than one effect size. Since different effect sizes within the same study are statistically dependent, including them in the same analysis would violate the assumption of independent data points which is fundamental to the principles of statistical analysis (Lipsey & Wilson, 2001). As Lipsey and Wilson state:

> It may be tempting to use the effect size as the unit of analysis despite multiple effect sizes from some studies; this procedure potentially introduces substantial error into any statistical inference. The inflated sample size (N of effect sizes rather than N of studies), the distortion of standard error estimates arising from inclusion of nonindependent data points, and the overrepresentation of those studies that contribute more effect sizes can render the statistical results highly suspect. (p. 105)

Therefore, studies with multiple measures or effects were grouped to assess the effect by overall study to come up with one general correlation or effect. This ensured that studies with multiple correlations were not overrepresented in the calculation of the overall mean effect size.

On the other hand, effect sizes that are based on large sample sizes have less sampling error and are more precise than studies with small sample sizes. (Lipsey & Wilson, 2001) Therefore, it is essential that large studies are appropriately weighted in the calculation of the mean effect size. If all effect sizes

were treated equally, it would be assuming that all effect sizes make the same contribution to the overall mean effect size (Lipsey & Wilson). Since studies with larger sample sizes should play a larger part in the meta-analysis than studies with small sample sizes, all study effect sizes were weighted by the inverse of the sampling error variance in the calculation of the mean effect size.

Based on the *rule of thumb* for product moment correlation effect size magnitudes suggested by Lipsey and Wilson (2001), correlation effect size values are considered small if less than or equal to .10, medium if equal to .25, and large if greater than or equal to .40. This meta-analysis yielded a combined effect of r= .349 which is interpreted as a moderately strong effect.

Distribution of Effect Size

The funnel plot in Figure 2 plots the standard error on the vertical axis and the converted Fisher Z effect size on the horizontal axis. Large studies, in terms of sample size, appear toward the top of the graph and cluster near the mean effect size with a few studies positively skewed. Smaller studies tend to cluster toward the bottom of the funnel. In the absence of publication bias the studies would be distributed symmetrically about the combined effect size. By contrast, in the presence of bias, the bottom of the plot would show a higher concentration of studies on one side of the mean than the other. This would reflect the fact that smaller studies, which appear toward the bottom, are more likely to be published if they have larger than average effects, which makes them more likely to meet

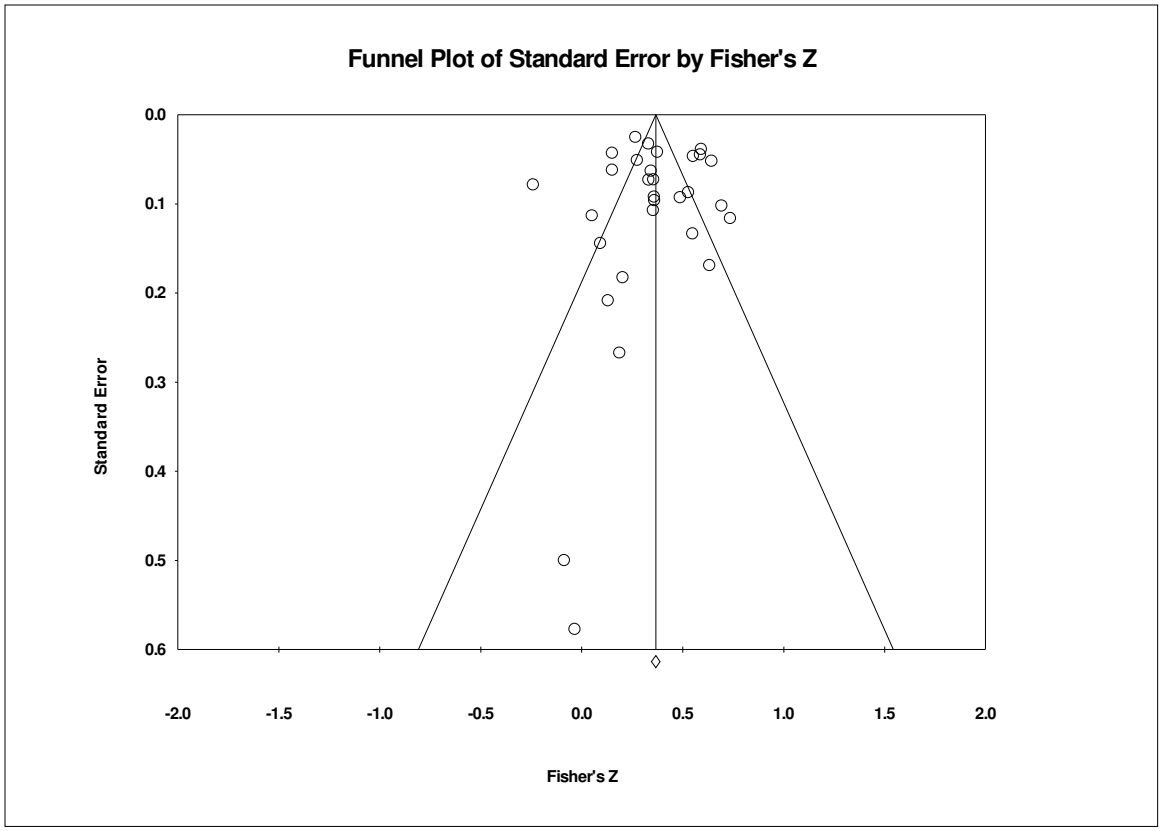

Figure 2. Funnel plot.

the criterion for statistical significance (Borenstein et al., 2007). The funnel plot presents a balanced picture of the studies in this meta-analysis.

Publication Bias

Publication bias is a major threat to the validity of research and can, "distort the totality of the available evidence on a research question, which leads to misleading inferences in reviews and meta-analyses" (Ioannidis & Trikalinos, 2007, p. 1,091). The assumption is that smaller studies with non-significant findings are often left unpublished, while large studies with significant findings are more like to be published (Lipsey & Wilson, 2001; Ioannidis & Trikalinos). By plotting sample size and effect size on a scatterplot, the data points should be in the shape of a funnel (Lipsey & Wilson). In order to determine the presence or lack of publication bias common approaches seek to determine the presence of asymmetry, visually represented in funnel plots (Ioannidis & Trikalinos). In the present meta-analysis, the funnel plot presents a balanced picture of the included studies. Additionally, unpublished studies represent approximately 57% of the included studies in the meta-analysis. With the number of unpublished studies outnumbering published studies, it is unlikely that publication bias is present within the study.

However, in order to ensure this issue of publication bias was addressed appropriately within the study, a fail-safe N calculation was performed for this meta-analysis. The fail-safe N estimates the number of unpublished studies needed to nullify a positive effect (Lipsey & Wilson, 2001). This meta-analysis

incorporates data from 30 studies, which yielded a z-value of 9.581 and corresponding 2-tailed p-value of 0.00. The fail-safe N is 5,992. This means that the researcher would need to locate and include 5,992 *null* studies in order for the combined 2-tailed p-value to exceed 0.05. In other words, there would need to be 200 missing studies that show a negative or non-significant effect for every observed study for the effect to be nullified. The fail-safe N test provides additional support for a lack of publication bias as represented in the funnel plot in Figure 2.

Summary of Meta-Analysis

Examination of the effect size distribution indicated that the included studies in the meta-analysis represent a heterogeneous distribution. This finding led the researcher to select and utilize a random effects model for the meta-analysis. After selecting the random effects model, test were performed to determine if there is a presence of publication bias within the meta-analysis. From the results of the funnel plot, fail-safe N, and the inclusion of a large number of unpublished studies (57%), it is likely that publication bias is not an influence on the outcome of the meta-analysis.

Table 12 displays the results of the meta-analysis examining the effects of school culture on student achievement. The display includes a listing of the authors of each of the studies, along with the subgroups included in the meta-analysis as computed with the Comprehensive Meta-Analysis software. The table also shows the subgroups measured, the correlation coefficient, the lower and

Table 12

Results of Meta-Analysis

				Statistics for each study			
Study Name	Publication Type	Subgroup	Correlation	Lower Limit	Upper Limit	Z-Value	p-Value
Alig-Mielcarek (2003)	Dissertation	Elementary	0.358	0.285	0.428	8.969	0.000
Arnold (2007)	Record of Study	Elementary	0.092	-0.188	0.359	0.641	0.522
Barth (2001) a	Dissertation	Middle	0.341	0.210	0.461	4.891	0.000
Brown, Claudet, Olivarez (2003)	Journal (online)	Middle	0.561	0.293	0.746	3.748	0.000
Demery (2000)	Dissertation	Elem/Midd	-0.236	-0.375	-0.086	-3.059	0.002
DiPaola & Hoy (2005)	Project Muse	High School	0.321	0.187	0.443	4.561	0.000
Dowis (2005)	Dissertation	Elementary	0.201	-0.153	0.509	1.115	0.265
Erbe (2000)	Presentation Paper	Elementary	0.502	0.431	0.567	11.869	0.000
Fraley (2007)	Dissertation	K-12	0.268	0.173	0.359	5.392	0.000
Gruenert (2005)	Journal	K-12	0.319	0.261	0.376	10.128	0.000
Henderson et al (2005)	Journal	Middle	0.186	-0.324	0.612	0.702	0.483
Herndon (2007)	Dissertation	Elementary	0.345	0.177	0.493	3.905	0.000
Hirsch & Emerik (2006a)	Published Report	Elementary	0.331	0.217	0.436	5.459	0.000

Table 12

Results of Meta-Analysis (continued)

				Statistics for each study			
Study Name	Publication Type	Subgroup	Correlation	Lower Limit	Upper Limit	Z-Value	p-Value
Hirsch & Emerik (2006b)	Published Report	Elementary	0.260	0.214	0.306	10.584	0.000
Hoy & Hannum (1997)	Journal	Middle	0.528	0.462	0.588	13.108	0.000
Klinginsmith (2007)	Dissertation	Middle	0.150	0.030	0.267	2.444	0.015
Krawczyk (2007)	Dissertation	Elem	0.453	0.297	0.585	5.257	0.000
Leithwood & Mascall (2008)	Journal	K-12	0.340	0.143	0.511	3.303	0.001
McGuigan & Hoy (2006)	Journal	Elementary	0.627	0.469	0.746	6.336	0.000
Pounder, Ogawa, & Adams (1995)	Journal	K-12	0.346	0.170	0.500	3.747	0.000
Roney, Coleman, Schlichting (2007)	Journal	Middle	-0.086	-0.788	0.713	-0.173	0.863
Sherblom, Marshall, & Sherblom (2006)	Journal	Elementary	0.567	0.494	0.632	12.378	0.000
Smith & Hoy (2007)	Journal	Elementary	0.600	0.457	0.713	6.791	0.000
Smith, A (2006)	Dissertation	K-12	0.500	0.280	0.670	4.112	0.000
Smith, K (2008)	Dissertation	Elementary	0.484	0.343	0.603	6.065	0.000

Table 12

Results of Meta-Analysis (continued)

				Statistics for each study			
Study Name	Publication Type	Subgroup	Correlation	Lower Limit	Upper Limit	Z-Value	p-Value
Soileau (2007)	Record of Study	High School	0.130	-0.271	0.493	0.627	0.531
Solomon (2007)	Dissertation	Middle	0.150	0.067	0.231	3.518	0.000
Sweatt (2000)	Dissertation	K-12	-0.034	-0.823	0.800	-0.059	0.953
Sweetland & Hoy (2000)	Journal	Middle	0.532	0.475	0.584	15.276	0.000
Williams (2006)	Dissertation	Elementary	0.051	-0.169	0.266	0.451	0.652
Overall			0.349	0.282	0.412	9.581	0.000

upper limits, the z score, and the level of significance for each study in the meta-analysis as well as the overall effect size. A chart of all coded data can be found in Appendix A. The overall effect size was found to be r = .349 (p = .000), representing a moderately strong effect of school culture on student achievement.

Figure 3 displays the forest plot for the present study showing individual study effect sizes and their corresponding 95% confidence intervals. The forest plot visually displays information from the individual studies included in the meta-analysis as well as the estimate of the overall effect of all studies together (Lewis & Clarke, 2001). The effect size of each study is represented by a square. A horizontal line runs through each square to represent the 95% confidence interval of each study. The plot illustrates the dispersion of the effect sizes of the individual studies included in the meta-analysis and also demonstrates the varying levels of precision of the included studies. Studies with small sample sizes are represented by longer horizontal lines, representing larger confidence intervals due to the lack of confidence associated with smaller studies. Larger studies are represented by shorter horizontal lines, representing smaller confidence intervals and the high level of confidence associated with larger studies (Borenstein et al., 2007).

The diamond at the bottom of the forest plot represents the overall estimate and confidence interval for the meta-analysis. “The center of the diamond represents the pooled point estimate, and its horizontal tips represent

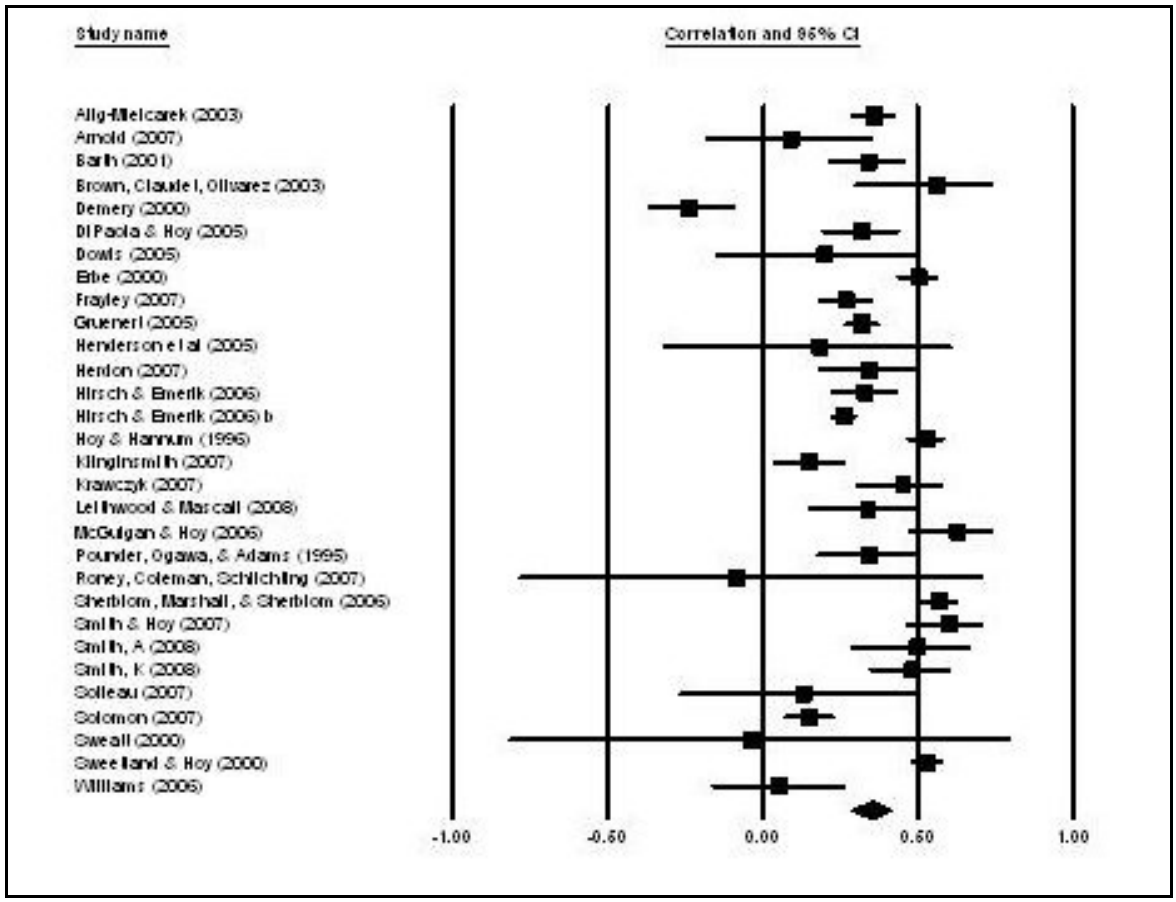

Figure 3. Forest plot.

the confidence interval." (Lewis & Clark, 2001, p. 1,479) Examination of the forest plot in figure three illustrates that all but three studies in the meta-analysis contained a positive effect size. It also illustrates that the overall mean effect of r = .349 is a good representation of the effect sizes contained in the individual studies.

Research Question 1

The primary research question presented for study in this meta-analysis asked: what is the effect size of school culture on student achievement in K – 12 schools in the United States. The results of the meta-analysis produced an effect size of r = .349 (p=0.000) representing the effect of school culture variables on student achievement. Therefore, the null hypothesis that there will be no correlation between school culture and student achievement was rejected. An effect of .349 represents a moderately strong effect of school culture on student achievement.

Research Question 2

The second research question: Are there dimensions of school culture that have larger effect sizes than others on student achievement at the K-12 level was to be addressed pending the availability of adequate samples sizes by cultural dimension. Given the relatively small number of studies that represented Dimension I: Professional Orientation and Dimension IV: Student-Centered Focus, as well as the overlapping nature of five additional studies, it was

determined that a comparison between cultural dimensions would not produce valid results.

Summary

This chapter presented the findings of the meta-analysis conducted on 30 identified studies examining the effects of school culture on student achievement. In addition, the chapter provided a summary of study characteristics and meta-analytic tests used to determine the level of homogeneity and publication bias of included studies. Utilizing a random effects model, a moderate effect of $r = 0.349$ ($p = 0.000$) was found between school culture and student achievement.

CHAPTER 5: DISCUSSION AND CONCLUSIONS

This chapter provides a discussion and interpretation of the findings of the present meta-analysis. The chapter begins with a summary of findings, followed by the researcher's interpretation of the findings. The chapter then discusses the findings relative to previous studies examining the relationship between student culture and student achievement. This is followed by a discussion of the findings relative to principal leadership and teacher effectiveness. The chapter continues with a discussion of the practical implications of the findings, resulting conclusions, and the presentation of suggestions for additional study relative to principal leadership, school culture, student achievement, and teacher effectiveness.

Summary and Analysis of Findings

The meta-analysis utilizes Schoen and Teddlie's (2008) model of school culture as the operational definition of school culture. This model describes four dimensions: (a) Dimension I: Professional Orientation, (b) Dimension II: Organizational Structure, (c) Dimension III: Quality of the Learning Environment, and (d) Dimension IV: Student-Centered Focus. A comprehensive search of existing studies produced a total of 30 studies that met all established criteria for inclusion. These 30 studies were examined using a random effects model to determine the overall effect of school culture on student achievement. Results of the meta-analysis reveal an overall effect size of $r = .349$ ($p=0.000$).

This finding represents a strong moderate effect of school culture on student achievement. A quick view of the forest plot (see Figure 3) show this finding to be a good representation of the individual studies contained in the meta-analysis. This finding also compares with the findings of other meta-analyses that have examined the relationship between school culture and student achievement, most notably is the work of Waters et al. (2003) and Marzano et al. (2005). In their analysis of 30 years of research on leadership and student achievement, they reported correlations on *The 21 Responsibilities of the School Leader*. School culture is analyzed as one of these 21 responsibilities and correlational results are reported between school culture and student achievement in both the 2003 and 2005 publication. In the 2003 publication, the report correlation for the responsibility of culture contained 13 studies and 709 schools. The overall correlation between school culture and student achievement was report as r = .29. In their 2005 publication, they again reported findings on all 21 of the leadership responsibilities. This time, reported correlation for school culture included 15 studies and 819 schools, with a reported correlation of r = .25.

The finding of a strong moderate effect of school culture and student achievement in this study includes 2,686 schools from the 30 included studies. This is double the number of studies included in Marzano et al.'s (2005) study relative to school culture and also includes more than three times the numbers of school within the included studies. Marzano et al.'s work with the 21

responsibilities of school leadership is widely accepted among researchers and practicing educators. Given the level of significance (p = .000) of the current meta-analysis and the numbers of studies included in the analysis, the results appear to be a valid representation of the effects of the correlation between school culture and student achievement. The finding of a strong moderate effect further establishes the correlation between school culture and student achievement in the research literature.

Principal Leadership and Teacher Effectiveness

When analyzing the findings of the present analysis they must also be interpreted within the larger context of this study. As outlined in chapter 1, student achievement is used in this study as a proxy measure of teacher effectiveness. Therefore, it is also important to examine the findings of this study in terms of the relationship between principal leadership and teacher effectiveness. The literature reviewed in chapter 2 does not provide a clear, quantitatively measurable, definition of teacher effectiveness. However, the research does provide justification for the use of student achievement data as a proxy measure of teacher effectiveness and provides a quantifiable measure of teacher effectiveness that can be correlated with quantitative measures of school culture.

As discussed in the theoretical framework for the meta-analysis, the research reviewed clearly shows that principal leadership is correlated with student achievement (Hallinger & Heck, 1996, 1997; Hallinger et al., 1996;

Leithwood et al., 2004; Walters et al., 2003). However, the literature indicates that principal leadership does not have a direct impact on student achievement, but rather it impacts student achievement through indirect or mediating factors (Leithwood et al., 2004; Hallinger & Heck, 1996, 1997; Hallinger et al., 1996; Robinson, 2007). School culture, climate, and related elements of culture emerged as a common theme and is described by many researchers and authors as an important factor in improving student performance (Blasé & Blasé, 1999; Brock & Groth, 2003; Evans, 1996; Hallinger & Heck, 1997; Hallinger et al., 1996; Hollas, 2001; Kruger et al., 2007; Leithwood et al., 2004; Leithwood et al., 2006; Liontos, 1992; Marzano et al., 2005; Supovitz & Christman, 2005; Waters et al., 2003; Zigarmi et al., 2005).

The strong moderate effect of r = .349 found between school culture and student achievement provides further validation that school culture is a significant mediating factor of leadership on student achievement. Since student achievement serves as a proxy measure of teacher effectiveness, the findings of this study also indicates that there is a strong moderate correlation between school culture as a mediating factor of principal leadership and teacher effectiveness.

Implications for Findings

The results of the study show a correlation of r = .349 between the mediating factor of school culture on teacher effectiveness as measured by student achievement. This finding has several practical implications within the

research and education communities. First of all, the finding of a strong moderate relationship between school culture and teacher effectiveness as measured by student achievement provides practicing school administrators with an area of focus to improve the effectiveness of teachers and achieve higher levels of student performance. Given the many mediating factors that exist in the field of education, it is important that principals have empirical evidence that relates to specific mediating factors that lead to improved student achievement. This finding will be beneficial for school principals to assess the culture of their school and develop strategies to design any areas of weakness in school culture. Based on the study findings, improvements in school culture should lead to improvement in student achievement, and by proxy, indicate improved teacher effectiveness.

The finding of a moderately strong correlation between school culture and teacher effectiveness as measure by student achievement supports the inclusion of the study of school culture by pre-service school administrators. Schools of education should consider providing opportunities for the in-depth study of school culture within their graduate level programs. This would allow prospective school leaders with opportunities to observe, analyze, and understand the importance of school culture prior to assuming the role of principal or assistant principal. Given these opportunities, a school leader will be more likely to examine cultural elements within their school and recognize the importance of school culture to the school improvement process.

The findings also support the inclusion of school culture measures as a component of administrative evaluation process. If there is a significant correlation between school culture and student achievement as this study shows, then administrators should seek to maintain, establish, or improve a positive culture within their school. By including evaluations of school culture as part of administrative evaluations, principals will be held accountable for trying to ensure that a positive culture exists or is created.

Suggestions for Further Research

The research and findings of this study provide several areas for possible future research. Based on the findings of this study, the most obvious question left to answer is how. How can practicing administrators improve the culture of schools? Are there specific practices that can be put in place? Do certain models of professionalism and collaboration lend themselves more to the establishment of and maintenance of positive school culture than others. One current movement that is underway which may need validation of its effectiveness in improving school culture is the Professional Learning Communities (PLC) model which many schools and systems are beginning to implement.

Vescio, Ross, and Adams (2008) conducted a review of research examining the impact of PLCs on teaching practices and student learning. Based on their findings, few studies on PLCs were found to, “move beyond the self-report of positive impact” (Vescio et al., 2008, p. 80). Their research found 11 studies, 10 in the United States and one in England that examine the impact of

PLCs on teaching practices and students learning. Of these 11 studies, only eight made an attempt to make connections between PLCs and improved student achievement. There is a definite need for additional empirical research relating PLCs to improved teacher effectiveness and increased student achievement. As Vescio et al. state:

> "Additional and rigorous research documenting the impact of teaching practice and student achievement is imperative." (p. 89)

In addition, other models designed to improve the culture of the school should be examined empirically to determine their effect on teacher effectiveness and student achievement.

The present study did not contain enough studies by cultural dimension to effectively analyze the correlation of each of Schoen and Teddlie's dimensions of culture. Additional quantitative research in each of the dimensions, especially Dimension I: Professional Orientation and Dimension IV: Student-Centered Focus, will provide valuable data to further prioritize the dimensions of culture and possibly give principals and other school leaders with more specific areas of focus that may lead to improved student achievement.

In addition to the need for additional research based on the findings of this study, the research reviewed in the literature review illustrates the continued need for the development of an agreed upon definition of school culture so effective processes and instruments can be developed to measure the same components of school culture and provide data which is comparable from school

to school. The model of culture as defined by Schoen and Teddlie provides a possible starting point for such a model.

Conclusion

Whether a school culture is considered *toxic*, as defined by Deal and Peterson (1999) or is functional, an understanding and recognition of the culture of the school is essential to achieve and/or maintain high levels of student performance. Examining, the Balanced Leadership Framework provided by Marzano et al. (2005), culture ranks sixth highest in the order of correlations with student academic achievement, with a correlation of r = .25. The highest correlation found by Marzano et al. was in the area of situational awareness, with a correlation of r = .33. Other leadership behaviors that were reported as having a higher correlation with improved student academic achievement than culture included: (a) flexibility, r = .28, (b) discipline, r = .27, (c) outreach, r = .27, and (d) monitoring/evaluating, r = .27.

The findings of the current meta-analysis of r = .349, represents a strong moderate correlation between school culture and student achievement. When comparing this result to the correlations provided by Marzano et al., this would place school culture at the top of the list of the order of correlation with student achievement. Recognizing that other behaviors included in Marzano, Waters, and McNulty's work would fit into the broader definition of school culture used in this study, the different timeframes used for inclusion of studies, and other study related factors, this direct comparison cannot be made. However, this finding

does validate the high level of importance that school principals must place on school culture as they seek to achieve high levels of student achievement.

In today's world of high stakes accountability, student achievement is ultimately the final measure by which the effectiveness of a school, teacher, and principal is judged. It is crucial for practicing school principals to recognize school culture as a major factor contributing to the ultimate goal of improved student achievement. Stolp (1994) states the importance of principals recognizing the critical nature of school culture as follows:

> "By deepening their understanding of school culture, these leaders will be better equipped to shape the values, beliefs, and attitudes necessary to promote a stable and nurturing environment." (Stolp, p. 1)

Many practicing school leaders feel the public and political pressure of achieving high levels of student performance in as quick of a manner as possible. This pressure has led to the search for a quick, magic bullet approach to improving student achievement. Programs are often quickly implemented, without appropriate study, input, planning and training, and are then abandoned just a quickly based on lack of improvement in student achievement. Little thought is given to the impact that school culture plays in success or failure of any improvement effort.

Marzano et al. (2005) discuss this in terms of *first-order* and *second-order* changes. A first-order change is described as a change that: (a) "is perceived as

an extension of the past", (b) "fits within existing paradigms", (c) "is consistent with prevailing values and norms", (d) "can be implemented with existing knowledge and skills," (e) "requires resources currently available to those responsible for implementing the innovations", and (f) "may be accepted because of a common agreement that the innovation is necessary" (p. 113). In first-order changes, culture should provide a sense of team spirit and cooperation as the changes are being implemented (Marzano et al.).

Second-order changes are described at the opposite end of the spectrum. Second-order changes are described as changes that: (a) "is perceived as a break with the past", (b) "lies outside existing paradigms", (c) "conflicts with prevailing values and norms", (d) "requires the acquisition of new knowledge and skills", (e) "requires resources currently not available to those responsible for implementing the innovations", and (f) "may be resistant because only those who have a broad prospective of the school see the innovation as necessary" (Marzano et al., 2005, p. 113). Marzano et al. indicate that second-order changes are negatively correlated with school culture and may lead to deterioration in team spirit, cooperation, and a common language that are typically associated with a first-order change.

Although the first and second-order changes described above provide excellent insight into the importance of school culture in the change and school improvement process, it is important that principals use caution in determining the level of change being implemented. Principals must be fully aware of the

culture of the school to determine if the change to be implemented is a first or second-order change. In practice, it is easy to assume that what seems to be a first-order change on the surface may actually be a second-order change to many teachers and staff members. It is common place for teachers within the same building to be at varying levels of skill and understanding of what seems to be a simple change in practice. It is essential for building level principals to assess the culture and understanding of the change being implemented regardless of the perceived order of change. This is especially important for principals new to a school building, who may not be aware of the existing values and norms within the school or the knowledge and skill levels of the teachers within the building. Any improvement effort is likely to fail if it is in conflict with the predominant culture of the school.

In many cases, principals will have to develop the culture that they want within their school, and this takes time. Quick fixes, if successful at all, only exist at the surface and will quickly deteriorate if they are not supported by the culture of the school. Establishing a school culture supportive of continuous improvement is the only way to provide opportunities for lasting and sustainable school improvement to occur. Principals must invest the necessary time and resources in order to develop such a culture. Research indicates that school culture correlates with teachers' attitudes towards their work and stronger school cultures have more highly motivated teaching (Stolp, 1994). A positive school culture that encourages continuous improvement and leads to more highly

motivated teachers, leads to more effective teaching, and ultimately higher student achievement. “Unless we address the issue of school culture … there is little chance that school improvement will be achieved” (Hopkins, 1995 in Schoen & Teddlie, 2008, p. 148).

Summary

The findings of the present meta-analysis of r = .349 (p = .000) represent a strong moderate correlation between the mediating factor of school culture and student achievement as a proxy measure of teacher effectiveness. These findings are based on a comprehensive search of empirical studies and provide a statistically significant evidence that improvements in school culture should lead to improvements in teacher effectiveness and higher levels of student achievement. These results strengthen the existing research related to school culture and student achievement and provide a possible focus area for principals and other school leaders as they seek to improve teacher effectiveness and student achievement.

The focus on school culture necessitates further research on how principals can effectively improve the culture of their schools. This is accompanied by the need to empirically evaluate the effectiveness of current models and practices being implemented to improve school culture and their impact on student achievement. In addition, further research is needed relative to the specific dimensions of Schoen and Teddlie’s dimensions of culture. Finally, the research in the area of school culture would be greatly enhanced by the

establishment of consistent and empirically measurable definition of school culture.

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APPENDIX A: STUDIES REVIEWED AND INCLUDED IN META-ANALYSIS

Study Number	Study Name	Publication Type	Subgroup within Study	Outcome Measures and Leader's EI	Correlation	Sample Size
1	Alig-Mielcarek (2003)	Dissertation	Elem Read	Survey	0.21	146
1	Alig-Mielcarek (2003)		Elem Math	Survey	0.26	146
1	Alig-Mielcarek (2003)		Elem Read	Survey	0.45	146
1	Alig-Mielcarek (2003)		Elem Math	Survey	0.49	146
2	Arnold (2007)	Record of Study	Elem overall	LPI & TAKS (shared vision)	0.043	51
2	Arnold (2007)		Elem overall	LPI & TAKS (others to act)	0.141	51
3	Barth (2001) a	Dissertation	Middle Math High	OHI & SAT	0.134	31
3	Barth (2001) a		Middle Math Low	OHI & SAT	0.463	38
3	Barth (2001) b		Middle Lang. High	OHI & SAT	0.268	31
3	Barth (2001) b		Middle Lang. Low	OHI & SAT	0.425	38
3	Barth (2001) c		Middle Read High	OHI & SAT	0.214	31
3	Barth (2001) c		Middle Read Low	OHI & SAT	0.434	38
4	Brown, Claudet, Olivarez (2003)	Journal (online)	Middle	OCLI & TAAS (Org citizenship)	0.65	38
4	Brown, Claudet, Olivarez (2003)		Middle	OCLI & TAAS (Leadership/support)	0.51	38
4	Brown, Claudet, Olivarez (2003)		Middle	OCLI & TAAS (Collaboration)	0.51	38
5	Demery (2000)	Dissertation	Elem/Midd Math	Survey and NCEOG	-0.25	30
5	Demery (2000)		Elem/Midd Math	Survey and NCEOG	-0.33	30
5	Demery (2000)		Elem/Midd Math	Survey and NCEOG	-0.25	30
5	Demery (2000)		Elem/Midd Read	Survey and NCEOG	-0.16	30
5	Demery (2000)		Elem/Midd Read	Survey and NCEOG	-0.25	30
5	Demery (2000)		Elem/Midd Read	Survey and NCEOG	-0.17	30
6	DiPaola & Hoy (2005)	Project Muse	HS Read	OCBSS & Ohio 12th Grade Prof Test	0.27	97
6	DiPaola & Hoy (2005)		HS Math	OCBSS & Ohio 12th Grade Prof Test	0.37	97
7	Dowis (2005)	Dissertation	Elem State RC	School Culture Triage Survey & PACT	0.14	18
7	Dowis (2005)		Elem State RC	School Culture Triage Survey & PACT	0.26	18
8	Erbe (2000)	Presentation Paper	Elem Math 97	Survey & State Report Card	0.54	80
8	Erbe (2000)		Elem Math 97	Survey & State Report Card	0.31	80
8	Erbe (2000)		Elem Math 97	Survey & State Report Card	0.67	80
8	Erbe (2000)		Elem Math 94	Survey & State Report Card	0.46	80

8	Erbe (2000)			Elem Math 94	Survey & State Report Card	0.28	80
8	Erbe (2000)			Elem Math 94	Survey & State Report Card	0.66	80
9	Fraley (2007)		Dissertation	K-12 LA	SCS & ISTEP	0.187	35
9	Fraley (2007)			K-12 LA	SCS & ISTEP	0.201	35
9	Fraley (2007)			K-12 LA	SCS & ISTEP	0.34	35
9	Fraley (2007)			K-12 LA	SCS & ISTEP	0.176	35
9	Fraley (2007)			K-12 LA	SCS & ISTEP	0.199	35

Study Number	Effect Direction		Culture Dimension		Key Term	Location
1	3	Positive 3	2	1) professional Orientation	goals	Ohio
1	3	Negative 2	2	2) organizational structure	goals	Ohio
1	3	Unspecified 1	3	3) learning environment	academic press	Ohio
1	3		3	4) student-centered focus	academic press	Ohio
2	3		2	5) All	shared vision	Texas
2	3		2		enabling others to act	Texas
3	3		5		Organizational Health	WV
3	3		5		Organizational Health	WV
3	3		5		Organizational Health	WV
3	3		5		Organizational Health	WV
3	3		5		Organizational Health	WV
3	3		5		Organizational Health	WV
4	3		1,3		Organizational Citizenship	Texas
4	3		2		Leadership/support	Texas
4	3		1		Collaboration	Texas
5	2		3		Academic emphasis	NC
5	2		3		Academic emphasis	NC
5	2		3		Academic emphasis	NC
5	2		3		Academic emphasis	NC
5	2		3		Academic emphasis	NC
5	2		3		Academic emphasis	NC
6	3		1,3		Organizational Citizenship	Ohio
6	3		1,3		Organizational Citizenship	Ohio
7	3		1		Collaboration	SC

7	3	1	Collegiality	SC
8	3	3	Focus on Learning	Chicago
8	3	2	Inclusive Leadership	Chicago
8	3	4	Parent Involvement	Chicago
8	3	3	Focus on Learning	Chicago
8	3	2	Inclusive Leadership	Chicago
8	3	4	Parent Involvement	Chicago
9	1	1	Collaboration	Indiana
9	1	1	Collegial Support	Indiana
9	1	2	Collaborative Leadership	Indiana
9	1	2	Unity of Purpose	Indiana
9	1	3	Attitude toward School Improv.	Indiana

Study Number	Study Name	Publication Type	Subgroup within Study	Outcome Measures and Leader's EI	Correlation	Sample Size
9	Fraley (2007)		K-12 LA	SCS & ISTEP	0.427	35
9	Fraley (2007)		K-12 Math	SCS & ISTEP	0.237	35
9	Fraley (2007)		K-12 Math	SCS & ISTEP	0.263	35
9	Fraley (2007)		K-12 Math	SCS & ISTEP	0.358	35
9	Fraley (2007)		K-12 Math	SCS & ISTEP	0.179	35
9	Fraley (2007)		K-12 Math	SCS & ISTEP	0.144	35
9	Fraley (2007)		K-12 Math	SCS & ISTEP	0.468	35
10	Gruenert (2005)	Journal	K-12 Math	SCS & SA	0.253	81
10	Gruenert (2005)		K-12 Math	SCS & SA	0.379	81
10	Gruenert (2005)		K-12 Math	SCS & SA	0.336	81
10	Gruenert (2005)		K-12 Math	SCS & SA	0.455	81
10	Gruenert (2005)		K-12 Math	SCS & SA	0.278	81
10	Gruenert (2005)		K-12 Math	SCS & SA	0.471	81
10	Gruenert (2005)		K-12 LA	SCS & SA	0.079	81
10	Gruenert (2005)		K-12 LA	SCS & SA	0.206	81
10	Gruenert (2005)		K-12 LA	SCS & SA	0.173	81
10	Gruenert (2005)		K-12 LA	SCS & SA	0.397	81
10	Gruenert (2005)		K-12 LA	SCS & SA	0.234	81
10	Gruenert (2005)		K-12 LA	SCS & SA	0.506	81

11	Henderson et al (2005)	Journal	Gr 8 Read	OHI & Tenn R Card (teach affil)	-0.086	10
11	Henderson et al (2005)		Gr 8 Read	OHI & Tenn R Card (Ac. Emph)	0.35	10
11	Henderson et al (2005)		Gr 8 Math	OHI & Tenn R Card (teach affil)	-0.075	10
11	Henderson et al (2005)		Gr 8 Math	OHI & Tenn R Card (Ac. Emph)	0.498	10
12	Herdon (2007)	Dissertation	Elem Math	SCS & MAP(colab leadership)	0.283	62
12	Herdon (2007)		Elem Math	SCS & MAP (collaboration)	0.139	62
12	Herdon (2007)		Elem Math	SCS & MAP (unity of purpose)	0.364	62
12	Herdon (2007)		Elem Math	SCS & MAP (collegial support)	0.308	62
12	Herdon (2007)		Elem Math	SCS & MAP (learning partnership)	0.602	62
12	Herdon (2007)		Elem CA	SCS & MAP(colab leadership)	0.243	62
12	Herdon (2007)		Elem CA	SCS & MAP (collaboration)	0.084	62
12	Herdon (2007)		Elem CA	SCS & MAP (unity of purpose)	0.361	62
12	Herdon (2007)		Elem CA	SCS & MAP (collegial support)	0.235	62
12	Herdon (2007)		Elem CA	SCS & MAP (learning partnership)	0.674	62
13	Hirsch & Emerick (2006a)	Published Report	Elem Read Meet	TWC & AIMS	0.333	38
13	Hirsch & Emerick (2006a)		Elem Read Exceed	TWC & AIMS	0.477	38
13	Hirsch & Emerick (2006a)		Elem Math Meet	TWC & AIMS	0.331	38

Study Number	Effect Direction	Culture Dimension	Key Term	Location
9	1	4	Learning Partnership	Indiana
9	1	1	Collaboration	Indiana
9	1	1	Collegial Support	Indiana
9	1	2	Collaborative Leadership	Indiana
9	1	2	Unity of Purpose	Indiana
9	1	3	Attitude toward School Improv.	Indiana
9	1	4	Learning Partnership	Indiana
10	1	1	Collaboration	Indiana
10	1	1	Collegial Support	Indiana
10	1	2	Collaborative Leadership	Indiana
10	1	2	Unity of Purpose	Indiana
10	1	3	Attitude toward School Improv.	Indiana
10	1	4	Learning Partnership	Indiana
10	1	1	Collaboration	Indiana

10	1	1	Collegial Support	Indiana
10	1	2	Collaborative Leadership	Indiana
10	1	2	Unity of Purpose	Indiana
10	1	3	Attitude toward School Improv.	Indiana
10	1	4	Learning Partnership	Indiana
11	2	4	Teacher Affiliation	Tenn
11	3	3	Academic emphasis	Tenn
11	2	4	Teacher Affiliation	Tenn
11	3	3	Academic emphasis	Tenn
12	3	2	Collaborative Leadership	Missouri
12	3	1	Collaboration	Missouri
12	3	2	Unity of Purpose	Missouri
12	3	1	Collegial Support	Missouri
12	3	4	Learning Partnership	Missouri
12	3	2	Collaborative Leadership	Missouri
12	3	1	Collaboration	Missouri
12	3	2	Unity of Purpose	Missouri
12	3	1	Collegial Support	Missouri
12	3	4	Learning Partnership	Missouri
13	3	2	Leadership	Arizona
13	3	2	Leadership	Arizona
13	3	2	Leadership	Arizona

Study Number	Study Name	Publication Type	Subgroup within Study	Outcome Measures and Leader's EI	Correlation	Sample Size
13	Hirsch & Emerick (2006a)		Elem Math Exceed	TWC & AIMS	0.297	38
13	Hirsch & Emerick (2006a)		Middle Read Meet	TWC & AIMS	-0.007	18
13	Hirsch & Emerick (2006a)		Middle Read Exceed	TWC & AIMS	0.299	18
13	Hirsch & Emerick (2006a)		Middle Math Meet	TWC & AIMS	0.102	18
13	Hirsch & Emerick (2006a)		Middle Math Exceed	TWC & AIMS	0.371	18
13	Hirsch & Emerick (2006a)		H S Read Meet	TWC & AIMS	0.499	16
13	Hirsch & Emerick (2006a)		H S Read Exceed	TWC & AIMS	0.425	16
13	Hirsch & Emerick (2006a)		H S Math Meet	TWC & AIMS	0.3	16
13	Hirsch & Emerick (2006a)		H S Math Exceed	TWC & AIMS	0.345	16

14	Hirsch & Emerick (2006b)	Published Report	ELEM	TWC & EOG	0.308	935
14	Hirsch & Emerick (2006b)		Middle	TWC & EOG	0.179	370
14	Hirsch & Emerick (2006b)		HS	TWC & EOG	0.203	281
15	Hoy & Hannum (1996)	Journal	Middle Math	OHI-RM & SA	0.28	86
15	Hoy & Hannum (1996)		Middle Math	OHI-RM & SA	0.73	86
15	Hoy & Hannum (1996)		Middle Math	OHI-RM & SA	0.53	86
15	Hoy & Hannum (1996)		Middle Read	OHI-RM & SA	0.28	86
15	Hoy & Hannum (1996)		Middle Read	OHI-RM & SA	0.7	86
15	Hoy & Hannum (1996)		Middle Read	OHI-RM & SA	0.51	86
16	Klinginsmith (2007)	Dissertation	Middle Math	Survey and MAP (vision)	0.189	133
16	Klinginsmith (2007)		Middle Math	Survey and MAP (goals)	0.169	133
16	Klinginsmith (2007)		Middle Math	Survey and MAP (Expectations)	0.108	133
16	Klinginsmith (2007)		Middle CA	Survey and MAP (vision)	0.16	133
16	Klinginsmith (2007)		Middle CA	Survey and MAP (goals)	0.155	133
16	Klinginsmith (2007)		Middle CA	Survey and MAP (Expectations)	0.121	133
17	Krawczyk (2007)	Dissertation	Elem	Survey & State Report Card	0.417	61
17	Krawczyk (2007)		Elem	Survey & State Report Card	0.487	61
18	Leithwood & Mascall (2008)	Journal	K-12	Survey & State Accountability Test	0.34	90
19	McGuigan & Hoy (2006)	Journal	Elem Math	ESS & SA	0.67	40
19	McGuigan & Hoy (2006)		Elem Read	ESS & SA	0.58	40
20	Pounder, Ogawa, & Adams (1995)	Journal	K-12	IPOE, OJSS, & SAT	0.494	57
20	Pounder, Ogawa, & Adams (1995)		K-12	IPOE, OJSS, & SAT	0.1778	57
21	Roney, Coleman, Schlichting (2007)	Journal	Middle 05	OHI-M and EOG (teach affil)	0.006	5
21	Roney, Coleman, Schlichting (2007)		Middle 05	OHI-M and EOG (Ac. Emph.)	0.55	5
21	Roney, Coleman, Schlichting (2007)		Middle 05	OHI-M and EOG (Coll. Lead.)	-0.41	5
21	Roney, Coleman, Schlichting (2007)		Middle 06	OHI-M and EOG (teach affil)	0.02	5
21	Roney, Coleman, Schlichting (2007)		Middle 06	OHI-M and EOG (Ac. Emph.)	0.14	5

Study Number	Effect Direction	Culture Dimension	Key Term	Location
13	3	2	Leadership	Arizona
13	2	2	Leadership	Arizona
13	3	2	Leadership	Arizona
13	3	2	Leadership	Arizona

13	3	2	Leadership	Arizona
13	3	2	Leadership	Arizona
13	3	2	Leadership	Arizona
13	3	2	Leadership	Arizona
13	3	2	Leadership	Arizona
14	3	2	Leadership	NC
14	3	2	Leadership	NC
14	3	2	Leadership	NC
15	1	2	Collegial Leadership	NJ
15	1	3	Academic Emphasis	NJ
15	1	4	Teacher Affiliation	NJ
15	1	2	Collegial Leadership	NJ
15	1	3	Academic Emphasis	NJ
15	1	4	Teacher Affiliation	NJ
16	3	2	Vision Identification	Missouri
16	3	2	Goal Acceptance	Missouri
16	3	3	High Performance Expectations	Missouri
16	3	2	Vision Identification	Missouri
16	3	2	Goal Acceptance	Missouri
16	3	3	High Performance Expectations	Missouri
17	3	3	Learning Environment	SC
17	3	4	Home-School Relations	SC
18	3	2	Collective Leadership	US
19	3	3	Academic Emphasis	Ohio
19	3	3	Academic Emphasis	Ohio
20	3	2	Goal Achievement	US
20	3	2	Collective Leadership	US
21	3	4	Teacher Affiliation	NC
21	3	3	Academic emphasis	NC
21	2	2	Collective Leadership	NC
21	3	4	Teacher Affiliation	NC
21	3	**3**	Academic emphasis	NC

Study Number	Study Name	Publication Type	Subgroup within Study	Outcome Measures and Leader's EI	Correlation	Sample Size
21	Roney, Coleman, Schlichting (2007)		Middle 06	OHI-M and EOG (Coll. Lead.)	-0.7	5
22	Sherblom, Marshall, & Sherblom (2006)	Journal	Elem Math	CSC and MAP results	0.69	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC and MAP results	0.5	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC and MAP results	0.49	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC and MAP results	0.35	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC and MAP results	0.48	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC and MAP results	0.75	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC and MAP results	0.56	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC and MAP results	0.65	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC and MAP results	0.45	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC and MAP results	0.57	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC-I and MAP results	0.39	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC-I and MAP results	0.65	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC-I and MAP results	0.64	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC-I and MAP results	0.61	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Math	CSC-I and MAP results	0.3	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC-I and MAP results	0.5	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC-I and MAP results	0.63	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC-I and MAP results	0.73	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC-I and MAP results	0.68	40
22	Sherblom, Marshall, & Sherblom (2006)		Elem Read	CSC-I and MAP results	0.48	40
23	Smith, A (2006)	Dissertation	K-12 overall	SCS & SAT	0.52	17
23	Smith, A (2006)		K-12 overall	SCS & SAT	0.67	17
23	Smith, A (2006)		K-12 Math	SCS & SAT	0.28	17
23	Smith, A (2006)		K-12 Read	SCS & SAT	0.48	17
24	Smith, K (2008)	Dissertation	Elem Read	SCI & SOL	0.505	69
24	Smith, K (2008)		Elem Math	SCI & SOL	0.462	69
25	Smith & Hoy (2007)	Journal	Elem Math	OHI, CES, OTS (academic opt)	0.6	99
26	Soileau (2007)	Record of Study	High School	LPI & TAKS (shared vision)	0.132	26
26	Soileau (2007)		High School	LPI & TAKS (others to act)	0.128	26
27	Solomon (2007)	Dissertation	Middle Math	Prin lead ques & MAP	0.153	138
27	Solomon (2007)		Middle CA	Prin lead ques & MAP	0.154	138

27	Solomon (2007)		Middle Math	Prin lead ques & MAP	0.146	138
27	Solomon (2007)		Middle CA	Prin lead ques & MAP	0.148	138
28	Sweatt (2000)	Dissertation	K-12	Questionnaire and TAAS TLI	-0.034	6
29	Sweetland & Hoy (2000)	Journal	Middle Math	OHI, OCDQ, & NJ EWT	0.58	86

Study Number	Effect Direction	Culture Dimension	Key Term	Location
21	2	2	Collective Leadership	NC
22	3	1	Belonging	Missouri
22	3	3	expectations	Missouri
22	3	2	School Leadership	Missouri
22	3	5	Culture	Missouri
22	3	4	Relations	Missouri
22	3	1	Belonging	Missouri
22	3	3	expectations	Missouri
22	3	2	School Leadership	Missouri
22	3	5	Culture	Missouri
22	3	4	Relations	Missouri
22	3	4	Data Utilization	Missouri
22	3	2	leader support	Missouri
22	3	1	Learning Community	Missouri
22	3	5	Staff Climate	Missouri
22	3	1	Collaboration	Missouri
22	3	4	Data Utilization	Missouri
22	3	2	leader support	Missouri
22	3	1	Learning Community	Missouri
22	3	5	Staff Climate	Missouri
22	3	1	Collaboration	Missouri
23	3	5	Culture	Arizona
23	3	5	Culture	Arizona
23	3	5	Culture	Arizona
23	3	5	Culture	Arizona
24	3	5	Climate	VA
24	3	5	Climate	VA

25	3	3	Academic Optimism	Texas
26	3	2	shared vision	Texas
26	3	2	enabling others to act	Texas
27	3	2	Vision Identification	Missouri
27	3	2	Vision Identification	Missouri
27	3	2	Goal Acceptance	Missouri
27	3	2	Goal Acceptance	Missouri
28	2	3	Teacher Expectations	Texas
29	3	2	Empowerment	NJ

Study Number	Study Name	Publication Type	Subgroup within Study	Outcome Measures and Leader's EI	Correlation	Sample Size
29	Sweetland & Hoy (2000)		Middle Math	OHI, OCDQ, & NJ EWT	0.48	86
29	Sweetland & Hoy (2000)		Middle Math	OHI, OCDQ, & NJ EWT	0.48	86
29	Sweetland & Hoy (2000)		Middle Math	OHI, OCDQ, & NJ EWT	0.59	86
29	Sweetland & Hoy (2000)		Middle Read	OHI, OCDQ, & NJ EWT	0.58	86
29	Sweetland & Hoy (2000)		Middle Read	OHI, OCDQ, & NJ EWT	0.5	86
29	Sweetland & Hoy (2000)		Middle Read	OHI, OCDQ, & NJ EWT	0.46	86
29	Sweetland & Hoy (2000)		Middle Read	OHI, OCDQ, & NJ EWT	0.57	86
30	Williams (2006)	Dissertation	Elem	PAL & CRCT	0.051	81

Study Number	Effect Direction	Culture Dimension	Key Term	Location
29	3	2	Collegial Leadership	NJ
29	3	1	Teacher Professionalism	NJ
29	3	3	academic press	NJ
29	3	2	Empowerment	NJ
29	3	2	Collegial Leadership	NJ
29	3	1	Teacher Professionalism	NJ
29	3	3	academic press	NJ
30	3	5	Climate	Georgia

APPENDIX B: STUDIES REVIEWED AND EXCLUDED FROM THE META-ANALYSIS

Study	Study
Angelides and Ainscow (2000)	Liu (2004)
Brown, K. (2005)	Long (2008)
Brown, L. (2001)	Louis and Marks (1998)
Chapman (1998)	Loup (1997)
Cooper (1998)	Marcoulides, Heck, and Papanastasiou (2005)
Creasey (2005)	Marks and Louis (1997)
Cunningham (2003)	Marks and Printy (2003)
Duffy-Friedman (2007)	McGuigan (2005)
Famularo (1995)	Michael (2003)
Fisher (2005)	O'Donnell and White (2005)
Fowler (2006)	Ogletree (2005)
Friedkin and Slater (1994)	Pritchard, Morrow, and Marshall (2005)
Gaziel (2001)	Quiambao (2004)
Gentilucci and Muto (2007)	Ramey and Dornseif (1994)
Goddard, Sweetland, and Hoy (2000)	Reed (2005)
Gordan (2005)	Robinson (2007)
Griffith (1995)	Ross and Gray (2006)
Griffith (2004)	Shipman (1993)
Hannel (2007)	Somech (2005)
Heck and Marcoulides (1993)	Starcher (2006)
Hoffman, Hoffman, and Guldemond (2002)	Stewart (2008)
Hoy, Tarter, and Hoy (2006)	Sweetland and Hoy (2000)
Huber (1999)	Tozoglu (2006)
Imperial (2005)	Turnbo (2007)
Johnson and Stevens (2006)	Varlack (2008)
Kelly, Thornton, and Daugherty (2005)	Wahlstrom and Louis (2008)
King (2006)	Waters, Marzano, and McNulty (2003)
Kruger, Witziers, and Sleegers (2007)	Witziers, Bosker, and Kruger (2003)
Lawson (2001)	Young (2007)
Le Clear (2005)	Zigarelli (2001)

APPENDIX C: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

University and Medical Center Institutional Review Board
East Carolina University • Brody School of Medicine
600 Moye Boulevard • Old Health Sciences Library, Room 1L-09 • Greenville, NC 27834
Office **252-744-2914** • Fax **252-744-2284** • **www.ecu.edu/irb**
Chair and Director of Biomedical IRB: L. Wiley Nifong, MD
Chair and Director of Behavioral and Social Science IRB: Susan L. McCammon, PhD

TO: Mark Bulris, Doctoral Student, College of Education, ECU

FROM UMCIRB

DATE: July 6, 2009

RE: Human Research Activities Determined to Meet Exempt Criteria

TITLE: "A Meta-Analysis of Research on the Mediated Effects of Principal Leadership on Student Achievement: Examining the Effect Size of School Culture on Student Achievement as a Proxy Measure of Teacher Effectiveness"

UMCIRB #09-0558

This research study has undergone IRB review on 7/3/09. It is the determination of the IRB Chairperson (or designee) that these activities meet the criteria set forth in the federal regulations for exemption from 45 CFR 46 Subpart A. These human research activities meet the criteria for an exempt status because they are research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. NOTE: 1) This information must be existing on the date this IRB application is submitted. 2) The data collection tool may not have an identifier or code that links data to the source of the information. The Chairperson (or designee) deemed this **unfunded** study **no more than minimal risk.** This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any changes must be submitted to the UMCIRB for review prior to implementation to allow determination that proposed changes do not impact the activities eligibility for exempt status. Should it found that a proposed change does require more substantive review, you will be notified in writing within five business days.

The following items were reviewed in determination exempt certification:
- Internal Processing Form – Exempt Application (dated 06/25/09)

It was furthermore determined that the reviewer does not have a potential for conflict of interest on this study.

The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies that fall under the purview of Food and Drug Administration regulations. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.