The Relationship Between Middle School Climate and Student Mathematics Achievement

Krista J. Sly
B.S.E., Northwest Missouri State University, 1991
M.S.E.D., Northwest Missouri State University, 1996

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Major Advisor

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Abstract

The purpose of this study was to determine whether a relationship exists between middle school climate and middle school student achievement in mathematics. This quantitative study employed purposive sampling from Missouri middle schools that had completed Cycle 4 of the Missouri School Improvement Process and had participated in the Middle School/Junior High School Missouri Advanced Questionnaire (AQ) during the 2010-2011 academic year. The sample included 72 Missouri middle schools with the aforementioned characteristics. The independent variable in this study was the student, teacher, and parent perceptions of school climate (safety, interpersonal relationships, teaching and learning, and institutional environment) from the schools included in the sample. The independent variable of climate perceptions was measured using the Advanced Questionnaire. The dependent variable was the percentage of students scoring at or above Proficient on the mathematics portion of the Missouri Assessment Program. A Pearson correlation coefficient was calculated to determine the strength and relationship of each pair of the independent and dependent variables specified in each research question. Results indicated a statistically significant relationship exists between student, teacher, and parent perceptions in each dimension of school climate and the percentage of students scoring at or above Proficient in mathematics. Specifically, the students' perception of school climate in the dimension of safety and the parents' perception of school climate in the institutional environment showed the strongest relationships to mathematics achievement. Staff perceptions of school climate in all dimensions showed moderate relationships to mathematics achievement. Recommendations for further research include expanding the study to

include the relationship between school climate and mathematics achievement in elementary schools and high schools, including other achievement variables, conducting longitudinal studies to analyze student growth, and looking at other variables within the sample such as class size and teacher turnover. School administrators can analyze school climate using the Missouri AQ and utilize the results to focus specific school improvement efforts. Additionally, schools can use the data from their analysis to probe specific AQ items that respondents rated low seeking to understand stakeholder perceptions about middle school climate. School climate and human behavior involve intermingling variables. Finding specific strategies that effectively change negative perceptions should be part of every school improvement plan.

Dedication

This dissertation is dedicated to my mom who was my biggest cheerleader, my hero, and the person who taught me to lead with my heart. She battled lung cancer during my doctorate work and lost her battle as I was finishing my journey. I can still hear her say, "You can do it Kris." My mom instilled in me a strong work ethic, humility, and the idea that what you do is more important than what you say. I miss her more than the sun's rays hitting earth.

To my dad I say "thank you" for always believing in me and for being such a wonderful father, grandfather, and great-grandpa. I love you. And to my children Lacy and Dylan for their understanding of my journey and for always being okay with mom giving an enormous amount of time to public education. I am proud of the woman and man you have become. You both have made the world a better place.

Finally, to my husband and best friend, David, who graciously sacrificed time with me so I could pursue my goal. Your sweet soul cannot be measured or analyzed. It is always present and provides a light to the world. You make me a better person. I love you. I am blessed to have all of you in my life.

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"Twenty years from now you will be more disappointed by the things you didn't do than by the ones you did do. So throw off the bowlines. Sail away from the safe harbor. Catch the trade winds in your sails. Explore. Dream. Discover." – Mark Twain

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Chapter One

Introduction

Schools should be places where students feel safe, are respected by peers and teachers, have a positive esteem, and are academically successful. To accomplish such conditions, schools must intentionally foster positive social, emotional, and cognitive capabilities and dispositions of students. At the same time, schools can and should create a climate conducive for learning (National School Climate Council, 2007), as a positive school climate can increase academic, social, and emotional learning (McNeely, Nonnemaker, & Blum, 2002). A positive school climate is associated with, and predictive of, academic achievement, healthy student development, and overall school success (Cohen, McCabe, Michelli, & Pickeral, 2009). Thus, measuring, analyzing, and managing a school's climate should be a part of school improvement processes.

A National School Climate Center (NSCC) report, noted that measuring school climate requires collecting multiple stakeholder perceptions, yet measuring school climate and analyzing the results to help inform school improvement efforts can be difficult (as cited in Thapa, Cohen, Higgins-D'Allesandro, & Guffey, 2012). Such a study involves many interacting elements, particularly those concerned with human behavior (Freiberg, 1998). Some of the elements that are difficult to study include human variables such as stakeholder relationships with the school faculty, perceptions of stakeholders about the school, experiences of staff members in the school organization, and socio-economic status of students.

Another problem with studying school climate is that although schools may measure school climate, the results are not often used to guide school improvement

(NSCC, 2007). Unfortunately, results from federal- and state-mandated school assessments are what schools use to measure, to prioritize, and to guide classroom practice (Darling-Hammond, 2007). For example, one federal mandate for accountability in schools has been legislated by the No Child Left Behind Act (2001). This legislation includes no requirements for schools to measure school climate; however, this act does mandate that schools measure student achievement in reading and mathematics (NCLB, 2001). Therefore, schools have been spending time, money, and personnel on reading and mathematics achievement without considering the role school climate plays in that achievement.

The No Child Left Behind Act (NCLB, 2001) promised to strengthen the American education system by measuring academic achievement of all students using state-developed assessments. By raising expectations on those assessments each year, the goal of the legislation was that, by the year 2014, all students would be Proficient or Advanced in mathematics and reading (NCLB, 2001). NCLB put in motion a school movement that created systems aimed at analysis of academic data, but those systems may have sidelined the role school climate plays in educational reform. Stakeholder perceptions of variables associated with school climate, are also important to the success of schools. NCLB called for schools to have a supportive learning environment, yet mandated accountability in the NCLB system is narrow and does not require measurement of a school's learning environment (Cohen, Pickeral, & McCloskey, 2009).

In spite of any measurement difficulties, school climate is important and must be evaluated and monitored from PreK through grade 12 (NSCC, 2007), especially during the crucial years of adolescence, as school climate is important to the healthy

development of adolescent students (McNeely et al., 2002). To understand the unique

characteristics of middle school students one would only have to see Elizabeth walking to

school with her newly colored hair, high heels, Miss Kitty backpack, and note in hand for

her teacher that reads, "Miss Ogdahl, you rock." How we meet the needs of Elizabeth

and the other thousands of adolescents walking through middle schools in the U.S. is

complex, and vitally important to their development and school success.

During early adolescence, substantial changes occur for students socially,

academically, physically, and emotionally, and educators must ensure that they are

responsive to the special needs of students of this age group (Nevens, 2000).

Furthermore, middle school climates play an integral role in meeting adolescent needs

and measuring and analyzing the climate of middle schools is an important process in

establishing successful middle schools (Thapa, Cohen, Higgins-D'Allesandro, & Guffey,

2012). In the position paper *This We Believe*, the National Middle School Association

(National Middle School Association [NMSA], 1995) stated that schools must meet the

needs of young adolescents both developmentally and academically. Successful schools

are not only characterized by academic success but also by social and emotional success.

Lounsbury (2010) called for schools to be inviting, safe, and supportive as adolescents

are a unique population and each young person needs a positive school climate to

promote positive and meaningful learning.

Understanding the relationship that school climate has with achievement helps

schools identify variables and processes that should be discussed in school improvement

efforts. NSCC (2007) recommended schools analyze climate data from all stakeholders

and use that data in school improvement planning to help students develop socially,

emotionally, and academically. Studying complex factors that influence stakeholders'

perceptions of and experience with school climate is important since perceptions guide

human behavior in important ways (Ajzen, 2003). Stakeholder perceptions are

influenced by the behaviors of those in the organization, and schools should routinely

evaluate school climate, recognizing student, parent, and teacher voices (NSCC, 2007).

Because schools have much to learn about the specific variables that shape a school

climate (Cohen, McCabe, Michelli, & Pickeral, 2009), adequately investigating

relationships that exist between school climate and achievement is worthy research.

One academic discipline that becomes increasingly more difficult and more

important for middle school students is mathematics. Eighth grade is a critical point for

students in mathematics as the skills become increasingly abstract. Mastering algebraic

and advanced mathematical concepts is important at this point in a student's education

(Anfara & Stacki, 2002), such as linear equations, complex algebraic expressions, and

geometric transformations. However, American students' levels of achievement in

mathematics are low compared to those of their counterparts in other countries. In fact,

the National Center for Education Statistics (NCES) (2012) reported that America ranks

37th out of 47 nations in eighth grade mathematics. Additionally, assessment data from

the state of Missouri revealed that in the 2011-2012 school year only 51.5% of eighth

grade students were considered Proficient in mathematics (Missouri Department of

Elementary and Secondary Education [DESE], 2011b). Additionally, Missouri was the

only state in which eighth grade math scores dropped on the National Assessment for

Educational Performance (NAEP) from 2009 to 2011. The average percentage of

students in Missouri who performed at or above NAEP Proficient levels dropped 3%

from 2009-2011 (NCES, 2012). Figure 1.1 shows Missouri's scores in relation to other states.
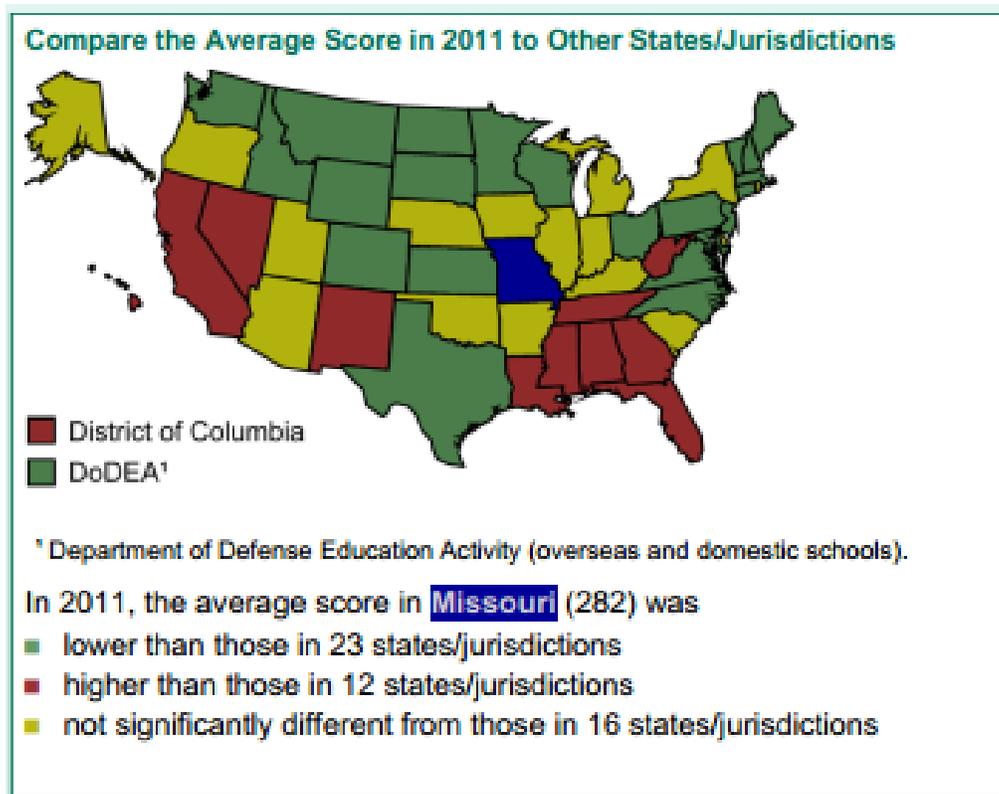
Figure 1. The Nation's Report Card Mathematics 2011 State Snapshot Report, by National Center for Educational Statistics 2011, available at http://nces.ed.gov/nationsreportcard/pdf/ stt2011/2012451MO8.pdf

If schools are to improve this situation and enhance students' academic achievement in mathematics, educators should look at the variables that contribute to such achievement (Barile, Donohue, Anthony, Baker, Weaver, & Henrich, 2012). In this regard, school climate in Missouri middle schools is one of the variables that should be monitored and analyzed to investigate further relationships that exist between achievement and stakeholder perceptions regarding school climate.

Background

School leaders and teachers are under intense pressure from the public and the government to increase student achievement (Darling-Hammond, 2007), causing educators to face daunting educational issues. NCLB has created constraints that complicate the environments in which teachers and students are working (Darling-Hammond, 2007), thus pressuring teachers to "teach to the test." High-stakes testing creates complications for schools knowing that the importance of both emotional and social intelligence is critical to the students' development. Schools charged to meet high-stakes policy mandates create environments that focus on the test score, and may neglect the curriculum and environment needed for students' healthy development. Although the evaluation mandated by NCLB identifies schools not meeting adequate yearly progress, such assessments are not sufficient to correct the problem (Darling-Hammond, 2007). Furthermore, under NCLB, quantitative data have become the preferred way to measure educational progress. Educators are, therefore, quick to look at data, such as state achievement test scores, and often overlook data revealing the affective side of school environment. One specific set of affect data available to Missouri educators is the Missouri Advanced Questionnaire (AQ), which the Missouri School Improvement Program (MSIP) uses to provide data on processes that affect student achievement. The Missouri AQ is administered to teachers, students, and parents, allowing Missouri educators to look at affect data from the perspective of these three different stakeholders (Missouri DESE, 2012b). Bolman and Deal (2002) stated that a school's success is largely based on how the school is perceived by its stakeholders, and middle schools across Missouri that are positively perceived by stakeholders can have a positive impact

on student success. Likewise, if stakeholders' perceptions about the schools are negative, success of students could be negatively impacted.

Statement of the Problem

NCLB has required that schools prove they are making adequate yearly progress and that all students are Proficient or Advanced in their studies (NCLB, 2001). As a result, the MSIP accreditation system, which occurs under the MSIP division of DESE, relies heavily on student performance (Missouri DESE, 2012c). Schools that do not meet minimum standards of performance can risk losing state accreditation status and also be labeled as not meeting adequate yearly progress (AYP). Both losing accreditation and being labeled as not making AYP could negatively impact a school district's reputation; plus, stakeholders' and constituents' perceptions about the school's ability to provide a quality education could be negatively affected. To fulfill the NCLB requirements and state accreditation status with limited federal, state, and local funds, schools need to focus on processes that result in improved student achievement in order to make the most efficient use of funding.

Coleman et al. (1966) found that a student's socio-economic status (SES) overrides all other school variables that are predictors of student achievement; however, ensuing research countered Coleman's findings. For example Edmonds (1979) who is credited with beginning the effective schools movement, focused on identifying variables associated with successful schools and found that school climate is one of the correlates of successful schools. Similarly, Peterson and Deal (1998) stated that schools would flounder and die without a strong positive climate. The results of recent research have also indicated that school climate is linked to student achievement, positive youth

development, and school success (Cohen & Geier, 2010; Cohen, McCabe, Michelli, & Pickeral, 2009; Thapa et al., 2012). Along the same lines, NSCC (2007) recommended schools collect and analyze data connected to school climate using a valid and reliable tool. Additionally, NSCC recommended using data from various stakeholders including students, parents, and faculty. The Missouri Advanced Questionnaire (AQ), a tool used to assess school climate, is designed to acquire data from students, parents, and faculty about school processes, including school climate processes, associated with successful schools. Participation in the AQ by Missouri public schools is required once every five years during the MSIP accreditation process with all stakeholders (e.g., students, parents, and teachers) (Missouri DESE, 2012b).

A part of the AQ contains school climate items. Because student achievement is linked to school climate, especially in the areas of productivity, performance, and satisfaction, it is important to identify specific relationships between student achievement and school climate, as well as to assess the different perspectives of stakeholders (Cohen & Geier, 2010). Although research has shown school climate can have an impact on the performance of a school (Cohen, McCabe, Michelli, & Pickeral, 2009), there is no specific information on how the MSIP AQ findings may be related to the math scores of middle school students.

Purpose of Study

Hoy and Hannum (1997) noted that one unique population often neglected by research is that of middle school students. Furthermore, NSCC (2007) claimed that measuring a school's climate is recommended and needed. Identifying specific factors such as school climate that positively affect adolescents' education is worthy research.

Due to the unique characteristics of adolescents, educators, policymakers, and parents are called upon to be concerned with improving the emotional, social, and academic schooling for adolescents. While it is known that school climate is a factor that affects student achievement (Hoy, 2012), it is unknown if Missouri middle school stakeholders' perceptions about school climate are related to student achievement. The purpose of this study was to determine the extent of the relationships that exist between middle school climate as measured by the Missouri AQ and the achievement of students scoring at or above the Proficient level on the mathematics section of the MAP.

Analyzing climate data and the relationships that may exist with student achievement can help schools be specific about goals and strategies within their school improvement plans. While it is known that the climate impacts student achievement, it is not known if there is a difference among specific perceived dimensions of climate on different populations specifically, students, teachers, and parents. Additionally, it is not known if those dimensions play a larger role in one stakeholder's population compared to the other stakeholder's population. Therefore, this study proposes to fill a gap about the stakeholder perceptions about specific dimensions of school climate and the effect they have on mathematics achievement of Missouri middle school students.

Significance of the Study

Comparing existing data from the Missouri AQ and the mathematics test of the Missouri Assessment Program (MAP) may reveal relationships between specific stakeholder perceptions concerning school climate and mathematics achievement, thereby allowing school officials to make informed decisions as to the most effective ways to improve schools. The pressure for school improvement, motivated by NCLB,

requires school officials to seek efficient strategies that will increase student achievement through programs that are easy and cost-effective to implement with a relatively short proving period. This study was conducted to research the climate-achievement link in middle schools, which can be used to inform school improvement. Additionally, the data that were examined in this study are readily accessible to all school officials. Analyzing the AQ can provide helpful guidance for administrators in using survey data that may impact student math achievement. If specific relationships between school climate and math achievement can be identified, schools can use this information to inform their decisions about school improvement.

Schools are more embattled today as all the NCLB mandates and sanctions, affect stakeholders' views of school climate and schools' recruitment of high-quality teachers and administrators. How people perceive a school's climate affects student achievement, regardless if those perceptions are accurate (Freiberg, 1998). The results of this study may provide school leaders with specific information about stakeholders' perceptions of school climate and the relationships that may exist with mathematics achievement and would, therefore, add to the significance of the investigation. Therefore, it is important to study stakeholder perceptions regarding school climate so school improvement efforts can target effective strategies to change those perceptions when necessary.

Delimitations

For this study, the researcher set the following delimitations:

1. This study focused on mathematics content and generalizations to other content areas may not be feasible.

2. This study focused on achievement data from middle school students in grades 6-8 and generalizations to other grade levels may not be feasible.

3. This study focused on middle schools and generalization of results to elementary and high schools may not be feasible.

Assumptions

This research was conducted with the following assumptions:

1. The mathematics MAP data retrieved from the Missouri Department of Elementary and Secondary Education (DESE) were reliable, valid, complete, and accurate.

2. The AQ and MAP data collected from the Missouri middle school districts were accurate.

3. The respondents completed the survey items honestly.

4. The data entry and statistical analysis of AQ information were completed accurately.

Research Questions

In order to conduct the study, essential questions were established. These questions helped focus the research and led to a greater understanding of the importance of the research. The following research questions guided this study:

1. To what extent is there a relationship between Missouri public middle school students' perceptions of school climate, as measured by the Missouri AQ, and the percentage of middle school students' mathematics achievement scores at or above Proficient, as measured by the Missouri Assessment Program?

2. To what extent is there a relationship between Missouri public middle school teachers' perceptions of school climate, as measured by the Missouri AQ, and the percentage of middle school students' mathematics achievement scores at or above Proficient, as measured by the Missouri Assessment Program?

3. To what extent is there a relationship between Missouri public middle school parents' perceptions of school climate, as measured by the Missouri AQ, and the percentage of middle school students' mathematics achievement scores at or above Proficient, as measured by the Missouri Assessment Program?

Definition of Terms

The study required the use of specific vocabulary. In order to clarify terminology, the following items are defined:

AYP. Adequate Yearly Progress is the accountability system that the NCLB legislation required of states to use to communicate if schools are meeting the state targets in math and communication arts. The percentage of students in a particular school at or above the standard must be met in order for a school to be meeting AYP. The achievement target for proficiency increases each year until 2014 when the target requires all students must be Proficient or Advanced in mathematics and communication arts (NCLB 2001).

Advanced. The students who are Advanced as defined by the Missouri Assessment guidelines. Advanced students demonstrate in-depth understanding of all concepts and can apply that knowledge in complex ways (Missouri DESE, 2012a).

APR. Annual Performance Rating is given each year to every public school in the state of Missouri and is based on data submitted to the state on the core data report (Missouri DESE, 2012a).

Advanced Questionnaire (AQ). The Advanced Questionnaire is a survey tool administered to all Missouri public schools once every five years and is distributed to their students, parents, faculty, and boards of education (Missouri DESE, 2012b).

Basic. The students who are Basic as defined by the Missouri assessment guidelines. Students scoring at Basic demonstrate a partial understanding of the grade-level content (Missouri DESE, 2012a).

Below Basic. The students who are Below Basic as defined by the Missouri assessment guidelines. Students scoring Below Basic do not demonstrate an understanding of the grade-level content (Missouri DESE, 2012a).

Bottom Two. The bottom two refers to the number of students with an achievement level score of Below Basic or Basic (Missouri DESE, 2012a).

Free and Reduced Lunch Count. Students whose families are at or below 130% of the poverty level are eligible for free lunch. Students whose families are between 130% and 185% of the poverty level are eligible for reduced-price meals. The free and reduced count for a school is the percentage of students eligible for free or reduced lunch based on federal guidelines (United States Department of Agriculture, 2012).

MAP. Missouri Assessment Program, which is the state assessment, is administered to all public school students in the state of Missouri. The MAP is an assessment that uses constructed response, selected response, and performance event

questions. The results of the MAP test are used as part of the Missouri AYP and APR

totals (Missouri DESE, 2011d).

> **Middle School**. Many grade configurations constitute a middle school and it is
not characterized necessarily by grade span, but also by the structures of developmentally
appropriate programs and practices that meet adolescents' needs (Irvin, 1997). For the
purposes of this study, middle school is defined as students in grades six through eight.

> **MSIP.** The Missouri School Improvement Program is the process used to award
accreditation to those schools in Missouri that meet the standards outlined by the state
law and the State Board of Education regulation (Missouri DESE, 2012c).

> **NCLB.** No Child Left Behind Act is defined as Public Law 107-110 and is an
amendment to the Elementary and Secondary Education Act (ESEA) of 1964 enacted
under President George W. Bush on January 8, 2002. This federal statute is to ensure
that all children receive a quality education and that schools be held to the same standard
of student achievement. This act requires all schools to create and administer annual
assessments to show that they are making Adequate Yearly Progress (NCLB, 2001).

> **Proficient.** The students who are Proficient as defined by the Missouri
Assessment guidelines. Proficient students demonstrate knowledge and skills associated
with the grade for which the student is being tested (Missouri DESE, 2012a).

> **Socioeconomic Status (SES).** Socioeconomic status is a study variable referring
to certain social groups that are identified based on the level of family income. For this
study, the SES refers to income low enough to receive free or reduced lunch (United
States Department of Agriculture, 2012).

Student Achievement. Student achievement refers to the student score on the MAP and is categorized as Below Basic, Basic, Proficient, or Advanced (Missouri DESE, 2012a).

Top Two. The top two refers to the number of students with an Achievement Level score of Proficient or Advanced (Missouri DESE, 2012a).

Overview of the Methods

The population for this study was made up of students enrolled in Missouri middle schools, defined as schools with students in grades six through eight and whose students, faculty, and parents completed the Missouri Middle School/Junior High School AQ during the 2010-2011 school year. From all middle schools in the state of Missouri, a purposive sample was taken of Missouri middle schools that were administered the Missouri Middle School/Junior High School AQ and the mathematics MAP during the 2010-2011 academic year. The representative sample included 72 Missouri public middle schools (See Appendix A). The sample represented all areas of the state including rural, urban, and suburban. Middle school achievement data from the MAP and Missouri AQ 2010-2011 Cycle 4 MSIP review were collected and analyzed.

The dependent variable was student achievement as measured by the percentage of middle school students' mathematics MAP scores at or above Proficient, at each of the 72 middle schools in the sample. The independent variables were student, parent, and teacher perceptions retrieved from the AQ of each of the 72 middle schools in the sample. Specific items analyzed from the AQ survey were about school climate and were categorized into the NSCC climate dimensions of safety, teaching and learning, interpersonal relationships, and institutional environment. Statistical analyses were

conducted using the IBM SPSS Statistics Faculty Pack 21 for Windows. A Pearson correlation coefficient was calculated to determine the strength and direction of the relationship of each pair of independent and dependent variables. Additionally, a *p* value was calculated for each pair of independent and dependent variables.

Organization of the Study

Chapter one provided an overview of this study, including an introduction, problem statement, significance of the study, rationale for the study, research questions, and an overview of the methodology used. Also included in chapter one were the definition of terms, delimitations, and assumptions. Chapter two presents a review of related literature including information about the Missouri assessment program, history of school climate research, definition and dimensions of school climate, developmental characteristics and needs of middle school students, and measurement of school climate. Chapter three provides the research design, population and sample, instrumentation, validity and reliability, data collection procedures, statistical analyses, hypothesis testing, and concludes with limitations related to the study. Chapter four presents descriptive statistics and results from the hypothesis testing. Chapter five contains the summary findings, further implications of the results, and recommendations for further potential research.

Chapter Two

Review of Literature

Understanding the relationships among educational stakeholders' perceptions of

school climate and mathematics achievement of middle school students requires a review

of relevant literature on the topics related to school climate and mathematics assessment.

This chapter addresses the No Child Left Behind Act (2001) and its accountability

mandates, which forms the basis for current schooling contexts and plays a significant

role in the way that teachers, administrators, children, and parents may perceive the

school climate. The definition, dimensions, and history of school climate, along with the

effect school climate has on academic achievement, will be reviewed. Next, this chapter

addresses the nuances that are particular to the climate in middle schools. Additionally,

adolescents' developmental and academic needs are defined, as well as the relationship of

those needs to academic learning and the interaction of those needs with school climate.

Furthermore, the implications for how middle school students perceive school climate are

discussed. Lastly, this chapter examines school climate dimensions and how those

dimensions are associated with the survey used in this study to measure student, staff, and

parent perceptions regarding school climate.

Educators and researchers no longer debate the influence of school climate on

student social, emotional, and academic achievement (Bolman & Deal, 2002).

Researchers have been studying school climate for decades. Both Anderson (1982) and

The National School Climate Council (2007) reported that specific climate dimensions

must be studied and perceptions of all stakeholders must be used in the research on

school climate. Hoy (2012) also stated that the gap in research on school climate lies in

identifying and understanding the specific processes that affect achievement the most. The review of literature contextualizes school climate as it relates to the No Child Left Behind Legislation. Likewise, the history of school climate research purports that schools must measure specific dimensions of school climate. Student achievement may be affected and schools must examine the perceptions of school climate of various educational stakeholders (e.g., parents, teachers, and students).

No Child Left Behind and Missouri Assessment Program

Each state has developed and implemented instruments to determine whether its schools are meeting the NCLB mandates. The state of Missouri uses the Missouri Assessment Program (MAP) tests in reading, mathematics, science, and social studies to meet the NCLB measurement requirements. Starting in 2001, the MAP was administered to public school students in grades 3 through 8 and grades 10 and 11. Most recently, the state added End of Course (EOC) testing in grades 9 and 11 in the areas of mathematics, communication arts, science, and social studies. The four achievement levels on the MAP are (a) Advanced, (b) Proficient, (c) Basic, and (d) Below Basic (Missouri, DESE 2102a). NCLB mandated that all students be Proficient or Advanced in both communication arts and mathematics by the year 2014. In 2011-2012, Missouri assessment data revealed that only 51.5% of eighth grade students were considered proficient or advanced in mathematics (Missouri Department of Elementary and Secondary Education [DESE], 2012a). Missouri's mandated mathematics proficiency target for 2011-2012 was 81.7%; therefore, Missouri missed AYP in mathematics by 30.2%. Both proficiency and improvement are part of Missouri's accreditation process.

Missouri Mathematics Grade Level Expectancies (GLEs) contain the concepts,

skills, and procedures for students to understand and learn mathematics (Missouri DESE,

2008). Each GLE is aligned to the Show-Me Content and Process Standards. The

specific content outlined in Missouri GLEs for seventh and eighth grade students contain

the following mathematical strands: Numbers and Operations, Algebraic Relationships,

Geometric and Spatial Relationships, and Measurement (Missouri DESE, 2008).

Specifically, the language of the GLEs calls for schools to address the standards in the

context of problem solving, reasoning, communicating, making connections, and

designing and analyzing. Examples of skills that demonstrate proficiency within the

Algebraic Relationship strand ask students to analyze the nature of slope and intercepts in

linear equations, model and solve problems using multiple representations such as linear

equations, and solve problems using linear equations through the use of algebraic

symbols.

On a five-year cycle, the Missouri Department of Elementary and Secondary

Education (DESE) Accreditation Team, determines whether schools are accredited,

provisionally accredited, or unaccredited (Missouri DESE, 2012c). The academic

performance of students is a major variable in the accreditation process with student

scores in mathematics and communication arts on the MAP tests, published annually on

each school's Annual Performance Report (APR). These scores, along with eight other

areas, are used to determine the accreditation level that a school will receive. Performing

well on the MAP and EOC tests is a constant focus for Missouri public schools, and a

direct mandate from the NCLB Act (2001). Schools not meeting the NCLB yearly

proficiency targets for two consecutive years are labeled "in need of improvement"

(Missouri, DESE 2012c); plus, failing to regain accreditation within two years could

result in a school being taken over by the State Department of Education. Moreover, those schools that do not meet accreditation requirements risk losing their accreditation, a situation that can impact stakeholder perceptions of school climate, and students in unaccredited schools are afforded the right to transfer to an accredited school.

AYP is the improvement measure that determines how close schools and states are to achieving the goal of No Child Left Behind, which states that all students be Proficient or Advanced in mathematics and communication arts. Becoming fully accredited is vital to schools. According to Bolman and Deal (2002), maintaining legitimacy and support in the eyes of multiple constituencies is of critical importance. Schools may lose stakeholder confidence if they are issued provisional accreditation or labeled unaccredited. Equally important are the punitive provisions a school is assigned when not meeting AYP. School climate, as defined earlier, is a complex set of factors and conditions that may be affected when schools are placed under sanctions associated with not meeting AYP. If such sanctions do occur, school climate may become less positive and, therefore, may have an adverse effect on student achievement. According to Bolman and Deal (2002), regaining stakeholder confidence would be a by-product of schools labeled as "needing improvement" because the perceived success of a school by its stakeholders is a large part of a school being successful.

The state of Missouri currently utilizes, as part of its public school accreditation process, a survey tool known as the Missouri AQ, which contains a battery of questions, some of which are designed to discern the climate of a given school district. These questions employ a Likert-type scale and are distributed to every student, faculty member, and parent in the district (Missouri, DESE 2012b). Although the data are

published, they do not become part of the determination for a school in making AYP.

Since its inception in 2001, Missouri has completed four cycles of Missouri School Improvement Plan (MSIP) reviews with every school having completed at least the fourth cycle MSIP review process (Missouri, DESE 2012c). Therefore, every middle school has Missouri AQ data from cycle four readily available for analyses. Results from the AQ may reveal patterns or relationships between student achievement in mathematics and specific school climate processes that are measured on the AQ. To determine any specific relationships that may exist between school climate and student achievement, The National School Climate Center (Thapa et al., 2012) recommended that all schools measure school climate and use that data as part of a comprehensive school improvement plan. However, while NCLB calls for schools to have a supportive learning environment, the legislation does not mandate accountability of the school's learning environment (Cohen, Pickeral, & McCloskey 2009). Measuring school progress in a more comprehensive manner is needed (Darling-Hammond, 2007). School climate is part of this comprehensive picture of a school's progress. The Missouri AQ measures perceptions about school climate variables and is readily available for all middle schools in Missouri to use as a comprehensive plan for improved student learning socially, emotionally, and academically.

To further conceptualize how NCLB has impacted school climate, and potentially contributed to stakeholder perceptions, one needs to look at how school climate was perceived prior to NCLB. Decades of research have shown school climate affects student achievement but to better understand the relationship between school climate and academic performance, one should consider its history (NSCC, 2007).

History of School Climate

A large body of research supports the importance of school climate and its effects on student achievement (e.g., Anderson, 1982; Cohen, McCabe, Michelli, & Pickeral, 2009; Ellis, 1988; Frieberg 1998; Hoy & Hannum, 1997; Thapa et al., 2012). As long ago as the early 20th century, Perry (1908) noted the role climate played in organizations as he addressed the value of schools being fair, calm and orderly, and the importance of the staff having sympathy for the student. He claimed that students are influenced by their surroundings and schools must provide more than a "mere housing" (p. 303). In 1916, Dewey theorized that schools should nurture a climate of civil interaction and take advantage of the social nature of learning. Although Dewey did not explicitly use the term s*chool climate*, his beliefs about group work, social skills, and the education for social responsibility and democracy encompassed the dimensions of a positive school climate. The early theorists understood the importance of a positive school climate for learning and development to occur.

Anderson (1982) noted that school climate grew from the study of organizational climate research and school effects research. Researchers examined situational characteristics that affected individual behavior. According to Anderson (1982), researchers began studying organizational climate systematically in the 1950s. The earlier findings of Halpin and Croft (1963), who developed the Organizational Climate Descriptive Questionnaire (OCDQ) to measure a school's climate, focused on teachers' perspectives concerning the relationship they had with the principal. Halpin and Croft identified eight dimensions relating to teacher and principal behaviors that affected a school's climate. Teacher dimensions included disengagement, hindrance, esprit, and

intimacy. Disengagement referred to the way teachers work together, often not working as a team. Hindrance referred to the way teachers perceive their duties, such as work being required as busy work and unnecessary. Esprit referred to the way teachers feel in regard to being satisfied with their job, for example, feeling a sense of making a difference with their job and feeling a sense that their needs are being met within the school community. Finally, intimacy referred to teachers' perception that the school community has positive relationships. Principal dimensions included aloofness, production emphasis, trust, and consideration. Aloofness referred to the perception that the principal cares less about the people within the school and more about the rules. Production emphasis referred to the perception that the principal is task-oriented. Trust, which teachers viewed as a positive trait, referred to the perception that the principal is a team player and cares about those in the school community. Consideration referred to the nurturing of school personnel, such as being more concerned with how teachers are treated. These dimensions allowed schools to measure their organization's climate as perceived by teachers and classify their school along a continuum from "open" to "closed." An open climate was characterized by members being energetic and moving toward the school's goals, while a closed climate was characterized by members being apathetic and having a lack of progress moving towards the school's goals (Halpin & Croft 1963).

Sparking debate about school climate variables, Coleman, McCabe, Michelli, & Pickeral (1966) stated that socio-economic status (SES) overrides all other variables in a school. He concluded that factors such as school climate had a negligible effect on student achievement, family backgrounds had the greatest impact on student

achievement, and SES was the determining factor in students' academic success. Challenging Coleman et al., Edmonds (1979) proposed that administrative leadership, high expectations of student achievement, renewed emphasis on basic skills, a safe and orderly environment, and frequent monitoring of student achievement were variables that affect student achievement. Edmonds reiterated the importance of school climate as one variable that affects student academic achievement and learning in his work, which was the beginning of the Effective Schools research.

The difference between school culture and school climate consumed some of the early organizational climate researchers. Halpin and Croft (1963) theorized that school culture is viewed from an anthropological perspective while school climate is viewed from a psychological perspective. They claimed how stakeholders in a school see people, events, and things around them in relation to their experiences and feelings, along with how they interact with stimuli, are a part of a school's climate. Freiberg (1998) believed that those directly involved in the organization must determine the school's climate, thus making school climate a psychological perspective. According to the NSCC (2007), the discussion should not be focused on the differences between school climate and culture, but should identify and measure the school variables that affect school climate, including school climate in relation to school improvement. There is evidence to support that the climate of a school matters and schools must not only measure school climate but also include those measures in comprehensive school improvement plans (Thapa et al., 2012).

Definition of School Climate

School climate has been studied for decades and has been defined in various contexts such as the atmosphere, ethos, tone, ideology, community, personality, or milieu

of a school (Hoy & Miskel, 2008). The definition also relates to how one feels about the

school and the people involved in the school (Chandler, Kern, & Durodoye, 1996) or how

staff and students feel about their experiences in a school (Bryk & Schneider, 2002).

Both the definition of school climate and the dimensions of school climate have varied

based on the researcher. For example, Forehand and Gilmer (1964), defined school

climate as the set of characteristics that describes an organization, distinguishing it from

the other organizations and that influences behavior of those in the organization. School

climate research seemed to decline for a decade during 1970 – 1980. Research about

school climate is not as abundant during this 10-year span. Freiberg (1999) who called

school climate the "heart and soul" (p. 1) of a school, said that school climate should

encompass not only the health of the learning environment but also identify areas that

need improvement. Furthermore, he stated that we notice the school climate only when

something is seriously wrong. Thapa et al. (2012) called school climate an organizational

phenomena.

Recently, there has been a formal, consolidated definition of school climate,

which includes four areas of school functioning: (a) physical safety, (b) relationships of

those in the school environment, including faculty, students, and parents; (c) instructional

methods, and (d) the actual physical environment of the school. This definition of school

climate was agreed upon during a consensus-building meeting in April 2007 by the

National Center for Learning and Citizenship, Education Commission of the States, and

the National School Climate Center (NSCC) for Social and Emotional Education (NSCC,

2007). The findings from these collaborative meetings led the committee to determine

that there was an enormous discrepancy between current empirical research on positive

school climate and what is actual practice in schools, in state and federal education departments, and in the colleges and universities in which teachers are educated (NSCC, 2007). The NSCC definition of school climate is as follows:

> School climate refers to the quality and character of school life. School climate is based on patterns of students', parents' and school personnel's experience of school life, and reflects norms, goal, values, interpersonal relationships, teaching and learning practices, and organizational structures. A sustainable, positive school climate fosters youth development and learning necessary for a productive, contributing and satisfying life in a democratic society. (NSCC, 2007, p. 5)

For this study, the NSCC definition of school climate was used. Not only does this definition encompass the whole child, but it also involves multiple stakeholders and their experiences. Additionally, this definition takes into account the safety, interpersonal relationships, teaching and learning, and institutional environment: four important school climate dimensions (NSCC, 2007).

The five core standards the NSCC associates with their definition are the following: developing a shared plan including gathering disaggregated climate data; promoting learning and addressing barriers to learning; enhancing learning and student engagement; creating welcoming, safe, and supportive environments; and promoting social and civic responsibilities with a commitment to social justice (Thapa et al., 2012).

Dimensions of School Climate

Anderson (1982) noted that one major issue related to the research on school climate is the many dimensions that evolved within the school climate research. Tagiuri (1968) defined the dimensions as school environment, milieu, social system, and culture.

The school environment is the physical and material aspect of the school. Millieu is the social areas of schools that deal with persons and groups. Social systems are areas that encompass relationships of persons and groups, and the culture is the belief systems and values of the organization. According to Anderson (1982), Tagiuri's dimensions comprised a broad construct of school climate and Tagiuri's construct enveloped the idea that school climate is the total environment within a school building. As further discussion of the total environment of a school, Hoy, Tarter and Bliss (1990) suggested that a healthy organization is one that possesses the dimensions of a positive school climate.

Hoy, Tarter, and Hoy (2006) proposed academic optimism as a construct of school climate and one that has been shown to affect student achievement. Academic optimism encompasses three dimensions of school climate: (a) a teacher's sense of collective efficacy, (b) teachers' trust in parents and students, and (c) teacher's academic press, also referred to as academic emphasis. According to Hoy, et al, the first dimension, a teacher's sense of collective efficacy, is part of teaching and learning; a dimension identified by NSCC. Teacher perceptions of how their efforts can positively affect student achievement are an important dimension of school climate and part of collective efficacy. Goddard (2001) reported that students' achievement is positively affected by an organizations' collective efficacy. Teacher collective efficacy is an important part of teaching and learning. Hoy, Tarter, and Hoy's second dimension of teacher trust in parents and students parallels the NSCC dimension of interpersonal relationships. Hoy et al. (2006) stated that a sense of trust can help foster and increase positive relationships with students and parents. Trusting relationships are fostered in

safe and caring environments where positive interpersonal relationships are established.

Neither staff cohesion nor staff conflicts exist in a vacuum. Miller and Fredericks (1990)

illustrated that children learn by example and that the moral fabric of a school is set and

nurtured by the teachers in the environment. Children view teachers' values, and

consciously or unconsciously, emulate those behaviors. When teachers were more

committed to their students and developed stronger relationships with students, the

students were more willing to prove themselves (Kerr, Lunkenheimer, & Olson, 2007).

Finally, Hoy et al. (2006) noted that the third dimension, academic press, which is also

called academic emphasis, "is the extent to which a school is driven by a quest for

academic excellence" (p. 427), and involves school climates that engage students in

academic learning and provide safe supportive structures where students can learn. As

Hoy (2012) stated, none of the dimensions of school climate occur in isolation. Each

interacts and affects the other. If teachers' sense of collective efficacy is high, then this

self-efficacy will affect academic press. Hoy et al. (2006) also noted that academic

emphasis is greater when collective efficacy is strong. When trusting relationships are

present, teacher self-efficacy increases, thus increasing teacher academic press.

The research defining the school climate dimensions overlap and point to four

specific school climate dimensions. The three noted dimensions of Hoy et al. (2006)

overlap and are encompassed in the four NSCC school climate dimensions. Cohen

(2006) explained that the four major aspects of school life that shape climate are safety,

teaching and learning, relationships, and environmental-structural. Additionally,

Pickeral, Evans, Hughes, and Hutchison (2009) reported safety, relationships, teaching

and learning, and environment as the spheres of the school. More recently, Thappa et al.

(2012) noted that NSCC issued a policy statement defining four school climate dimensions that should be measured and monitored: safety, interpersonal relationships, teaching and learning, and institutional environment.

Middle School Climate and Adolescent Needs

Schools must consider early adolescents' needs and be responsive to these needs to guide students toward a healthy, productive, and contributive life as an adult. Eccles and Wigfield (1993) noted that changes in puberty, in conjunction with the transition to middle school, create a crucial and difficult period of development for adolescents, who experience social, psychological, and biological changes. According to the National Middle School Association (1995) there are important changes that come during adolescence. These changes can be marked by

- rapid bone growth;

- development of sex characteristics;

- development of abstract thinking;

- a sense of social consciousness;

- a sense of fairness; and

- sudden and intense emotions due to brain development.

Between the ages of ten to fifteen, the adolescents' profound personal and emotional changes are extreme, more than any other period in their lives.

Mertens (2006) noted that the middle school years could be extremely influential in protecting students against risky behaviors such as sex, alcohol, and drug use, and early adolescence is a time that can mark the beginning of behaviors that lead to academic failure (Eccles & Wigfield, 1993). At the same time the middle school

environment can be an opportunity and best chance to influence students' future. Therefore, analyzing the middle school environment by gaining student, faculty, and parent perceptions of school climate could yield data that would affect students' achievement (NSCC, 2007).

Cohen, McCabe, Michelli, and Pickeral (2009) stated that to help assure healthy development in youth and the learning needed for students to have a satisfied, productive, and contributive life, a positive climate is needed. Cohen and Geier (2010) reported that according to a Gallup and Rose Poll, parents reported the school's number one job is to help children develop into responsible citizens. Continuing, Cohen and Geier stated that schools should teach students to become more socially, emotionally, and ethically able, and should provide safe, caring, participatory, and responsive schools. Furthermore, Cohen and Geier (2010) suggested that the most powerful way for schools to accomplish the aforementioned goals is to measure and work to improve school climate because measuring school climate recognizes the role educating the whole child plays in student success, including the emotional, ethical, civic, and intellectual aspects of learning.

In 1995, the National Middle School Association provided a framework that called for schools educating adolescents, to foster health, wellness, and safety; to be committed to young adults; to develop positive relations with students; to foster emotional and social health; and to develop positive partnerships with parents and communities (NMSA). Revisiting this framework, Nevens (2000) specifically noted that adolescents need a positive school climate. Similarly, Thapa et al. (2012) noted that, according to the National School Climate Center, positive school climates foster youth development and provide youth with learning needed for a productive life in a democratic

society. Adolescents need a safe environment to meet the emotional, social, physical, and intellectual developmental changes, and they need to feel safe in school. Also, Cohen, McCabe, Michelli, and Pickeral (2009) stated that students will learn better if they feel safe, connected, and engaged. Succinctly, NSCC has called for schools to be safe and happy places where students are supported and cared for (NSCC, 2007).

The National Middle School Association (1995) listed the following six characteristics needed for healthy, responsive, and developmentally appropriate middle schools: (a) educators that want to teach adolescents (b) schools with visions that include achievement (c) relationships and family partnerships (d) high expectations for all (e) one caring and responsive adult for every student, family, and community partnership, and (f) a positive school climate. Climates should be safe and supportive including the presence of health and social support services (Lounsbury, 2010). Open and consistent communication with parents is also vital to a positive school climate. Epstein (1995) contended that strong school partnerships with parents support a better school climate. Additionally, middle schools should be staffed with teachers who want to develop supportive and caring relationships, who understand this unique period in the life of students, and who will serve as advocates for adolescents (Lounsbury, 2010).

In a study by Booth (2011), young adolescents shared their needs with researchers. Specific needs noted by adolescents were: to feel safe, to have a positive self-esteem, to be physical, and to learn. These same students indicated that they worried about their personal safety and comfort and expressed their desire to have schools that were safe. Furthermore, the students noted that they needed to be treated with respect by teachers and other students; the students indicated that they were misunderstood. When

teachers ignored the students' opinions, the students' emotions built up and led to behavior issues. In addition, Booth found that students liking or not liking school was linked to academic reasons. For example, although students consistently expressed a desire to learn, they became frustrated when they did not feel that their voices were heard or that they could be successful. Students in the study wanted to feel valued and respected. Additionally, Cohen and Geier, (2010) stated adolescents' self-esteem was affected by school climate.

Feeling safe and connected involves the social interaction of the participants within the organization just as students and teachers interact and develop relationships within school. Barile et al. (2012) said that the teacher-student relationship is a significant factor in successful schools. For example, one specific effect a positive teacher and student relationship has on schools is a decrease in dropouts. Pickeral et al. (2009) noted that the Center for Social and Emotional Education reported a fundamental dimension of school climate deals with relationships. Schools with caring and responsible adults who connect with students help prevent risk factors for adolescents. According to Hoy and Hannum (1997), positive relationships promote academic achievement by helping to ensure positive school health for adolescents. Another dimension of relationships in middle schools is the parent, family, and school connectedness.

Way, Reddy, and Rhodes (2007), found that the perceptions of middle school students can have psychological and behavioral implications for students, including students' perceptions of teacher and peer support. They found as students progressed through middle school, their perception of positive teacher and peer support dropped

significantly. Students' self-esteem and safety can also be affected by their perception of teacher and peer support. Similarly, Way et al. (2007) found that, over time, as adolescents' perception of school climate declined, there was an increase in behavior problems and depressive symptoms.

Motivation is also a factor in adolescent achievement. Locke and Latham (2004) found that the ability to acquire skills and the amount of effort a person gives in using those skills is affected by motivation. Furthermore, Eccles and Wigfield (1993) noted that motivation in adolescents is connected to school environment and often decreases during adolescence, making school climate an important factor in middle schools. Likewise, Thappa et al. (2012) noted that the National Center for Learning and Citizenship stated that a positive school climate promotes student motivation.

School Climate and Student Success

Freiberg (1998) reported climate and instruction had nearly as much impact on student learning as the learner's aptitude. Similarly, Hoy and Sabo (1998) stated that a positive school climate is associated with positive youth development. In fact, a number of studies have confirmed that school climate has a direct impact on the achievements of students (Cohen, McCabe, Michelli, & Pickeral, 2009; Hoy, 2012; McNeely, Nonnemaker & Blum, 2002). Improvements that are made to the school climate have an influence on the academic performance of the students; therefore, if positive improvements are made to the school climate, those improvements would have a positive impact on the academic and social performance of the students (Zins & Elias, 2006). School climate that is positive in nature not only facilitates greater achievement of students, but also provides promotion of students' emotional and social development

(Zins & Elias, 2006). Furthermore, Zins and Elias noted that when students are experiencing a positive climate, positive outcomes result in students being less at-risk for anti-social behavior and less likely to use drugs. In addition, Cohen, McCabe, Michelli, and Pickeral (2009) stated that a positive school climate results in better attendance and higher morale. In a more recent study, Wynn, Carboni, and Patall (2007) suggested that the socioeconomic status and race of students are the least significant variables that are directly linked to the achievement of the students; rather, the climate of the school plays a more important role. When schools possessing similar race and socioeconomics composition were compared, about 72% of variance in achievement of schools was explained by the variable of climate.

Assessing School Climate

Hoy (2012) noted that researchers of school climate have been working to identify variables, both cognitive and social, that make a difference for students and teachers. Schools must measure all the dimensions that shape school climate and recognize the three stakeholder groups in the environment: students, parents, and educators (Cohen, McCabe, Michelli, & Pickeral, 2009). To improve learning environments, Freiberg (1998) said that measuring and collecting data concerning school climate is not enough. Schools must do something with the data they collect. Additionally, Thapa et al. (2012) noted that the NSCC recommends schools not only measure school climate, but also include in school improvement plans.

As a social system, schools have a number of variables that interact to make them either effective or ineffective. Regardless of their experiences or perceptions, the individual stakeholders are key variables that play a role in the school's effectiveness.

Freiberg (1998) said that the perceptions individuals involved in the school have about climate factors may be more realistic than objective measures even though the perceptions are more subjective. Freiberg suggested that feedback from stakeholders is a large part of responding to the needs of the school community and concluded that climate can be measured, can be changed, and is a real factor in influencing the affective and cognitive outcomes of students. If researchers are using different stakeholders' opinions about climate, in which different perceptions cohabit, then perceptions can adequately define the school variables within the climate dimensions.

Thus assessing school climate involves collecting data from stakeholder's perceptions. The behavior of the people and their perceptions are entirely dependent on the way in which they perceive the situations they are in and the people they encounter. Plus, the perceptions of people are highly entwined with their emotions (Bandura, 1989). Self-efficacy also plays an important role in shaping people's behavior as it is related to the person's confidence to take action and stay persistent in that reaction (Bandura, 1989). People whose self-esteem and self-confidence are lower are more prone to adopt the behavior of other people. Therefore, a person's level of self-efficacy has an effect on personal changes (Bandura, 1989). Self-efficacy also determines the activities in which a person would want to engage.

According to Ajzen (2003), individuals perceive the situations they are in regarding the events, people, and even relationships, and those perceptions shape people's behavior because their awareness of the events, people, and relationships, helps them to gather and gain knowledge by hearing, seeing, and sensing. People make sense out of what they say and hear and their perceptions have either a positive or negative

impact about that situation, person, or the event (Ajzen, 2003). As a result, it is important to note that the perceptions about school climate have a positive or negative impact on the thinking of a person and in turn, influence how a person acts (Ajzen, 2003). Therefore, perceptions play a crucial role in shaping the behavior of the person.

Research has supported a series of positive consequences from educating students in a school with a healthy school climate, yet there are few states that have either a climate specialist or have developed school climate policies (Cohen, McCabe, Michelli, & Pickeral, 2009). In a recent policy scan, Cohen, McCabe, Michelli, & Pickeral (2009) discovered that, of those states that indeed had school climate policy written into their accountability plans (22), only six states had done so and only in a limited manner, and the other 16 subscribed to school climate in relation to special education, health, or safety concerns. The state of Missouri assesses school climate through the use of a survey titled the Advanced Questionnaire on which are specific questions relating to climate dimensions. All three suggested stakeholder groups are surveyed in Missouri: students, parents, and faculty (Missouri, DESE 2012b).

Summary

The literature review provided background related to the study of school climate including the history of research regarding school climate, the dimensions of school climate, and the most recent definition of school climate. A review of the No Child Left Behind legislation and its impact on schools was discussed. The current age of accountability has left schools overly focused on test scores, often overlooking the role school climate plays in students' healthy development, including academic achievement. The NSCC (2007) recommended schools measure, monitor, and manage school climate.

Because schools should measure school climate and use the data to develop school

improvement plans, the discussion of the Missouri AQ as a tool that measures dimensions

of school climate was mentioned. A discussion of the needs of adolescents in relation to

school climate was provided along with a review school climate and the link to student

achievement. The chapter concluded with a discussion of school climate assessment

noting the importance stakeholder perceptions play in human behavior, thus, affecting

student achievement (Ajzen, 2003). Until we understand stakeholder perceptions about

specific aspects of school climate, we cannot develop strategies to change these

perceptions. In chapter three, the researcher discusses the topics of research design,

population sample, hypothesis, research variables, instrumentation, data collection

procedures, and statistical analysis as related to this study. Chapter four provides results

and describes the results for each research question.

Chapter Three

Methods

The primary purpose of this study was to determine the factors of middle school

climate, if any, that affect student achievement in mathematics. This chapter presents the

methodology used to identify those relationships that may exist. The chapter contains the

following sections: research design, population and sample, sampling procedures,

instrumentation, data collection, data analysis and hypothesis testing, limitations of the

study, and a brief summary of the chapter.

Research Design

This quantitative investigation was a correlational study designed to examine the

extent of a relationship between the dependent variable of student achievement as

measured by the percentage of students scoring Proficient or Advanced on the

mathematics portion of the Missouri Assessment Program (MAP) and the independent

variables of middle school student, parent, and teacher perceptions of school climate as

measured on the Missouri Advanced Questionnaire (AQ). Copies of these surveys are

attached in Appendices B, C, and D. The researcher retrieved data publicly available

from the Missouri DESE website section that includes school data and statistics

(Missouri, DESE 2012d).

Population and Sample

The population of interest for this study was all students in the 272 middle schools

in Missouri. The sample for this study was defined as Missouri middle schools that

educate students in grades six through eight, that completed the Cycle 4 Missouri School

Improvement Program (MSIP) review during the 2010-2011 academic year, and that also

participated in the Middle School/Junior High School AQ. There were 72 Missouri

middle schools that met the above referenced requirements to be included in this sample.

Appendix A contains a list of those 72 Missouri middle schools.

This study's sample of middle schools included 35,790 students among whom

44.75% were female and 55.25% were male. The average percentage of students from

the 72 middle schools qualifying for free and reduced lunch was 49%, and the average

mobility rate for the schools was 25.9% (Missouri DESE, 2011c). Table 1 shows specific

ethnicity demographics for the students in the sample.

Table 1

Ethnicity of Students Included in the Sample

Ethnicity	Black	Asian	Hispanic	Indian	White	Total
Number of Students	5,842	844	1,102	119	27, 485	35,392

Note. Adapted from information provided by the Missouri Comprehensive Data System 2011, generated

by the Missouri Department of Elementary and Secondary Education, 2011c.

The census of the Missouri schools included in this study's sample represented

areas of the state including *Large City,* which is an urban area with a population of

250,000 or more, to *Rural,* which is a remote rural territory that is more than 25 miles

from an urbanized area and is more than 10 miles from an urban cluster. The study

sample included 7 schools classified as *City*, 19 classified as *Suburban*, 17 classified as

Town, and 29 classified as *Rural*. *City*, *Suburban*, *Town*, and *Rural* classifications were

each further divided into sizes (U.S. Department of Education, 2008a). The census

designations and definitions of the schools in the study and the number of schools

included in the sample are included in Table 2.

Table 2.

Census Urban-Rural Designation of Middle Schools

US Census Designation	Census Definition	Number of Schools
City, Large	Inside an urbanized area and inside a principal city with a population of 250,00 or more	1
City, Midsize	Inside an urbanized area and inside a principal city with population $< 250,000$ and $\geq 100,000$	6
City, Small	Inside an urbanized area and inside a principal city with population $< 100,000$	0
Suburb, Large	Outside a principal city and inside an urbanized are with population of 250,00 or more	18
Suburb, Midsize	Outside a principal city and inside an urbanized are with population $< 250,000$ and $\geq 100,000$	1
Suburb, Small	Outside a principal city and inside an urbanized area with population $< 100,000$	0
Town, Fringe	Inside an urban cluster that is ≤ 10 miles from an urbanized area	1
Town, Distant	Inside an urban cluster that is > 10 miles and ≤ 35 miles from an urbanized area	11
Town, Remote	Inside an urban cluster that is > 35 miles of an urbanized area	5
Rural, Fringe	Is ≤ 5 miles from an urbanized area, as well as rural territory that is ≤ 2.5 miles from an urban cluster	9
Rural, Distant	Is > 5 miles and < 25 miles from an urbanized area, as well as rural territory that is > 2.5 miles but ≤ 10 miles from an urban cluster	12
Rural, Remote	Is > 25 miles from an urbanized area and > 10 miles from an urban cluster	8

Note. Adapted from information about the urban-centric locale categories provide in *The Documentation to the NCES Common Core of Data Public Elementary/Secondary School Locale Code File: School Year 2005-2006*, by the U.S. Department of Education, National Center for Educational Statistics 2008a, p. 4.

Sampling Procedures

Purposive sampling, as described by Lunenburg & Irby (2008), is a type of non-random sampling where the researcher has knowledge of the independent and dependent variables that drive the sample selection. In this study the sample was selected based on both of the following criteria:

1. Missouri middle schools that had completed Cycle 4 MSIP during the 2010-2011 academic year.

2. Missouri middle schools that had participated in the Middle School/Junior High Missouri School Improvement Program Advanced Questionnaire.

The 72 middle schools in the sample represent 42 Missouri school districts.

Instrumentation

There were two instruments utilized in this study. The first was the Missouri Middle School/Junior High School Advanced Questionnaire. The other instrument used was the mathematics portion of the MAP assessment. These two instruments are described in the following subsections.

Missouri Advanced Questionnaire. Administration of the Missouri Advanced Questionnaire (AQ) is mandated by school districts as part of the Missouri School Improvement Program (MSIP) review to help evaluate educational processes in schools (K. A. Jamtgaard, personal communication, June 6, 2012). The agency responsible for reviewing and accrediting school districts in the state of Missouri is MSIP. Missouri has completed four cycles of MSIP reviews. Although MSIP does not use the AQ data to determine accreditation, it does mandate that during MSIP review cycles schools administer the AQ to provide data that could be useful to school officials to guide school

improvement efforts. The AQ, which is administered in November or December during

the academic year of the MSIP review, (K. A. Jamtgaard, personal communication, June

6, 2012) is used in conjunction with other school data collected during MSIP. However,

the AQ Schools can also elect to give the AQ during off-MSIP review years. The

Missouri AQ is administered to students, parents, and teachers of grades 3-12. Included

in the AQ are seven different forms, including one for students in grades 3-4, grade 5,

grades 6-8, and grades 9-12, with each grade-span AQ designed for the reading ability of

the students in these grade levels participating in the survey. Additionally, an AQ is

available for support staff, parents, and board of education members (Missouri, DESE

2012b).

Staff from the Office of Social and Economic Data Analysis (OSEDA), along

with researchers with survey experience from the University of Missouri and educators

from school districts who were members of the MSIP committee and who were involved

in setting up the MSIP standards, created the Missouri AQ (K. A. Jamtgaard, personal

communication, June 6, 2012). Also, some members of Missouri's DESE helped develop

the survey. Basically, this questionnaire contains items that measure the effectiveness of

school processes. According to Preis (2009), the AQ items were based on current

research into school effectiveness and best practices. The survey is used to gain data to

identify which school process variables have the strongest correlation with student

achievement (K. A. Jamtgaard, personal communication, June 6, 2012).

First administered in 1990-1991 for the first MSIP reviews, some AQ items on the

first questionnaire were based on Edmonds (1979) effective schools research. Other

items were adapted from the National Educational Longitudinal Study, conducted by the

U.S. Department of Education (K. A. Jamtgaard, personal communication, June 6, 2012). The Missouri AQ has gone through three revisions, one per each new cycle of MSIP reviews, to improve the quality of data collected through the questionnaire and to address the most current literature findings on school effectiveness (K. A. Jamtgaard, personal communication, June 6, 2012). During each redesign of the Missouri AQ, a process similar to that used in the development phase was followed, with district and DESE staff members participating in and directing the focus of the AQ items. The most recent revisions incorporated measures from the work of Marzano, Pickering, and Pollock, and the factors that are associated with improvements in student achievement (K. A. Jamtgaard, personal communication, June 6, 2012).

In order to meet MSIP requirements, districts must have minimum response rates. Specifically, teacher and student response rates must meet a minimum of 60%, and the parent response rate must meet 25% (Missouri DESE, 2012b). The faculty, support staff, board of education, and student versions of the AQ are administered electronically, while the parent version is a paper copy. All students deliver a paper version of the questionnaire to parents or guardians at home; then, these questionnaires are returned to the child's school in a sealed envelope. Next, test coordinators at the school mail envelopes containing parent survey responses to DESE for scoring (K. A. Jamtgaard, personal communication, June 6, 2012). Missouri has a historically high percentage of teacher and student respondents using this census methodology for the Missouri AQ with actual response rates for the questionnaires being consistent with faculty at 73%, students at 85%, and parents at 53% (K. A. Jamtgaard, personal communication, June 6, 2012).

The MSIP AQ uses a census methodology, which acquires and records specific information from the six different stakeholder groups. The AQ uses a Likert Scale. There are five possible responses to each item from 1(strongly disagree) to 5 (strongly agree). The student version contains 83 items, the parent version contains 59 items, and the teacher version contains 104 items All AQ versions contain items that address the same scales or categories. Categories included in the AQ and their definitions are shown in Table 3. For this study, AQ items used were from the four dimensions of school climate that NSCC (2007) recommended schools measure: safety, interpersonal relationships, institutional environment, and teaching and learning. Climate items were used that were asked of all stakeholders.

Table 3

Missouri AQ Categories/Scales and What They Measure

AQ Scale Category	Measures
School Leadership	Identifies the degree to which leadership is perceived as effective in improving student learning
Parental Involvement	Identifies the degree to which parents are viewed as partners in the education of their children
Safe and Orderly Environment	Identifies the degree to which the school environment is safe and orderly
School Climate	Identifies the degree to which all students feel respected and valued
Guaranteed and Viable Curriculum	Identifies the degree to which essential curriculum has been identified in the district and the degree to which students have adequate opportunity to learn the content
Professional Development	Identifies the impact of professional development on improving learning for all students
Community Capital	Identifies the level of commitment and support by the community for the school
Efficacy and Expectations	Identifies the degree to which teachers and students believe that they are capable of impacting student achievement
Classroom Management	Identifies the degree to which educational personnel establish and enforce classroom management processes that enhance student learning

Note: Preis, S. (2009). *A study of the public schools of Missouri.* Retrieved from Joint Committee on Education website: http://www.senate.mo.gov/jced/

MAP Test. The Missouri Assessment Program (MAP), a standardized, criterion-referenced test, is an annual statewide measure of student achievement in grades 3 through 12. The MAP is the instrument used by Missouri DESE to measure student

achievement as outlined in NCLB (2001), which emphasized mathematics and communication arts achievement and mandated annual testing in both of these subjects in grades 3 through 12. The MAP test is administered in the spring of each year and involves multiple testing formats, including selected-response questions, constructed-response questions, and performance events (Missouri DESE, 2011d); however, the performance events were not used during the 2010-2011 academic year. Recommended test administration times for each grade-level assessment are three to five hours. Sections of the MAP are both timed and not timed. Selected-response items provide a list of four possible correct answers. Constructed-response question items require students to write a response to the prompt addressed in the question. Students scoring at Proficient or Advanced levels in mathematics and communication arts are considered to be in the Top Two and these scores are used to determine if the school has met Adequate Yearly Progress as stipulated by NCLB (2001).

Measurement AQ. The Missouri Advanced Questionnaire (AQ) uses a Likert Scale to measure MSIP data. There are five possible responses to each item from 1 (strongly disagree*)* to 5 (strongly agree). Mean scores are calculated for each response and from each response group in each school. The number of respondents indicating they either agreed or strongly agreed with an item is combined into a single percentage along with the total number of responses from each item. Results from the Missouri AQ are reported by these percentages for each item. Also the AQ data also reports the number of participant responses missing for each item.

This study utilized survey items that measured dimensions of school climate from the Missouri AQ student survey, parent survey, and teacher survey. The items are all

related to one of the dimensions of school climate and measure the same processes across all stakeholders. Each item the researcher used was categorized using the following NSCC (2007) school climate dimensions: safety, teaching and learning, interpersonal relationships, and institutional environment. There were six items from the Missouri AQ categorized under the climate dimension of safety and used in this study. Physical and emotional security and clear norms and rules are included in this dimension. The stakeholders along with the exact items used are included in Table 4.

Table 4

Missouri AQ Items Measuring Safety Dimension

Stakeholder	Survey Item	Survey Item Description
Student	#44	I feel safe at school
Student	#60	Discipline is handled fairly in my school
Parent	#40	I feel my child is safe at school
Parent	#44	Discipline in my child's school is handled fairly
Faculty	#59	I feel safe at school
Faculty	#72	Discipline at this school is handled fairly

Note. Adapted from the *Missouri Advanced Questionnaire for Students, Parents, and Faculty 2011,* generated by the Missouri Department of Elementary and Secondary Education, 2012b.

The five items from the Missouri AQ categorized under the climate dimension of institutional environment, were used in this study. Social connectedness and engagement along with physical surroundings are included in this dimension. The stakeholders along with the exact items used are included in Table 5.

Table 5

Missouri AQ Items Measuring Institutional Environment Dimension

Stakeholder	Survey Item	Survey Item Description
Student	#47	I like going to this school
Student	#35	There is a feeling of belonging at my school
Parent	#45	If I could, I would send my child to a different school
Faculty	#71	I usually look forward to each working day as a teacher
Faculty	#69	This school makes students feel like they belong

Note. Adapted from the *Missouri Advanced Questionnaire for Students, Parents, and Faculty 2011*, generated by the Missouri Department of Elementary and Secondary Education, 2012b.

The nine items from the Missouri AQ categorized under the climate dimension of teaching and learning where used in this study. Support for learning and support for the social and civic development of students are contained in this dimension. The stakeholders along with the exact items used are included in Table 6.

Table 6

Missouri AQ Items Measuring Teaching and Learning Dimension

Stakeholder	Survey Item	Survey Item Description
Student	#37	Teachers make clear what I am supposed to learn
Student	#29	I can do well in school
Student	#59	My teachers expect very good work
Parent	#51	I know what my child's teachers expect in school
Parent	#28	My involvement has improved my child's achievement
Parent	#55	My teachers expect very good work from my child
Faculty	#87	I begin instruction by presenting clear learning goals
Faculty	#45	I believe that I can positively impact student learning
Faculty	#54	All staff hold high expectations for student learning

Note. Adapted from the *Missouri Advanced Questionnaire for Students, Parents, and Faculty 2011*, generated by the Missouri Department of Elementary and Secondary Education, 2012b.

The 11 items from the Missouri AQ categorized under the climate dimension of interpersonal relationship were used in this study. Respect for diversity and the social supports for students are included in this dimension. The stakeholders along with the exact items used are included in Table 7.

Table 7

Missouri AQ Items Measuring Interpersonal Relationship Dimension

Stakeholder	Survey Item	Survey Item Description
Student	#28	Differences among students and their families are respected in my school
Student	#36	Teachers in my school really care about me
Student	#49	I am treated fairly at school
Student	#51	My parents have a good idea about what goes on at school
Parent	#33	The school values and respects differences among students and their families
Parent	#36	My child is given a fair chance to succeed at school
Parent	#38	I know how well my child is doing in class
Faculty	#25	Emphasis is placed on valuing and respecting differences among students and their families in our school
Faculty	#70	If students in this school have a problem, teachers will listen and help
Faculty	#67	Students are treated fairly in school
Faculty	#20	Parents are encouraged to discuss their child's educational needs with the school

Note. Adapted from the *Missouri Advanced Questionnaire for Students, Parents, and Faculty 2011*, generated by the Missouri Department of Elementary and Secondary Education, 2012b.

The researcher used a panel consisting of educational practitioners and a graduate student not familiar with or bias towards MSIP to categorize the AQ items used in the survey into one of the following National School Climate Center's climate dimensions:

- Safety

- Institutional Environment

- Interpersonal Relationships

- Teaching and Learning

Table 8 contains information about the panel used to categorize the AQ items and the degree of agreement between the panel member and the researcher.

Table 8

Panel Members Used to Classify AQ questions by NSCC Dimensions

Field	Title	Results
Education	Secondary Communication Arts Department Chair for St. Joseph School District	90% Agreed with Researcher
	Eighth grade communication arts teacher for St. Joseph School District	
Education	Assistant Director of Special Education for St. Joseph School District	100% Agreed with Researcher
Government	OSEDA Research Associate and Research Assistant Professor with the Department of Rural Sociology	100% Agreed with Researcher
Education	Instructional Coach and Math Teacher	100% Agreed with Researcher
Undergraduate Student	Southwest Oklahoma State University Student	100% Agreed with Researcher

Each person from the panel was given the AQ items and the NSCC recommended climate dimensions with descriptors (see Appendix E). The panel members were asked to sort the AQ items into the NSCC climate dimension that best expressed the AQ item.

The panel reached consensus on all items except one. The AQ items were categorized based on the majority of the panel recommendations.

Measurement MAP. The variable, student achievement in mathematics, was measured by examining the percentage of middle school students at each school scoring Proficient or Advanced on the mathematics portion of the Missouri Assessment Program (MAP). The percentage of students scoring Proficient or Advanced on the MAP is a collective measure of a school's student achievement in mathematics in Missouri. The Outstanding Schools Act of 1993 led to the development of the Missouri Assessment Program (Missouri DESE, 2012c) and required Missouri to create a statewide assessment system that would measure the level of achievement on state standards. In 2002, the NCLB legislation was enacted, calling further for states to create grade-level assessments in communication arts and mathematics for grades 3 through 8. As a result, Missouri DESE contracted with McGraw-Hill to develop assessments that would test proficiency as mandated by NCLB. Students' scale scores on the assessment result in students' assessment levels being classified as Below Basic, Basic, Proficient, or Advanced, with Below Basic and Basic considered by the Missouri DESE to be the Bottom Two and Proficient and Advanced are considered the Top Two. Table 9 includes data about the relationship between the mathematics MAP scale score ranges and mathematics MAP achievement levels for grades 6 through 8 (Missouri DESE, 2012a).

Table 9

Mathematics MAP Scale Score Range and Achievement Levels 2010-2011

Grade	Below Basic	Basic	Proficient	Advanced
6	495-627	628-680	681-720	721-845
7	510-639	640-684	685-723	724-860
8	525-669	670-709	710-740	741-885

Note. Adapted from *Missouri Assessment Program Grade-Level Assessments Guide to Interpreting Results* generated by the Missouri Department of Elementary and Secondary Education, 2011b.

Reliability and Validity. Reliability refers to the consistency that a test assesses what it is supposed to measure (Lunenburg & Irby, 2008). On both the AQ and MAP reliability is documented. Cronbach's alpha (1951) was used to establish internal reliability of the AQ scales. A Cronbach's alpha value closer to one indicates high reliability. OSEDA has reported a Cronbach's alpha of .71 for the Missouri AQ (K. A. Jamtgaard, personal communication, June 6, 2012). The Missouri AQ for MSIP Cycle 4 had a Cronbach's alpha of .65 or higher across all subscales (Missouri DESE, 2011a). Experts in the field are consulted on each category or scale of the AQ. Additionally, a panel of experts from both DESE and school districts participate in the discussion and review of the instruments. Pilot tests are conducted to ensure the items contain the appropriate wording for the intended audiences (K. A. Jamtgaard, personal communication, June 6, 2012).

CTB/McGraw Hill developed the MAP assessment, which is nationally normed and tested yearly for its reliability and validity. In 2010, the Missouri DESE published a technical report providing evidence of the reliability and validity of the MAP test scores.

According to the Missouri Department of Elementary and Secondary Education (2012a), CTB/McGraw Hill and DESE have developed MAP assessments in response to criteria set by the Missouri legislature. DESE stated that MAP scores are reliable and valid measures of achievement relative to the Show-Me Standards (Missouri DESE, 2011a). Cronbach's alpha (1951) was used to establish internal reliability of the MAP tests. The reliability of the mathematics portion of the MAP is .92 for grades 6, 7, and 8 as shown in table 10 (Missouri DESE, 2011a).

Table 10

Cronbach's Alpha Internal Consistency Coefficient for the 2010-2011 Mathematics Portion of the Missouri MAP Test

Grade	Content	Cronbach's Alpha
6	Math	0.92
7	Math	0.92
8	Math	0.92

Note. Adapted from the *Missouri Assessment Program Grade-Level Assessments: Technical Report 2010 and 2011*, generated by the Missouri Department of Elementary and Secondary Education, 2011a.

Additionally, DESE uses inter-rater reliability to ensure that the constructed-response items are reliable. A second reader is used to score constructed-response items and a weighted Kappa value rates the strength of agreement between the two readers' scores. A Kappa value of 0 indicates a poor strength agreement between the first and second reader while a Kappa value of .81-1.0 indicates a very strong agreement. The DESE technical report states that the mathematics MAP test has a very strong inter-rater reliability with a Kappa value of .99 (Missouri DESE, 2011a).

Validity is a measure of the degree that the test assesses what it is meant to measure (Lunenburg & Irby, 2008). Content validity and convergent validity were employed to analyze the content validity of the Missouri AQ. According to Keith Jamtgaard at the Office of Social and Economic Data Analysis (OSEDA), revisions and pilot testing were conducted for the Missouri AQ to test for validity (Personal communication, June 6, 2012). An expert panel consisting of DESE officials and Missouri school district officials review and discuss the AQ to ensure that all items are appropriate for the intended audience of the AQ (K A. Jamtgaard, personal communication, June 6, 2012). Also, OSEDA researches, and gains information regarding the topics of each AQ subscale to control for convergent validity (K. A. Jamtgaard, personal communication, June 6, 2012).

The construct validity of the MAP test has been measured using item-response theory (IRT) models. Missouri DESE (2011a) reported that only three items in grade 6, one item in grade 7, and no items in grade 8 were flagged as a poor fit. Each item flagged as a poor model data fit was examined more closely by analyzing the performance of the examinee. DESE reported that the items flagged for misfit did not have differences of practical importance. A large number of items flagged as misfits would indicate caution in interpretation of scores; however, a total of only 12 items out of 830 on the MAP test were flagged as poor fit indicating strong construct validity (Missouri DESE, 2011a).

Data Collection Procedures

Permission to conduct this study was obtained prior to collecting data. A Proposal for Research was submitted on October 2, 2012 to the Baker University

Institutional Review Board (IRB) and was later approved (see Appendices F and G). The

researcher requested an exempt review due to archival data being non-personally

identifiable and available to the public on the DESE website. After approval was

obtained, the researcher contacted the Missouri Department of Elementary and Secondary

Education's school improvement division to obtain a list of middle schools that

completed Cycle 4 MSIP review and participated in the Middle School/Junior High

School Missouri AQ for the 2010-2011 academic year.

The first set of data was from the items related to school climate on the Cycle 4

AQ survey. All Missouri schools were mandated to administer the AQ to students,

parents, and faculty to meet the requirements for the Missouri School Improvement

Program (MSIP). Student, parent, and faculty responses from the Missouri AQ were

retrieved with help from Keith Jamtgaard at OSEDA. The second set of data was derived

from the DESE state assessment test in mathematics. All students in the state of Missouri

were given the Missouri Assessment Program test yearly in mathematics. Statistical

information concerning each middle school's demographics, including SES, was gathered

from the Missouri DESE website.

The researcher accessed the DESE School Report Card site to obtain MAP data

on the above-mentioned middle schools. The MAP was used for statewide evaluation in

the spring of 2011 to measure the achievement of students in mathematics for that

specific school year. The number of middle school students scoring Proficient or

Advanced in mathematics during the 2010-2011 academic year was collected from the

School Report Card site. Additional demographic information was collected on each of

the middle schools in the sample such as ethnicity, school size, gender, and number of students.

The MAP scores for each middle school in the study were compiled and entered into an Excel spreadsheet by the percentage of students scoring Proficient or Advanced. The researcher contacted OSEDA to request help collecting the data from the AQ items used in the research. The researcher was able to obtain the data on all AQ items used in the research for parents, students, and teachers from the research sample of middle schools with the school's name, district name, demographic information, and AQ responses. Then, the researcher entered the school mean Missouri AQ scores for students, parents, and faculty on each of the items that rated school climate as noted in Chapter one. Scores for each item were noted as a percentage of agree or strongly agree. Scores were stored in an Excel spreadsheet.

Data Analysis and Hypothesis Testing

This study employed quantitative methods of data analysis. The quantitative data collected for each middle school in the study were the percentage of students who scored Proficient or Advanced on the mathematics math portion of the MAP test. Additionally calculated for each school was the overall mean for each AQ item used in the study and for each stakeholder in the study. Finally, relationships between achievement and climate survey responses were analyzed.

The following research questions with corresponding hypotheses were addressed in this study:

Research question 1. To what extent is there a relationship between Missouri public middle school students' perceptions of school climate, as measured by the

Missouri AQ, and the percentage of middle school students' mathematics achievement scores at or above Proficient, as measured by the Missouri Assessment Program?

Research hypothesis 1. A relationship exists between middle school students' perceptions about school climate (school safety, institutional environment, interpersonal relationships, and teaching and learning) and student achievement in mathematics in Missouri middle schools.

In order to analyze the relationships between middle school students' perceptions about school climate and student achievement in mathematics, a Pearson's correlation coefficient was calculated between the mean of each of the student climate AQ items which measured the following dimensions of climate: school safety, institutional environment, interpersonal relationships, and teaching and learning, and the percentage of middle school students scoring at or above Proficient on the Missouri mathematics MAP assessment. Both the strength and direction of the linear relationship between perceptions of school climate and student achievement in mathematics in each of the middle schools were measured using the correlation coefficients. A hypothesis test was conducted to determine if each correlation was statistically significant at $\alpha = .05$.

Research question 2. To what extent is there a relationship between Missouri public middle school teachers' perceptions of school climate, as measured by the Missouri AQ, and the percentage of middle school students' mathematics achievement scores at or above Proficient, as measured by the Missouri Assessment Program?

Research hypothesis 2. A relationship exists between middle school teachers' perceptions about school climate (school safety, institutional environment, interpersonal

relationships, and teaching and learning) and student achievement in mathematics in Missouri middle schools.

In order to analyze the relationships between middle school teachers' perceptions about school climate and student achievement in mathematics, a Pearson's correlation coefficient was calculated between the mean of each of the teacher climate AQ items which measured the following dimensions of climate: safety, institutional environment, interpersonal relationships, and teaching and learning and the percentage of middle school students scoring at or above Proficient on the Missouri mathematics MAP assessment. Both the strength and direction of the linear relationship between perceptions of school climate and student achievement in mathematics in each of the middle schools were measured using the correlation coefficients. A hypothesis test was conducted to determine if each correlation was statistically significant at $\alpha = .05$.

Research question 3. To what extent is there a relationship between Missouri public middle school parents' perceptions of school climate, as measured by the Missouri AQ, and the percentage of middle school students' mathematics achievement scores at or above Proficient, as measured by the Missouri Assessment Program?

Research hypothesis 3. A relationship exists between middle school parents' perceptions about school climate (school safety, institutional environment, interpersonal relationships, and teaching and learning) and student achievement in mathematics in Missouri middle schools.

In order to analyze the relationships between middle school parents' perceptions about school climate and student achievement in mathematics, a Pearson's correlation coefficient was calculated between the mean of each of the parent climate AQ items

which measured each of the following dimensions of climate: safety, institutional

environment, interpersonal relationships, and teaching and learning and the percentage of

middle school students scoring at or above Proficien*t* on the Missouri mathematics MAP

assessment. Both the strength and direction of the linear relationship between

perceptions of school climate and student achievement in mathematics in each of the

middle schools were measured using the correlation coefficients. A hypothesis test was

conducted to determine if each correlation was statistically significant at $\alpha = .05$.

Limitations

Lunenberg and Irby (2008) said that limitations are features that the researcher

cannot control and may affect the interpretation of the results. The following limitations

were identified regarding this study:

1. School scores cannot be generalized to individuals.

2. AQ data were collected through student, faculty, and parent self-reports,
   which were based on perceptions; therefore, one survey respondent may
   interpret a survey question differently from another.

3. The instruction, test preparation, and the test-taking environment may have
   been inconsistent among schools included in the study.

4. Causal effects about school climate cannot be determined from this
   correlational study.

5. The researcher had no control over the survey respondents' efforts in
   answering the items or the students' efforts in completing the mathematics
   MAP assessment.

Summary

All Missouri school districts that have been through Cycle 4 MSIP review process in the year 2010-2011 were the focus and population of this study. This quantitative analysis used a correlational design to determine the relationship between school climate and students' achievement on the Missouri Assessment Program mathematics portion of the achievement test. A purposive sample was taken from the population to include all middle schools in which the AQ was used to collect data regarding school climate during the 2010-2011 academic year. Achievement data from each middle school in the sample were measured using the mathematics portion of the MAP. Results of the data analysis for this study are presented in chapter four.

Chapter Four

Results

The previous chapters detailed the background to the study, reviewed literature

relevant to the study, and identified the methodology of the study. Chapter four will

present detailed statistics obtained through following the methodology outlined in chapter

three as they relate to the research questions. The purpose of the quantitative study was

to examine the correlation, if any, between perceptions of school climate and middle

school student achievement in mathematics.

Hypothesis Testing

A hypothesis was proposed for each of the four dimensions of school climate

(safety, institutional environment, relationships, and teaching and learning). Each of the

hypotheses is stated below along with the results of the calculation of the correlation

coefficient and the hypothesis test for the significance of that correlation.

RQ 1. To what extent is there a relationship between Missouri public middle

school students' perceptions of school climate, as measured by the Missouri AQ, and the

percentage of middle school students' mathematics achievement scores at or above

Proficient, as measured by the Missouri Assessment Program? In order to address this

research question the following research hypotheses were tested:

H 1. The percentage of students in Missouri middle school who agree or strongly

agree that they feel safe in school is positively correlated with the percentage of students

who score at or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of

students in Missouri middle schools who agree or strongly agree that they feel safe in

school is positively correlated with the percentage of students who scored at or above

Proficient on the mathematics portion of the MAP indicated the relationship was

statistically significant ($r = .689$, $N = 72$, $p = .000$). The relationship between the

students' perception of school safety and mathematics achievement was positive and

strong. There was sufficient evidence to support the research hypothesis that as the

percentage of students who agreed they feel safe in school increased, the percentage of

students scoring at or above Proficient in mathematics increased.

H 2. The percentage of students in Missouri middle school who agree or strongly

agree that the institutional environment is such that they feel a sense of belonging and

like going to school is positively correlated with the percentage of students who score at

or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of

students in Missouri middle schools who agree or strongly agree that the institutional

environment is such that they feel a sense of belonging and like going to school is

positively correlated with the percentage of students who scored at or above Proficient on

the mathematics portion of the MAP indicated the relationship was statistically

significant ($r = .589$, $N = 72$, $p = .000$). The relationship between the students'

perception of institutional environment and mathematics achievement was positive and

moderately strong. There was sufficient evidence to support the research hypothesis that

as the percentage of students who agreed they like going to school and feel a sense of

belonging in school increased, the percentage of students scoring at or above Proficient in

mathematics increased.

H 3. The percentage of students in Missouri middle schools who agree or strongly agree that interpersonal relationships in relation to school climate are positive (e.g., differences are respected in school, teachers really care about students, students are treated fairly, and parents know what is going on in school) is positively correlated with the percentage of students who score at or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of students in Missouri middle schools that agree or strongly agree that interpersonal relationships in relation to school climate are positive (e.g., differences are respected in school, teachers really care about students, students are treated fairly, and parents know what is going on in school) was positively correlated with the percentage of students who scored at or above Proficient on the mathematics portion of the MAP indicated the relationship was statistically significant ($r = .525$, $N = 72$, $p = .000$). The relationship between the students' perception of interpersonal relationships and mathematics achievement was positive and moderately strong. There was sufficient evidence to support the research hypothesis that as the percentage of students who agreed they feel respected, they are treated fairly, and parents know what is going on in school increased, the percentage of students scoring at or above Proficient in mathematics increased.

H 4. The percentage of students in Missouri middle school who agree or strongly agree that teaching and learning is positive (e.g., learning targets are clear, teachers expect very good work, and students know they can do well in school) is positively correlated with the percentage of students who score at or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of students in Missouri middle schools who agree or strongly agree that teaching and learning is positive (e.g., learning targets are clear, teachers expect very good work, and students know they can do well in school) was positively correlated with the percentage of students who scored at or above Proficient on the mathematics portion of the MAP indicated the relationship was statistically significant ($r = .469$, $N = 72$, $p = .000$). The relationship between the students' perception of teaching and learning and mathematics achievement was positive and moderately strong. There was sufficient evidence to support the research hypothesis that as the percentage of students who agreed learning targets are clear, teachers expect good work, and student know they can do well in school increased, the percentage of students scoring at or above Proficient in mathematics increased.

RQ 2. To what extent is there a relationship between Missouri public middle school district teachers' perceptions of school climate, as measured by the Missouri AQ, and the percentage of middle school students' mathematics achievement scores at or above Proficient, as measured by the Missouri Assessment Program? In order to address this research question the following research hypotheses were tested:

H 5. The percentage of teachers in Missouri middle school who agree or strongly agree that they feel safe in school is positively correlated with the percentage of students who score at or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of teachers in Missouri middle schools who agree or strongly agree that they feel safe in school was positively correlated with the percentage of students who scored at or above

Proficient on the mathematics portion of the MAP indicated the relationship was statistically significant ($r = .350$, $N = 72$, $p = .003$). The relationship between the teachers' perception of school safety and mathematics achievement was positive and moderately strong. There was sufficient evidence to support the research hypothesis that as the percentage of teachers who agreed they feel safe in school increased, the percentage of students scoring at or above Proficient in mathematics increased.

H 6. The percentage of teachers in Missouri middle schools who agree or strongly agree that the institutional environment is such that they like going to work and they feel students have a sense of belonging is positively correlated with the percentage of students who score at or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of teachers in Missouri middle schools who agree or strongly agree that the institutional environment is such that they like going to work and they feel students have a sense of belonging and was positively correlated with the percentage of students who scored at or above Proficient on the mathematics portion of the MAP indicated the relationship was statistically significant ($r = .303$, $N = 72$, $p = .010$). The relationship between the teachers' perception of institutional environment and mathematics achievement was positive and moderately strong. There was sufficient evidence to support the research hypothesis that as the percentage of teachers who agreed they like going to work and they feel students have a sense of belonging in school increased, the percentage of students scoring at or above Proficient in mathematics increased.

H 7. The percentage of teachers in Missouri middle school who agree or strongly agree that interpersonal relationships in relation to school climate are positive (e.g.,

differences are respected in school and teachers really care about students,) is positively

correlated with the percentage of students who score at or above Proficient on the

mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of

teachers in Missouri middle schools who agree or strongly agree that interpersonal

relationships in relation to school climate are positive (e.g., differences are respected in

school and teachers really care about students,) was positively correlated with the

percentage of students who scored at or above Proficient on the mathematics portion of

the MAP indicated the relationship was statistically significant ($r = .264$, $N = 72$, p

$=.025$). The relationship between the teachers' perception of interpersonal relationships

and mathematics achievement was positive and moderate. There was sufficient evidence

to support the research hypothesis that as the percentage of teachers who agreed that

differences are respected and teachers really care about students increased, the percentage

of students scoring at or above Proficient in mathematics increased.

H 8. The percentage of teachers in Missouri middle school who agree or strongly

agree that teaching and learning is positive (e.g., instruction is started on time, all

teachers expect very good work, and teachers know they can help students do well in

school) is positively correlated with the percentage of students who score at or above

Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of

teachers in Missouri middle schools who agree or strongly agree that teaching and

learning is positive (e.g., instruction is started on time, all teachers expect very good

work, and teachers know they can help students do well in school) is positively correlated

with the percentage of students who scored at or above Proficient on the mathematics

portion of the MAP indicated the relationship was statistically significant ($r = .264$, $N =$

72, $p = .025$). The relationship between the teachers' perception of teaching and learning

and mathematics achievement was positive and moderate. There was sufficient evidence

to support the research hypothesis that as the percentage of teachers who agreed that

instruction is started on time, all teachers expect very good work, and teachers know they

can help students do well in school increased, the percentage of students scoring at or

above Proficient in mathematics increased.

RQ 3. To what extent is there a relationship between Missouri public middle

school district parents' perception of school climate, as measured by the Missouri AQ,

and the percentage of middle school students' mathematics achievement scores at or

above Proficient, as measured by the Missouri Assessment Program? In order to address

this research question the following research hypotheses were tested:

H 9. The percentage of parents in Missouri middle school who agree or strongly

agree that they feel their school is safe is positively correlated with the percentage of

students who score at or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of

parents in Missouri middle schools who agree or strongly agree that they feel their school

is safe was positively correlated with the percentage of students who scored at or above

Proficient on the mathematics portion of the MAP indicated the relationship was

statistically significant ($r = .647$, $N = 72$, $p = .000$). The relationship between the

parents' perception of school safety and mathematics achievement was positive and

moderately strong. There was sufficient evidence to support the research hypothesis that

as the percentage of parents who agreed their school was safe increased, the percentage of students scoring at or above Proficient in mathematics increased.

H 10. The percentage of parents in Missouri middle school who agree or strongly agree that the institutional environment is such that they feel they would send their student to another school is positively correlated with the percentage of students who score at or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of parents in Missouri middle schools who agree or strongly agree that the institutional environment is such that they feel they would send their student to another school was negatively correlated with the percentage of students who scored at or above Proficient on the mathematics portion of the MAP indicated the relationship was statistically significant ($r = -.743$, $N = 72$, $p = .000$). The relationship between the parents' perception of school safety and mathematics achievement was negative and strong. There was sufficient evidence to support the research hypothesis that as the percentage of parents who felt they would send their students to another school decreased, the percentage of students scoring at or above Proficient in mathematics increased.

H 11. The percentage of parents in Missouri middle schools who agree or strongly agree that interpersonal relationships in relation to school climate are positive (e.g., differences are respected in school, teachers really care about students, students are treated fairly, and parents know what is going on in school) is positively correlated with the percentage of students who score at or above Proficient on the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of

parents in Missouri middle schools who agree or strongly agree that interpersonal

relationships in relation to school climate are positive (e.g., differences are respected in

school, teachers really care about students, students are treated fairly, and parents know

what is going on in school) was positively correlated with the percentage of students who

scored at or above Proficient on the mathematics portion of the MAP indicated the

relationship was statistically significant ($r = .381$, $N = 72$, $p = .001$). The relationship

between the parents' perception of interpersonal relationships and mathematics

achievement was positive and moderately strong. There was sufficient evidence to

support the research hypothesis that as the percentage of parents who agreed that

differences are respected in school, teachers care about students, students are treated

fairly, and parents know what is going on in school increased, the percentage of students

scoring at or above Proficient in mathematics increased.

H 12. The percentage of parents in Missouri middle school who agree or strongly

agree that teaching and learning is positive (e.g., learning targets are clear, teachers

expect very good work, and parents' involvement helps their child do well in school) is

positively correlated with the percentage of students who score at or above Proficient on

the mathematics portion of the MAP.

The results of the hypothesis test for the correlation between the percentage of

parents in Missouri middle schools who agree or strongly agree that teaching and

learning was positive (e.g., learning targets are clear, teachers expect very good work,

and parents' involvement helps their child do well in school) is positively correlated with

the percentage of students who scored at or above Proficient on the mathematics portion

of the MAP indicated the relationship was statistically significant ($r = .379$, $N = 72$, $p = .001$). The relationship between the parents' perception of teaching and learning and mathematics achievement was positive and moderately strong. There was sufficient evidence to support the research hypothesis that as the percentage of parents who agreed that learning targets are clear, teachers expect very good work, and parents' involvement helps their child do well in school increased, the percentage of students scoring at or above Proficient in mathematics increased.

Summary

This chapter presented results of correlations used to address the research questions. The results were generated through the IBM Faculty Pack 21 SPSS computer statistical software. Results of the hypothesis testing showed all positive and strong correlations between student, parent, and teacher perceptions' of school climate and middle school student achievement at or above Proficient in mathematics except for one negative correlation. This negative correlation concerning parent perception of institutional environment had reverse coding on the survey. Parents were asked if they had the choice would they send their student to another school thus the negative correlation indicated that as the percentage of parents that would send their child to another school decreased, the percentage of students scoring at or above Proficient increased, therefore, indicating a strong correlation between parents' perception of school climate and students scoring at or above Proficient on the MAP.

In summary, the results indicate that student, teacher, and parent perceptions of school climate positively and significantly affected student achievement in mathematics at or above Proficient on the mathematics portion of the MAP. The size of the

relationship was strongest in students' perceptions of school climate in the dimensions of safety and interpersonal relationships. The strength of the relationship was the weakest in teachers' perceptions of school climate in the dimensions of interpersonal relationships and teaching and learning. It must be noted that no causal relationship can be concluded from this research study. The study only showed correlations existed between school climate perceptions and the percentage of students scoring at or above Proficient on the MAP. Chapter five contains findings from the study, findings related to the literature, implications for action, recommendations for future research, and a summary.

Chapter Five

Interpretation and Recommendations

The purpose of this research was to determine the extent of the relationship

among student, parent, and teacher perceptions of school climate and the percentage of

students scoring at or above Proficient in mathematics. This chapter provides an

overview of the main points in chapters one through four. Chapter five includes a study

summary, findings relating to the literature, recommendations for actions, and

implications for future research.

Study Summary

This quantitative study examined the relationships among the perceptions of

middle school students, parents, and teachers regarding school climate and students'

achievement on the mathematics portion of the Missouri Assessment (MAP). In this

section, a brief overview is given of chapters one through four. The overview consists of

the problem, the purpose statement and research questions, a review of the methodology,

and the major findings of the study.

Overview of the Problem. There was a lack of information regarding how

student, parent, and teacher perceptions of school climate in Missouri middle schools as

measured by the Missouri AQ were related to student achievement in mathematics. The

Missouri AQ, which contains items that are related to school climate, is administered to

every student, parent, and teacher of public schools in the state of Missouri at least every

five years, or during the year the respected school and district participates in the MSIP

review. Schools have accessibility to data from the Missouri AQ, and knowing what

relationships exist between the AQ and mathematics achievement may provide specific

opportunities to implement school improvement strategies, which in turn, could affect school climate, and influence student achievement in mathematics, thus improving the quality of education for students.

Purpose Statement and Research Questions. Understanding if student, parent, and teacher perceptions of school climate had a relationship to Missouri middle school student achievement on the mathematics portion of the MAP was the purpose of this study. Perceptions were measured by the Missouri DESE AQ, which is administered to every public school in the state of Missouri. Further understanding of the impact school climate may have on student achievement in middle schools will inform professional development practices for Missouri school districts. Three research questions were posed to guide the research and determine the relationship between student, parent, and teacher perceptions of school climate as measured by the Missouri AQ and the percentage of students scoring at or above Proficient on the mathematics MAP tests.

Review of the Methodology. The sample for this study included 72 Missouri middle schools within the target population that completed the MSIP Cycle 4 and participated in the Missouri AQ during the 2010-2011 academic year. The sample was selected from the available schools on the DESE website based on the aforementioned criteria. Mathematics achievement scores for each middle school in the study were retrieved from MAP scores publicly available on the DESE website. Keith Jamtgaard, research associate and research assistant professor at OSEDA aided the researcher in collecting Missouri AQ data from each middle school in the study. Four hypotheses addressed each of the three research questions. For each hypothesis, a correlation

coefficient and significance of correlation test determined whether a statistically significant relationship existed.

Major Findings. Results from this study provided evidence that student, parent, and teacher perceptions of school climate had a statistically significant relationship with middle school student achievement in mathematics. A summary of findings for each research question is noted below.

Results for research question 1 revealed a statistically significant relationship between middle school students' perceptions of school climate and the percentage of middle school students' mathematics achievement scores at or above Proficient. The analysis of the climate dimension of safety revealed a positive and strong relationship and the other three dimensions revealed a moderately strong and positive relationship.

Results for research question 2 revealed a statistically significant relationship between middle school parents' perceptions of school climate and the percentage of middle school students' mathematics achievement scores at or above Proficient. The analysis of climate dimension of safety revealed a strong and positive relationship while teaching and learning, and interpersonal relationships revealed a moderately strong and positive relationship. There was a very strong and negative correlation concerning parent perception of institutional environment and student mathematics achievement. The item asked of parents on the AQ was reverse coded. Parents were asked if they had the choice would they send their student to another school. Thus, the negative correlation indicated that as the percentage of parents that would send their child to another school decreased, the percentage of students scoring at or above Proficient increased.

Results for research question 3 revealed a statistically significant relationship between middle school teachers' perceptions of school climate and the percentage of middle school students' mathematics achievement scores at or above Proficient. Analysis of the climate dimension of safety and institutional environment revealed a moderately strong and positive relationship. Analysis of both interpersonal relationships and teaching and learning revealed a moderate and positive relationship.

Findings Related to the Literature

The responses to all research questions were consistent with other earlier studies looking at relationships between student achievement and school climate (Anderson, 1982; Cohen & Geier, 2010; Hoy et al., 1991). This study examined the relationship between school climate and student achievement in mathematics. The importance of stakeholder perceptions regarding school climate was significant and statistically noted by the results in this study. Across all stakeholder groups (student, teacher, and parent) and in each dimension of school climate (safety, institutional environment, interpersonal relationships, and teaching and learning), there was a statistically significant relationship between perceptions of school climate and student achievement in mathematics. The results from this study support the research conducted by leaders in the field of school climate who have noted that school climate is important to student achievement (Anderson, 1982; Cohen, McCabe, Michelli, & Pickeral, 2009; Frieberg, 1998; NSCC 2007). Identifying and studying the variables surrounding school climate and the factors that contribute to student outcomes has significant implications to the field of education (Frieberg, 1998).

NSCC (2007) recommended that schools measure the following four dimensions of school climate: safety, institutional environment, interpersonal relationships, and teaching and learning. Additionally, NSCC (2007) noted that schools must examine the perception of school climate of various stakeholders. The NSCC study analyzed the four recommended dimensions of school climate and from the perceptions of three different stakeholders (students, parents, and teachers). Frieberg (1998) noted that perceptions regarding climate of individuals involved in the school might be a more realistic and objective measure than other measures of school achievement. Hoy (2012) noted that none of the dimensions of school climate occurs in isolation. If students perceive that they have safe supportive structures in place, they will believe they can learn and have a greater sense of self-efficacy. If they perceive teachers will support that learning, then students will be motivated to learn. The results of this study reveal that as the percentage of stakeholder perceptions about school climate in all dimensions increased the percentage of students scoring at or above Proficient increased. Safety, interpersonal relationships, institutional environment, and teaching and learning are all important dimensions of school climate and which the study showed have a statistically significant positive relationship to middle school mathematics achievement.

The NCLB Act (2001) has put tremendous focus on raising student achievement, the primary focus for the Missouri DESE. However, Cohen (2006) and NSCC (2007) both have argued that the goals of education also call for educators and policy makers to address the social, emotional, and ethical growth of students. There is ample evidence that middle school students need a school environment that is positive and holistic in nature, and addresses many of the dimensions of school climate (NMSA, 1999; NSCC,

2007). Schools that spend vast amounts of time and resources only on preparing for standardized assessments may fail to establish a safe and supportive environment that is needed for a positive school climate for adolescents (Darling-Hammond, 2007; NSCC 2007). The findings of this study reflect and support the research that providing a positive school environment for adolescents has a statistically significant positive relationship to mathematics achievement.

Students' perceptions of school climate in all dimensions had a significant and strong positive correlation to student achievement and students' perceptions about safety showed the strongest correlation. Nevens (2000) revisited the NMSA framework for schools educating adolescents and confirmed the role that safety plays in developing positive outcomes. Developing positive relations with students and positive partnerships with parents is vital to schools making adolescents feel safe (Nevens, 2000). The results from this study support the research. Students' perceptions of school safety and interpersonal relationships showed a strong and positive correlation. The students' perception of how safe they felt in school and how positive they felt the teacher-student relationships were had an impact on student achievement. When students' perceptions about feeling safe and having positive interpersonal relationships with teachers increased, their achievement in math increased. Booth (2011) noted that adolescents have a need to feel safe. Specifically, adolescents worry about their personal safety and comfort and want their schools to be safe (Booth, 2011).

Way et al. (2007) noted that students progressing through middle school often lose the positive perception of teacher support and students' self-esteem and feeling of safety could be affected by their perceptions of teacher and peer support. The perception

of safety could affect their achievement. The study showed that student perceptions

about interpersonal relationships have a strong and positive correlation to middle school

student achievement in mathematics, and parent perceptions about interpersonal

relationships have a moderately strong and positive correlation to student achievement in

mathematics. Teacher perceptions about interpersonal relationships show a positive and

moderate correlation to middle school student achievement in mathematics. Hoy et al.

(2006) noted that fostering trust could increase positive relationships with parents and

students. Trusting relationships are fostered in safe and caring environments in which

positive interpersonal relationships are established (Hoy et al., 2006). Students are more

willing to prove themselves when teachers developed stronger relationships (Kerr,

Lunkenheimer, & Olson 2007). Thapa et al. (2012) found that students are more

motivated when the school climate is positive. Thus finding that student and parent

perceptions about interpersonal relationships have a strong positive relationship, and with

mathematics achievement is significant to school leaders and teachers.

Hoy (2012) stated that academic press involves a school climate that engages

students in academic learning by providing safe supportive structures in which students

can learn. If students perceive that they have safe supportive structures in place, they will

believe that they can learn and have a greater sense of self-efficacy. If they perceive

teachers will support that learning, then they will be motivated to learn. The results of

this study support the research that students' perceptions about safety, institutional

environment, interpersonal relationships, and teaching and learning affect student

achievement. Adolescents need a positive climate for healthy development and academic

success (Cohen, McCabe, Michelli, & Pickeral, 2009). No previous studies were found

that considered the relationship among the four dimensions of school climate, as measured by the Missouri Middle School/Junior High AQ, and percentage of students scoring at or above Proficient in mathematics.

Conclusions

The final section for chapter five gives closure to the study. Implications for action based on the major findings of the study are given. Additionally, suggestions are given for future research, and concluding remarks are made.

Implications for Action. The findings of this study have strong implications for educators and policy makers, specifically those educating middle school students. The results of the study indicated a positive and significant relationship between student, parent, and teacher perceptions about school climate and students' achievement in mathematics. Middle school is a crucial time for students, and adolescents need healthy and positive learning environments. Using the results from this study, the following implications for action are noted.

Measuring student, parent, and teacher perceptions about school climate in middle school and analyzing results should be a part of every school improvement plan. Leaders should spend time analyzing the Missouri AQ and determine the levels of perceptions about middle school climate. Identifying each stakeholder's perceptions about school climate can inform a school leader about goals and strategies needed for the building. For example, if student and parent perceptions regarding trust of teachers are low, administrators could work to plan, present, and implement professional development to support the faculty in implementing processes and strategies to develop a school climate that has positive interpersonal relationships. Additionally, programs to build trusting

relationships could be a focus for the building. The research alerts middle school leaders and teachers to the importance that safety, institutional environment, interpersonal relationships, and teaching and learning have on student achievement. Cohen and Geier (2010) noted that the most powerful way for schools to accomplish providing safe, caring, participatory, and responsive schools is to measure and work to improve school climate.

Understanding stakeholder perceptions about middle school climate and finding specific strategies that effectively change negative perceptions should be part of every school improvement plan. Leaders should probe specific AQ items that were rated as strongly disagree or disagree and implement follow-up surveys or conduct focus groups to understand why stakeholders hold these negative perceptions about school climate. For example, if students and parents hold negative perceptions about school safety, leaders could ask these stakeholders why the students perceive that they are not safe or why the parents perceive the school is not safe. Bolman and Deal (2002) noted that the perceived success of a school by its stakeholders is a large part of a school being successful.

Therefore, analyzing a building's school climate from student, parent, and teacher perspectives in middle schools can help leaders develop a course of action for improving academic achievement in mathematics.

Recommendations for future research. The relationship between middle school student achievement in mathematics and student, parent, and teacher perceptions about school climate was examined in this study. No one study can effectively examine all aspects of a topic. Recommendations for future research include the following:

1. Expand the study to include elementary and high schools from the same sample population's district.

2. Expand the study to include other achievement variables such as communication arts assessment scores, graduation rates, attendance rates, dropout rates, or other standardized test scores.

3. Utilize another survey that measures school climate and has been recommended by the NSCC.

4. Analyze data from Missouri middle schools not included in this study due to not being in Cycle 4 MSIP during the 2010-2011 academic year.

5. Employ a longitudinal study to analyze student growth over time and school climate.

6. Examine additional variables within the sample such as length of teacher tenure, principal turnover, class size, and discipline.

7. Employ a study to identify causal factors from all stakeholders concerning their perceptions about safety, institutional environment, interpersonal relationships, and teaching and learning. For example, schools with positive climates could be identified and examined regarding what they do differently in each of the dimensions of school climate and across each stakeholder.

8. Employ a study of the psychology of stakeholder perceptions and what techniques best change perceptions.

Concluding remarks. The purpose of this research was to determine if there was a relationship between student, parent, and teacher perceptions of school climate and the

percentage of students scoring at or above Proficient in mathematics. This study examined the relationship between the four dimensions of school climate with student achievement in mathematics. The schools in the study were Missouri middle schools that completed the MSIP Cycle 4 review during the 2010-2011 academic year and also participated in the Middle School/Junior High School AQ. A positive relationship was found between high levels of school climate and student achievement in mathematics. Missouri practitioners can utilize data from the Missouri AQ to analyze school climate and plan school improvement efforts. Based on the relationship between climate and achievement in this study, leaders, policy makers, and practitioners should accept the responsibility for providing a positive school climate for adolescents.

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Appendices

Appendix A: Missouri Middle Schools Included in Study

Middle Schools Included in the Study for the 2010-2011 Academic Year

School ID	School District	School Name
0051233000	CASSVILLE R-IV	CASSVILLE MIDDLE
0061043000	LAMAR R-I	LAMAR MIDDLE
0100873000	SOUTHERN BOONE CO. R-I	SOUTHERN BOONE MIDDLE
0100893000	HALLSVILLE R-IV	HALLSVILLE MIDDLE
0121092050	POPLAR BLUFF R-I	POPLAR BLUFF JR. HIGH
0130553000	HAMILTON R-II	HAMILTON MIDDLE
0160962050	CAPE GIRARDEAU 63	CENTRAL JR. HIGH
0180473000	EAST CARTER CO. R-II	EAST CARTER CO. R-II MIDDLE
0191423000	RAYMORE-PECULIAR R-II	RAYMORE-PECULIAR EAST MIDDLE
0191523000	BELTON 124	YEOKUM MIDDLE
0200013000	STOCKTON R-I	STOCKTON MIDDLE
0240893000	EXCELSIOR SPRINGS 40	EXCELSIOR SPRINGS MIDDLE
0250033000	CLINTON CO. R-III	CLINTON CO. R-III MIDDLE
0330902050	SALEM R-80	SALEM JR. HIGH
0341243000	AVA R-I	AVA MIDDLE
0361383000	NEW HAVEN	NEW HAVEN MIDDLE
0361393000	WASHINGTON	WASHINGTON MIDDLE
0391343000	REPUBLIC R-III	REPUBLIC MIDDLE
0391393050	LOGAN-ROGERSVILLE R-VIII	LOGAN-ROGERSVILLE MIDDLE
0391413000	SPRINGFIELD R-XII	CARVER MIDDLE
0391413020	SPRINGFIELD R-XII	CHEROKEE MIDDLE
0391413040	SPRINGFIELD R-XII	HICKORY HILLS MIDDLE
0391413060	SPRINGFIELD R-XII	JARRETT MIDDLE
0391413080	SPRINGFIELD R-XII	PERSHING MIDDLE
0391413100	SPRINGFIELD R-XII	PIPKIN MIDDLE
0391413120	SPRINGFIELD R-XII	PLEASANT VIEW MIDDLE
0391413140	SPRINGFIELD R-XII	REED MIDDLE
0391413160	SPRINGFIELD R-XII	STUDY MIDDLE
0461313000	WILLOW SPRINGS R-IV	WILLOW SPRINGS MIDDLE
0470623000	ARCADIA VALLEY R-II	ARCADIA VALLEY MIDDLE
0480802100	CENTER 58	CENTER MIDDLE
0491322050	CARL JUNCTION R-I	CARL JUNCTION JR. HIGH
0500023000	GRANDVIEW R-II	GRANDVIEW MIDDLE
0500053000	DUNKLIN R-V	SENN-THOMAS MIDDLE

0511563000	LEETON R-X	LEETON MIDDLE
0570023000	ELSBERRY R-II	IDA CANNON MIDDLE
0611563000	MACON CO. R-I	MACON MIDDLE
0661023000	ELDON R-I	ELDON MIDDLE
0661052050	SCHOOL OF THE OSAGE	OSAGE MIDDLE
0670613000	CHARLESTON R-I	CHARLESTON MIDDLE
0680703000	MONITEAU CO. R-I	CALIFORNIA MIDDLE
0691063000	MONROE CITY R-I	MONROE CITY MIDDLE
0810943000	ST. JAMES R-I	ST. JAMES MIDDLE
0830033000	PLATTE CO. R-III	PLATTE CITY MIDDLE
0840013000	BOLIVAR R-I	BOLIVAR MIDDLE
0850453000	LAQUEY R-V	LAQUEY R-V MIDDLE
0880813000	MOBERLY	MOBERLY MIDDLE
0890893000	RICHMOND R-XVI	RICHMOND MIDDLE
0920873000	FT. ZUMWALT R-II	FT. ZUMWALT NORTH MIDDLE
0920873050	FT. ZUMWALT R-II	DR. BERNARD J. DUBRAY MIDDLE
0920873070	FT. ZUMWALT R-II	FT. ZUMWALT SOUTH MIDDLE
0920873090	FT. ZUMWALT R-II	FT. ZUWMALT WEST MIDDLE
0920913000	ORCHARD FARM R-V	ORCHARD FARM MIDDLE
0950592050	STE. GENEVIEVE CO. R-II	STE. GENEVIEVE MIDDLE
0960882050	HAZELWOOD	NORTHWEST MIDDLE
0960882070	HAZELWOOD	CENTRAL MIDDLE
0960882100	HAZELWOOD	EAST MIDDLE
0960882130	HAZELWOOD	NORTH MIDDLE
0960882150	HAZELWOOD	WEST MIDDLE
0960882170	HAZELWOOD	SOUTHEAST MIDDLE
0960953000	PARKWAY C-2	SOUTHWEST MIDDLE
0960953020	PARKWAY C-2	CENTRAL MIDDLE
0960953040	PARKWAY C-2	NORTHEAST MIDDLE
0960953060	PARKWAY C-2	SOUTH MIDDLE
0960953080	PARKWAY C-2	WEST MIDDLE
0960992000	BAYLESS	BAYLESS JR. HIGH
1000613000	SCOTT CO. R-IV	SCOTT CO. MIDDLE
1060042050	BRANSON R-IV	BRANSON JR. HIGH
1071523000	HOUSTON R-I	HOUSTON MIDDLE
1090023000	WRIGHT CITY R-II	WRIGHT CITY MIDDLE
1110862050	GREENVILLE R-II	GREENVILLE JR. HIGH
1121033000	SEYMOUR R-II	SEYMOUR MIDDLE

Appendix B: Student Version of MSIP Advanced Questionnaire

Advance Questionnaire

Student Questionnaire Grades 6-8

1. What is your sex?

○ Male   ○ Female

2. Which best describes you?

○ White(not Hispanic)   ○ American Indian

○ Asian   ○ Hispanic

○ African American (not Hispanic)

3. Is there usually an adult at home or wherever you go right after school?

○ Yes   ○ No

4. How many days of school did you miss last month?

○ None   ○ 5 to 10 days

○ 1 or 2 days   ○ More than 10 days

○ 3 or 4 days

5. How many hours of television do you usually watch each day?

○ 1 hour or less   ○ 3 hours   ○ 5 hours

○ 2 hours   ○ 4 hours   ○ 6 hours or more

6. How many hours a day do you spend playing on the computer or with video games?

○ 1 hour or less   ○ 3 hours   ○ 5 hours

○ 2 hours   ○ 4 hours   ○ 6 hours or more

7. Which of the following best describes your grades so far in school?

○ Mostly A   ○ Mostly C

○ Half A & B   ○ Half C & D

○ Mostly B   ○ Mostly D

○ Half B & C   ○ Below D

8. How much time do you usually spend on homework each day?

○ I don't usually have it assigned   ○ 1 hour

○ I have it, but I don't usually do it   ○ 2 hours

○ 1/2 hour or less   ○ More than 2 hours

9. How often does someone at home help you with your homework?

○ Almost every day   ○ Never or hardly ever

○ Once or twice a week   ○ I do not have homework

○ Once or twice a month

Please select the circle below that best describes how often you do the following:	Not at all	Rarely	Occasionally	Regularly
10. Talk with one of your parents about your experiences in school.	○	○	○	○
11. Talk with one of your parents about your plans for high school classes.	○	○	○	○
12. Talk with one of your parents about your plans for after high school.	○	○	○	○

Please indicate how often you experience the following in most of your classes by clicking one of the circles below:	Never	Rarely	Occasionally	Often	Regularly
13. I am required to take notes.	○	○	○	○	○

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14. My teachers place students in small groups.

15. I am asked to use pictures, graphs, maps, or charts to present my information.

16. I am asked to summarize new material.

17. I am asked to revise or correct errors in my work.

18. I am asked to Identify similarities and differences.

19. I am given opportunities to work on my own long-term projects.

20. I am asked to relate what I already know to new material.

21. I am given opportunities to present what I have learned to other students.

22. My graded assignments are returned to me before I am tested on the information.

23. Teachers enforce the rules fairly.

Indicate how much you agree or disagree with each statement by clicking one of the circles.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
24. My opinion is valued by teachers and administrators.					
25. My teachers let me know when I am doing a good job.					
26. During our classes we stay focused on learning and don't waste time.					
27. Being successful in school today will help me in my future.					
28. Differences among students and their families are respected in this school.					
29. I can do well in school.					
30. I learn a lot in this school.					
31. I like reading.					
32. There are students from my school that belong to street gangs.					
33. My teachers help me understand my mistakes on assignments.					

Indicate how much you agree or disagree with each statement by clicking one of the circles.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
34. Most of my teachers tell me how I am doing in their class.	○	○	○	○	○
35. There is a feeling of belonging at my school.	○	○	○	○	○
36. Teachers in my school really care about me.	○	○	○	○	○
37. My teachers make clear what I'm supposed to learn.	○	○	○	○	○
38. Our classes are often interrupted.	○	○	○	○	○
39. In most classes, if I am having trouble learning something, my teacher usually finds another way to help me understand.	○	○	○	○	○
40. Most of my teachers are well prepared when class starts.	○	○	○	○	○
41. In my school, all students are given a chance to succeed.	○	○	○	○	○
42. My teachers want me to share my ideas in class.	○	○	○	○	○
43. There is good communication between teachers and students.	○	○	○	○	○

Indicate how much you agree or disagree with each statement by clicking one of the circles.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
44. I feel safe at school.	○	○	○	○	○
45. My school provides me with the textbooks and learning materials I need to learn.	○	○	○	○	○
46. Most kids around here drink alcohol a lot.	○	○	○	○	○
47. I like going to this school.	○	○	○	○	○
48. This community is a good place to grow up.	○	○	○	○	○
49. I am treated fairly at school.	○	○	○	○	○
50. If a student has a problem there are teachers who will listen and help.	○	○	○	○	○

51. My parents have a good idea of what goes on at school.

	○	○	○	○	○
52. The community is proud of this school.	○	○	○	○	○
53. Drug use is common among kids in this community.	○	○	○	○	○

Indicate how much you agree or disagree with each statement by clicking one of the circles.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
54. My teachers think I can learn.	○	○	○	○	○
55. My teachers are good teachers.	○	○	○	○	○
56. Students at my school are friendly.	○	○	○	○	○
57. My family believes that I can do well in school.	○	○	○	○	○
58. Teachers treat me with respect.	○	○	○	○	○
59. My teachers expect very good work from me.	○	○	○	○	○
60. Discipline is handled fairly in my school.	○	○	○	○	○
61. I have been encouraged to think about career or educational goals at school.	○	○	○	○	○
62. If I have a personal problem, I can talk to the counselor.	○	○	○	○	○
63. My counselor makes visits to my classroom.	○	○	○	○	○

Submit Survey

If you have any problems, questions or comments about this survey, please contact Fred Raithel e-mail
RaithelF@missouri.edu or by telephone (573-882-7396)

Appendix C: Faculty Version of MSIP Advanced Questionnaire

Advance Questionnaire

Certificated Faculty Questionnaire

1. Record the type of assignment which best reflects your primary assignment (you may choose more than one).

☐ School Guidance Counselor ☐ Classroom Teacher

☐ Library Media Specialist ☐ Administrator

☐ Special Education Teacher ☐ Other

Indicate how much you agree or disagree with each statement by clicking one of the circles. If you have no experience on which to base a response or the item is not applicable to you, leave it blank.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
2. My school collaborates with community agencies to meet the needs of students.	○	○	○	○	○
3. There are effective supports in place to assist students who are in jeopardy of academic failure.	○	○	○	○	○
4. I emphasize the importance of effort with students.	○	○	○	○	○
5. In our school, there is adequate support for classroom teachers to address special education students' IEP goals.	○	○	○	○	○
6. There is adequate collaboration between special education staff and classroom teachers in our school.	○	○	○	○	○
7. There is adequate professional development for teachers working with special education students in our school.	○	○	○	○	○
8. Instructional time available to teachers is protected from all types of interruptions.	○	○	○	○	○
9. Our principal uses classroom management as part of our evaluation.	○	○	○	○	○
10. Clear rules that promote good behavior are enforced in our school.	○	○	○	○	○
Indicate how much you agree or disagree with each statement by clicking one of the circles. If you have no experience on which to base a response or the item is not applicable to you, leave it blank.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
11. Clear rules regarding behavior have been established in my classroom.	○	○	○	○	○
12. Educators in our school use effective practices to promote positive behavior.	○	○	○	○	○

13. Teachers in our school use effective practices to keep all students actively engaged in learning.

14. Educators in our school respond to inappropriate behaviors quickly and effectively.

15. Norms for conduct that foster collegiality and professionalism among professional staff and administrators are clear and routinely followed.

16. Teachers in my school are routinely involved in formulating schoolwide decisions and policies.

17. Teachers are routinely engaged in collaborative problem solving around instructional issues.

18. Effective vehicles are in place for parents and community to communicate with the school.

19. In our school we communicate effectively to parents and the community.

20. Parents are encouraged to discuss their child's educational needs with the school.

Indicate how much you agree or disagree with each statement by clicking one of the circles. If you have no experience on which to base a response or the item is not applicable to you, leave it blank.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

21. I routinely analyze disaggregated student data and use it to plan my instruction.

22. An assessment system is used that provides timely feedback on specific knowledge and skills for individual students.

23. My school administers assessments througout the school year that are used to guide instruction.

24. My school uses assessment data to evaluate and align the curriculum.

25. Emphasis is placed on valuing and respecting differences among students and their families in our school.

26. Student opinions are valued by teachers and administrators.

27. Faculty and staff solicit input from diverse student groups regarding the improvement of our school.

28. I feel comfortable having discussions regarding racial / ethnic issues with my colleagues.

29. Individual student differences are appreciated at our school.

30. Students are provided with opportunities to construct and work on long-term projects of their own design.

Indicate how much you agree or disagree with each statement by clicking one of the circles. If you have no experience on which to base a response or the item is not applicable to you, leave it blank.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
31. In our school teachers are encouraged to be instructional leaders.	O	O	O	O	O
32. My school's principal fosters shared beliefs and a sense of community and cooperation.	O	O	O	O	O
33. My school's principal monitors the effectiveness of school practices and their impact on student learning.	O	O	O	O	O
34. Our principal identifies issues in the school that could potentially become problems.	O	O	O	O	O
35. My school's principal systematically engages faculty and staff in discussions about current research on teaching and learning.	O	O	O	O	O
36. Our school teaches and reinforces student self-discipline and responsibility.	O	O	O	O	O
37. Students who are prone to violence are systematically identified.	O	O	O	O	O
38. Our school promotes an environment of mutual respect among students.	O	O	O	O	O
39. The content considered essential for all students to learn versus that considered supplemental has been identified and communicated to teachers.	O	O	O	O	O
40. My school systematically ensures that teachers address essential content.	O	O	O	O	O

Indicate how much you agree or disagree with each statement by clicking one of the circles. If you have no experience on which to base a response or the item is not applicable to you, leave it blank.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
41. The amount of essential content that has been identified can be addressed in the instructional time available to teachers.	O	O	O	O	O
42. The essential content is organized and sequenced in a way that students have ample opportunity to learn it.	O	O	O	O	O
43. Our principal promotes innovation.	O	O	O	O	O
44. I have the skills necessary to meet the needs of all learners in my classroom.	O	O	O	O	O
45. I believe that I can positively impact student performance.	O	O	O	O	O
46. I have received violence prevention training.	O	O	O	O	O
47. Our professional development improves student achievement.	O	O	O	O	O

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48. I have received adequate training in using computers and other technology to support my work with students. ○ ○ ○ ○ ○

49. The professional development activities I attend are related to my district's Comprehensive School Improvement Plan. ○ ○ ○ ○ ○

50. I have received professional development on differentiating instruction for learners. ○ ○ ○ ○ ○

Indicate how much you agree or disagree with each statement by clicking one of the circles. If you have no experience on which to base a response or the item is not applicable to you, leave it blank.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
51. My school adequately prepares all students for post-secondary education, and/or successful entry into the workforce.	○	○	○	○	○
52. Students are held accountable for doing quality work.	○	○	○	○	○
53. The mission of this school is clearly defined.	○	○	○	○	○
54. All staff in our school hold high expectations for student learning.	○	○	○	○	○
55. There are open channels of communication among students, staff and administrators.	○	○	○	○	○
56. There are avenues for recognizing and rewarding the accomplishments of all students.	○	○	○	○	○
57. There are sufficient library media materials to support my program.	○	○	○	○	○
58. Career-Technical education is an essential part of the district's program of studies.	○	○	○	○	○
59. I feel safe at this school.	○	○	○	○	○
60. The library media center materials are current and in good condition.	○	○	○	○	○

Indicate how much you agree or disagree with each statement by clicking one of the circles. If you have no experience on which to base a response or the item is not applicable to you, leave it blank.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
61. In our community, people tend to trust each other.	○	○	○	○	○
62. My professional development has improved the way I teach.	○	○	○	○	○
63. My school provides suggestions to parents on ways to assist at home with their child's learning.	○	○	○	○	○
64. My school views parents as partners in the educational process.	○	○	○	○	○

65. My school has created specific strategies to better involve parents in the education of their child.   ○ ○ ○ ○ ○

66. The board has high expectations for student achievement.   ○ ○ ○ ○ ○

67. Students are treated fairly in this school.   ○ ○ ○ ○ ○

68. The community is proud of this school.   ○ ○ ○ ○ ○

69. This school makes students feel they belong.   ○ ○ ○ ○ ○

70. If students in this school have a problem, teachers will listen and help.   ○ ○ ○ ○ ○

Indicate how much you agree or disagree with each statement by clicking one of the circles. If you have no experience on which to base a response or the item is not applicable to you, leave it blank.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
71. I usually look forward to each working day as a teacher.	○	○	○	○	○
72. Discipline is handled fairly in this school.	○	○	○	○	○
73. Collaboration with classroom teachers to integrate library and media resources and skills into classroom instruction is adequate.	○	○	○	○	○
74. The librarian/media specialist requests my input into the selection of resources.	○	○	○	○	○
75. There is adequate instruction in the use of library and media resources for classes and individual students.	○	○	○	○	○
76. There is systematic collaboration across subject areas in our building.	○	○	○	○	○
77. Individual counseling services are available to students.	○	○	○	○	○
78. The board establishes policies and permits administrators to implement these policies on a day to day basis.	○	○	○	○	○
79. The community provides enough money to adequately provide quality educational programs to children.	○	○	○	○	○
80. Overall, my school building is in good condition.	○	○	○	○	○
81. If I had a chance to choose all over again, I would still choose teaching as a career.	○	○	○	○	○
82. There is systematic collaboration between the academic and career education programs in our district.	○	○	○	○	○

83. How much homework time do you assign your students each day:

○ Do not assign   ○ 2 hours

○ 1/2 hour or less   ○ More than 2 hours

○ 1 hour

Please click on the circle below that best describes how often you do the following:	Never	Rarely	Occasionally	Often	Regularly
84. Students are taught effective note-taking skills.	○	○	○	○	○
85. I assess the level of prior knowledge of all students before initiating instruction.	○	○	○	○	○
86. Organize students into flexible groups based on their understanding of the content and skill level.	○	○	○	○	○
87. Begin instructional units by presenting students with clear learning goals.	○	○	○	○	○
88. Begin instructional units by having students identify personal learning goals that fit within the learning goals presented by the teacher.	○	○	○	○	○
89. Provide students with specific feedback on the extent to which they are accomplising the learning goals.	○	○	○	○	○
90. Have students keep track of their own performance on the learning goals.	○	○	○	○	○
91. Have students assess themselves relative to their personal learning goals after completing a unit.	○	○	○	○	○
92. Make use of cooperative learning groups.	○	○	○	○	○
93. Have students construct verbal or written summaries of new content.	○	○	○	○	○

Please click on the circle below that best describes how often you do the following:	Never	Rarely	Occasionally	Often	Regularly
94. Have students represent new content in nonlinguistic ways (e.g. mental image, picture, pictograph, graphic organizer, physical model, enactment).	○	○	○	○	○
95. Provide students with opportunities to practice important skills and procedures prior to assessment.	○	○	○	○	○
96. I alter instructional strategies when students are having difficulty learning the material.	○	○	○	○	○
97. Model or demonstrate important skills or procedures.	○	○	○	○	○

98. Incorporate contextual/real life learning in the classroom.

99. Incorporate problem solving instructional activities in the classroom.

100. Have students revise and correct errors in their work as a way of reviewing and revising content.

101. Have students compare and classify content.

102. Have students construct metaphors and analogies.

103. Provide specific feedback on the homework assigned to students.

104. Incorporate information about careers in my instruction.

Submit Survey

If you have any problems, questions or comments about this survey, please contact Fred Raithel e-mail RaithelF@missouri.edu or by telephone (573-882-7396)

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Appendix D: Parent Version of MSIP Advanced Questionnaire

Advance Questionnaire

Parent Questionnaire

1. In what grade is your child?

○ K-1   ○ 7th

○ 2nd   ○ 8th

○ 3rd   ○ 9th

○ 4th   ○ 10th

○ 5th   ○ 11th

○ 6th   ○ 12th

2. My child is a:

○ Boy   ○ Girl

3. What is your relationship to the child?

○ Mother   ○ Grandmother

○ Father   ○ Grandfather

○ Stepmother   ○ Other relative

○ Stepfather   ○ Unrelated

4. How many adults in your household work outside the home for pay?

○ None

○ 1

○ 2

○ 3 or more

5. How many years have you lived in this school district?

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○ Under 5 years

○ 5-10 years

○ 11-15 years

○ Over 15 years

6. How many hours of television does your child usually watch each day?

○ 1 hour or less   ○ 4 hours

○ 2 hours   ○ 5 hours

○ 3 hours   ○ 6 or more hours

7. Which best describes your household?

○ Single parent   ○ Two parent household (step-family)

○ Two parent household (mother/father) ○ Other

8. Which best describes you?

○ White (not Hispanic)   ○ American Indian

○ African American (not Hispanic)   ○ Hispanic

○ Asian

9. How many children in your household are under 18 years old?

○ None   ○ 4

○ 1   ○ 5

○ 2   ○ 6

○ 3   ○ 7 or more

10. Please mark any of the following educational programs in which your child participates:

☐ Gifted/Talented Program   ☐ Special Education

☐ Career-Technical Education   ☐ English Language Learners

11. Which category best describes your age?

○ Under 30   ○ 50 - 59

○ 30 - 39   ○ 60 or over

○ 40 - 49

12. What one thing is likely to take the largest share of your child's time in the year after high school?

○ Working full-time

○ Attending a two-year college, vocational-technical or business school

○ Attending a four-year college, service academy, or university

○ Serving in the military

○ Other

13. Which best describes your level of education?

○ Elementary school   ○ Some college

○ Some high school   ○ College graduate

○ High school graduate   ○ Graduate school

14. Which category best describes the total annual income of your household?

○ Under $10,000   ○ $40,000 - $49,999

○ $10,000 - $19,999   ○ $50,000 - $59,999

○ $20,000 - $29,999   ○ $60,000 - $69,999

○ $30,000 - $39,999   ○ Over $70,000

15. Which of the following best describes your child's grades so far in school?

○ Mostly A   ○ Half C & D

○ Half A & B   ○ Mostly D

○ Mostly B   ○ Below D

○ Half B & C   ○ Letter grades are not given

○ Mostly C

16. Would you say that public schools in this community have improved from five years ago, gotten worse, or stayed the same?

○ Improved   ○ Stayed the same

○ Gotten worse

17. How much time does your child spend on homework each day?

○ Doesn't have any   ○ 1 hour

○ Doesn't do it   ○ 2 hours

○ 1/2 hour or less   ○ More than 2 hours

18. How many hours a day does your child spend playing on the computer or with video games?

○ 1 hour or less   ○ 4 hours

○ 2 hours   ○ 5 hours

○ 3 hours   ○ 6 hours or more

19. Please fill in the circle below that best describes how often during the past 12 months you have done each of the following things:	Never	Once or twice	3 to 5 times	6 to 10 times	More than 10 times
Talked to your child's teacher.	○	○	○	○	○
Gone to an open house at school.	○	○	○	○	○
Attended parent/teacher meetings.	○	○	○	○	○
Visited the school on your own.	○	○	○	○	○
Helped with school activities.	○	○	○	○	○

20. Students are often given the grades A, B, C, D, and F to denote the quality of their work. If the public schools in this

community were graded the same way, what grade would you give them--A, B, C, D, or F?

○ A ○ C ○ F

○ B ○ D ○ Don't know

21. How much time does your child spend reading at home each day?

○ No time at all   ○ About 1 hour

○ 10 -15 minutes   ○ 2 hours or more

○ 20 -30 minutes

22. Please answer YES or NO to the following:	Yes	No
I know the first name of 5 or more of my child's closest friends.	○	○
I know the parents of 5 or more of my child's closest friends.	○	○
I enforce family rules about how many hours my child can watch TV, or play video/computer games.	○	○
I enforce family rules about doing homework.	○	○
My child has access to the internet at home.	○	○

23. Please fill in the circle below that best describes how often you do the following:	Not at all	Rarely	Occasionally	Regularly
Talk to your child about his/her experiences in school.	○	○	○	○
Talk to your child about his/her plans for high school classes.	○	○	○	○
Talk to your child about his/her plans for after high school.	○	○	○	○

24. Is your child covered by some kind of family medical insurance?

○ Yes, through an employer plan   ○ Yes, through Medicaid

○ Yes, through some other plan   ○ No, my child has no medical insurance

Indicate how much you agree or disagree with each statement by clicking one of the circles.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
25. The school recognizes the accomplishments of my child.	○	○	○	○	○
26. My child's opinions are valued by teachers and administrators.	○	○	○	○	○
27. My child's school promotes an environment of mutual respect among students.	○	○	○	○	○
28. My involvement in my child's education has improved his/her achievement.	○	○	○	○	○
29. Parents are asked for input about school decisions.	○	○	○	○	○
30. Our school has a program that teaches and reinforces student self-discipline and responsibility.	○	○	○	○	○
31. My school has clear procedures for handling school emergencies.	○	○	○	○	○
32. There are students from my child's school that belong to street gangs.	○	○	○	○	○
33. The school values and respects differences among students and their families.	○	○	○	○	○
34. Effective assistance is provided for children having difficulty in school.	○	○	○	○	○
35. The way they teach at this school works well for my child.	○	○	○	○	○
36. My child is given a fair chance to succeed at school.	○	○	○	○	○
37. My child likes attending this school.	○	○	○	○	○
38. I can talk with my child's teachers or principal whenever I need.	○	○	○	○	○
39. I know how well my child is doing in class.	○	○	○	○	○
40. I feel my child is safe at school.	○	○	○	○	○

Indicate how much you agree or disagree with each statement by clicking one of the circles.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
41. I receive information about the educational services available to my child at school.	○	○	○	○	○

42. My child's school building is in good condition.

43. The community provides enough money to for the schools to do a good job.

44. Discipline in my child's school is handled fairly.

45. If I could, I would send my child to a different school.

46. The school encourages parents to be involved.

47. In our community people tend to trust each other.

48. My child has been taught in school about respect for other cultures.

49. The school offers suggestions about how I can help my child learn at home.

50. I am a partner with the school in my child's education.

51. I know what my child's teachers expect in school.

52. The community is proud of this school.

53. My child's teachers are good teachers.

54. I expect my child to do well in school.

55. My child's teachers expect very good work from my child.

56. The school has helped my child establish educational and career plans.

57. The guidance counselor is available to help my child if he/she has a personal problem.

58. Career-Technical Education is an essential part of the district's program of studies.

59. I am aware of adult learning opportunities offered by the district.

Submit Survey

If you have any problems, questions or comments about this survey, please contact Fred Raithel e-mail
RaithelF@missouri.edu or by telephone (573-882-7396)

Appendix E: National School Climate Center Dimensions of School Climate

The 12 Dimensions of School Climate Measured

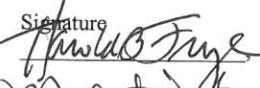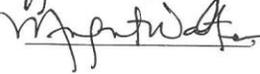| Dimensions	Major Indicators
Safety	
1 Rules and Norms	Clearly communicated rules about physical violence; clearly communicated rules about verbal abuse, harassment, and teasing; clear and consistent enforcement and norms for adult intervention.
2 Sense of Physical Security	Sense that students and adults feel safe from physical harm in the school.
3 Sense of Social-Emotional Security	Sense that students feel safe from verbal abuse, teasing, and exclusion.
Teaching and Learning	
4 Support for Learning	Use of supportive teaching practices, such as: encouragement and constructive feedback; varied opportunities to demonstrate knowledge and skills; support for risk-taking and independent thinking; atmosphere conducive to dialog and questioning; academic challenge; and individual attention.
5 Social and Civic Learning	Support for the development of social and civic knowledge, skills, and dispositions including: effective listening, conflict resolution, self-reflection and emotional regulation, empathy, personal responsibility, and ethical decision making.
Interpersonal Relationships	
6 Respect for Diversity	Mutual respect for individual differences (e.g. gender, race, culture, etc.) at all levels of the school—student-student; adult-student; adult-adult and overall norms for tolerance.
7 Social Support—Adults	Pattern of supportive and caring adult relationships for students, including high expectations for students' success, willingness to listen to students and to get to know them as individuals, and personal concern for students' problems.
8 Social Support—Students	Pattern of supportive peer relationships for students, including: friendships for socializing, for problems, for academic help, and for new students.
Institutional Environment	
9 School Connectedness/Engagement	Positive identification with the school and norms for broad participation in school life for students, staff, and families.
10 Physical Surroundings	Cleanliness, order, and appeal of facilities and adequate resources and materials.
Staff Only	
11 Leadership	Administration that creates and communicates a clear vision, and is accessible to and supportive of school staff and staff development.
12 Professional Relationships	Positive attitudes and relationships among school staff that support effectively working and learning together.

Appendix F: IRB Application

BAKER
UNIVERSITY

Date: 11/28/2012

SCHOOL OF EDUCATION
GRADUATE DEPARTMENT

IRB PROTOCOL NUMBER _____

(IRB USE ONLY)

IRB REQUEST
Proposal for Research
Submitted to the Baker University Institutional Review Board

I.   **Research Investigator(s)** (Students must list faculty sponsor first)

Department(s)   **School of Education Graduate Department**

Name	Signature	
1. Harold Frye		Major Advisor
2. Margaret Waterman		Research Analyst
3. Patricia Bandre'		University Committee Member
4. Tyran Sumy		External Committee Member

Principal Investigator: Krista Sly
Phone: (816) 294-3855
Email: kristajsly@stu.bakeru.edu
Mailing address: Box 134, Fort Supply, OK 73841

Faculty sponsor: Dr. Harold Frye
Phone: 913-344-1220
Email: Harold.Frye@bakeru.edu

Expected Category of Review: __x_Exempt ___ Expedited ___Full

II: Protocol: (Type the title of your study)

Relationships Among Parent, Student, and Teacher Responses to the Missouri School
Improvement Program Cycle Four Advanced Questionnaire Climate Items and Student
Mathematics Achievement on the Missouri Assessment Program

Summary

In a sentence or two, please describe the background and purpose of the research.

The purpose of this quantitative correlational study is to examine the relationship between middle school climate and middle school mathematics achievement in 72 Missouri middle schools.

The literature on school climate supports the importance of school climate on student achievement. Despite the abundance literature supporting a positive school climate, studying specific climate dimension variables that affect mathematics achievement in Missouri middle schools is lacking. This study may reveal predictive relationships between middle school climate variables and middle school mathematics achievement.

Briefly describe each condition or manipulation to be included within the study.

Only archival data from the Missouri Department of Elementary and Secondary (DESE) Education will be used. No conditions or manipulations will be included in the study.

What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.
Will the subjects encounter the risk of psychological, social, physical or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.

Data from Missouri middle schools involved in Cycle 4 Missouri School Improvement Program will be used in the study. Data will be gathered on the Missouri middle schools parent, student, and faculty perceptions of school climate using the Missouri Advanced Questionnaire (AQ). The AQ is administered to students, parents, and faculty of Missouri schools and consists of 63 individual student questions, 104 individual faculty questions, and 59 individual parent questions. The student version of the Missouri AQ is included in this document in Appendix A. The AQ measures the following scales:

School Leadership
Parent Involvement
Safe and Orderly Environment
School Climate
Guaranteed and Viable Curriculum
Professional Development
Community Capital
Efficacy and Expectations
Classroom Management

Archival data for student achievement will be collected for the 72 middle school buildings. For each middle school included in the study, test scores from the

mathematics test on the Missouri Assessment Program (MAP) will be collected. Data for both the AQ and MAP test is public data that can be accessed on the DESE website.

Will any stress to subjects be involved? If so, please describe.

No, subjects will not be involved in any stress as archival data only will be used.

Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.

No, the subjects will not be deceived or misled in any way.

Will there be a request for information which subjects might consider to be personal or sensitive? If so, please include a description.

No information considered personal or sensitive will be requested. All data for this study is public information that is available on the DESE website.
.
Will the subjects be presented with materials which might be considered to be offensive, threatening, or degrading? If so, please describe.

No, the subjects will not be presented with any materials in this study.

Approximately how much time will be demanded of each subject?

No time will be asked of any subjects in this study.

Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.

There are 287 Middle Schools in the state of Missouri. The 72 Missouri middle schools representing 42 different Missouri school districts in this study are ones that have completed Cycle 4 of the Missouri School Improvement Program (see Appendix B). These schools are defined as those serving students who were in grades six through eight, and who completed the Middle School/Jr. High School Advanced Questionnaire during the 2010-2011 academic year.

The subjects in this study are students, parents, and faculty of the 72 Missouri middle schools that completed Cycle 4 MSIP review during the 2010-2011 academic year. The archival data used in the study is available to the public. No permission is needed to gain access to the public data.

What steps will be taken to insure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?

No request for participation is needed in this study. All data used in this study is archival data released to the public by DESE and available to the public.

How will you insure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not.

No consent is needed in this study as all data exist on a public website and data are not in any way identified by students.

Will any aspect of the data be made a part of any permanent record that can be identified with the subject? If so, please explain the necessity.

No aspect of the data at the individual level will be permanent. This study will only use records of data at the cumulative level for each school in the study.

Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher or employer? If so, explain.

No individual records will be used in this study. Only comprehensive data from each school will be used.

What steps will be taken to insure the confidentiality of the data? Where will it be stored? How long will it be stored? What will be done with it after the study is completed?

All data used in this study is available to the public and released on the DESE website. There are no confidentiality steps needed. At the conclusion of this study and publication of results is completed, data will continue to reside on the DESE website, responsible to that state department.

If there are any risks involved in the study, are there any offsetting benefits that might accrue to either the subjects or society?

There are no risks involved in this study.

Will any data from files or archival data be used? If so, please describe.

Data from the Missouri Assessment Program (MAP) mathematics test will be used to measure the achievement of middle schools included in this study. Scores from the Missouri Advanced Questionnaire in the 2010-2011 academic year will be used to measure student, parent, and faculty perceptions of specific climate dimensions.

Appendix G: IRB Approval

January 28, 2013

Krista Sly
Box 134
Fort Supply, OK 73841

Dear Ms. Sly:

The Baker University IRB has reviewed your research project application (M-0155-0114-0128-G) and approved this project under Exempt Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Baker University IRB requires that your consent form must include the date of approval and expiration date (one year from today). Please be aware of the following:

1. At designated intervals (usually annually) until the project is completed, a Project Status Report must be returned to the IRB.
2. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
3. Notify the OIR about any new investigators not named in original application.
4. Any injury to a subject because of the research procedure must be reported to the IRB Chair or representative immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform Office of Institutional Research (OIR) or myself when this project is terminated. As noted above, you must also provide OIR with an annual status report and receive approval for maintaining your status. If your project receives funding, which requests an annual update approval,

you must request this from the IRB one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Carolyn Doolittle, EdD
Chair, Baker University IRB