

**Relationships between School Climate and Student Performance:
School- and Student-level Analyses**

BY

Keith Zander
B.A., Emory University, 2005

THESIS

Submitted as partial fulfillment of the requirements
for the degree of Master of Arts in Psychology
in the Graduate College of the
University of Illinois at Chicago, 2011

Chicago, Illinois

Defense Committee:

Roger Weissberg, Chair and Advisor
Rachel Gordon
Kimberly Kendziora, American Institutes for Research

ACKNOWLEDGEMENTS

I would like to thank my committee members Rachel Gordon, Kimberly Kendziora, and Roger Weissberg, for their support throughout this project. They each provided unique and constructive feedback, as well as pertinent resources that were invaluable in the completion of my thesis. I would also like to acknowledge Peter Ji for his assistance in cleaning the dataset and guiding me through multiple exploratory analyses that ultimately informed the study's research questions. Finally, I would like to express my gratitude for Autym Hymann who expertly navigated me through the required university policies and procedures involved in the thesis process.

KJZ

TABLE OF CONTENTS

<u>CHAPTER</u>	<u>PAGE</u>
I. INTRODUCTION.....	1
A. Background.....	1
B. School Climate.....	1
1. How is Climate Experienced by Members of a School?.....	3
2. How is Climate Described as a Particular Set of Values or Characteristics.....	5
a. School Safety.....	6
b. Expectations.....	7
c. Student Support.....	7
d. Peer Social Climate.....	8
3. How does School Climate Influence Student Outcomes?.....	8
C. Research Questions and Hypotheses.....	9
1. Research Question #1.....	9
2. Research Question #2.....	10
3. Research Question #3.....	11
4. Research Question #4.....	12
II. METHODS	14
A. Participants.....	14
1. Students.....	14
2. Schools.....	14
B. Independent Variables.....	15
1.Student Connection Survey.....	15
C. Dependent Variables.....	16
1.Explore Achievement Test.....	16
2.Grade Point Average.....	17
3.Absences.....	17
III. RESULTS	18
A. Descriptive Analyses.....	18
B. Preliminary Analyses of the Independent and Dependent Variables.....	21
C. Student-Level Analyses.....	22
D. School-Level Analyses.....	24
E. Analyses of Interactions Between Student- and School-Level Variables.....	26
IV. DISCUSSION.....	27
A. Research Question #1.....	27
B. Research Question #2.....	29
C. Research Question #3.....	33
D. Research Question #4.....	35
E. Conclusions.....	36

TABLE OF CONTENTS (continued)

<u>CHAPTER</u>		<u>PAGE</u>
V.	CITED LITEERATURE.....	39
VI.	APPENDICES.....	44
	A. Appendix A.....	44
	B. Appendix B.....	47
VII.	Internal Review Board Approval Notice.....	50
VIII.	Vita.....	51

LIST OF TABLES

<u>TABLE</u>		<u>PAGE</u>
I.	Descriptive Statistics for Student-Level Variables	15
II.	Descriptive Statistics for School-Level Variables	20
III.	Correlations between Student Level Variables.....	20
IV.	HLM Effects of Student-Level Variables on Academic and Behavioral Performance.....	20
V.	HLM Effects of Student-Level Variables on Academic and Behavioral Performance	20
VI.	HLM effects of interactions of school- on student-level perceptions of climate on academic and behavioral performance	20

LIST OF ABBREVIATIONS

GPA	Grade Point Average
HLM	Hierarchical Linear Modeling
PSC	Peer Social Climate
SCS	Student Connection Survey

SUMMARY

School climate has been widely recognized as an important component of successful schools and a predictor of a variety of student outcomes. However, there is an ongoing debate as to whether climate should be conceptualized and analyzed at the individual- or the school-level. This study used Hierarchical Linear Modeling to examine the relationship between 9th-grade students' perceptions of climate and their academic and behavioral performance. Multi-level methods helped to distinguish student- and school-level effects. Generally, results indicated that school climate simultaneously affects students on an individual and collective level. HLM analyses revealed that the majority of variance in school climate scores was within schools. Additionally, individual perceptions of climate were more strongly associated with better student performance than aggregate ratings, particularly students' perceptions of teacher's expectations and school safety. However, more between-school variance in students' academic and behavioral performance was explained by aggregate ratings of climate than within-school variance by individual ratings. Limited, yet positive support was found for the possibility that aggregate perceptions of climate may moderate the relationship between individual perceptions and student performance. Based on these findings, suggestions for how to more explicitly conceptualize and analyze climate at the individual- and school-level are provided.

INTRODUCTION

A time of particular vulnerability for many students occurs during their transition from elementary school to high school (Felner & Adan, 1988; Roderick, 1995; Allensworth & Easton, 2007). As they enter high school, students may encounter a number of organizational differences from the K–8 school setting, such as increased student body size (Eccles & Midgley, 1988) and exposure to a greater number of teachers and instructional styles (Roderick, 1995). The transition to high school may entail numerous policy changes as well, such as stricter grading procedures and increased expectations for classroom behavior (Eccles & Midgley, 1990). A number of previous studies have demonstrated that the organizational and policy changes experienced during a student’s transition to high school may be particularly challenging for minority students from low-income backgrounds (Roderick, 1995; Seidman, Aber, Allen, & French, 1996; Eccles, Lord, & Midgley, 1991). Consequently, it is of great importance to examine factors that may positively or negatively affect the adaptation of low-income minority students as they experience this transition.

School Climate

How students adapt during the transition to high school depends in part on their perception of the new environment (Reyes et al., 2000). For instance, previous research has found that failure and absence rates were lower schools in which 9th-grade students perceived their teachers to be more supportive and attentive (Allensworth & Easton, 2007). Perceptions of the school environment are most commonly examined in the context of research on school climate. Previous research regarding this construct has repeatedly demonstrated positive relationship between school climate and academic achievement, as well as decreased instances of misconduct and aggression (Battistich & Hom, 1997; Battistich, Solomon, Kim, Watson, &

Schaps, 1995; Griffith, 1999; Kuperminc, Leadbeater, & Blatt, 2001). Based on this evidence, the United States Department of Education (2010) recently awarded nearly 40 million dollars to 11 states to assist in the develop of “measurement systems to assess conditions for learning.”

Although researchers and practitioners commonly agree that climate is an important factor in determining the success of a school (Keefe, Kelly, & Miller, 1985), there are a wide variety of definitions and measures of climate available (Cohen, McCabe, Micheli, & Piceral, 2009). For the purpose of the present study, school climate is defined as *the relatively enduring quality of the internal environment of the school that (a) is experienced by its members, (b) can be described in terms of the values of a particular set of characteristics of the school, and (c) influences their behavior* (Tagiuri, 1968). Despite the large number of school climate definitions available, Tagiuri’s was chosen for the following reasons. First, it asserts that climate should be framed through the perceptions of those who experience it. Although a number of environmental characteristics influence climate, it is fundamentally grounded in how the members of said environment experience those characteristics. This assumption places an emphasis on the importance of *psychosocial* climate (Moos, 1979), as opposed to the more easily observed physical aspects of the environment, or the *organizational* climate (James, Joyce, & Slocum, 1988). Findings from a number of recent studies support a focus on students’ perceptions of the environment as opposed to more objective aspects, finding them to be most relevant for understanding students’ adjustment and well being (Connell & Wellborn, 1991; Eccles et al., 1993; Way, Reddy, & Rhodes, 2007). Additionally, Tagiuri stated that despite the complex nature of climate, “it can be described in terms of the values of a particular set of characteristics.” In other words, although psychosocial climate is more complex than observing social interactions or quantifying physical aspects of the environment, it remains a measurable

phenomenon. Finally, Tagiuri's definition posits that climate directly influences behavior. This proposition is supported by a large amount of research described above that has demonstrated a consistent, positive relationship between perceptions of climate and students' academic and behavioral performance. Although Tagiuri's definition is helpful in providing a framework for understanding the construct of school climate generally, a more detailed examination of how the definition applies to the present study is needed.

How is Climate Experienced by Members of a School?

Although school climate has been studied extensively in both the educational and psychological fields, there is an ongoing debate regarding the proper unit of analysis for this important construct. Many researchers have argued that climate is a property of the school (James, 1982). From this perspective, all members of the school, including students and staff, experience a similar climate through their shared contact with the same environment (Van Horn, 2003). Other researchers argue that climate it is a subjective psychological property of each individual member of the school (Miller & Fredericks, 1990). From this perspective, each member of the school perceives a unique climate based on their personal characteristics and experience.

Clearly, whether climate is perceived as an individual or school property directly influences how this construct is assessed, modeled, and informs relevant interventions. When viewed as a school-level construct, climate scores are typically assessed as a mean of the individual scores in a school with individual differences between members viewed as random error. From this perspective, all members in a school experience a similar climate, although some may be more affected by this climate than others. Consequently, interventions based on this perspective are developed to improve school-wide characteristics that affect climate. When

viewed as an individual-level construct, student's climate scores are assessed independently, not in an aggregated value (Sirotnik, 1980). From this perspective, members in the same school will have different perceptions of climate that can affect their behavior in a variety of ways. Van Horn (2003) notes that climate-based interventions developed from this perspective should emphasize working directly with students to change their perceptions of the school.

Few previous studies have explicitly examined the appropriate unit of analysis for school climate. In a comprehensive review of school climate studies Anderson (1982) noted, "(climate) studies rarely acknowledge, much less provide a theoretical rationale for their choices of units of analysis" (p. 386). Almost 20 years later Griffith (1999), citing Anderson's findings, commented, "the problem remains knowing when to aggregate data and when to make appropriate individual-level and group-level inferences" (p. 343). The few studies that have purposefully examined the proper unit of analysis for school climate have generated mixed results. Mok and McDonald (1994) used multi-level analyses to determine that climate was an individual-level construct as they found that only 3% of variance in students' climate ratings was determined by the school level factors. However, using multi-level analyses, Van Horn (2003) found evidence supporting the school-level conceptualization of climate, as between-school differences in climate scores predicted students' behavior more accurately than differences within the same school.

As evidenced by these two studies, there is no clear statistical method for analyzing the correct conceptualization of school climate. Griffith (1999) noted that previous studies have analyzed individual and aggregate perceptions of climate for a variety of purposes, "to develop climate scales, to classify climates of schools and classrooms, and to correlate school climate with student academic performance, school structural characteristics, and school student population composition" (p. 343). Individual and school climate ratings can be analyzed as the

dependent variable (Mok & McDonald, 1994), or modeled as a predictor of student behavior (Van Horn, 2003). Additionally, some studies focus on teachers' climate ratings (Van Horn, 2003), while others measure students' perceptions (Mok & McDonald, 1994). Despite the number of methodological options in studying school climate, the majority of recent studies share the approach of employing multi-level analyses. This method of analysis is necessary to accurately investigate the proper unit of analysis for school climate as it can simultaneously analyze the variance in individual- and school-level climate ratings.

More recently, as studies have begun to employ a multi-level approach to studying school climate, significant variance has been found at both the individual and school levels. In their examination of 5th graders' perceptions of climate, Koth, Bradshaw, & Leaf, (2008) found that individual factors (race and gender) accounted for the most variance in school climate ratings. However, they also found that classroom (teacher characteristics & class size) and school (enrollment & staff turnover) factors significantly predicted variance in climate ratings. Similar to Koth et al.'s findings, most multi-level studies of school climate have demonstrated a mix of significant individual- and school-level findings (Griffith, 1999). The present study will contribute to the growing number of studies using multi-level methods, explicitly examining the proper unit of analysis of school climate by modeling individual and school climate ratings as predictors of 9th-grade students' academic and behavioral performance.

How is Climate Described as a Particular Set of Values or Characteristics?

As discussed previously, school climate is a multi-dimensional construct that has been measured in a number of different ways. Initially, climate was measured from the perception of school staff to inform more appropriate professional development. Recently however, research has focused increasingly on students' perceptions of climate as it has been shown to influence

their academic and behavioral performance (Koth et al., 2008). Typically, when measuring school climate from the student perspective, there is a focus on psychological factors that relate to students' academic performance and their general well-being (Esposito, 1999). The present study assessed four psychological characteristics of school climate from the student perspective, specifically those that relate to "social and emotional conditions for learning" (Osher, Kendziora, & Chinen, 2008).

The four social and emotional conditions included in the present study are: School Safety, Expectations, Student Support, and Peer Social Climate. The Student Connection Survey (SCS), a measure developed collaboratively by the American Institutes for Research and a large urban public school district, assessed these four constructs. These four constructs were determined to be important factors in students' perception of school climate based on previous research and practical experience (Osher, Kendziora, & Chinen, 2008). The SCS is unique in that it was developed collaboratively with the stakeholders who used the assessment, helping to ensure its content would be appropriate for the students who completed the survey and the results would be actionable by districts and schools. Additionally, the constructs measured by the SCS align closely with the four major factors of school climate outlined by the National School Climate Council: safety, teaching, learning, and relationships.

School Safety is defined as the extent to which students feel physically and emotionally secure. This includes a lack of violence (e.g., fighting, bullying, and crime), as well as a mutual trust and respect among school members (Osher, Kendziora, & Chinen, 2008). Previous research has demonstrated the effect of the school's physical environment on students' behavior (National School Boards Association, 1996). Improving students' perceptions of safety throughout the school building can improve academic and behavioral performance (Koth et al., 2008).

Additionally, positive perceptions of emotional safety can help to fulfill students' basic psychological needs for a sense of belonging, autonomy and influence (Osher, Kendziora, & Chinen, 2008). Schools in which students do not feel emotionally safe or cared for may demonstrate increased levels of disorder and lower academic achievement (Gottfredson & Gottfredson, 1989).

Expectations reflect the school staffs' expected level of effort for students' academic and behavioral performance. This includes providing a rigorous and relevant academic curriculum, access to engaging and challenging courses, as well as opportunities to participate in service-learning and extracurricular activities (Osher, Kendziora, & Chinen, 2008). Previous research has demonstrated that when students believe the school staff holds high expectations for them, they are more likely to demonstrate better academic and behavioral performance (Catalano et al., 2004). Even more importantly to the current study, the positive relationship between staff expectations and student performance is especially relevant for low-income students. Muller (2001) found that low-income high school students' performance on a standardized exam was more strongly linked to their perception of teacher expectations than their more affluent peers.

Student Support represents how much students feel listened to, cared about, and helped by adults in the school (Osher, Kendziora, & Chinen, 2008). Positive student support can act as a protective factor against the negative effects of numerous risk factors (Mitchell-Copeland, 1997) and strongly associates with students' emotional, behavioral and academic development (Baker, 2006). Additionally, Voelkl (1995) found that students who perceived school staff to be supportive demonstrated increased class participation and in turn, higher academic performance. Although students become increasingly reliant on peer groups rather than adults for support as they transition into high school (Solowdow, 1999), those who perceive their teachers as

supportive throughout this transition display more positive academic attitudes and social-emotional adjustment (Midgley et al., 1989). Finally, similar to High Expectations, previous research suggests that due to their increased likelihood to experience negative school outcomes, the teacher-student relationship is particularly important for low-income students (Murray, Murray, & Waas, 2008).

Peer Social Climate is defined as the ability of students to maintain healthy interpersonal relationships with peers and adults, and have access to a multitude of coping strategies to manage stress and difficult situations (Osher, Kendziora, & Chinen, 2008). Several studies have demonstrated the relationship between Peer Social Climate and students' academic and behavioral performance. Interventions focused on developing students' interpersonal skills have reported better grade point average, attendance, and classroom behavior (Durlak, Weissberg, & Pachan, 2010). Students with strong interpersonal skills demonstrate an increased ability to cope with stressful situations in and out of the classroom, work collaboratively with other students, and set and achieve their goals (Osher, Kendziora, & Chinen, 2008).

How does School Climate Influence Student Outcomes?

The final aspect of Taguri's (1968) definition posits that perceptions of school climate are associated with student outcomes. The present study focuses specifically on two student outcomes: academic performance and behavior. Academic performance is measured using a standardized assessment as well as grade point average (GPA), and behavior is measured using student attendance.

Previous research has demonstrated a consistent relationship between perceptions of school climate and better GPA and standardized test performance, as well as decreased absences. Griffith (2002) found that individual and school level perceptions of climate were positively

associated with GPA. Battistich et al. (1995) found that individual and school level perceptions of climate were positively associated with students' standardized test scores for math and reading. Moos and Moos (1978) reported that classroom perceptions of climate were positively associated with better student attendance.

Research Questions and Hypotheses

The present study examined the relationship between individual and aggregate perceptions of school climate and students' academic and behavioral performance using Hierarchical Linear Modeling. Four research questions and related hypotheses were chosen to investigate the proper unit of analysis of school climate and its relationship to important student outcomes:

Research Question #1: How much variance in school climate scores is within and between schools? If more variance in climate scores is found between schools, it would support the theory that climate is most appropriately conceptualized as a school-level construct. From this perspective, although students within the same school experience a similar climate, students who attend different schools are likely to experience a distinctly different climate based on the unique environment they interact with on a daily basis. If more variance in climate scores is found within schools, it would support the theory that climate is more appropriately conceptualized as an individual-level construct. From this perspective, students within the same school can experience a wide range of climates in the same environment depending on their own personal experiences and characteristics.

Although a limited number of studies have explicitly examined this question using an adolescent sample, Mok and McDonald (2004), found less than 5% between-school variance in school climate ratings of 12th-grade students (as opposed to 95% within-school variance),

indicating that an individual-level conceptualization of climate was most appropriate.

Consequently, it is hypothesized that there will be more within school variance in 9th-grade students' school climate scores than between school variance. Additionally, as the SCS measures psychosocial climate, or students' unique perceptions of their environment, it is more likely that students' ratings will vary more within the same school based on their individual differences than aggregated values between schools (Griffith, 1999).

Research Question #2: What is the relationship between individual and aggregate perceptions of school climate and students' academic and behavioral performance? In other words, how do individual students' perceptions of climate relate to their performance and how does the aggregate school perception of climate relate to student performance? Although many previous studies have examined the relationship between climate and student performance, none have used the SCS. Based on a number of previous studies that have established a positive relationship between students' perceptions of climate and their academic and behavioral performance (Battistich et al., 1995; Griffith, 1999; & Kuperminc, Leadbeater, & Blatt, 2001), it is hypothesized that generally, both individual and aggregate perceptions of the four SCS constructs will be associated with more advantageous outcomes.

Specifically, a more consistent positive relationship is expected between individual perceptions of climate and students' academic and behavioral performance than with aggregate perceptions because "people tend to react to experiences as they subjectively perceive them, not necessarily to how the experiences are objectively" (Koth et al., 2008, p. 96). In the current study, students' individual perceptions of climate are viewed as subjective as they are based on each student's unique characteristics and their interpretation of the school environment. On the other hand, aggregate perceptions of climate are viewed as objective as they are based on the

general consensus of climate in the school calculated from the average response of all students. Consequently, it follows that even if the aggregate or objective perception of climate in particular school was negative, if an individual student perceived the climate in their school to be positive, they would be more likely to perform better academically and behaviorally.

Research Question #3: How much variance in students' academic and behavioral performance is explained by individual and aggregate perceptions of school climate? Although the second research question focuses on the general relationship (i.e., positive or negative) between climate and academic and behavioral performance, the third research question provides more detail regarding how well perceptions of climate explain within- and between-school differences in performance. For each measure of students' academic and behavioral performance, a portion of the variance is within schools (i.e., how different are the standardized test scores of students in the same school) and the remaining portion is between schools (i.e., how different are the standardized test scores of students across different schools?). The third research question asks what proportion of the within-school variance in academic and behavioral performance can be explained by individual students' perceptions of climate, and what proportion of the between-school variance in academic and behavioral performance can be explained by aggregate perceptions of climate?

Previous multi-level studies of climate have reported that individual perceptions of climate explained significant amounts of within-school variance in student outcomes, and that aggregate perceptions of climate explained significant amounts of between-school variance in student outcomes (Griffith, 1999). However, previous studies have used a number of different climate measures and tested a wide range of student populations, making it difficult to draw any specific conclusions. Consequently, in the current study, it is generally predicted that significant

amounts of both the within- and between-school variance in students' academic and behavioral performance will be explained by both individual and aggregate perceptions of climate respectively.

Although difficult to make any specific hypotheses due to the variability in methods and findings represented in previous research, it is expected that more between-school variance in student performance will be explained by aggregate perceptions of climate than within-school variance will be explained by individual perceptions of climate. This prediction is based on the reasoning that individual differences in students' academic and behavioral performance within the same school can more likely be attributed to a number of other factors (e.g., intelligence, income level) beyond their unique perception of climate. For example, even if two students in the same school have identical perceptions of the amount of support provided by teachers, these two students could perform differently on a standardized exam if one student has advanced test-taking abilities.

On the other hand, differences in the average academic and behavioral performance between schools can be more likely attributed to the aggregate or objective perception of climate in those schools. For example, if two schools serving a similar population of students reported different aggregate scores on a standardized exam, it is likely that there are some fundamental differences in those schools (i.e., how safe students feel). Further supporting this hypothesis, in Van Horn's (2003) study using a climate measure similar to the SCS, he found that between-school differences in climate ratings explained more variance in student performance than within-school differences.

Research Question #4: Do aggregate perceptions of climate influence the relationship between students' individual perceptions of climate and their academic and behavioral

performance? Although a number of studies have found significant student- and school-level effects of climate on student performance (Koth et al., 2008), it is unclear how these effects might interact to affect student performance. For instance, it is possible that while one student in a school perceives teacher support to be extremely low due to a negative experience with an instructor, the general or aggregate perception of teacher support in that school may be high. If the general perception of teacher support in the school is high, it is likely that the student with a negative perception will subsequently experience more supportive teachers and may perform better academically. In other words, the aggregate perception of climate in the school may act as a buffer to strengthen the relationship between an individual student's perception of climate and their academic and behavioral performance.

Although an increasing number of studies have advocated for a multi-level study of school climate, few have explicitly tested how individual- and school-level perceptions interact with one another in relation to student performance. Griffith (1999) examined this type of interaction using a sample of elementary school students and found that "group or school-level climate moderated within-school relations of climate to student self-reported academic performance" (p. 360). Despite testing a younger sample of students and using self-reported academic performance as opposed to school-provided GPAs and test scores, Griffith's (1999) findings provide support for the hypothesis that positive aggregate perceptions of school climate will be significantly associated with a stronger relationship between students' individual perceptions of climate and their academic and behavioral performance. Due to the lack of previous research regarding the interactive effect of individual and aggregate perceptions of climate on student performance, no scale-specific hypotheses are warranted.

METHODS

Participants

This study used survey data from 9th-grade students enrolled in urban public high schools during the 2006–2007 school year. This sample was part of a larger database composed of all 6th-grade through 12th-grade students who took the Student Connection Survey (SCS) in 2007. However, only 9th-grade students from public high schools with no missing data for the variables of interest were included in this sample.

Students. The final sample of students (N = 6,672) included 3,010 African American (45%), 2,912 Hispanic (44%), 566 Caucasian (8%), 175 Asian/Pacific Islander (3%) and 9 Native American (<1%) students. The gender distribution was 3,509 female (53%) and 3,163 male (47%). The sample was primarily low-income with 5,978 students receiving free or reduced-price lunch (87%). Additionally, 866 students had an Individualized Education Program (IEP) (13%), and 278 were English Language Learners (ELL) (4%).

Schools. The final sample (N = 72) consisted of all regular enrollment high schools, meaning no application or referral process was necessary to enroll. Magnet and Alternative schools were excluded as previous research has demonstrated that the climate and student population within these schools can be vastly different from those with regular enrollment policies (Grunbaum, Lowry, & Kann, 2001). Including schools with specialized enrollment policies could erroneously artificially inflate the amount of between-school variance in climate scores. On average, the schools' gender distribution was even, composed of 50% female and 50% male students. The schools were overwhelmingly low-income with an average of 95% of students receiving free or reduced-price lunch. Additionally, the schools enrolled an average of 20% special-education students and 5% ELL students.

Two different types of variables were included in the study, independent variables that consisted of the four SCS scales and dependent variables that consisted of the three measures of academic and behavioral performance.

Independent Variables

Student Connection Survey. The American Institutes for Research and a large urban public school district developed the SCS collaboratively to measure student perceptions of social-emotional conditions for learning. The four constructs measured were Safety, Expectations, Support, and Peer Social Climate. Items for the SCS were drawn from two sources: a review of existing measures, as well as 22 focus groups composed of parents, students and administrators, all conducted by the American Institutes for Research.

A pilot version of the SCS was administered to a representative sample of students in December 2006 and in the spring of 2007 a final operational version was given to all 6th through 12th graders. Two versions of the SCS were administered in 2007, one to middle grade students (6th-grade – 8th-grade) and one to high school students (see Appendix A). The high school version contained 64 total items, 55 of which correspond to the four constructs measured by the SCS (see Appendix B). The additional nine items measured student participation in extracurricular activities. The average SCS response rate for all high schools in 2007 was 64% and the average response rate for the current sample was similar at 59%.

Individual-level SCS for each 9th grader in the sample were calculated by taking the mean of their responses from select groupings of the 55 items. Each item was scored on a 4-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree.” Each of the four constructs, Safety ($\alpha = .83$), Expectations ($\alpha = .81$), Support ($\alpha = .77$), and Peer Social Climate ($\alpha = .79$), had adequate reliability (American Institutes for Research, 2007). All negatively phrased items were

reverse scored for the current study so that more positive responses corresponded to a higher number. School-Level SCS scores were included the entire school population and were calculated by taking the mean of their responses from select groupings of the 55 items.

The Safety construct was composed of 13 items and measured students' perceptions of their physical and emotional safety (e.g., "Most students in this school treat each other with respect" and "I sometimes stay home because I don't feel safe at school"). The Expectations construct was composed of 17 items and measured students' perceptions of teachers' expectations for their academic and behavioral effort (e.g., "My teachers often require me to explain my answers," and "When students in this school already know the material that is being taught, the teacher gives them more-advanced assignments."). The Support construct was composed of 14 items and measured students' perceptions of the school staffs' effort to nurture, encourage, and support them (e.g., "My teachers really care about me," and "Adults in this school apply the same rules to all students equally."). The Peer Social Climate construct was composed of 11 items to measure students' perceptions of their peers' ability to maintain healthy interpersonal relationships and demonstrate a multitude of coping strategies to manage stress and difficult situations (e.g., "Most students in my school try to work out their disagreements with other students by talking to them," and "Most students in my school stop and think before doing anything when they get angry.").

Dependent Variables

Explore Achievement Test. The Explore was given to all 9th-grade students in the spring of 2007. A standardized assessment, the Explore acts as an objective measure of achievement as it is composed of identical questions and scoring procedures for each student. The Explore offers a baseline assessment of the academic ability of students in their first year of high school and

correlates strongly with students' future performance on other standardized exams such as the ACT (ACT, 2007). The Explore consists of four sections, Reading, Math, Science, and English. Student scores for each of these sections are calculated from students' raw scores (i.e., number of questions answered correctly), into scale scores ranging from 1–25, with higher scores indicating superior performance. The Composite score is calculated by averaging together the student's scale score and rounding up to the nearest whole number (ACT, 2007). As it represents performance across the four sections of the Explore, the Composite score was used for all analyses in the present study. Each of the four sections, Reading ($\alpha = .85$), Math ($\alpha = .84$), Science ($\alpha = .82$), and English ($\alpha = .86$), and particularly the Composite ($\alpha = .95$), displayed excellent reliability based on a nationally representative sample of 9th-grade students (ACT, 2007). Ninth graders in the current sample (13.8) scored lower than the nationally representative sample (16.1) on the composite scale.

Grade Point Average. GPA also represents students' academic performance but is a more subjective measure than a standardized assessment as it is calculated by teachers. Student's first semester GPA was provided by the school district. GPA was calculated using letter grades students received in each class (A, B, C, D, or F), as well as the number of academic credits assigned to each class. GPA was measured on a 5-point scale, ranging from 0.00 – 5.00 ($M = 2.23$, $SD = 1.04$) with higher values indicating better performance.

Absences. Absences are a common behavioral indicator representing whether or not a student attends school on a daily basis. School staff, typically teachers, record student attendance during each class period. The school district calculated and provided students' number of absences from the first semester, which consisted of 100 school days. Absences were measured in half (.50) or full (1.00) increments and totals ranged from 0–70 days ($M = 7.97$, $SD = 7.83$).

RESULTS

The present study used Hierarchical Linear Modeling (HLM) to investigate and distinguish the effects of student- and school-level variables on a variety of outcomes. HLM was chosen as the primary method of analysis for two reasons. First, there was potential in the data for students who attended the same school to report more similar perceptions of climate than students who attended different schools. Students who attend the same school are more likely to be exposed to a common environment than students who attend different schools. HLM is able to accommodate this interdependency between students in the same school while ordinary linear regression and ANOVA cannot (Raudenbush & Byrk, 2002). Second, HLM can estimate the amount of variance at the student-level (Level 1 – within-schools) and the school-level (Level 2 – between-schools) on a given outcome variable, distinguishing to what degree the outcome variable is associated with student- and school-level factors.

The results of this study are organized into five sections: (a) descriptive analyses, (b) preliminary analyses of the independent and dependent variables, (c) student-level analyses of academic/behavioral performance, (d) school-level analyses of academic/behavioral performance, and (e) analyses of interactions between student- and school-level variables.

Section 1 - Descriptive Analyses

Table 1 and Table 2 contain the Means, Standard Deviations, and coding information for all student- and school-level variables, including independent variables (SCS scales scores) and dependent variables (GPA, Explore, and absences).

TABLE 1. Descriptive Statistics for Student-Level Variables

Variable	<i>M</i>	<i>SD</i>
<i>Independent Variables</i>		
SCS—Safety	2.54	.43
SCS—Peer Social Climate	2.24	.45
SCS—Expectations	2.64	.39
SCS—Support	2.35	.42
<i>Dependent Variables</i>		
Explore Composite	13.83	2.62
1 st Semester GPA	2.23	1.04
1 st Semester Absences	7.97	7.83

Note. N = 6,672 Students.

TABLE 2. Descriptive Statistics for School-Level Variables

Variable	<i>M</i>	<i>SD</i>
<i>Independent Variables</i>		
SCS—Safety	2.51	.18
SCS—Peer Social Climate	2.29	.11
SCS—Expectations	2.66	.10
SCS—Support	2.45	.11

Note. N = 72 Schools.

Mean SCS scale scores at the student- and school-level ranged from 2.24 to 2.66, corresponding to a relatively neutral response in-between the Likert scale choices “Disagree” (coded ‘2’) and “Agree” (coded ‘3’). At both the student- and school-level, Peer Social Climate was the lowest rated scale and Expectations was the highest rated. Student-level climate scores displayed greater variability than school-level scores as their standard deviations ranged from .39 to .45 and the latter ranged from .10 to .18. As mentioned previously, the average Explore

Composite score for the current sample ($M = 13.83$, $SD = 2.62$) was below the national average. Additionally, although students on average missed almost eight days of school their first semester ($M = 7.87$, $SD = 7.83$), this value was actually slightly below the district average. Additionally, the large variability in absences was to be expected as previous research has demonstrated a number of individual- and school-level factors strongly affect student attendance (Baker, Sigmon, & Nugent, 2001). Finally, the average 1st semester GPA ($M = 2.23$, $SD = 1.04$) corresponded to a “C,” or average performance.

Table 3 shows the correlations among student-level SCS scores, and the three measures of academic and behavioral performance. The four SCS scales correlated positively; Expectations and Support ($r = .62$) and Safety and Peer Social Climate ($r = .46$) related most strongly. Correlations for the dependent variables behaved as expected. GPA and Explore scores positively correlated with one another and negatively correlated with number of absences. Finally, most SCS scales associated positively with better academic and behavioral performance. Contrary to prediction, Peer Social Climate correlated negatively with GPA and Explore, and Support correlated negatively with Explore scores.

TABLE 3. Correlations between Student Level Variables

Variable	GPA	Absences	Explore	Safety	PSC	Expect	Support
GPA	1						
Absences	-.54*	1					
Explore	.45*	-.21*	1				
Safety	.05*	-.11*	.13*	1			
Peer Social Climate	-.08*	-.03*	-.20*	.46*	1		
Expectations	.23*	-.13*	.11*	.11*	.17*	1	
Support	.11*	-.08*	-.08*	.18*	.29*	.62*	1

Note. N = 6,672 students. *. Correlation is significant at the .01 level. Peer Social Climate (PSC). Negative correlation with absences indicates less school days missed.

Section 2 – Preliminary Analyses of Independent and Dependent Variables

The first step in the HLM process calls for testing a null model consisting only of the outcome variable of interest. The null model does not include any covariates and therefore closely resembles a random-effects ANOVA. Similar to a random-effects ANOVA, the results of the null model can be used to determine the amount of within- and between-school variance present in each dependent variable, also known as the Intraclass Correlation Coefficient (Raudenbush & Byrk, 2002). As the current study includes three dependent variables, three separate null models were tested. Null models revealed that the majority of variance was within schools for three dependent variables, Explore scores (77%), 1st Semester GPA (91%), and 1st Semester Absences (86%). Additionally, as the amount of within- and between-school variance in school climate scores was of particular relevance to the current study, another series of null models were tested, one for each scale of the SCS. As predicted, the majority of variance in climate scores was within-schools for the four SCS scales: Safety (92%), Expectations (95%), Support (91%), and Peer Social Climate (93%).

Results of the null model also included a Chi Square statistic that tested if the amount of between-school variance in each outcome variable was significantly greater than zero. If the variance in the dependent variables does not differ significantly from zero it is not advisable to continue with the HLM analyses (Raudenbush & Byrk, 2002). However, all three dependent variables, Explore Composite scores, 1st Semester GPA's, and 1st Semester Absences, displayed an amount of between-school variance that was significantly different from zero, X^2 's (71, N = 6,672) = 759.47 to 2267.04, $p < .01$. Additionally, Chi Square tests of the four SCS scales, Safety, Expectations, Support, and Peer Social Climate, revealed that climate scores differed significantly across schools as well, X^2 's (71, N = 6,672) = 385.54 to 1190.50, $p < .01$.

Section 3 – Student-Level Analyses

As both the independent and dependent variables differed significantly across schools it was advisable to proceed with the multi-level analyses. The Level 1 analyses examined relationships between student-level variables and the three dependent variables. Three separate student-level HLM analyses were conducted, one for each measure of students' academic/behavioral performance. Four SCS scale scores, Safety, Expectations, Support, and Peer Social Climate, were included in each analysis to determine their relationship with students' academic and behavioral performance.

All student-level SCS scale scores were group centered on the mean SCS scale score of the school that student attended. Student-level SCS scale scores were group-mean centered as the relationship between SCS scale scores and outcome variables was expected to vary between schools. Centering or standardizing variables prior to the analysis also allows for the direct comparison of beta coefficients. (Raudenbush & Byrk, 2002).

Results from the Level 1 analyses partially supported the hypothesis that positive individual perceptions of school climate would be significantly associated with better academic and behavioral performance (see Table 4). In support of the hypothesis, students' perceptions of Safety ($\beta = .96, p < .05$) and Expectations ($\beta = 1.33, p < .05$) associated positively with Explore Composite scores. Students' perceptions of Safety ($\beta = .12, p < .05$) and Expectations ($\beta = .64, p < .05$) also related positively with 1st Semester GPA. Lastly, students' perceptions of Safety ($\beta = -.73, p < .05$) and of Expectations ($\beta = -2.40, p < .05$) correlated negatively with 1st Semester Absences. However, results from other SCS scales did not support the hypothesis. Specifically, students' perceptions of Peer Social Climate associated negatively with Explore Composite Scores ($\beta = -1.59, p < .05$) and 1st Semester GPA ($\beta = -.34, p < .05$), and associated positively associated with 1st Semester Absences ($\beta = .54, p < .05$). Additionally, students' perceptions of Support correlated negatively with Explore Composite scores ($\beta = -.34, p < .05$).

TABLE 4. HLM Effects of Student-Level Variables on Academic and Behavioral Performance

Variable	Safety	PSC	Expect	Support
Explore	.96*	-1.59*	1.33*	-.72*
GPA	.12*	-.34*	.64*	.01
Absences	-.73*	.54*	-2.40*	-.11

Note. *. β significant at the .05 level. Negative relationship with absences indicates less school days missed. Peer Social Climate (PSC).

Section 4 – School-Level Analyses

Level 2 analyses examined relationships between aggregated school-level variables and the three indicators of academic and behavioral performance. Again, three separate Level 2 analyses were conducted, one for Explore Composite Scores, 1st Semester GPA's, and 1st Semester Absences. For the Level 2 analyses, the aggregated values of the four SCS scale scores were entered as independent variables to determine their relationship with students' academic and behavioral performance. All SCS scales were grand-mean centered to increase the interpretability of results (Raudenbush & Byrk, 2002).

Results from the Level 2 analyses provided mixed support for the hypothesis that positive aggregate perceptions of school climate would be significantly associated with better academic and behavioral performance (see Table 5). Aggregate perceptions of Safety ($\beta = 7.05, p < .05$) and Expectations ($\beta = 9.29, p < .05$) were positively associated with Explore Composite Scores ($\beta = 4.52, p < .05$). Safety was also positively associated with GPA ($\beta = 1.00, p < .05$) and negatively associated with increased absences ($\beta = -9.51, p < .05$). In contrast to the hypothesis, both Peer Social Climate ($\beta = -7.27, p < .05$) and Support ($\beta = -9.18, p < .05$) related negatively with Explore scores.

TABLE 5. HLM Effects of School-Level Variables on Academic and Behavioral Performance

Variable	Safety	PSC	Expect	Support
Explore	7.05*	-7.27*	9.29*	-9.18*
GPA	1.00*	-1.10	2.61	-1.31
Absences	-9.51*	3.83	-6.23	3.80

Note. *. β significant at the .05 level. Negative relationship with absences indicates less school days missed. Peer Social Climate (PSC).

Calculations based on results from the null, Level 1, and Level 2 models strongly supported the third hypothesis that aggregate perceptions of school climate would better explain between-school differences in academic and behavioral performance than individual perceptions explained within-school differences. These findings were calculated by comparing the amount of unexplained within- and between-school variance in each dependent variable (calculated from the null model) to the amount of within- and between-school variance explained after the inclusion of individual (Level 1 model) and aggregate climate scores (Level 2 model) into the analyses.

Results indicated that 34% of the within-school variance of Explore Composite Scores was explained by the addition of individual perceptions of climate to the Level 1 model, although 61% of the between-school variance was explained by the addition of aggregate perceptions of climate to the Level 2 model. Further, 7% of the within-school variance of 1st Semester GPA's was explained by the addition of individual perceptions of climate to the Level 1 model, although 20% of the between-school variance was explained by the addition of aggregate perceptions of climate to the Level 2 model. Finally, 2% of the within-school variance of 1st Semester Absences

was explained by the addition of individual perceptions of climate to the Level 1 model, although 22% of the between-school variance was explained by the addition of aggregate perceptions of climate to the Level 2 model.

Section 5 – Level 1 and Level 2 Interactions

These analyses examined whether aggregate school perceptions of climate influenced the relationship between individual students' perceptions of climate and their academic/behavioral performance. Three analyses of interactions were conducted for each SCS scale, one for each outcome variable. For example, three separate analyses were conducted to examine whether aggregate school perceptions of Safety moderated the relationship between individual students' perception of Safety and their Explore Composite Score, 1st Semester GPA, and 1st Semester Absences. The same process was then repeated for the other three SCS scales.

Results from these analyses showed limited support for the hypothesis that positive aggregate perceptions of school climate would be significantly associated with a stronger relationship between students' individual perceptions of climate and better academic and behavioral performance. Of the 12 possible interactions (see Table 6), only two indicated that a higher aggregate school climate was associated with a stronger relationship between individual perceptions of climate and students' academic and behavioral performance. Specifically, in schools where the aggregate perception of Peer Social Climate was higher, so was the strength of the relationship between individual perceptions of Peer Social Climate and GPA ($\beta = .71, p < .05$). Additionally, in schools where the aggregate perception of Peer Social Climate was more positive, the strength of the relationship between individual perceptions of Peer Social Climate and Absences became increasingly negative ($\beta = -8.04, p < .05$).

TABLE 6. HLM effects of interactions of school- on student-level perceptions of climate on academic and behavioral performance

Variable	Safety X Safety	PSC X PSC	Expectations X Expectations	Support X Support
Explore	.44	.55	-.49	.21
GPA	.03	.71*	-1.34*	.48
Absences	1.75	-8.04*	8.69*	-.11

Note. *. β significant at the .05 level. Negative relationship with absences indicates less school days missed. Peer Social Climate (PSC).

Two interactions did not support the above hypothesis. Specifically, in schools where the aggregate perception of staff Expectations increased, the relationship between individual perceptions of teachers' Expectations and GPA became increasingly negative ($\beta = -1.34, p < .05$). Additionally, in schools where the aggregate perception of teachers expectations' increased, the relationship between individual perceptions of Expectations and Absences became increasingly positive ($\beta = 8.69, p < .05$).

DISCUSSION

The purpose of this study was to investigate the relationship between 9th grade students' individual and aggregate perceptions of school climate and their academic and behavioral performance. Specifically, Hierarchical Linear Modeling was used to answer four research questions: (a) How much variance in school climate scores is within and between schools? (b) What is the relationship between individual and aggregate perceptions of school climate and students' academic and behavioral performance? (c) How much variance in students' academic and behavioral performance is explained by individual and aggregate perceptions of school

climate? And (d) Do aggregate school perceptions of climate influence the relationship between students' individual perceptions of climate and their academic and behavioral performance?

Research Question # 1: How much variance in school climate scores is within and between schools?

In order to better understand the proper unit of analysis for school climate, a null model with no other covariates was tested to determine the amount of within- and between-school variance in climate scores. As predicted, the majority of variance in all four SCS scales was primarily within schools. In other words, students within the same school displayed more variability in their perception of climate than the average perceptions of climate between schools. Specifically, there was at least 90% within-school variance in all four scales. These findings are consistent with previous research (Mok & McDonald, 2004) and provide further support for the theory that School Climate is an individual, psychological construct, largely dependent on each individual's characteristics and experiences. However, it should be noted that despite the small amount of between-school variance in climate scores, schools did differ significantly on each of the four scales.

A possible explanation for the large amount of within-school variance in SCS scale scores was the wording of individual items. Klein, Conn, Smith, and Sorra (2001) commented that the reference group for a particular item and consequently, set of items, can directly affect the amount of inter-rater agreement when aggregating scores. Specifically, they suggest that when an item contains the words, "I," "my," or "you," raters will generally focus on their personal experiences, thus increasing the amount of variance when aggregating scores. Alternatively, when an item contains words like "we" or "our," participants are more likely to take a shared perspective, resulting in less variance when scores are aggregated.

Klein et al. (2001) tested this theory and confirmed that items using the individual as the reference group displayed more variability than items using the organization as a reference group. Although this hypothesis was tested using participants from a manufacturing plant in a study of organizational climate, it is conceivable that similar patterns would be found in the present study. As more than 80% of the items included in the SCS contain “I,” “my,” or “you,” it is likely the wording of the items contributed to the large amount of within-school variance found for each scale.

It should be noted that none of the 11 items included in the Peer Social Climate scale used the words “I,” “my,” or “you,” yet this scale displayed 93% within-school variance. However, it is still possible that the large amount of within-school variance found in the Peer Social Climate was due to the wording of the items. Specifically, this scale was composed of items that required participants to assess their peers’ ability to maintain healthy interpersonal relationships and demonstrate a multitude of coping strategies to manage stress and difficult situations (e.g., “Most students in my school try to work out their disagreements with other students by talking to them”). Peer assessment requires “norm referencing,” a process in which the rater must “locate himself or herself in relation to the performance of peers and to prescribed learning targets” (Topping, 1998, p. 255). Items that induce norm referencing are more likely to increase the amount of variation in scores (Shrock & Coscarelli, 2007).

Research Question # 2: What is the relationship between individual and aggregate perceptions of school climate and students’ academic and behavioral performance?

Results indicated that as predicted, positive individual perceptions of climate were significantly associated with better academic and behavioral performance. Specifically, students’ ratings of school safety and teacher’s expectations were significantly associated with better

Explore Composite Scores, 1st semester GPA, and 1st semester Absences. The finding that this relationship was consistent across three different measures of student performance further corroborates the theory that developing a positive climate is essential for a successful school. The finding supporting a positive relationship between individual perceptions of climate and student performance is consistent with previous research using a variety of measures and populations (Battistich et al., 1995; Griffith 2002; Moos & Moos, 1978).

Other individually rated SCS scales however, were negatively related to students' academic and behavioral performance. Specifically, individual perceptions of Peer Social Climate were negatively associated with Explore Composite Scores and 1st Semester GPA's. Although counter to the original hypothesis, there is a plausible explanation for the negative relationship between students' individual perceptions of Peer Social Climate and their academic performance. As mentioned previously, this scale required participants to engage in norm referencing, a process that prompts the participant to compare themselves to their peers. The negative relationship between Peer Social Climate and academic performance may have been the result of successful students (as measured by GPA and Explore Scores) rating their peer's social skills more negatively in an effort to distinguish themselves from lower performing students.

Although there were some inconsistencies in terms of the relationship between individual climate scores and students' academic and behavioral performance, one consistent pattern did emerge. Students' perceptions of teachers' Expectations, as well as Safety were both significantly associated with better student performance across all three measures. In particular, the Expectations scale displayed the strongest positive relationship to student performance when compared to Safety and the other scales significantly associated the same outcomes. This result is consistent with previous research, including a study conducted by the National Research

Council (2004), who found that increased teacher expectations were consistently related to 9th-grade students' success, especially for low-income students.

As opposed to individual perceptions, aggregate perceptions of school climate displayed a less consistent relationship with better academic and behavioral performance. Only aggregate perceptions of Safety were significantly and positively associated with all three measures of academic and behavioral performance. It should be noted that Safety was the only SCS scale significantly associated with the academic and behavioral performance across all three measures at the student- and school-level. Although aggregate perceptions of Expectations were associated with better 1st Semester GPA and 1st Semester Absences, those findings were not significant. Expectations were only significantly associated with better Explore scores. In contrast to the hypothesis, aggregate perceptions of Peer Social Climate and Support were significantly associated with lower Explore scores. As the majority of findings from the school-level analyses were not significant, individual perceptions of climate appear to be more strongly linked to student performance than aggregate perceptions.

It is possible that the lack of significant findings at the school-level was due to methodological limitations as opposed to reflecting the true nature of the relationship between aggregate perceptions of climate and students' academic and behavioral performance. Van Houtte (2005) noted that when interested in "organizational" or "collective" climate, aggregation is not only required, but is "inevitable" (p. 76). However, the aggregation of individual perceptions of climate may still "reflect individual characteristics and filters," leaving potential for "erroneous inferences" (Van Houtte, p. 76). Additionally, as mentioned previously, many SCS items were focused on individual perceptions of school climate (i.e. "I can get extra help at school outside of my regular classes"). Consequently, the aggregation of SCS scores may not

have represented the true “collective” climate within the school. Third, based on the large amount of within-school variance in climate scores described previously, the aggregation of individual scores may not have reflected the actual collective climate in each school. Griffith (1999) commented that,

Statistical approaches that rely on aggregated data provided by individuals imply fairly uniform perceptions of individuals in each aggregate and overlook the fact that the students and school staff, although in the same school or classroom, may vary widely in their perceptions of the school or classroom environment. It is more likely, particularly among larger and more socio-demographically diverse schools that student and teacher perceptions of the school or classroom environment would differ. (p. 343).

Perhaps if there were more agreement among individuals’ perception of climate within each school, more significant school-level effects would have emerged.

Although these analyses did not reflect a strong relationship between aggregate perceptions of climate and student performance, there is theoretical support for this association in previous literature. Social Comparison (Festinger, 1954) and Social Identity (Hogg, 1992) theory both suggest that group consensus exerts a strong influence on individual perceptions, motivations, and behaviors. Further, Owens (1987) postulated that as the group determines what is “right and wrong,” (Van Houtte, p. 82) non-conformists can be penalized socially or even physically. Although these theories were not developed in a school context, it is plausible that they are applicable in educational settings as well.

Furthermore, both the individual- and school-level findings from this study in regard to 1st semester GPA’s and 1st semester absences should be interpreted with caution as the SCS was administered in the Spring of 2007, although the student’s GPA’s and absences were recorded in

the Winter of 2006. Ideally, student's perceptions of climate would have been measured in closer proximity to the measures of academic and behavioral performance. This would have allowed for a more accurate investigation of the relationship between perceptions of climate and student performance. However, students' 2nd semester GPA and Absences were not available for this study.

Research Question # 3: How much variance in students' academic and behavioral performance is explained by individual and aggregate perceptions of school climate?

Results confirmed the hypothesis that aggregate perceptions of school climate would explain more variance in students' academic and behavioral performance than individual perceptions. In fact, for all three measures of student performance, more between-school differences in each outcome variable were accounted for by the inclusion of aggregate ratings of climate than within school differences by the inclusion of individual ratings. This result may seem surprising given the limited amount of between school variance in Explore scores (23%), 1st Semester GPA (9%), and 1st Semester Absences (14%), as well as the lack of significant relationships between aggregate perceptions of climate and student performance. However, these findings indicate that aggregate perceptions of climate are an important factor in discerning between school differences in student performance.

Although the current results are inconsistent in terms of individual and school level effects, they are representative of the general school climate literature. As noted previously, some school climate studies have found mainly between-school effects (Anderman, 1992), although others have found mainly within-school effects (Rowan, Raudenbush, & Kang, 1991). However, similar to the current study, Griffith (1999) noted that many multi-level studies of school climate have resulted in a mix of student- and school-level effects (Battistich et al., 1995;

Goh et al., 1995; Nunnery, 1993; Phillips, 1997; Rowan et al., 1991, as cited in Griffith, 1999). Consequently, the results from this study, as well as previous research, support the conclusion that the proper unit of analysis for climate is not simply the student or the school, but rather a combination of the two.

These results have important implications for developing school-based interventions to improve climate. As demonstrated in research question two, students' individual perceptions of climate are more strongly and consistently related to their performance than aggregate perceptions. Consequently, if a school was concerned with improving the academic and behavioral outcomes of their lowest performing students it would be most effective to first identify students who had the lowest individual perceptions of climate and then develop a targeted interventions for that group specifically. This approach would be more likely to improve those students' academic and behavioral outcomes than implementing a school-wide climate intervention as students' individual perceptions of climate are more strongly linked to their performance than the aggregate perception in the school.

On the other hand, if a school was interested in understanding why their overall academic and behavioral performance was lower than another school serving a similar population of students, it could be helpful for them to examine differences in the aggregate perceptions of climate between the two schools. As demonstrated above, aggregate perceptions of climate explained a significant amount of the between-school differences in all the three measures of academic and behavioral performance included in this study. Most notably, aggregate perceptions of climate accounted for more than 60% of the variance between schools in terms of their standardized test performance. This finding is particularly important given the current education policy that places a large emphasis on schools' standardized test scores (Hursh, 2007).

Consequently, in the above example, it would be helpful for the lower performing school to identify a specific aspect of climate (i.e., Safety) in which the aggregate perception of their students was significantly lower than the aggregate perception of students from the higher performing school. Subsequently developing a school-wide intervention focused on that specific aspect of climate (i.e., Safety) could help the lower performing school to improve their overall academic and behavioral performance.

Research Question # 4: Do aggregate school perceptions of climate influence the relationship between students' individual perceptions of climate and their academic and behavioral performance?

To further investigate the complexities of the proper unit of analysis for school climate, it was examined whether aggregate perceptions of climate influenced the relationship between individuals' perceptions of climate and their academic and behavioral performance. In other words, as the aggregate perception of climate in a school changed, how did it affect the relationship between individual students' perceptions of climate and their academic and behavioral performance?

Results indicated that only two of the 12 possible interactions- both regarding Peer Social Climate - were in the predicted direction indicating that positive aggregate school climate was associated with a stronger relationship between individual perceptions of climate and better academic and behavioral performance. This result is not surprising as all of the items that composed the Peer Social Climate scale were focused on the behavior of *other* students in the school. It is likely that the Peer Social Climate scale represented a more accurate collective representation of climate than the other SCS scales which all contained items that required self-reflection (i.e., "I worry about crime and violence in this school."). Perhaps if the other SCS

scales provided a more accurate representation of the collective climate within a school, more significant interactions would have been found. Additionally, these findings may have been influenced by the methodological limitations discussed previously when aggregating individual climate scores.

Although promising, the lack of significant interactions across the other SCS scales makes it difficult to draw any general conclusions about how school-level perceptions of climate may moderate student-level perceptions. Further, the limited number of previous studies that have examined the interaction of school- and student-level perceptions of climate prohibit making any generalizations from the current findings. However, these results indicate the need for a closer examination of how individual and aggregate perceptions of school climate interact to affect students' academic and behavioral performance. As evidenced by the results of this study and previous research, climate influences student behavior at the individual- and collective-level. Further efforts in this area could help researchers make more informed and accurate decisions when determining the appropriate unit of analysis of school climate in future studies and interventions.

Conclusions

This multi-level study of climate was unique in that it focused specifically on 9th grade students from a large, predominately low-income, urban school district. As discussed previously, the transition from middle to high school can be a difficult experience for adolescents, particularly those from a low-income background. Findings from this study support previous research that claim school climate is an important factor in the academic and behavioral performance of low-income, urban students as they transition to high school. Positive individual perceptions of school safety and teacher's expectations were consistently associated with better

performance on standardized tests and GPA's, as well as fewer absences. It is possible that these aspects of climate are particularly salient for 9th graders as they enter high school. However, conclusions drawn from these results should be done so with caution as the data used in this study was cross-sectional. Future studies should examine perceptions of climate longitudinally, comparing the relationship between climate and student performance before and after the high school transition.

Generally, results from this study were consistent with findings from previous multi-level studies of school climate (Griffith, 1999) despite the large variety of measures and populations present in the literature. Both individual and aggregate perceptions of climate were positively associated with students' academic and behavioral performance; however, individual ratings displayed a stronger relationship. HLM analyses also revealed that although individual perceptions of climate were more strongly linked to student performance than aggregate ratings, more between-school variance was accounted for by aggregate ratings of climate than within-school variance by individual ratings. Finally, analyses provided nominal, yet positive support for the possibility that aggregate perceptions of climate may moderate the relationship between individual perceptions and student performance.

These mixed results indicate that the proper unit of analysis for school climate is not simply the individual or the aggregate, but a combination of the two. In other words, it appears that school climate simultaneously affects students on a personal and collective level. The findings from this and other multi-level climate studies underscore the importance of researchers providing at minimum, a theoretical rationale for their choices of units of analysis. Ideally, more precise statistical procedures should be used in making this decision. For instance, examining the amount of within-school variance in climate scores can help to determine how similar (or

dissimilar) students' perceptions of climate are within a school. Further, examining the amount of between-school variance in climate scores can help to determine whether aggregate perceptions of climate differ by the school a student attends. Additionally, it is advisable to determine whether a measure is intended to assess individual or aggregate perceptions when developing a climate measure. As discussed previously, the wording of individual items can significantly impact the amount of inter-rater agreement and consequently, the accuracy when aggregating climate scores. Finally, a more in-depth examination of how aggregate and individual perceptions of climate interact in terms of their relationship in student performance is a promising topic of future research. Using these exploratory methods can help researchers make more informed decisions when investigating school climate as a predictor of student performance, or as an outcome itself.

CITED LITERATURE

- Anderman, E. M. (1992). *Classroom practices and perceptions of school culture: An HLM model*. Paper presented at the annual meeting of the American Psychological Association, Washington, DC.
- Allensworth, E., & Easton, J. (2007). *The on-track indicator as a predictor of high school graduation*. Chicago: Consortium on Chicago School Research.
- Anderson, C. S. (1982). The search for school climate: A review of the research. *Review of Educational Research*, 52, 368–420.
- Baker, J. A. (2006). Contributions of teacher-child relationships to positive school adjustment during elementary school. *Journal of School Psychology*, 44, 21–229.
- Baker, M. L., Sigmon, J. N., & Nugent, M. E. (2001). *Truancy reduction: Keeping students in school*. Washington DC: U.S. Department of Justice. Office of Juvenile Justice Programs.
- Battistich, V., & Hom, A. (1997). The relationship between students' sense of their school as a community and their involvement in problem behaviors. *American Journal of Public Health*, 87, 1997–2001.
- Battistich, V., Solomon, D., Kim, D., Watson, M., & Schaps, E. (1995). Schools as communities, poverty levels of student populations, and students' attitudes, motives, and performance: A multilevel analysis. *American Educational Research Journal*, 32, 627–658.
- Caldas, S. J. (1993). Reexamination of input and process factor effects on public school achievement. *Journal of Educational Research*, 86, 206–214.
- Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (2004). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *The ANNALS of the American Academy of Political and Social Science*, 591, 98–124.
- Cohen, J., McCabe, E. M., Micheli, N. M., & Pical, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record*, 111, 180–213.
- Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. In M. R. Gunnar & L. A. Sroufe (Eds.), *Self processes and development. The Minnesota Symposium on Child Psychology* (pp. 43-77). Hillsdale, NJ: Erlbaum.

- Dryfoos, J.G. (1997). The prevalence of problem behaviors: Implications for programs. In R.P. Weissberg, T.P. Gullotta, R.L. Hampton, B.A. Ryan, & G. R. Adams (Eds.), *Healthy children 2010: Enhancing children's wellness* (17–46). Thousand Oaks, CA: Sage.
- Durlak, J. A., Weissberg, R. P., & Pachan, M. (2010). A meta-analysis of after-school programs that seek to promote personal and social skills in children and adolescents. *American Journal of Community Psychology, 45*, 297-309.
- Eccles, J. S., & Midgley, C. (1988). Stage/environment fit: Developmentally appropriate classrooms for young adolescents. In R. E. Ames & C. Ames (Eds.), *Research on motivation in education*. New York: Academic Press.
- Eccles, J. S., & Midgley, C. (1990). Changes in academic motivation and self-perception during early adolescence. In R. Montemayor, G. R. Adams, & T. P. Gullotta (Eds.), *From children to adolescence: a transition period?* Newbury Park, CA: Sage.
- Eccles, J. S., Lord, S., & Midgley, C. (1991). What are we doing to early adolescents? The impact of educational contexts on early adolescents. *American Journal of Education, 89*, 521–542.
- Eccles, J. S., Midgley, C., Buchanan, C. M., Wigfield, A., Reuman, D., & Mac Iver, D. (1993). Development during adolescence: The impact of stage/environment fit. *American Psychologist, 48*, 90–101.
- Elliott, D. S., Hamburg, B. A., & Williams, K.R. (1998). Violence in American Schools: An overview. In D.S. Elliott, B.A. Hamburg, & K. R. Williams (Eds.), *Violence in American Schools* (pp. 3–18). New York: Cambridge University Press.
- Esposito, C. (1999). Learning in urban blight: School climate and its effect on the school performance of urban, minority, low-income children. *School Psychology Review, 28*, 365–377.
- Felner, R. D., & Adan, A. M. (1988). The school transitional project: An ecological intervention and evaluation. In R. H. Price, E. L. Cowen, R. P. Lorion, & J. Ramos-McKay (Eds.), *14 ounces of prevention: A casebook for practitioners* (111–122). Washington, DC: American Psychological Association.
- Festinger, L. (1954). Theory of social comparison. *Human Relations, 7*, 117-140.
- Finn, I. D., Pannozzo, G. M., & Voelkl, K. E. (1995). Disruptive and inattentive-withdrawn behavior and achievement among fourth graders. *Elementary School Journal, 95*, 421–434.
- Gottfredson, G. D., & Gottfredson, D. C. (1989). *School climate, academic performance, attendance, and dropout*. Baltimore: Johns Hopkins University, Center for Social Organization of Schools. (ERIC Document Reproduction Service No. ED 308 225)

- Griffith, J. (1999). School climate as “social order” and “social action”: A multi-level analysis of public elementary school student perceptions. *School Psychology of Education, 2*, 339–369.
- Griffith, J. (2000). School climate as group evaluation and group consensus: Student and parent perceptions of the elementary school environment. *The Elementary School Journal, 101*, 35-61.
- Griffith, J. (2002). A multilevel analysis of the relation of school learning and social environments to minority achievement in public elementary schools. *The Elementary School Journal, 102*, 349–366.
- Grunbaum, J., Lowry, R., & Kann, L. (2001). Prevalence of health-related behaviors among alternative high school students as compared with students attending regular high schools. *Journal of Adolescent Health, 29*, 337-343.
- Hogg, M. A. (1992). *The social psychology group of cohesiveness: From attraction to social identity*. New York: New York University Press.
- Hursh, D. (2007). Assessing no child left behind and the rise of neoliberal education policies. *American Educational Research Journal, 44*, 493-518.
- James, L. R. (1982). Aggregation bias in estimates of perceptual agreement. *Journal of Applied Psychology, 67*, 279–229.
- James, L. R., Joyce, William F., & Slocum, John W. (1988). Organizations do not cognize. *Academy of Management Review, 19*, 129–132.
- Keefe, J. W., Kelley, E. A., & Miller, S. K. (1985). School climate: Clear definitions and a model for a larger setting. *NASSP Bulletin, 69*, 70–77.
- Klein, K. L., Conn, A.B., Smith, D. B., & Sorra, J. S. (2001). Is everyone in agreement? An exploration of within-group agreement in employee perceptions of the work environment. *Journal of Applied Psychology, 86*, 3-16.
- Koth, C. W., Bradshaw, C. P., & Leaf, P. J. (2008). A multilevel study of predictors of student perceptions of school climate: The effect of classroom-level factors. *Journal of Educational Psychology, 100*, 96–104.
- Kuperminc, G. P., Leadbeater, B. J., & Blatt, S. J. (2001). School social climate and individual differences in vulnerability to psychopathology among middle school students. *Journal of School Psychology, 39*, 141–159.
- Midgley, C., Feldlaufer, H., & Eccles, J. (1989). Change in teacher efficacy and student self- and task-related beliefs in mathematics during the transition to junior high school. *Journal of Educational Psychology, 81*, 247–258.

- Miller, S. I., & Fredericks, J. (1990). The false ontology of school climate effects. *Educational Theory, 40*, 333–342.
- Mitchell-Copeland, J., Denham, S. A., & DeMulder, E. K. (1997). Q-sort assessment of child-teacher attachment relationships and social competence in the preschool. *Early Education and Development, 8*, 27–39.
- Mok, M. C., & McDonald, R. P. (1994). Quality of school life: A scale to measure student experience or school climate? *Educational and Psychological Measurement, 54*, 483–495.
- Moos, R. H., & Moos, B. S. (1978). Classroom social climate and student absences and grades. *Journal of Educational Psychology, 70*, 263–269.
- Moos, R. H. (1979). *Evaluating educational environments*. San Francisco: Jossey-Bass Publishers.
- Muller, C. (2001). The role of caring in the teacher-student relationship for at-risk students. *Sociological Inquiry, 71*, 241–255.
- Murray, C., Murray, K. M., & Waas, G. A. (2008). Child and teacher reports of teacher–student relationships: Concordance of perspectives and associations with school adjustment in urban kindergarten classrooms. *Journal of Applied Developmental Psychology, 29*, 49–61.
- National Research Council (2004). *Engaging schools: Fostering high school students' motivation to learn*. Washington, DC: National Academies Press.
- National School Boards Association (1996). *Learning by design: A school leader's guide to architectural services*. Alexandria, VA: National School Boards Association.
- Osher, D., Kendziora, K., & Chinen, M. (2008, March 31). *Student connection research: Final narrative report to the Spencer Foundation*. (Grant No. 200700169). Washington, DC: American Institutes for Research.
- Owens, R. (1987). *Organizational behavior in education*. Englewood Cliffs, NJ: Prentice-Hall.
- Raudenbush, S. W., & Byrk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Sage Publications, California.
- Reyes, O., Gillock, K. L., Kobus, K., & Sanchez, B. (2000). A longitudinal examination of the transition into senior high school for adolescents from urban, low-income status, and predominantly minority backgrounds. *American Journal of Community Psychology, 28*, 519-544.

- Roderick, M. (1995). School transitions and school dropout. In K. Wong (Ed.), *Advances in educational policy*. Connecticut: JAI Press.
- Rowan, B., Raudenbush, S.W., & Kang, S. J. (1991). Organizational design in high schools: A multilevel analysis. *American Journal of Education*, *99*, 238–266.
- Seidman, E., Aber, J. L., Allen, L., & French, S. E. (1996). The impact of the transition to high school on the self-esteem and perceived social context of poor urban youth. *American Journal of Community Psychology*, *24*, 409–515.
- Sirotnik, K. A. (1980). Psychometric implications of the unit-of-analysis problem (with examples from the measurement of organizational climate). *Journal of Educational Measurement*, *17*, 245–282.
- Solodow, W. (1999). The meaning of development in middle school. In J. Cohen (Ed.), *Educating minds and hearts: Social emotional learning and the passage into adolescence* (24–40). New York: Teachers College Press.
- Tagiuri, R. (1968). The concept of organizational climate. In R. Tagiuri & G. W. Litwin (Eds.), *Organizational climate: Explorations of a concept* (1–32). Boston: Division of Research, Graduate School of Business Administration, Harvard University.
- Topping, K. (1998). Peer assessment between students in colleges and universities. *Review of Educational Research*, *68*, 249–276.
- U.S. Department of Education. (2010). U.S. department of education awards \$38.8 million in safe and supportive school grants [Press release]. Retrieved from <http://www.ed.gov/news/press-releases/us-department-education-awards-388-million-safe-and-supportive-school-grants>
- Van Horn, M. L. (2003). Assessing the unit of measurement for school climate through psychometric and outcome analyses of the school climate survey. *Education and Psychological Measurement*, *63*, 1002–1019.
- Van Houtte, M. (2005). Climate or culture? A plea for conceptual clarity in school effectiveness research. *School Effectiveness and School Improvement*, *16*, 71–89.
- Voelkl, K. A. (1995). School warmth, student participation, and achievement. *Journal of Experiential Education*, *63*, 127–138.
- Way, N., Reddy, R., & Rhodes, J. (2007). Students' perceptions of school climate during the middle school years: Associations with trajectories of psychological and behavioral adjustment. *American Journal of Community Psychology*, *40*, 194–213.
- Wilson, W. J. (1990). *The truly disadvantaged: The inner city, the underclass, and public policy*. University of Chicago Press, Chicago.

APPENDIX A

1. How much do you agree with the following statements about your school:	Strongly Disagree	Disagree	Agree	Strongly Agree
I worry about crime and violence in school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students at this school are often teased or picked on	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students at this school are often threatened or bullied	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel safe when security is present	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I sometimes stay home because I don't feel safe at school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. How safe do you feel:	Not Safe	Somewhat Safe	Mostly Safe	Very Safe
Outside around the school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Traveling between home and school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the hallways and bathrooms of the school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In your classes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. How much do you agree with the following statements about students in your school:	Strongly Disagree	Disagree	Agree	Strongly Agree
<i>Most students in my school:</i>				
Don't really care about each other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Like to put others down	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help each other learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Don't get along together very well	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Just look out for themselves	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Treat each other with respect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stop and think before doing anything when they get angry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do their share of the work when we have group projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Give up when they can't solve a problem easily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get into arguments when they disagree with people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do their best, even when their school work is difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Think it's OK to fight if someone insults them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do all their homework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Say mean things to other students when they think the other students deserve it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Try to work out their disagreements with other students by talking to them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Think it's OK to cheat if other students are cheating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Try to do a good job on school work even when it is not interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. How much do you agree with the following statements about your teachers:	Strongly Disagree	Disagree	Agree	Strongly Agree
<i>My teachers:</i>				
Often connect what I am learning to life outside the classroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encourage students to share their ideas about things we are studying in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Often require me to explain my answers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Really care about me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help me make up work after an excused absence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Give me feedback on my assignments that helps me improve my work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Often assign homework that helps me learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. How much do you agree with the following:	Strongly Disagree	Disagree	Agree	Strongly Agree
Adults in this school are often too busy to give students extra help	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adults in the school apply the same rules to all students equally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I went to a different school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can get extra help at school outside of my regular classes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An adult at this school has helped me plan for life after high school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When students in this school already know the material that is being taught, the teacher gives them more-advanced assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my classes, we often discuss different interpretations of things we read	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students in this school are expected to take four years of math	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students in this school are expected to take four years of science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students in this school are expected to take more than two years of a foreign language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students in this school are encouraged to take advanced classes, such as honors, Advanced Placement (AP), or International Baccalaureate (IB), or classes that lead to professional certification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Please indicate how often you have done the following this school year:	Never	1 or 2 Times	3 or 4 Times	5 or More Times
<i>This school year, how often have your teachers given you an assignment to:</i>				
Write a research paper of 5 or more pages using multiple sources of information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Write a paper in which you defended your own point of view or ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make a formal presentation to a class about something you read or researched	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Please indicate how often you have done the following this school year:	Never	1 or 2 Times	3 or 4 Times	5 or More Times
<i>This school year, how often have you:</i>				
Talked to a teacher about a problem you were having in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Talked to an adult at school about something that was bothering you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Talked to an adult at school about something outside of school that is important to you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Talked to a counselor at school in depth about planning for college	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. DURING THIS SCHOOL YEAR, have you participated in any of the following activities outside of regular class hours? Include only activities that are offered at your school or are sponsored by your school.	Yes	No		
School sports or cheerleading	<input type="radio"/>	<input type="radio"/>		
Arts or music group (for example, band, chorus, theater, or photography club)	<input type="radio"/>	<input type="radio"/>		
Organization or club based on nationality, culture, or ethnicity (for example, Black Student Union, Asian Students Association)	<input type="radio"/>	<input type="radio"/>		
Academic club or competition (for example, Academic Decathlon, science club, Spanish club, book club, math team, National Honor Society, debate team)	<input type="radio"/>	<input type="radio"/>		
Club or organization that provides community service (for example, Key Club)	<input type="radio"/>	<input type="radio"/>		
School yearbook, newspaper, or literary magazine	<input type="radio"/>	<input type="radio"/>		
Student council or student government	<input type="radio"/>	<input type="radio"/>		
Junior Reserve Officer Training Corps (JROTC)	<input type="radio"/>	<input type="radio"/>		
Other club, committee, or organization not included in this list (for example, chess club, computer club)	<input type="radio"/>	<input type="radio"/>		

Think about your class schedule on Monday this week. Which **one** of the following classes did you have **closest to lunch but before lunch**?

- English
 Foreign Language
 Mathematics
 Science
 Social Studies

Answer the following questions about the class you marked above.

9. How much do you agree with the following statements about this class:

The teacher for this class:

Notices if I have trouble learning something

Will help me improve my work if I do poorly on an assignment

Strongly Disagree	Disagree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. How much do you agree with the following statements about this class:

The topics we are studying are interesting and challenging

This class really makes me think

I am usually bored in this class

Strongly Disagree	Disagree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX B

Scale	Item #	Item
Safety	1	I worry about crime and violence in school_R
Safety	2	Students at this school are often teased or picked on_R
Safety	3	Students at this school are often threatened or bullied_R
Safety	4	I feel safe when security is present
Safety	5	I sometimes stay home because I don't feel safe at school_R
Safety	6	How safe do you feel outside around the school
Safety	8	How safe do you feel in the hallways and bathrooms of the school
Safety	9	How safe do you feel in your classes
Safety	10	Most students in my school don't really care about each other_R
Safety	11	Most students in my school like to put others down_R
Safety	13	Most students in my school don't get along together very well_R
Safety	14	Most students in my school just look out for themselves_R
Safety	15	Most students in my school treat each other with respect
Peer Social Climate	16	Most students in my school stop and think before doing anything when they get angry
Peer Social Climate	17	Most students in my school do their share of work when we have group projects
Peer Social Climate	18	Most students in my school give up when they can't solve a problem easily_R
Peer Social Climate	19	Most students in my school get into arguments when they disagree with people_R
Peer Social Climate	20	Most students in my school do their best, even when their school work is difficult
Peer Social Climate	21	Most students in my school think its OK to fight if someone insults them_R
Peer Social Climate	22	Most students in my school do all their homework
Peer Social Climate	23	Most students in my school say mean things to other students when they think the other students deserve it_R

Scale	Item #	Item
Peer Social Climate	24	Most students in my school try to work out their disagreements with other students by talking to them
Peer Social Climate	25	Most students in my school think its ok to cheat if other students are cheating_R
Peer Social Climate	26	Most students in my school try to do a good job on school work even when it is not interesting
Support	30	My teachers really care about me
Support	31	My teachers help me make work after an excused absence
Support	32	My teachers give me feedback on my assignments that helps me improve my work
Support	35	Adults in this school are often too busy to give students extra help_R
Support	36	Adults in the school apply the same rules to all students equally
Support	37	I wish I went to a different school_R
Support	39	A counselor at this school has helped me plan for life after high school
Support	38	I can get extra help at school outside of my regular classes
Support	49	This school year, how often have you talked to a teacher about a problem you were having in class
Support	50	This school year, how often have you talked to an adult at school about something that was bothering you
Support	51	This school year, how often have you talked to an adult at school about something outside of school that is important to you
Support	52	This school year, how often have you talked to a counselor at school in depth about planning for college
Support	62	My teacher for my class closest to but before lunch notices if I have trouble learning something
Support	63	My teacher for my class closest to but before lunch will help me improve my work if I do poorly on an assignment
Expectations	27	My teachers often connect what I am learning to life outside the classroom
Expectations	28	My teachers encourage students to share their ideas about things we are studying in class
Expectations	29	My teachers often require me to explain my answers
Expectations	33	My teachers often assign homework that helps me learn
Expectations	34	My teachers think all students can do challenging work
Expectations	40	When students in this school already know the material that is being taught, the teacher gives them more-advanced assignments

Scale	Item #	Item
Expectations	41	In my classes, we often discuss different interpretations of things we read
Expectations	42	Students in this school are expected to take four years of math
Expectations	43	Students in this school are expected to take four years of science
Expectations	44	Students in this school are expected to take more than two years of a foreign language
Expectations	45	Students in this school are encouraged to take advanced classes such as honors, Advanced Placement (AP), or International Baccalaureate (IB), or classes that lead to professional certification
Expectations	46	This school year, how often have your teachers given you an assignment to write a research paper of 5 or more pages using multiple sources of information
Expectations	47	This school year, how often have your teachers given you an assignment to write a paper in which you defended your own point of view or ideas
Expectations	48	This school year, how often have your teachers given you an assignment to make a formal presentation to a class about something you read or researched
Expectations	64	In this class the topics we are studying are interesting and challenging
Expectations	65	This class really makes me think
Expectations	66	I am usually bored in this class_R

Note. All items followed by a _R are reversed scored.

IRB APPROVAL NOTICE

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 672)
203 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612-7227

**Determination Notice
Research Activity Does Not Involve “Human Subjects”**

November 23, 2010

Keith Zander, BA
Psychology
1007 West Harrison Street
M/C 285
Chicago, IL 60612
Phone: (773) 793-5219

**RE: Research Protocol # 2010-1005
“Relationships between School Climate and Student Performance: Student-and-School-Level Analyses”**

Dear Mr. Zander:

The above proposal was reviewed on November 22, 2010 by OPRS staff/members of IRB #2. From the information you have provided, the proposal does not appear to involve “human subjects” as defined in 45 CFR 46. 102(f).

The specific definition of human subject under 45 CFR 46.102(f) is:

Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains

- (1) data through intervention or interaction with the individual, or
- (2) identifiable private information.

Intervention includes both physical procedures by which data are gathered (for example, venipuncture) and manipulations of the subject or the subject’s environment that are performed for research purposes. *Interaction* includes communication or interpersonal contact between investigator and subject. *Private information* includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, and information which has been provided for specific purposes by an individual and which the individual can reasonably expect will not be made public (for example, a medical record). Private information must be individually identifiable (i.e., the

identity of the subject is or may readily be ascertained by the investigator or associated with the information) in order for obtaining the information to constitute research involving human subjects.

All the documents associated with this proposal will be kept on file in the OPRS and a copy of this letter is being provided to your Department Head for the department's research files.

If you have any questions or need further help, please contact the OPRS office at (312) 996-1711 or me at (312) 355-2908. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Charles W. Hoehne, B.S., C.I.P.
Assistant Director, IRB # 2
Office for the Protection of Research Subjects

cc: Gary E. Raney, Psychology, M/C 285
Roger Weissberg, Psychology, M/C 285

VITA

Keith Zander

EDUCATION

Ph. D., 2013 (expected)	University of Illinois – Chicago, IL Anticipated Degree: Master of Arts/Doctor of Philosophy in Psychology, 2012 Area of Study: Community & Prevention Research Minor: Statistics, Methods & Measurement	2008 – Present
B.A., 2005	Emory University – Atlanta, GA Majors: Psychology & Philosophy	2001 - 2005

ACADEMIC HONORS & AWARDS

<i>Graduate Student Representative</i> – Social and Emotional Learning Special Interest Group – American Educational Research Association	2010 – Present
<i>Outstanding Presentation</i> – Midwest Ecological-Community Psychology Conference	Winter, 2010
<i>Psi Chi National Honor Society in Psychology</i> – Emory University	2002- 2005

PROFESSIONAL AFFILIATIONS

Society for Community Research and Action (Graduate Student Member)	2008 – Present
American Educational Research Association (Graduate Student Member)	2008 – Present
American Psychological Association (Graduate Student Member)	2008 - 2010

RESEARCH EXPERIENCE

University of Illinois at Chicago – Department of Psychology, Graduate Research Assistant 2008 – 2010

- Worked directly with advisor, Dr. Roger Weissberg, President of the Collaborative for Academic and Social and Emotional Learning (CASEL).
- Conducted statistical analyses of teacher, student and school wide data concerning the advancement of student's social and emotional skills as well as their academic abilities.
- Prepared written reports summarizing findings for internal and external use.

DePaul University – Department of Psychology, Research Assistant May 2006 – June 2008

- Intervention Meta Analysis – Assisted in the collection and analysis of 300 studies in order to examine the effectiveness of school based interventions in low-income urban schools.
- Intervention Grant – Managed a team to provide research-based support for a grant to develop a community-focused intervention for low-income adolescents.

- Parent Child Interaction Therapy – Scored and entered various clinical measures, tested the integrity of clinical sessions and created tools to further analyze program effectiveness.

University of Florida – Department of Psychology, Research Assistant

2007 – 2008

- Family Health Self Empowerment Program – Recruited participants and distributed surveys for the creation of a community based, culturally sensitive, lifestyle intervention for children and their families.

PROFESSIONAL EXPERIENCE

*Chicago Public Schools – Community Schools Initiative - Chicago, IL,
Evaluation and Research Analyst*

2009 – Present

- Manage a team of other evaluators towards the collection and analysis of numerous district-wide data sets to be summarized in profiles that will be distributed to community school partners to inform their practice.
- Supervised the design, implementation, and analysis of an internal process evaluation that consisted of over 40 interviews with community school staff. The evaluation culminated in a final report summarizing the evaluation's findings and provided a number of school- and district-level recommendations.
- Organized and led an initiative-wide professional development session to disseminate the results of the internal process evaluation.
- Collaborate with external evaluators concerning evaluation design and revisions of written reports.
- Provide data support for grant reporting purposes.

*University of Illinois at Chicago – Department of Psychology,
Graduate Teaching Assistant*

2008 – 2010

- Research Methods in Psychology – Dr. David McKirnan
- Research Methods in Psychology – Dr. Mathew Patton
- Research Methods in Psychology – Dr. Evelyn Behar

Teach for America – Vashon High School, St. Louis, MO, Special Educator

2005 – 2007

- One of 2000 selected from more than 17,000 applicants nationwide to teach in under-resourced public schools.
- Taught World Literature, Geometry and Behavior Disability classes to students ranging in age from sophomores to seniors.
- Case Manager responsible for the Individualized Education Plan of twelve special education students
- Created and facilitated a Geometry Club in which up to forty students each week received tutoring, ACT preparation and opportunities to take math related field trips.
- Varsity wrestling and baseball coach

VOLUNTEER SERVICE

*American Educational Research Association Annual Meeting, Social and Emotional
Special Interest Group - Submission Reviewer* Summer 2010

- Evaluated conference submissions, providing detailed feedback and recommendations for acceptance.

Midwestern Ecological Community Psychology Conference Fall 2009
Planning Committee Member

- Assisted in the development of the conference program, including scheduling conference presentations and events.
- Assisted in logistical planning, including choosing venues and meals, marketing and advertising, inviting speakers/presenters, etc.

SELECTED PRESENTATIONS

Zander, K., Burnside, E., & Poff, M. (2011, June). *Implementing and Sustaining Community-School Partnerships: Implications of an Evaluation of the Chicago Community School Initiative*. Symposium to be conducted at the biennial meeting for the Society for Community Research and Action. Chicago, IL.

Zander, K., Burnside, E., & Poff, M. (2011, May). *Evaluating Chicago Public School Programs: Perspectives of Internal and External Evaluators*. Roundtable discussion to be presented at the annual meeting for the Midwestern Psychological Association. Chicago, IL.

Zander, K., Burnside, E., & Poff, M. (2010, Oct). *Collaborative Development of an Implementation and Sustainability Process Strategy for the Chicago Community Schools Initiative*. Symposium presented at the annual meeting for the Midwest-Ecological Community Psychology Conference. Urbana, IL.

Ray, A., Diaz, M., McCrary, J., Hipps, J. A., & **Zander, K.** (2010, May). *Chicago's Community Schools Initiative: Initial Evaluation Findings*. Roundtable discussion presented at the annual meeting for the American Educational Research Association. Denver, CO.

Weissberg, R. P., Laue, S., Grey, C., Utne O'Brien, M., **Zander, K.**, & Ji, P. (2010, May). *A Collaboration to Promote Social and Emotional Learning in Chicago Public Schools: Successes and Challenges*. Paper presented at the annual meeting for the American Educational Research Association. Denver, CO.

Weissberg, R. P., Laue, S., Grey, C., Utne O'Brien, M., **Zander, K.**, & Ji, P. (2010, May). *Whole-School SEL Implementation/Systemic Perspectives*. Roundtable discussion presented at the annual meeting for the American Educational Research Association. Denver, CO.