

THE RELATIONSHIP BETWEEN SCHOOL DIVISION CLIMATE AND STUDENT
ACHIEVEMENT OF SCHOOL DIVISIONS IN THE COMMONWEALTH OF VIRGINIA

By

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Abstract

Researchers and reformers have suggested that school climate is an important aspect of effective schools (Hoy & Hannum, 1997, p. 290). Literature also suggests that effective schools have a positive school climate (Chrispeels, 1990). The purpose of this study is to determine if the climate of schools affects the student achievement in school divisions in the Commonwealth of Virginia.

The construct study conducted herein relies exclusively upon data collected by the Virginia Department of Education (VDOE) and reported in the Discipline, Crime and Violence Incidents annual report (DCVI), the Free and Reduced Lunch report, and the Truancy report to form a climate index (CI). A Hierarchical Cluster analysis was used to determine relationships between school division climate, as measured by the CI, and student achievement, as measured by the Virginia Standards of Learning (SOL) Tests, in school divisions in the Commonwealth of Virginia.

Based on the CI, there is a relationship between school division climate and student achievement in English/reading, mathematics, history/social science, and science in the Commonwealth of Virginia. Moreover, incidents of disorderly conduct combined with the number of students who receive free and reduced lunch are the best predictors of student achievement.

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Dedication

I dedicate this dissertation to my parents, Robert and Donna Clark. Without their love and support I would not be successful. Their words of encouragement and wisdom have given me both strength and endurance. Mom, I have decided to retire from being a professional student and pay back my student loans. Do you have some money I can borrow? Pap, thanks for the late night conversations and for being in my life. I love both of you. Not bad work for a little boy from Pittsburgh who failed the first grade.

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CHAPTER 1

A school's climate is its atmosphere for learning. It includes the feelings people have about school and whether it is a place where learning can occur. Positive school climate makes a school a place where both staff and students want to spend a substantial portion of their time; it is a good place to be (p. 5).

Howard, Howell, and Brainard (1987)

INTRODUCTION

The concept and ideologies of student achievement have been the focus of many school leaders and research studies. Literature suggests that a relationship exists between school climate and student achievement (Brookover et al., 1978; Bulach et al., 1995; Gayton, 1999). Hoy and Hannum (1997) found school climate to be an important aspect in effective schools. Hoy, Tarter, and Kottkamp (1991) reported "positive school climate has become part of the effective school rhetoric and is advocated by educational practitioners and reformers as a specific means for improving student achievement" (p. 1). The theory itself may sound simple; create a positive school climate and students will succeed. However, assessing the condition of a school's climate is not as simple as it may sound.

Anderson (1982) indicated that school climate is rather broad and takes into account many dimensions of a school. Tagiuri (1968) and Moos and Insel (1974) conceptualized important components in determining a school's climate. Tagiuri's concept of school climate focuses on the quality of the environment within a school. In his taxonomy, school climate is synonymous with a school's atmosphere. The climate factors of a school are internal and depend on the ecology, milieu, social system, and culture of the environment. Ecology (the physical and material aspects of the

environment), milieu (persons and groups), social system (relationship patterns), and culture (values and beliefs) address the differences in social aspects of the environment. Moos and Insel's (1974) concept of school climate focuses on social ecology, which is defined as the relationship between human interaction and the physical and social aspects of a school. In their work, school climate is directly related to human environment, and the climate factors of a school are considered internal and external. While ecological factors may be somewhat controlled, characteristics of a personal nature, such as SES may not be controlled and therefore are considered external factors. Collectively, Moos and Insel's dimensions of social ecology shape the climate or environment of a school. Table 1, is a comparison between Tagiuri's dimensions of school climate and Moos and Insel's dimensions of school climate.

Howard et al. (1987) wrote that for school climate to be productive and satisfying, the basic human needs of the students, teachers, and administrators must be met. These human needs include (a) physiological needs, (b) safety needs, (c) acceptance and friendship needs, (d) achievement and recognition needs, and (e) needs to maximize one's potential (p.6). The needs identified by Howard are very similar to that of Maslow (1943) which include (a) physiological needs, (b) safety needs, (c) love and belonging needs, (d) esteem needs, and (e) the need for self-actualization. Howard showed that hierarchical needs are generalized to a school's climate or setting, whereas Maslow's hierarchical needs are more global. Moreover, Howard identified eight factors that contribute to the quality of a school's climate. These factors are (a) continuous academic and social growth, (b) respect, (c) trust, (d) high morale, (e) cohesiveness, (f) opportunities for input, (g) school renewal, and (h) caring (p. 7). To better understand

Table 1

Dimensions of School Climate: A Comparison

	Tagiuri's Dimensions	Moos & Insel's Dimensions	
Ecology	Physical and material aspects	Ecological factors	Geographical, meteorological, and architectural aspects
Milieu	Social presence of persons or groups	Behavioral setting	Presence of behavioral and material components
Social System	Relationship patterns of persons or groups	Organizational structure	Span of control and size of the organization
Culture	Social meaning systems, values, and beliefs	Characteristics of personal Functional and situational dimension	Age, ability level, SES Contingencies for maintaining behaviors

school climate, researchers have attempted to conceptualize its meaning. Bulach, Malone and Castleman (1995) define climate as those psychological attributes (culture) and institutional attributes (climate) that give an organization its personality. According to Deal and Peterson (1999), cultural patterns and traditions evolve over time and are crystallized by both triumphs and tragedies. While Deal and Peterson believe the term “culture” provides a more comprehensive view of a school’s environment, school climate will be the focal point of this study to provide a more immediate view of a school and school district’s environment.

Though difficult to define (Hoy et al., 1991; Shore, 1995), school climate has been given numerous definitions. Halpin and Croft (1962) classify climate as being equivalent to the school’s personality and state that climate can be defined by the perception held by group members. To further their point, they incorporate the following analogy into their definition: “personality is to the individual what climate is to the organization” (p. 1). Sackney (1988) referred to climate as “...the perception that individuals have of various aspects of the internal environment of the school and that influences their behavior” (p. 16). School climate has also been defined as a set of internal characteristics that distinguishes one school from another and influences the behavior of its members (Hoy et al., 1991, p. 8). Lastly, Hoy and Miskel (1996) identify school climate as “a relatively enduring quality of the entire school that is experienced by members, describes their collective perceptions of routine behavior, and affects their attitudes and behavior in the school” (p. 1).

Several common themes emerge from these definitions of school climate. In all of the definitions, it is believed that school climate is present, whether good or poor;

school climate is internal and involves the behaviors of its members; and, school climate evolves from perceptions, behaviors, and the attitudes of its members. Since each definition suggests that school climate is internal, they therefore appear to coincide with Tagiuri's (1968) taxonomy of school climate rather than that of Moos and Insel (1974).

School officials must consider the many factors that can influence and affect the climate of a school, such as socioeconomic status (SES); legislative mandates on accountability practices; district, school, and class size; and external fiscal responsibilities that cannot be controlled by the school. Additional factors such as truancy, student discipline, and administrative leadership are internal and can be controlled by the school. While this study focused on SES (external), student discipline (internal), and truancy (internal) as factors related to school climate, it must be noted that the other factors previously mentioned may also have an effect on school climate and will also be explored in this chapter.

Socioeconomic Status

Coleman et al., (1966) concluded that the SES of parents is the best predictor of student achievement. The Coleman report was significant in that it led to effective school and school climate research among those who were not expecting to find that the SES of parents was a strong predictor of student achievement (Bulach, Malone & Castleman, 1995). Studies conducted since that time have both supported and opposed Coleman's findings. Fisher (2003) found that there was no relationship between SES and achievement in reading test scores of fourth grade students. However, Benson (2003) found that schools with low SES are more likely to have poor school climate when compared to those schools with high SES.

Fiscal Responsibilities

Fiscal responsibility is yet another factor that can affect school climate and student achievement. According to the National Center for Education Statistics (based on the Consumer Price Index), the national average of expenditures per-pupil has increased from \$6,000 in 1987 to \$7,500 in 2002. It is estimated that expenditures per-pupil will increase to nearly \$9,400 by the fiscal year 2012. As pupil expenditures increase, researchers and economists debate over the equity of public school funding and its impact on student achievement.

Alexander and Salmon (1995) contend that the wealth of a community should not impede the quality of a child's education. Because localities (Alexander & Salmon, 1995; Biddle & Berliner, 2002) depend on local taxes for nearly half their funding, impoverished communities receive less funding than wealthy communities resulting in inequities in the quality of school buildings, instructional resources and equipment, teacher experience and qualifications, and class size. While some researchers (Biddle & Berliner, 2002; Alexander & Salmon, 1995; Greenwald, Hedges & Laine, 1996) report that inequities in funding may have a lasting effect on student achievement, others (Turner, 2000; Hanushek, 1989) disagree, arguing that there is a lack of empirical evidence due to other variables such as family characteristics and school leadership that were not considered in earlier studies.

A recent study conducted by the Joint Legislative Audit and Review Commission (JLARC) on the Factors and Practices Associated with School Performance in Virginia (2004) found that low-achieving school divisions tend to face more adverse fiscal conditions than that of higher achieving school divisions. The JLARC reported the

average Standard of Learning (SOL) test score for low-achieving school divisions was 410 compared to that of 463 from higher achieving school districts. It is significant that the revenue capacity per capita was \$894 with an adjusted gross income per capita of \$11,918 in low-achieving school districts compared to a revenue capacity per capita of \$1,553 with an adjusted gross income per capita of \$22,609 in high-achieving school districts.

Legislative Mandates on Accountability Practices

Along with fiscal responsibilities and the SES of school divisions, school officials must also address legislative mandates on accountability practices. National, state, and local measures for accountability of student achievement may also affect the climate of a school. Accountability measures dating back to the National Defense Education Act (NDEA) of 1958, the Elementary and Secondary Education Act of 1965 (ESEA), and the 1983 report on "A Nation at Risk" have politically influenced education policies and practice ranging from the state level to school divisions and individual schools. In each case, legislation focused on the concern that American public schools were in need of immediate reform.

The current accountability legislation, the No Child Left Behind Act of 2001 (NCLB), has placed greater emphasis on the use of standardized testing for schools to document student achievement and to demonstrate the effectiveness of their schools. With so many factors to consider (SES, budget needs, parental and community support, students' effort), a great debate has arisen as to who is truly accountable for student achievement. While some accept responsibility, others blame those they believe to be responsible.

School Size

The size of a school and size of a school district are other factors that may be related to school climate and student achievement. Cotton (1996) reported that the social behaviors of students in smaller schools appear to be more positive.

Driscoll, Halcoussis, and Svorny (2003) examined the impact of school district size, school size, and class size on academic performance. The California Academic Performance Index (API), measured by the Stanford Achievement Test – 9th Edition (SAT – 9), was used to measure academic performance. The size of a school was measured by student membership. Enrollment of 300 to 400 students in elementary schools and 400 to 800 students in secondary schools was considered to be an effective school in terms of student achievement. Driscoll et al., (2003) concluded that larger class and school size, as well as the size of a school district, impede academic performance as measured by the API. In addition, a large student enrollment appears to have the greatest impact on middle school student performance. Driscoll et al., (2003) suggest that reducing the size of school districts, schools, and classes is important to reforming education in public schools primarily at the elementary school level.

Behavior of Students

Lastly, student behavior is yet another factor that may affect school climate is the social behavior of students. Sugai and Horner (2001) assert that teaching and learning occur best in a positive school climate free from disruptive and violent behaviors. The challenge of providing a positive, orderly, courteous, and safe environment has become increasingly difficult. With the eight factors determining a quality school climate, Howard

et al. (1987) also includes a list of 24 factors that are problematic symptoms of a negative school climate. Among these factors are:

1. high student absenteeism,
2. high frequency of student discipline problems,
3. vandalism, and
4. high student dropout rate (p.8).

Colvin, Kameenui, and Sugai (1993) contend that for students to achieve, a safe environment must be provided and can be achieved by addressing student behavior in a way that allows for more focus on the learning process. Cotton (1996) reported that behaviors such as physical assault, possession of weapons, gang violence, substance abuse, and physical and sexual abuse occur more frequently and have a profound effect on student and staff safety, and student achievement.

Table 2, illustrates a three-year comparison of student behavior in the Commonwealth of Virginia. The specific offenses are listed under student behavior. Statistics are provided for each school year beginning with the 2000 – 2001 school year and ending with the 2002 – 2003 school year.

According to the Commonwealth of Virginia's Discipline, Crime and Violence Incidents (DCVI) annual report gang violence, substance abuse (tobacco, alcohol, and drugs), and physical and sexual abuse (sexual offense, rape and attempted rape, and sexual battery against students and staff) have increased over a three-year period among students in the Commonwealth. While physical assault (battery against students and staff) during the 2002 – 2003 school year decreased from the 2001 – 2002 school year, it has increased from the 2000 – 2001 school year. Lastly, the 2002 – 2003 school

Table 2

Student Behavior: A Three-Year Comparison in the Commonwealth of Virginia

Student Behavior	2000 – 2001	2001 – 2002	2002 – 2003
Physical Assault	7,368	7,759	7,509
Weapons Violation	1,999	2,144	1,907
Gang Violence	74	83	168
Substance Abuse	10,711	10,218	10,846
Physical/Sexual Abuse	2,404	2,887	3,133

year experienced the fewest number of weapons violations reported in the three-year period.

Principal Leadership

The behaviors of school administrators also appear in literature as factors that may influence school climate and student achievement (Edmonds, 1979; Weber, 1971). Edmonds (1979) reported, “urban schools that teach poor children successfully have strong leadership and a climate of expectation that students will learn” (p. 15). Weber’s (1971) study of four successful inner-city schools with low SES found that strong leadership was the main reason behind the success in each school.

In 1974, the Office of Education Performance Review in the State of New York published a report on two low SES inner-city schools, one high-achieving school and one low-achieving school. The study, which supported Weber’s (1971) findings, found

strong leadership to be responsible for high student achievement in one school and lack of leadership to be responsible for low student achievement in the other school.

Recent studies (Schulman, 2002) have examined the effects of leadership styles and school climate on student achievement. The Organizational Climate Description Questionnaire-Revised Edition (OCDQ-RE) was given to principals from 30 elementary schools to measure the perception of principals' and teachers' behaviors. The results of the study indicated that there was no relationship between leadership style and student achievement, nor was there a relationship between school climate and student achievement. However, teachers who felt positively about the school were found to have a high rate of job satisfaction. A review of teacher self-efficacy indicated that when teachers felt positively about their schools' climate and had administrative support they were able to accomplish more goals and tasks.

Statement of the Problem

School leaders and teachers are under intense pressure to demonstrate the effectiveness of their schools through student achievement. The shift in measuring educational progress from qualitative to quantitative measures is evident with the development of standardized testing such as the Virginia SOL tests and the provisions outlined under the NLCB Act. Such accountability measures may affect how educators and students feel about their schools.

Theoretically, if educators are happy and feel a sense of importance to the school and their work, they will be productive teachers. Likewise, if students are happy and feel a sense of importance to their work and the school, they will achieve academically. If both are true, in theory, the climate of the school should be conducive

to both teaching and learning. If both are not true, theoretically, the climate of the school will be poor and counterproductive to both teaching and learning. Therefore, it is important to identify factors associated with both a good school climate and a poor school climate. It is equally important to identify relationships between these factors and student achievement.

Research Questions

The purpose of this study was to determine the relationship between school division climate and student achievement of school divisions in the Commonwealth of Virginia. The following research questions guided this study:

1. Is there a relationship between school division climate, as measured by the Climate Index (CI), and student achievement in school divisions in the Commonwealth of Virginia?
2. Is there a relationship between school division climate, as measured by the CI, and state accreditation in English/reading of school divisions in the Commonwealth of Virginia?
3. Is there a relationship between school division climate, as measured by the CI, and state accreditation in mathematics of school divisions in the Commonwealth of Virginia?
4. Is there a relationship between school division climate, as measured by the CI, and state accreditation in history/social science of school divisions in the Commonwealth of Virginia?
5. Is there a relationship between school division climate, as measured by the CI,

and state accreditation in science of school divisions in the Commonwealth of Virginia?

Significance of the Study

In the review of related literature, no studies were found that address the relationship between school climate and student achievement at the school division level. Moreover, studies have relied exclusively on surveys and questionnaires to determine relationships that exist between various factors that influence student achievement and their relationship to the climate of a school. This study is significant in that it uses preexisting data to better understand the relationship between school division climate and student achievement in school divisions across the Commonwealth of Virginia. A Hierarchical Cluster method was used to create the CI resulting in five clusters of school divisions based on three reports provided by the VDOE. These reports include the Free and Reduced Lunch report; Discipline, Crime, and; Violence Incident report, and; Truancy report.

These reports were used to construct the CI for several reasons. As previously discussed, many researchers have found SES to be linked to student achievement. Secondly, according to the National Center for Education Statistics (NCES, 2003), school crime has become of great interest to researchers and educators. The NCES reported that, for students to reach their fullest potential, schools must provide a safe learning climate. Lastly, chronic absenteeism or truancy has also been found to affect student achievement. McCluskey, Bynum, and Patchin (2004) indicated “chronic school absenteeism has been identified as a precursor to undesirable outcomes in

adolescence, including academic failure, school dropout, and juvenile delinquency” (p. 214).

Individual schools and school divisions will be able to use the CI from this study to determine relationships between their schools’ climate and the level of student achievement. More specifically, relationships may be identified between the types of student behaviors and their impact on a school’s climate. School leaders may want to review statistical relationships between student behavior and student achievement as a rationale for developing programs and for directing both material and human resources toward providing a learning environment conducive to academic success in their school divisions and school buildings.

Definition of Terms

1. Climate is defined as “a relatively enduring quality of the entire school that is experienced by members, describes their collective perceptions of routine behavior, and affects their attitudes and behavior in the school” (Hoy & Miskel, 1996, p 1).
2. Climate Index (CI) is an index created specifically for this study to measure the climate existent in school divisions within the Commonwealth of Virginia based on data reported to the Virginia Department of Education (VDOE) in the DCVI annual report, Truancy report, and Free and Reduced Lunch report.
3. Socioeconomic status (SES) is “a person’s overall social position to which attainment in both the social and economic domains contribute” (Ainley et al., 1995, p. ix). For the purpose of this study, the number of students that received free and reduced lunch measures SES.

4. State Accreditation is a rating assigned to individual public schools based on the pass percentage rate of students in the content area of English/reading, mathematics, history/social science, and science.
5. Truancy reported to the VDOE is based on six unexcused accumulative absences for which conferences had been scheduled with parents.

Theoretical Model

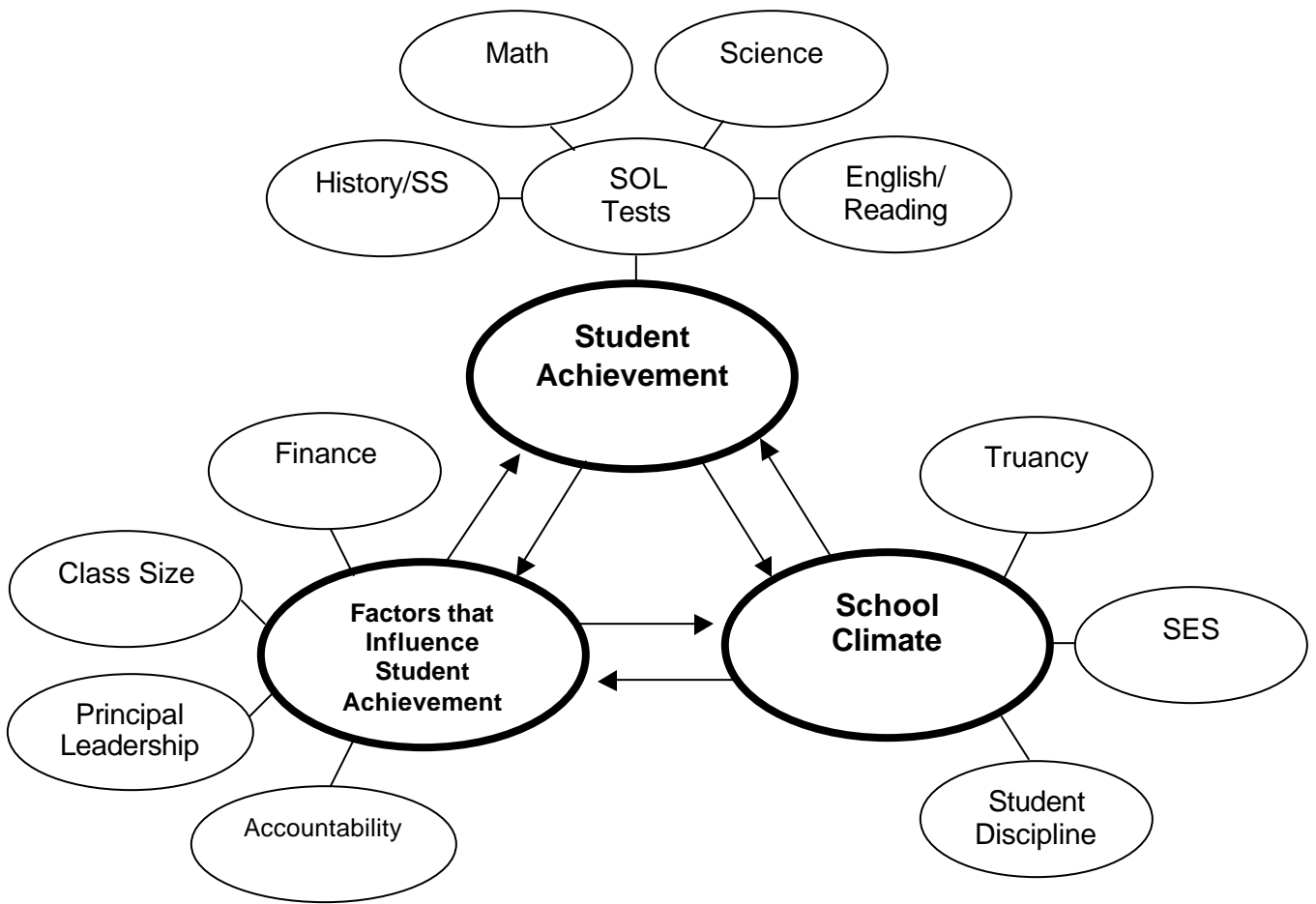


Figure 1. Theoretical Model

Organization of the Study

This study was organized into five chapters. Chapter 1 includes an introduction of the study, statement of the problem, theoretical framework, list of definitions and terms, and the organization of the study. Chapter 2 includes a review of related literature. Population, data collection, and research design are included in the methodology in Chapter 3. The answer to the research questions based on the results of the data collection is presented in Chapter 4. Lastly, Chapter 5 includes a summation and inferences based on the findings, related discussion, and recommendations for future studies.

CHAPTER 2

REVIEW OF RELATED LITERATURE

A healthy climate...has enthusiastic, hardworking students; a dedicated and cooperative teaching staff; and a sense of trust, mutual respect, and support between teachers and administrators. On the other hand, a school with a poor climate has students who are not interested in education, teachers who will not cooperate with the administration, and a principal who is out of touch with teacher and student needs (p. 32).

Ellis (1988)

Introduction

Included in Chapter 2 is a brief introduction that focuses on a review of related literature. The following sections are included: (a) defining school climate, (b) measuring school climate, (c) related climate studies, (d) student achievement, (e) identifying factors of school climate associated with student achievement, and (f) chapter summary.

Research supports the notions that school climate is an important aspect of effective schools (Hoy & Hannum, 1997, p.290). To achieve a positive school climate, basic human needs such as physiological needs, safety needs, acceptance and friendship needs, achievement and recognition needs, and the need to maximize potential must be addressed (Howard et al., 1987).

“Positive school climate has become part of the effective school rhetoric and is advocated by educational practitioners and reformers as a specific means for improving student achievement” (Hoy et al., 1991, p. 1). As research indicates, a relationship exists between school climate and student achievement (Anderson, 1982; Brookover et al., 1978; Bulach et al., 1995; Gayton, 1999). Researchers have found school climate to be rather broad, as they must take into account many factors of a school (Anderson,

1982; Sackney, L.1988; Moos and Insel, 1974; Tagiuri, 1968). Socioeconomic status (SES), school size (enrollment), and behaviors of school administrators appear in literature as factors that have influenced school climate (Bulach et al., 1995; Gayton, 1999). Additionally, legislative mandates on accountability practices, fiscal responsibilities, truancy, and student discipline may also affect the climate of a school.

Though difficult to define, and not always agreed upon, many definitions of school climate exist (Hoy et al., 1991; Shore, 1995). Researchers have argued that there is no single definition of school climate, and that most definitions are descriptive in nature and are not based on empirical evidence (Cushing, Horner, & Barrier, 2003). Halpin and Croft (1962) described school climate as “the organizational personality of a school; figuratively, personality is to the individual what climate is to the organization” (p. 1). Hoy, Hannum, and Tschannen-Moran (1998) describe organizational climate as a “set of internal characteristics that distinguishes one organization from another and influences the behavior of organizational members” (p. 337).

Organizational climate has also been defined as “a relatively enduring quality of the internal environment of an organization that (a) is experienced by its members, (b) influences their behavior, and (c) can be described in terms of the values of a particular set of characteristics (or attributes) of the organization” (Tagiuri & Litwin, 1968, p.27). Similar to that of Tagiuri and Litwin, Hoy and Miskel (1996) defined school climate as “a relatively enduring quality of the entire school that is experienced by members, describes their collective perceptions of routine behavior, and affects their attitudes and behavior in the school” (p. 1). Lastly, Litwin and Stringer (1968) referred to organizational climate as “a set of measurable properties of the work environment,

perceived directly or indirectly by the people who live and work in this environment and assumed to influence their motivation and behavior” (p. 1).

Common themes emerge from these definitions of school climate. In each case, it is believed that there is a presence of a climate, whether it is good or poor; that school climate is internal and involves the behaviors of its members; and, that school climate evolves from perceptions, behaviors, and the attitudes of its members. Anderson (1982) found four common themes that emerged from her extensive review of research-related articles on school climate. Her findings suggest that: (a) each school has a climate that is unique to their organization; (b) the characteristics of a school and its climate are diverse and complex; (c) climate affects the academics, behavior, values, and satisfaction of students; and (d) to improve student behavior, school climate must be further researched.

Measuring climate

In the late 1950s, studies on organizational climate focused on the work environment in the business industry and at the university level (Anderson, 1982). Social scientists examined several aspects of the work environment such as individual and group attitudes, individual and group perceptions of their organization, and how these attitudes and perceptions can be measured. Inventories such as the *College Characteristic Index* (Pace & Stern, 1958) were among the first developed to capture college students' attitudes and perceptions of their university.

In the early 1960s, researchers turned their attention to the climate existent in the public school classroom (Anderson, 1982). Instruments such as the *Classroom Environment Scale* (CES), the *Learning Environment Inventory* (LEI), and the *My Class*

Inventory (Walberg, 1969) were developed to measure classroom climate, and were theoretically grounded to Murray's (1938) work on environmental press. Although the LEI was used to measure the climate of a classroom, it has also been used to draw conclusions on school-wide climate (Anderson, 1982).

The most notable of early climate instruments is the Organizational Climate Descriptive Questionnaire (OCDQ) developed by Halpin and Croft (1962) at Ohio State University. Used to measure school climate based on staff perceptions, the OCDQ measures six types of organizational climate (open, autonomous, controlled, familiar, paternal, closed); three profile-factors (authenticity, satisfaction, leadership initiation); and, eight subtest descriptors that include characteristics of the group (disengagement, hindrance, esprit, intimacy) and behavior of the leader (aloofness, production emphasis, thrust, consideration).

While some (Brown & House, 1967; Thomas, 1976) argue that the OCDQ lacks consistency in showing that a relationship exists between school climate and student achievement, Andrews (1965) contends that a relationship has been found between school climate and student achievement when using the OCDQ. Perhaps the most important finding that emerged from the development and use of the ODCQ was the need for future exploration in the field of behavioral sciences; more specifically, further studies and analysis in the area of school climate and its effects on student achievement are needed. Halpin and Croft's OCDQ paved the way for the research and development of a plethora of climate instruments (Anderson, 1982).

Illustrated in Table 3 are several climate instruments used to measure school climate, the climate domains that are measured, and the number of items that appear

Table 3

School Climate Instruments

Instrument	Measure(s)	Item(s)
PCI	Custodial and Humanistic Orientations	20 – items; 5 point Likert Scale ranging from “Strongly Agree” to “Strongly Disagree”
OCI	Collegial Leadership, Professional Teacher Behavior, Achievement Press, and, Institutional Vulnerability	30 – items; 4 point Likert Scale ranging from “Rarely Occurs” to “Very Frequently Occurs”
OHI-E	Institutional Integrity, Collegial Leadership, Resource Influence, Teacher Affiliation, and Academic Emphasis	37 – items; 4 point Likert Scale ranging from “Rarely Occurs” to “Very Frequently Occurs”
CFK Ltd. School Climate Profile	Respect, Trust, High Morale, Opportunity for Input, Continuous Academic and Social Growth, Cohesiveness, School Renewal, and Caring	40 – items; 4 point Likert Scale ranging from “Almost Never” to “Almost Always”

on each climate survey along with the Likert Scale ranges.

Instruments such as the Pupil Control Ideology (PCI), Organizational Climate Index (OCI), the Organizational Health Inventory – Elementary Schools (OHI-E), the Charles F. Kettering Foundation, Ltd. School Climate Profile (CFK School Climate Profile), have been developed to measure various aspects of positive and negative school climates, the factors associated with each, and the impact of leadership styles on school climate and academic press.

The majority of climate surveys and questionnaires rely heavily on perception-based responses and opinions of a school's climate from its staff members and administrators (Anderson, 1982; Cushing et al., 2003). Sackney (1988) noted that the climate of a school most often reflects its current thinking and practices. As previously cited, Hoy and Miskel (1996) indicated that school climate describes routine behaviors and attitudes experienced by members of the organization. With the accountability of high-stakes testing, administrators must make decisions that are not always popular, and may affect routine behaviors and attitudes. Therefore, the exact time to implement a survey is difficult to determine, and may not yield the best results to measure a school's climate.

Lastly, Anderson (1989) found that student assessment of classroom climate is more realistic than a teacher's assessment of classroom climate. Anderson's findings support the notion that application of a climate instrument on instructional staff will only capture their perceptions of school climate, rather than provide a comprehensive measure of school climate. The use of state-reported data may provide a non-invasive approach to the study of school climate without having to control variations of routine

behaviors that may have an influence on survey responses. Regardless of the instrument selected to measure climate, the relationship among the facets of the school, the school's climate, the school's leadership, and student achievement, is used to categorize a school as being effective.

Climate studies

Recent studies have examined school climate and its relationship to student achievement. Gayton (1999) focused on the relationship between teacher-perceived school climate and the state accreditation status of elementary schools in West Virginia. Similar to Gayton, Parish (2002) studied the relationship between middle school climate and student achievement in the Commonwealth of Virginia, while Davidson (2000) examined the relationship between teacher perceptions of high school climate and selected characteristics of effective schools as defined by the state of Oklahoma. Callison (2002) studied teacher perception of school climate and its relationship to student achievement in the Sioux Falls School District in South Dakota. Lastly, Fisher (2003) studied the relationship between principal leadership style, school climate, and student achievement in elementary schools in Idaho.

Gayton (1999) studied elementary schools in West Virginia to determine if a significant relationship existed between teacher-perceived school climate and the state accreditation status of schools. Gayton also included the SES of schools and school size as part of her study. The CFK Ltd. School Climate Profile was used to measure teacher perception of the schools' climate. Student achievement was measured by results obtained from the 1998 Stanford Achievement Test – 9th Edition (SAT – 9). The number of students who received free or reduced lunch determined the SES of each

school. One hundred elementary schools participated in the study, 53 that earned full accreditation and 47 that lacked full accreditation. Schools with a student enrollment less than 290 were considered small schools. Schools with a student enrollment equal to or more than 290 were considered large schools. From her descriptive, one-shot case study, Gayton concluded that:

1. teachers in schools that lacked full accreditation status had a lower mean score in overall school climate compared to teachers in schools that earned full accreditation status;
2. schools that lacked full accreditation status had at least 61% of students who received free and reduced lunch;
3. high morale was the only predictor of low SES schools achieving full accreditation status; as morale decreased, the number of schools that earned full accreditation status also decreased;
4. large schools with high SES were more likely to lack full accreditation status when compared to large schools with low SES; and
5. small schools with low SES had a low mean score in the area of cohesiveness and therefore were less likely to earn full accreditation status.

Parish (2002) studied the relationship between organizational school climate and middle school student achievement on the eighth grade Standards of Learning (SOL) tests in the Commonwealth of Virginia. The School Climate Index (SCI) was used to study four factors of school climate (collegial leadership, teacher professionalism, academic press, and community engagement). Student achievement was measured by results obtained from two parts of the 2001 Virginia SOL tests, (a) English/reading, and

(b) mathematics. The number of students who received free or reduced lunch determined SES of each school. Six hundred and ninety-six teachers from 49 middle schools in the Commonwealth of Virginia completed the SCI. From her study, Parish determined that:

1. a relationship exists between school climate and student achievement in the areas of English/reading, and mathematics;
2. community engagement and academic press had an effect on student achievement in the area of English/reading
3. a relationship exists between the SES of students and student achievement as measured by both the English/reading, and mathematics.

Davidson (2000) examined the relationship between teacher perceptions of high school climate and selected characteristics of effective schools as defined by the state of Oklahoma. The Organizational Climate Description Questionnaire for Secondary Schools (OCDQ-RS) was used to assess teacher perceptions of the school's climate. The characteristics of an effective school were measured by the Oklahoma Educational Indicators Program (OEIP) based on three criteria (a) standardized test scores as measured by the Oklahoma Core Curriculum Tests, (b) graduation rate, and (c) dropout rate. Teachers from 30 schools, three from each of the 10 localities, with similar size and SES participated in the study. Davidson reported that:

1. out of 54 possible relationships, only three relationships were found. Relationships were found between school climate and student achievement in the general areas of Oklahoma history, supportive behavior in writing, and directive behavior and Oklahoma history; and

2. no relationship was found between teacher perception of school climate and graduation, and teacher perceptions of school climate and dropout rate.

Callison (2002) conducted a study to determine what relationship existed between teachers' assessments of school climate and student achievement in the Sioux Falls School Division in South Dakota. Additionally, Callison examined the differences between elementary and secondary school climate and student achievement. The OCI was used to measure teacher perceptions of school climate. Student achievement was measured by results obtained from the 2002 SAT – 9 administered to students in the fifth, eighth, and eleventh grade. Twenty-two elementary schools, five middle schools, and three high schools were included in the study. Twenty-five percent ($N = 317$) of the teachers from each school participated in the study. From her study, Callison concluded that:

1. no relationship was found between teachers' overall assessments of school climate at their school and student achievement;
2. teacher assessments of school climate were not closely related to student achievement at both the elementary and secondary levels;
3. collegial leadership, professional teacher behavior, achievement press, and institutional vulnerability were not found to be related to the teachers' assessments of their school and student achievement; and
4. elementary and secondary teachers share similar perceptions of school climate and students at both levels were similar in academic achievement.

Fisher (2003) examined the relationship between principal leadership style, school climate, and student achievement in elementary schools. The Multifactor

Leadership Questionnaire (MLQ) was used to categorize the principals' leadership style as transformational, transactional or laissez-faire. The Organizational Climate Description Questionnaire – Revised for Elementary schools (OCDQ-RE) was used to measure teachers' perception of school climate. The number of students that received free or reduced lunch determined the SES of each school. Six hundred forty teachers from 36 elementary schools in Idaho were administered the MLQ. To measure student achievement, data from the Idaho Reading Indicator and the Direct Mathematics and Writing Assessments were collected. Analysis determined if relationships existed between leadership and climate, leadership and student achievement, and climate and student achievement, as well as student SES.

1. Eighty-five percent of the schools found their principal's leadership style to be transformational while the remaining 15% found no dominant leadership style among their principals.
2. Ninety-two percent of schools that identified their principals as a transformational leader had also perceived their schools' climate as open.
3. Transformational leadership style was positively related to principal openness but was not related to teacher openness.
4. The transactional leadership style was negatively related to teacher openness but was not related to principal openness, while both principal and teacher openness were both negatively correlated to laissez-faire leadership style.
5. No relationship was found between student achievement and the SES of students in reading; however, there was a relationship between student achievement and the SES of students in math and writing.

Several commonalities exist among the studies. Each study focused on teacher's perception of school climate and how it affected student achievement. To measure teacher perception, a variety of climate surveys were used, each containing a Likert type scale. Although the climate instruments used focused on different aspects of the school such as leadership style, institutional integrity, teacher affiliation, and resource influence, each climate instrument included academic press as one of the domains. While some of the studies used the results from norm-referenced tests such as the SAT – 9, others used standardized test results such as the Virginia's SOL tests to measure student achievement. Lastly, each study took into consideration the SES of the population studied.

Gayton (1999) and Parish (2002) concluded that the SES of students is related to academic achievement and school climate in the content area of English. Their findings are consistent with Hoy's et al. (1998). While Fisher (2003) reported that there was no relationship between student achievement and the SES of students in reading, however, she did report that the SES of students was related to academic achievement and school climate in the content area of math and writing.

Student achievement

Historically, accountability measures on student achievement date back to the National Defense Education Act (NDEA) of 1958, the Elementary and Secondary Education Act of 1965 (ESEA), and the 1983 report of A Nation At Risk. In each case, legislation was created out of concern that American schools were in need of immediate reform. The urgency of current legislation, the No Child Left Behind Act (NCLB, 2002),

places emphasis on standardized testing as a way for public schools to demonstrate their effectiveness.

Chrispeels (1990) defined effective schools as schools in which students from all socioeconomic backgrounds, regardless of the school's size, score at comparable levels on standardized achievement tests. Furthermore, effective schools have a high expectation for all students, and possess a positive school climate and culture. Although some researchers have linked the climate of a school to student achievement (Anderson, 1982; Bookover et al. 1978), others (Purkey & Smith, 1982) contend that there is a lack of empirical evidence to make such an assumption.

In the Commonwealth of Virginia, the Virginia SOL tests have placed greater emphasis on the use of standardized testing for schools to document student achievement and demonstrate the effectiveness of the school. Student achievement, as measured by SOL tests established in 1995, serves as a basis for school accreditation and determining Adequate Yearly Progress (AYP) under the NCLB Act.

For the school year 2002 – 2003, Virginia's accreditation ratings place each public school within the Commonwealth in one of four categories, Fully Accredited, Provisionally Accredited – Meets State Standards, Provisionally Accredited – Needs Improvement, or Accreditation with Warning. Table 4 illustrates the four categories of accreditation status, the number of schools for each accreditation category, and the percentage of schools for each accreditation category. Only those schools that participate in the Virginia SOL tests were included.

Students in grades three, five, and eight and high school students required to take the End-of-Course Testing (EOC – Test) are expected to demonstrate proficiency

Table 4

Commonwealth of Virginia School Accreditation Status for the School Year 2002 – 2003

Category	Number of Schools	Percent of Schools
Fully Accredited	1,181	64%
Provisionally Accredited (Meets State Standards)	253	14%
Provisionally Accredited (Needs Improvement)	310	17%
Accredited with Warning	85	5%

in English/reading, mathematics, history/social science, and science. The Virginia Department of Education (VDOE) tracks the individual accreditation status of each school within the Commonwealth. The number of Fully Accredited schools during the 2002 – 2003 school year was 1,181, which represents 64% of schools in the Commonwealth. The number of Provisionally Accredited (Meets State Standards) schools during the 2002 – 2003 school year was 253, which represents 14% of schools in the Commonwealth. The number of Provisionally Accredited (Needs Improvement) schools during the 2002 – 2003 school year was 310, which represents 17% of schools in the Commonwealth. Lastly, the number of Accredited with Warning schools during the 2002 – 2003 school year was 85, which represents 5% of schools in the Commonwealth.

Factors of school climate

As previously cited (Howard et al., 1987), school climate must address the “safety

needs” (p. 6) of both the teachers and students if the school is to be successful. Sackney (1988) looked at two subdivisions of climate, “academic climate” and “social climate;” both having a set of norms, processes, and structures. Academic climate refers to the “quality of instruction and student performance,” and social climate refers to that which “indirectly impact student learning” (p. 9). Berliner and Biddle (1995) contend that to resolve existing problems in public education, certain social issues must be examined. These issues include income or wealth inequity (p. 216), diversity (p. 225), demographics (p. 231), violence and drugs (p. 233), and school size (p. 295). Brookover et al. (1978) concluded that student achievement is clearly affected by a school’s social environment and that “the differences in climate between schools are important aspects of the school’s social environment” (p. 303). Sugai and Horner (2001) reported that “learning and teaching occur best in school climates that are positive, orderly, courteous, and safe” (p. 2).

Behavior of Students

Allodi (2002) indicated, “learning environments vary from school to school, depending on the school’s social context” (p. 268). From her two-level analysis of classroom climate in relation to social context, Allodi concluded that a relationship exists between social contexts and learning environment, and supports the notion that school climate is linked to student achievement. Goddard, Sweetland and Hoy’s (2000) multi-level analysis of urban elementary schools found that an emphasis on academic press not only improves school climate, but also has a positive influence on student behavior. According to the National Center for Education Statistics (NCES, 2000), school climate influences the academic environment of a school by reducing behavioral problems such

as tardiness, absenteeism, verbal and physical conflicts, vandalism, weapons, alcohol, and drug abuse, and therefore increases the chances of academic success.

Kuperminc, Leadbeater and Blatt (2001) examined school social climates. Their regression analysis of low and high school climate revealed that high levels of emotional and behavioral problems were linked to low or negative school climate. “Defiance, disruptive and violent behaviors decrease the effectiveness, efficiency, and relevancy of teaching and learning for everyone” (Sugai & Horner, 2001, p. 2). Sugai and Horner have identified the following challenges that educators and the school community face (p. 2):

1. general lack of discipline (e.g., disrespect, insubordination),
2. increasing school violence (e.g., assaults, fighting),
3. inefficient use or loss of instructional time (e.g., decreased achievement and teaching time),
4. over-reliance on punishment-based, exclusionary programming (e.g., office discipline referrals, detention, suspensions, expulsions),
5. failed attempts to provide individualized and appropriate educational opportunities for students with disabilities and students from diverse backgrounds,
6. lack of fluency with specialized behavior practices (e.g., functional behavioral assessment, behavior intervention planning, teaching pro-social skills),
7. disenfranchisement of families and communities, and
8. fragmented, redundant, and inefficient multidisciplinary efforts.

Creating a positive school climate, particularly for students who are at-risk, can be helpful to alleviating academic, emotional, and behavioral issues (Felner, Brand, DuBois, Adan, Mulhall & Evans, 1995; Haynes, Emmons & Ben-Avie, 1997). Edmonds (1979) identified an orderly school environment as one of five factors that contribute to student achievement. Goddard et al. (2000) found focus on academic excellence to be a factor that contributes to the behavioral and environmental press of a school. Based on this research, it appears that academics and student behavior are factors of school climate.

Truancy

Truancy has also been linked to student achievement and school climate. Researchers contend that chronic school absenteeism among students can lead to academic failure, school dropout, and juvenile delinquency (McCluskey et al., 2004). Chronic truancy has also been linked with serious delinquency issues such as violence and substance abuse (Bell, Rosen, & Dynlacht, 1994). Mors and Moos (1978) contend that a poor classroom atmosphere and lack of teacher support can result in a high truancy rate. Reid (2003) concluded that a school's social climate contributed to 86% of the reasons for student truancy. Reid's findings identified school bullying, avoidance of exams, and the desire to leave school as the major causes of truancy. During the 2002 – 2003 school year, the VDOE reported 29,145 cases of truancy based on reports received from school divisions within the Commonwealth. Reported cases of truancy were based on six unexcused accumulative absences for which conferences had been scheduled with parents. Given these parameters, a minimum of 174,870 days (1,136,655 hours) of instructional time has been lost due to students that are truant.

Socioeconomic Status

Lastly, researchers have examined the relationship between SES of students and their academic achievement (Considine & Zappola, 2002; Coleman et al., 1966; Bulach, Malone & Castleman, 1995; Weber's, 1971; Benson, 2003; Hoy et al., 1998; Brookover et al., 1978; Spence, 2003). Socioeconomic status can be defined as "a person's overall social position...to which attainment in both the social and economic domain contribute" (Ainley et al., 1995, p. ix). Considine and Zappola (2002) contend "SES is determined by an individual's achievements in education; employment and occupational status; and income and wealth" (p.130).

The relationship between SES and academic performance of children is well established in sociological research (Considine & Zappola, 2002). Coleman et al., (1966) concluded that the SES of parents is the best predictor of student achievement. The Coleman report was significant in that it led to effective school and school climate research among those who disagreed that the SES of parents was a strong predictor of student achievement (Bulach, Malone & Castleman, 1995). Weber's (1971) study of four successful low SES inner-city schools found strong leadership, high expectation for student achievement, and an orderly and pleasant environment to be the main factors attributing to the success of each school.

Interest in the Weber study led to the New York State Office of Education Performance Review of 1974, which found that a low SES school could experience academic success. A case study approach was used to examine two low SES inner-city elementary schools, one high-achieving school (99% free and reduced lunch) and one low-achieving school (90% free and reduced lunch). Student achievement was based

on results obtained from the Bank Street Informal Reader Placement Test and MacMillan Textbook Test. Both schools were comparably similar in ethnicity and family income. Based on formal and informal interviews, as well as classroom observations, the findings showed that:

1. the differences in student performance in these two schools seemed to be attributed to factors under the schools' control;
2. administrative behaviors, policies, and practices in the schools appeared to have an impact on school effectiveness;
3. the more effective inner-city school was led by an administrative team which provided a good balance between both management and instructional skills;
4. the administrative team in the more effective school had developed a plan for dealing with the reading problem, and had implemented the plan throughout the school;
5. classroom reading instruction did not appear to differ between the two schools since classroom teachers in both schools had problems in teaching reading and assessing pupils' reading skills;
6. many professional personnel in the less effective school attributed children's reading problems to non-school factors, and were pessimistic about their ability to have an impact; thus creating an environment in which children failed because they were not expected to succeed. However, in the more effective schools, teachers were less skeptical about their ability to have an impact on children; and,

7. children responded to un-stimulating learning experiences predictably – they were apathetic, disruptive, or absent (p. vi).

Similar findings from Benson's (2003) study found social class and other variables such as parental involvement, student engagement in learning, instructional methods, expectations for student achievement, and school leadership as important correlates to student achievement. Hoy et al. (1998) reported "the socioeconomic status of a community is always a strong predictor of student achievement" (p. 353). Brookover et al. (1978) found that many low SES schools do not have a school climate that is conducive to student achievement; however, some "atypical" (p. 317) low SES schools did manage to create a climate that fostered high student achievement.

Benson (2003) investigated the relationship between school climate and student achievement in schools that serve children from low SES backgrounds. The study examined the notion that positive school climate is associated with student achievement among economically disadvantaged schools. Eight dimensions of school climate (trust, respect, high morale, opportunity for input, continuous academic and social growth, cohesiveness, school renewal and caring) were predictors of student achievement. Socioeconomic status was controlled by selecting elementary schools in Southeastern Virginia that had similar portions of students who qualified for the free and reduced lunch program. To measure student achievement, the mean pass-rate percentages of the third-grade SOL test scores from four schools were collected and categorized as high, medium or low achieving. The results of the survey indicated that school climate and student achievement were positively related and, when ranked by achievement, the

climate means of the four schools fell in perfect rank order from high SES to low SES (Benson, 2003).

Spence (2003) studied the extent to which achievement varied in low SES schools that differed in climate. More specifically, the study focused on teacher perception of school climate in low SES elementary schools, the relationship between school climate and achievement on the Virginia SOL tests, and the differences in climate and achievement. The Organizational Health Inventory for Elementary Schools (OHI-E) was used to measure total climate as well as five dimensions of climate such as institutional integrity, resource influence, collegial leadership, teacher affiliation, and academic emphasis. The survey was administered to 286 faculty members in 11 sample schools. The data analysis revealed that there was a positive relationship, in certain instances, between climate and achievement in the 11 low SES elementary schools surveyed. A relationship was as found among achievement, teacher affiliation, and academic emphasis. However, no relationships were found among achievement and institutional integrity, resource influence, and collegial leadership. Relationships were also found in achievement among schools that varied in academic emphasis. This suggested that those seeking to improve student achievement in low SES elementary schools should evaluate and address perceptions of climate in their schools, in general, and academic emphasis in particular.

Chapter Summary

“Positive school climate has become part of the effective school rhetoric and is advocated by educational practitioners and reformers as a specific means for improving student achievement” (Hoy et al., 1991, p. 1). Though difficult to define, and not always

agreed upon, many definitions of school climate exist (Hoy et al., 1991; Shore, 1995). From these definitions, common themes emerge. In each case, it is believed that there is a presence of a climate, whether it is good or poor; that school climate is internal and involves the behaviors of its members; and, that school climate evolves from perceptions, behaviors, and the attitudes of its members.

Research on organizational climate began in the late 1950's and focused on the work environment in the business industry and at the university level (Anderson, 1982). In the early 1960s, researchers turned their attention to the climate existent in the public school classroom (Anderson, 1982). Instruments such as the CES, the LEI, and the *My Class Inventory* (Walberg, 1969) were among the first instruments developed to measure classroom climate, and were theoretically grounded to Murray's (1938) work on environmental press. Additionally, instruments such as the PCI, OCI, the OHI-E, and the CFK Ltd. School Climate Profile, have been developed to measure various aspects of positive and negative school climates, the factors associated with each, and the impact of leadership styles on school climate and academic press. It is important to note that most climate surveys and questionnaires rely heavily on perception-based responses and opinions of a school's climate from its staff members and administrators (Anderson, 1982; Cushing et al., 2003). Therefore, the exact time to implement a survey is difficult to determine, and may not yield the best results to measure a school's climate.

Historic and current legislation (NDEA, ESEA, A Nation At Risk, and NCLB) have placed greater emphasis on public school education. Additional emphasis has been placed on the use of standardized testing as a means for documenting student

achievement. Literature suggests that a relationship exists between school climate and student achievement (Brookover et al., 1978; Bulach et al., 1995) and that research supports the notion that school climate is an important aspect of effective schools (Hoy & Hannum, 1997, p.290). If a positive school climate is symbolic of an effective school (Chrispeels, 1990), then further research is needed to identify which factors are affecting school climate.

CHAPTER 3

METHODOLOGY

All, regardless of race or class or economic status, are entitled to a fair chance and to the tools for developing their individual powers of mind and spirit to the utmost. This promise means that all children by virtue of their own efforts, competently guided, can hope to attain the mature and informed judgment needed to secure gainful employment, and to manage their own lives, thereby serving not only their own interests but also the progress of society itself.

A Nation at Risk (April, 1983)

Introduction

Included in Chapter 3 is brief introduction restating the purpose for this study and guiding research questions. The following sections are included in the methodology:

(a) population for the study, (b) data collection process, and (c) research design. A chapter summary is also included.

The purpose of this study was to determine the relationship between school division climate and student achievement of school divisions in the Commonwealth of Virginia. The following research questions guided this study:

1. Is there a relationship between school division climate, as measured by the Climate Index (CI), and student achievement in school divisions in the Commonwealth of Virginia?
2. Is there a relationship between school division climate, as measured by the CI, and state accreditation in English/reading of school divisions in the Commonwealth of Virginia?
3. Is there a relationship between school division climate, as measured by the CI, and state accreditation in mathematics of school divisions in the Commonwealth of Virginia?

4. Is there a relationship between school division climate, as measured by the CI, and state accreditation in history/social science of school divisions in the Commonwealth of Virginia?
5. Is there a relationship between school division climate, as measured by the CI, and state accreditation in science of school divisions in the Commonwealth of Virginia?

In theory if educators are happy and feel a sense of importance to the school and their work, they are more likely to be productive teachers. Likewise, if students are happy and feel a sense of importance to their work and the school, they will be more likely to achieve academically. If both are true, the climate of the school should be conducive to both teaching and learning. If both are not true, the climate of the school will more likely be poor and counterproductive to both teaching and learning. Therefore, it is important to identify factors associated with both a good school climate and a poor school climate. It is equally important to identify relationships between these factors and student achievement.

Methodology

Population

The population for this study is 132 public school divisions in the Commonwealth of Virginia. This population includes 1,829 elementary, middle, and high schools. For the purposes of this study, selected data submitted by each public school division to the Virginia Department of Education (VDOE) served as the database for this investigation.

Data Collection

Data collected from the results of the 2002 – 2003 Virginia Standard of Learning

(SOL) tests were used as the measure of student achievement. Each of the four content area (English/reading, mathematics, history/social science, and science) were included as part of this study.

Student achievement in the Commonwealth of Virginia is measured by Virginia's SOL tests and serves as a basis for school accreditation. Students in grades three, five, eight, and eleven are expected to pass with a proficient score in English/reading, mathematics, history/social science, and science. Accreditation status for the 2003 – 2004 school year was based on the test results from the 2002 – 2003 school year. To determine a school division's accreditation rating, the pass-percentage rate from each school within the school division was averaged for each content area.

Data submitted by individual school divisions to the VDOE appear on three reports. These reports include the:

- 1) Free and Reduced Lunch report
- 2) Discipline, Crime, and Violence Incident annual report, and
- 3) Truancy report.

For the purpose of this study, the percentage of students who received free and reduced lunch were used to determine the socioeconomic status (SES) for each school division in the Commonwealth of Virginia. As required by the School Nutrition Programs, school divisions must report free and reduced lunch statistics to the VDOE based on student membership (October 2003, claim month). Annually, the VDOE publishes the number and percent of students who receive free and reduced lunch for each school division. Data collected during the 2002 – 2003 school year were included in this study.

Under the NCLB Unsafe School Choice Option: Persistently Dangerous Schools Identification Criteria [Title IX, Sec. 9532.], each state receiving funds from the federal government must certify to the Secretary of Education that they are in compliance with the terms and conditions outlined under Title IX, Sec.9532 (p. 2). To meet such requirements, the Commonwealth of Virginia enacted the Discipline, Crime and Violence Incidents (DCVI) annual report (Code of Virginia - §221. -279.3:1), which also include the requirements established under the federal Gun-Free Schools Act of 1994 (GFSA, Sec. 14061). In accordance with the DCVI annual report, each school division in the Commonwealth is required to report incidents of serious nature that may occur in division schools to the VDOE. School divisions report data through a web-based submission process. The DCVI annual report is public record and can be obtained from the VDOE. Three reporting categories from the DCVI annual report were included in this study. These categories include incidences of (a) disorderly conduct, (b) fighting, and (c) vandalism. Data collected during the 2002 – 2003 school year were included. The number of incidents per 100 students was used in each category for each school division. These data were used to cluster school divisions according to like factors or similarities.

Lastly, incidents of truancy are also reported to the VDOE by each school division. The VDOE only publishes reports of truancy based on the number of students with whom a conference was scheduled after the student has accumulated six or more absences during the school year. Data collected from the Truancy report during the 2002 – 2003 school year were included in this study.

Research Design

Isaac and Michael (1971) define descriptive research as systematically describing the “facts and characteristics of a given population or area of interest, factually and accurately” (p. 18). Because this study sought to describe the relationship among factors contributing to school climate and the level of student achievement of school divisions in the Commonwealth of Virginia, this study was descriptive in nature. More specifically, data from the Free and Reduced Lunch report, the DCVI annual report, and the Truancy report were used to group school divisions according to like factors or similarities.

Everitt (1974) identified the cluster analysis as a method commonly used to separate data into basic groups. According to Everitt, there are several types of clustering methods (e.g. Hierarchical, Optimization-partitioning, Density, and Clumping) that can be used to group individuals or group variables. The Hierarchical Cluster method was selected for this study.

Everitt (1974) described the Hierarchical Cluster method as a process of classifying groups and repeating the process at different levels creating a dendrogram. The dendrograms are then used to illustrate clustered groups made at each successive level, and each cluster is based on like factors or similarities. To group school divisions according to like factors, a Hierarchical Cluster method was applied using the Johnson Max process. The Johnson Max is a process by which variables are stacked according to like factors or similarities. For the purpose of this study, variables were stacked forming five clusters of school divisions.

For the purpose of this study, clusters were created using raw data from each school division ($N = 132$) in the following reporting categories: (a) disorderly conduct, (b) fights, (c) vandalism, (d) truancy, and (e) free and reduced lunch. Several processes were followed prior to the clustering process. Descriptive data provided by the VDOE were downloaded to an Excel database. Raw data were rescaled based on infractions per 100 students for each school division. The number of students who received free and reduced lunch was also rescaled on a per-pupil scale of 100 for each school division. Using rescaled data, a mean score and standard deviation score was calculated for each reporting category. Rescaled data were then used to calculate z-scores. A separate z-score was determined for each school division in each reporting category and entered in SPSS version 11.0. To group school divisions according to like factors, a Hierarchical Cluster method was applied using the Johnson Max process. For the purpose of this study, variables were stacked forming five clusters of school divisions creating a CI representing all 132 public school divisions in the Commonwealth; Cluster One, $n = 41$, (Appendix C); Cluster Two, $n = 56$, (Appendix E); Cluster Three, $n = 21$, (Appendix G); Cluster Four, $n = 8$, (Appendix I); and Cluster Five, $n = 6$, (Appendix K). Clusters were analyzed to determine the relationship between school division climate and student achievement of school divisions in the Commonwealth of Virginia.

Achievement scores were averaged across the clusters to determine the possibility of a relationship between cluster membership and student achievement. Individual schools and school divisions are able to use the CI from this study to determine correlations that may exist between their school's climate and their level of

student achievement based on results obtained from the 2002 – 2003 Virginia SOL test results.

Summary

The purpose of this study was to determine the relationship between school division climate and student achievement of school divisions. The population for this study was 132 public school divisions in the Commonwealth of Virginia. Results from the 2002 – 2003 Virginia SOL tests were used to measure student achievement in each content area (English/reading, mathematics, history/social science, and science). Data collected from three reports (Free and Reduced Lunch report, DCVI annual report, and Truancy report) were used to create the CI. The number of incidents per 100 students was used in each category for each school division. The number of students who received free and reduced lunch was also measured on a per-pupil scale of 100. A Hierarchical Cluster, Johnson Max process was used to group school divisions according to like factors or similarities. Five clusters were created from the CI. Clusters were analyzed to determine the relationship between school climate and student achievement of school divisions in the Commonwealth of Virginia. The findings from the Hierarchical Cluster analysis are discussed in Chapter 4.

CHAPTER 4

PRESENTATION OF DATA

“Our schools became in our eyes not just the symbol but the cause of our well-being.”

Goodlad (1997, p. 20)

Introduction

Included in Chapter 4 is a brief introduction restating the purpose and population of this study followed by research questions and methodology procedures. Also included is a presentation of data followed by concluding remarks.

The purpose of this study was to determine if there is a relationship between school division climate and student achievement of school divisions in the Commonwealth of Virginia. The population for this study was 132 public school divisions inclusive of 1,829 elementary, middle, and high schools. The following research questions guided this study:

1. Is there a relationship between school division climate, as measured by the Climate Index (CI), and student achievement in school divisions in the Commonwealth of Virginia?
2. Is there a relationship between school division climate, as measured by the CI, and state accreditation in English/reading of school divisions in the Commonwealth of Virginia?
3. Is there a relationship between school division climate, as measured by the CI, and state accreditation in mathematics of school divisions in the Commonwealth of Virginia?

4. Is there a relationship between school division climate, as measured by the CI, and state accreditation in history/social science of school divisions in the Commonwealth of Virginia?
5. Is there a relationship between school division climate, as measured by the CI, and state accreditation in science of school divisions in the Commonwealth of Virginia?

For the purpose of this study, Hierarchical Clusters were created using raw data from each school division ($N = 132$) in the following reporting categories: (a) disorderly conduct (b) fights (c) vandalism (d) truancy, and (e) free and reduced lunch. School divisions were clustered based on like factors or similarities. Several processes were followed prior to the clustering process.

Descriptive data on incidents of disorderly conduct, fights, vandalism, truancy, and the number of students, who received free and reduced lunch, provided by the Virginia Department of Education (VDOE) were downloaded to an Excel database. Raw data were rescaled based on infractions per 100 students for each school division. The number of students who received free and reduced lunch was also rescaled on a per-pupil scale of 100 for each school division. Using rescaled data, a mean score and standard deviation score was calculated for each reporting category. Rescaled data were then used to calculate z-scores. A separate zscore was determined for each school division in each reporting category and entered in SPSS version 11.0. To group school divisions according to like factors, a Hierarchical Clustering method was applied using the Johnson Max process. The Johnson Max is a process by which variables are stacked according to like factors or similarities. For the purpose of this study, variables

were stacked forming five clusters of school divisions creating a CI representing 132 public school divisions in the Commonwealth (Cluster One, $n = 41$; Cluster Two, $n = 56$; Cluster Three, $n = 21$; Cluster Four, $n = 8$; and Cluster Five, $n = 6$). Clusters were analyzed to determine if there is a relationship between school climate, as measured by the CI, and student achievement of school divisions in the Commonwealth of Virginia.

Results from the 2002 – 2003 Virginia Standard of Learning (SOL) tests were used to measure student achievement. Accreditation status for the 2003 – 2004 school year is based on the test results from the 2002 – 2003 school year data. Because the state reports test results by individual schools, division pass-percentage rates had to be calculated for the purpose of this study. To determine a school division's pass-percentage rate, an average was calculated for each school (elementary, middle and high school) within the school division that participated in SOL testing in the content area of English/reading, mathematics, history/social science, and science. A mean score and standard deviation score was calculated for each school division ($N = 132$) in each content area. Lastly, a state mean score and standard deviation score was calculated inclusive of all school divisions in the Commonwealth of Virginia, in each content area.

Data collected from the Free and Reduced Lunch report, the Discipline, Crime, and Violence Incidents (DCVI) annual report, and Truancy report was used to create the CI. The number of incidents per 100, as well as the number of students who received free and reduced lunch per 100 was calculated for each category in each school division. All data were obtained from the VDOE. The Free and Reduced Lunch report and the DCVI annual report were included of all 132 public school divisions. However,

twenty-eight school divisions were omitted from the 2002 – 2003 Truancy report (Appendix A). As a result, the following options were considered:

- 1) use data from the 2001 – 2002 school year as it represents the most complete sets of data for each report, or
- 2) validate the use of data from the 2001 – 2002 Truancy report for the school divisions that were omitted ($n = 28$).

Because data from 2002 – 2003 school year represent the most recent data, it was decided to validate the use of the 2001 – 2002 Truancy report for those school divisions that were omitted ($n = 28$). The Pearson r , product moment correlation coefficient, was used to establish a relationship, and to validate the use of these data. Table 5 illustrates the results for each category along with its Pearson r correlation coefficient and level of significance.

Table 5

Results: The Pearson r , Product Moment Correlation Coefficient

<u>Categories</u>	<u>Pearson r Coefficient</u>	<u>Level of Significance</u>
Free and Reduced Lunch	.964	.000*
Disorderly Conduct	.922	.000*
Fighting	.755	.000*
Vandalism	.304	.116

*Correlation is significant at the 0.01 level (2-tailed)

According to Gay (1992), a coefficient of .60 or greater is usually considered adequate for group prediction purposes and therefore, considered acceptable for research. To validate the use of missing truancy data, data from the 2001 – 2002 reports were compared to the data from the 2002 – 2003 reports in the categories of disorderly conduct, fighting, vandalism, and free and reduced lunch. Results indicate that three of the four categories had a coefficient of .60 or greater, and were significant at the .01 level. These categories are: free and reduced lunch ($r = .964$), disorderly conduct ($r = .922$), and fights ($r = .755$). Vandalism ($r = .304$) was the only category that did not meet the .60 coefficient level, and was not significant at a level of .01. Because three of the four categories exceed the .60 coefficient level, a relationship was established between the 2001 – 2002 data and the 2002 – 2003 data and therefore, validated the use of the 2001 – 2002 Truancy report data for those school divisions that were omitted ($n = 28$) from the 2002 – 2003 Truancy report.

Presentation of Data

Research Question 1

Is there a relationship between school division climate, as measured by the CI, and student achievement in school divisions in the Commonwealth of Virginia?

Illustrated in Table 6, are mean scores and standard deviation scores of student achievement for each cluster of school divisions in each content area. Included are state mean scores and standard deviation scores for each content area.

The state pass-percentage score in each content area were as follows: English/reading, $M = 81.41$ ($SD = 3.64$); mathematics, $M = 80.54$ ($SD = 3.72$); each content area was higher than the pass-percentage score in Cluster One and Cluster

Table 6

Mean and Standard Deviation of Student Achievement by Cluster Groups

<u>Clusters</u>	<u>N</u>	<u>English/reading</u>		<u>Mathematics</u>		<u>History/social science</u>		<u>Science</u>	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	41	78.72	6.31	78.48	7.49	75.80	7.18	77.05	7.54
2	56	84.93	4.98	83.87	5.65	83.08	5.76	85.25	4.77
3	21	77.11	7.86	75.33	10.32	74.58	10.06	74.77	8.80
4	8	85.24	1.69	84.13	2.24	84.86	3.03	87.40	2.46
5	6	81.07	3.57	80.89	2.87	82.40	2.76	84.14	3.87
Total	132	81.41	3.64	80.54	3.72	80.14	4.63	81.72	5.49

Three. Additionally, science and English/reading had the highest pass-percentage score, whereas, mathematics and history/social science were slightly lower.

Cluster One, $n = 41$, (Appendix B) scored below Clusters Two ($n = 56$), Cluster Four ($n = 8$), and Cluster Five ($n = 6$), but had a higher student achievement score than Cluster Three ($n = 21$) in each content area. English/reading had a mean score of 78.72 ($SD = 6.31$); mathematics had a mean score of 78.48 ($SD = 7.49$); science had a mean score of 77.05 ($SD = 7.54$); and history/social science had a mean score of 75.80 ($SD = 7.18$). In each content area, Cluster One scored below the state mean score.

Cluster Two, $n = 56$, (Appendix D) scored below Cluster Four ($n = 8$) but had a higher student achievement score than Clusters One ($n = 41$), Cluster Three ($n = 21$), and Cluster Five ($n = 6$) in each content area. Science had a mean score of 85.25 ($SD = 4.77$); English/reading had a mean score of 84.93 ($SD = 4.98$); mathematics had a mean score of 83.87 ($SD = 5.65$); and history/social science had a mean score of 83.08 ($SD = 5.76$). In each content area, Cluster Two scored above the state mean score.

Cluster Three, $n = 21$, (Appendix F) had the lowest student achievement score in each content area. English/reading had a mean score of 77.11 ($SD = 7.86$); mathematics had a mean score of 75.33 ($SD = 10.32$); science had a mean score of 74.77 ($SD = 8.80$); and history/social science had a mean score of 74.58 ($SD = 10.06$). In each content area, Cluster Three scored below the state mean score.

Cluster Four, $n = 8$, (Appendix H) had the highest student achievement score in each content area. Science had a mean score of 87.40 ($SD = 2.46$); English/reading had a mean score of 85.24 ($SD = 1.69$); history/social science had a mean score of

84.86 ($SD = 3.03$); and mathematics had a mean score of 84.13 ($SD = 2.24$). In each content area, Cluster Four scored above the state mean score.

Cluster Five, $n = 6$, (Appendix J) scored below Clusters Two ($n = 56$) and Cluster Four ($n = 8$), but had a higher student achievement score than Clusters One ($n = 41$) and Cluster Three ($n = 21$) in each content area. Science had a mean score of 84.14 ($SD = 3.87$); history/social science had a mean score of 82.40 ($SD = 2.76$); English/reading had a mean score of 81.07 ($SD = 3.57$); and mathematics had a mean score of 80.89 ($SD = 2.87$). In three of the four content areas (science, history/social science, and mathematics), Cluster Five scored above the state mean score. In the content area of English/reading, Cluster Five reported a mean score of 81.07 ($SD = 3.57$), which was below the state mean score of 81.41 ($SD = 3.64$).

Is there a relationship between school division climate, as measured by the CI, and student achievement in school divisions in the Commonwealth of Virginia? The results from the Hierarchical Cluster analysis are presented in Table 7. The CI illustrates the mean score and standard deviation score for the state and each cluster in each reporting category (disorderly conduct, fights, vandalism, free and reduced lunch, and truancy). Incidents were based on infractions per 100 students. The number of students who received free and reduced lunch was also measured on a per-pupil scale of 100.

The state mean score for each reporting category on the CI was as follows: disorderly conduct ($M = 23.18$, $SD = 20.28$); fights ($M = 2.28$, $SD = 0.62$); vandalism ($M = 0.30$, $SD = 0.17$); free and reduced lunch ($M = 35.44$, $SD = 12.89$); and truancy ($M = 5.32$, $SD = 4.40$). Cluster One had the second lowest student achievement scores among the clusters and scored below the state mean score in each content area.

Table 7

Climate Index: Mean and Standard Deviation Score by Cluster Groups

<u>Clusters</u>	<u>Disorderly Conduct</u>		<u>Fights</u>		<u>Vandalism</u>		<u>Free and Reduced Lunch</u>		<u>Truancy</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	57.03	33.29	3.10	2.51	0.41	0.27	42.78	13.95	5.19	5.90
2	6.38	4.66	1.58	1.08	0.16	0.16	31.48	12.55	4.99	6.13
3	11.19	5.31	2.72	1.96	0.12	0.13	54.10	8.63	1.96	2.23
4	26.17	3.89	2.11	1.32	0.52	0.17	25.77	19.05	1.81	1.85
5	15.12	8.34	1.87	1.35	0.31	0.16	23.06	4.91	12.65	10.06
Total	23.18	20.28	2.28	0.62	0.30	0.17	35.44	12.89	5.32	4.40

Note. Mean and standard deviated scores are based on per-pupil scale of 100.

On the CI, Cluster One had the highest number of disorderly conduct ($M = 57.03$, $SD = 33.29$) and fighting ($M = 3.10$, $SD = 2.51$) infractions when compared to the remaining clusters and was above the state mean score of 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. The number of students who received free and reduced lunch ($M = 42.78$, $SD = 13.95$) in Cluster One was the second highest among the clusters and above the state mean score of 35.44 ($SD = 12.89$). Vandalism ($M = 0.41$, $SD = 0.27$) in Cluster One was the second highest among the clusters and above the state mean score of 0.30 ($SD = 0.17$). Lastly, truancy ($M = 5.19$, $SD = 5.90$), in Cluster One was the second highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$).

Cluster Two ($n = 56$) had the second highest student achievement scores among the clusters and scored above the state mean score in each content area. On the CI, Cluster Two reported the lowest number of disorderly conduct ($M = 6.38$, $SD = 4.66$) and fighting ($M = 1.58$, $SD = 1.08$) infractions compared to the remaining clusters and was below the state mean score 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. Vandalism ($M = 0.16$, $SD = 0.16$) in Cluster Two was the second lowest among the clusters and was below the state mean score of 0.30 ($SD = 0.17$). Truancy ($M = 4.99$, $SD = 6.13$) in Cluster Two was third highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$). Lastly, the number of students who received free and reduced lunch ($M = 31.48$, $SD = 12.55$) in Cluster Two was the third highest among the clusters but was below the state mean score of 35.44 ($SD = 12.89$).

Cluster Three ($n = 21$) had the lowest student achievement scores among the clusters and scored below the state mean score in each content area. On the CI,

Cluster Three reported the second lowest incidents of disorderly conduct ($M = 11.19$, $SD = 5.31$) among the clusters and was below the state mean score of 23.18 ($SD = 20.28$). Notably, Cluster Three had the highest number of students who received free and reduced lunch ($M = 54.10$, $SD = 8.63$) among the clusters and was above the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.72$, $SD = 1.96$) in Cluster Three was the second highest among the clusters and was higher than the state mean score of 2.28 ($SD = 0.62$). Truancy ($M = 1.96$, $SD = 2.23$) in Cluster Three was the second lowest among the clusters and was lower than the state mean score of 5.32 ($SD = 4.40$). Lastly, vandalism ($M = 0.12$, $SD = 0.13$) was the lowest among the clusters and was lower than the state mean score 0.30 ($SD = 0.17$).

Cluster Four ($n = 8$) had the highest student achievement scores among the clusters and scored above the state mean score in each content area. On the CI, Cluster Four had the second highest number of disorderly conduct ($M = 26.17$, $SD = 3.89$) infractions and the highest incidents of vandalism ($M = 0.52$, $SD = 0.17$) among the clusters and was above the above the state mean score of 23.18 ($SD = 20.28$) and 0.30 ($SD = 0.17$), respectively. The number of students who received free and reduced lunch ($M = 25.77$, $SD = 19.05$) in Cluster Four was the second lowest among the clusters and was below the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.11$, $SD = 1.32$) in Cluster Four was the third highest among the clusters but was below the state mean score of 2.28 ($SD = 0.62$). Lastly, Cluster Four had the lowest incidents of truancy ($M = 1.81$, $SD = 1.85$) among the clusters and was below the state mean score of 5.32 ($SD = 4.40$).

Cluster Five ($n = 6$) had the third highest student achievement scores among

each cluster and scored above the state mean score in each content area with the exception of English/reading. On the CI, Cluster Five had the lowest number of students who received free and reduced lunch ($M = 23.06$, $SD = 4.91$) among the remaining clusters and was below the state mean score of 35.44 ($SD = 12.89$). Notably, Cluster Five had the highest incidents of truancy ($M = 12.65$, $SD = 10.06$) among the remaining clusters and was above the state mean score of 5.32 ($SD = 4.40$). Cluster Five had the third lowest incidents of disorderly conduct ($M = 15.12$, $SD = 8.34$) and vandalism ($M = 0.31$, $SD = 0.16$) among the clusters. While incidents of disorderly conduct were below the state mean score of 23.18 ($SD = 20.28$), incidents of vandalism were higher than the state mean score of 0.30 ($SD = 0.17$). Lastly, fights ($M = 1.87$, $SD = 1.35$) in Cluster Five was the second lowest among the clusters and was below the state mean score of 2.28 ($SD = 0.62$).

In summary, Cluster One scored below the state mean score in each content area and had a lower achievement score than three of the four clusters. Additionally, Cluster One scored above the state mean score in four of the five categories on the CI (disorderly conduct, fights, vandalism, and free and reduced lunch). Cluster Two, which scored above the state mean score in each of the four content area, scored below the state mean score in each category on the CI. Cluster Three, which had the lowest student achievement scores and scored below the state mean score in each content area, had the highest number of students who received free and reduced lunch. Cluster Four, which scored above the state mean score in each content area, scored below the state mean score in two of the five categories on the CI, (disorderly conduct and vandalism). Cluster Five, which scored above the state mean score in each content

area with the exception of English/reading, scored below the state mean score in two of the five categories on the CI (vandalism and truancy). Lastly, each cluster reported a mean score of less than one incident of vandalism per 100 students.

Research Question 2

Is there a relationship between school division climate, as measured by the CI, and state accreditation in English/reading of school divisions in the Commonwealth of Virginia?

The results from the Hierarchical Cluster analysis are presented in Table 8. The CI illustrates the mean score and standard deviation score for each cluster in the content area of English/reading, and for each discipline area (disorderly conduct, fights, vandalism, free and reduced lunch, and truancy). Incidents were based on infractions per 100 students. The number of students who received free and reduced lunch was also measured on a per-pupil scale of 100.

In the content area of English/reading, Cluster One ($n = 41$) recorded the second lowest student achievement score ($M = 78.72$, $SD = 6.31$) among each remaining cluster and was below the state mean score of 81.41 ($SD = 3.64$). On the CI, Cluster One had the highest number of disorderly conduct ($M = 57.03$, $SD = 33.29$) and fighting ($M = 3.10$, $SD = 2.51$) infractions when compared to the remaining clusters and was above the state mean score of 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. The number of students who received free and reduced lunch ($M = 42.78$, $SD = 13.95$) in Cluster One was the second highest among the clusters and above the state mean score of 35.44 ($SD = 12.89$). Vandalism ($M = 0.41$, $SD = 0.27$) in Cluster One was the

Table 8

English/reading: Climate Index Mean and Standard Deviation Score by Cluster Groups

	<u>Cluster 1</u>		<u>Cluster 2</u>		<u>Cluster 3</u>		<u>Cluster 4</u>		<u>Cluster 5</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
English/reading	78.72	6.31	84.93	4.98	77.11	7.86	85.24	1.69	81.07	3.57
Disorderly Conduct	57.03	33.29	6.38	4.66	11.19	5.31	26.17	3.89	15.12	8.34
Fighting	3.10	2.51	1.58	1.08	2.72	1.96	2.11	1.32	1.87	1.35
Vandalism	0.41	0.27	0.16	0.16	0.12	0.13	0.52	0.17	0.31	0.16
Free and Reduce	42.78	13.95	31.48	12.55	54.10	8.63	25.77	19.05	23.06	4.91
Truancy	5.19	5.90	4.99	6.13	2.61	2.23	1.81	1.85	12.65	10.06

Note. English/reading mean and standard deviation scores are based on the student pass percentage rate for each cluster. Mean and standard deviation scores for the CI are based on per-pupil scale of 100.

second highest among the clusters and above the state mean score of 0.30 ($SD = 0.17$). Lastly, truancy ($M = 5.19$, $SD = 5.90$), in Cluster One was the second highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$).

In the content area of English/reading, Cluster Two ($n = 56$) recorded the second highest student achievement score ($M = 84.93$, $SD = 4.98$) among each remaining cluster and was above the state mean score of 81.41 ($SD = 3.64$). On the CI, Cluster Two reported the lowest number of disorderly conduct ($M = 6.38$, $SD = 4.66$) and fighting ($M = 1.58$, $SD = 1.08$) infractions compared to the remaining clusters and was below the state mean score 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. Vandalism ($M = 0.16$, $SD = 0.16$) in Cluster Two was the second lowest among the clusters and was below the state mean score of 0.30 ($SD = 0.17$). Truancy ($M = 4.99$, $SD = 6.13$) in Cluster Two was third highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$). Lastly, the number of students who received free and reduced lunch ($M = 31.48$, $SD = 12.55$) in Cluster Two was the third highest among the clusters but was below the state mean score of 35.44 ($SD = 12.89$).

In the content area of English/reading, Cluster Three ($n = 21$) recorded the lowest student achievement score ($M = 77.11$, $SD = 7.86$) among each remaining cluster and was below the state mean score of 81.41 ($SD = 3.64$). On the CI, Cluster Three reported the second lowest incidents of disorderly conduct ($M = 11.19$, $SD = 5.31$) among the clusters and was below the state mean score of 23.18 ($SD = 20.28$). Notably, Cluster Three had the highest number of students who received free and reduced lunch ($M = 54.10$, $SD = 8.63$) among the clusters and was above the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.72$, $SD = 1.96$) in Cluster Three was

the second highest among the clusters and was higher than the state mean score of 2.28 ($SD = 0.62$). Truancy ($M = 1.96$, $SD = 2.23$) in Cluster Three was the second lowest among the clusters and was lower than the state mean score of 5.32 ($SD = 4.40$). Lastly, vandalism ($M = 0.12$, $SD = 0.13$) was the lowest among the clusters and was lower than the state mean score 0.30 ($SD = 0.17$).

In the content area of English/reading, Cluster Four ($n = 8$) recorded the highest student achievement score ($M = 85.24$, $SD = 1.69$) among each remaining cluster and was above the state mean score of 81.41 ($SD = 3.64$). On the CI, Cluster Four had the second highest number of disorderly conduct ($M = 26.17$, $SD = 3.89$) infractions and the highest incidents of vandalism ($M = 0.52$, $SD = 0.17$) among the clusters and was above the above the state mean score of 23.18 ($SD = 20.28$) and 0.30 ($SD = 0.17$), respectively. The number of students who received free and reduced lunch ($M = 25.77$, $SD = 19.05$) in Cluster Four was the second lowest among the clusters and was below the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.11$, $SD = 1.32$) in Cluster Four was the third highest among the clusters but was below the state mean score of 2.28 ($SD = 0.62$). Lastly, Cluster Four had the lowest incidents of truancy ($M = 1.81$, $SD = 1.85$) among the clusters and was below the state mean score of 5.32 ($SD = 4.40$).

In the content area of English/reading, Cluster Five ($n = 6$) recorded the third highest student achievement score ($M = 81.07$, $SD = 3.57$) among each remaining cluster but was slightly below the state mean score of 81.41 ($SD = 3.64$). On the CI, Cluster Five had the lowest number of students who received free and reduced lunch ($M = 23.06$, $SD = 4.91$) among the remaining clusters and was below the state mean score of 35.44 ($SD = 12.89$). Notably, Cluster Five had the highest incidents of truancy

($M = 12.65$, $SD = 10.06$) among the remaining clusters and was above the state mean score of 5.32 ($SD = 4.40$). Cluster Five had the third lowest incidents of disorderly conduct ($M = 15.12$, $SD = 8.34$) and vandalism ($M = 0.31$, $SD = 0.16$) among the clusters. While incidents of disorderly conduct were below the state mean score of 23.18 ($SD = 20.28$), incidents of vandalism were higher than the state mean score of 0.30 ($SD = 0.17$). Lastly, fights ($M = 1.87$, $SD = 1.35$) in Cluster Five was the second lowest among the clusters and was below the state mean score of 2.28 ($SD = 0.62$).

In summary, Cluster Three had the lowest achievement score ($M = 77.11$, $SD = 7.86$), whereas, Cluster Four had the highest achievement score ($M = 85.24$, $SD = 1.69$) in the content area of English/reading. Although Cluster Three had the lowest achievement score, it reported half the number of incidents of disorderly conduct ($M = 11.19$, $SD = 5.13$) than Cluster Four ($M = 26.17$, $SD = 3.89$). Moreover, Cluster Three reported less infractions of disorderly conduct when compared to the state mean score of 23.18 ($SD = 20.28$). However, it must be noted that both Cluster Three and Cluster Four reported a significantly lower number of incidents of disorderly conduct when compared to Cluster One ($M = 57.03$, $SD = 33.29$), which had low student achievement in the content area of English/reading ($M = 78.72$, $SD = 6.31$). Cluster Two and Cluster Five both scored above the state mean score in the content area of English/reading ($M = 81.41$, $SD = 3.64$) and scored below the state mean score for infractions of disorderly conduct ($M = 23.18$, $SD = 20.28$).

Cluster One ($M = 3.10$, $SD = 2.51$) and Clusters Three ($M = 2.72$, $SD = 1.96$) reported the highest number of fights and were above the state mean score of 2.28 ($SD = 0.62$). In terms of student achievement, both Cluster One ($M = 78.72$, $SD = 6.31$) and

Cluster Three ($M = 77.11$, $SD = 7.86$) scored below the state mean score of 81.41 ($SD = 3.64$) in the content area of English/reading. Additionally, Cluster One ($M = 42.78$, $SD = 13.95$) and Cluster Three ($M = 54.10$, $SD = 8.63$) had the highest number of students who received free and reduced lunch, which were nearly twice as high as those students who received free and reduced lunch from Cluster Four ($M = 25.77$, $SD = 19.05$) and were above the state mean score of 35.44 ($SD = 12.89$).

Cluster Five reported the most incidents of truancy ($M = 12.65$, $SD = 10.06$), which was more than twice the number of incidents of truancy reported by the remaining clusters. With the exception of Cluster Five, the remaining clusters reported fewer incidents of truancy than the state mean score of 5.32 ($SD = 4.40$). Lastly, each cluster reported a mean score of less than one incident of vandalism per 100 students.

Research Question 3

Is there a relationship between school division climate, as measured by the CI, and state accreditation in mathematics of school divisions in the Commonwealth of Virginia?

The results from the Hierarchical Cluster analysis are presented in Table 9. The CI illustrates the mean score and standard deviation score for each cluster in the content area of mathematics, and for each discipline area (disorderly conduct, fights, vandalism, free and reduced lunch, and truancy). Incidents were based on infractions per 100 students. The number of students who received free and reduced lunch was also measured on a per-pupil scale of 100.

In the content area of mathematics, Cluster One ($n = 41$) recorded the second lowest student achievement score ($M = 78.48$, $SD = 7.49$) among each remaining

Table 9

Mathematics: Climate Index Mean and Standard Deviation Score by Cluster Groups

	<u>Cluster 1</u>		<u>Cluster 2</u>		<u>Cluster 3</u>		<u>Cluster 4</u>		<u>Cluster 5</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mathematics	78.48	7.49	83.87	5.65	75.33	10.32	84.13	2.24	80.89	2.87
Disorderly Conduct	57.03	33.29	6.38	4.66	11.19	5.31	26.17	3.89	15.12	8.34
Fighting	3.10	2.51	1.58	1.08	2.72	1.96	2.11	1.32	1.87	1.35
Vandalism	0.41	0.27	0.16	0.16	0.12	0.13	0.52	0.17	0.31	0.16
Free and Reduce	42.78	13.95	31.48	12.55	54.10	8.63	25.77	19.05	23.06	4.91
Truancy	5.19	5.90	4.99	6.13	2.61	2.23	1.81	1.85	12.65	10.06

Note. Mathematic mean and standard deviation scores are based on the student pass percentage rate for each cluster.

Mean and standard deviation scores for the CI are based on per-pupil scale of 100.

cluster and was below the state mean score of 80.54 ($SD = 3.72$). On the CI, Cluster One had the highest number of disorderly conduct ($M = 57.03$, $SD = 33.29$) and fighting ($M = 3.10$, $SD = 2.51$) infractions when compared to the remaining clusters and was above the state mean score of 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. The number of students who received free and reduced lunch ($M = 42.78$, $SD = 13.95$) in Cluster One was the second highest among the clusters and above the state mean score of 35.44 ($SD = 12.89$). Vandalism ($M = 0.41$, $SD = 0.27$) in Cluster One was the second highest among the clusters and above the state mean score of 0.30 ($SD = 0.17$). Lastly, truancy ($M = 5.19$, $SD = 5.90$), in Cluster One was the second highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$).

In the content area of mathematics, Cluster Two ($n = 56$) recorded the second highest student achievement score ($M = 83.87$, $SD = 5.65$) among each remaining cluster and was above the state mean score of 80.54 ($SD = 3.72$). On the CI, Cluster Two reported the lowest number of disorderly conduct ($M = 6.38$, $SD = 4.66$) and fighting ($M = 1.58$, $SD = 1.08$) infractions compared to the remaining clusters and was below the state mean score 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. Vandalism ($M = 0.16$, $SD = 0.16$) in Cluster Two was the second lowest among the clusters and was below the state mean score of 0.30 ($SD = 0.17$). Truancy ($M = 4.99$, $SD = 6.13$) in Cluster Two was third highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$). Lastly, the number of students who received free and reduced lunch ($M = 31.48$, $SD = 12.55$) in Cluster Two was the third highest among the clusters but was below the state mean score of 35.44 ($SD = 12.89$).

In the content area of mathematics, Cluster Three ($n = 21$) recorded the lowest

student achievement score ($M = 75.33$, $SD = 10.32$) among each remaining cluster and was below the state mean score of 80.54 ($SD = 3.72$). On the CI, Cluster Three reported the second lowest incidents of disorderly conduct ($M = 11.19$, $SD = 5.31$) among the clusters and was below the state mean score of 23.18 ($SD = 20.28$). Notably, Cluster Three had the highest number of students who received free and reduced lunch ($M = 54.10$, $SD = 8.63$) among the clusters and was above the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.72$, $SD = 1.96$) in Cluster Three was the second highest among the clusters and was higher than the state mean score of 2.28 ($SD = 0.62$). Truancy ($M = 1.96$, $SD = 2.23$) in Cluster Three was the second lowest among the clusters and was lower than the state mean score of 5.32 ($SD = 4.40$). Lastly, vandalism ($M = 0.12$, $SD = 0.13$) was the lowest among the clusters and was lower than the state mean score 0.30 ($SD = 0.17$).

In the content area of mathematics, Cluster Four ($n = 8$) recorded the highest student achievement score ($M = 84.13$, $SD = 2.24$) among each remaining cluster and was above the state mean score of 80.54 ($SD = 3.72$). On the CI, Cluster Four had the second highest number of disorderly conduct ($M = 26.17$, $SD = 3.89$) infractions and the highest incidents of vandalism ($M = 0.52$, $SD = 0.17$) among the clusters and was above the above the state mean score of 23.18 ($SD = 20.28$) and 0.30 ($SD = 0.17$), respectively. The number of students who received free and reduced lunch ($M = 25.77$, $SD = 19.05$) in Cluster Four was the second lowest among the clusters and was below the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.11$, $SD = 1.32$) in Cluster Four was the third highest among the clusters but was below the state mean score of

2.28 ($SD = 0.62$). Lastly, Cluster Four had the lowest incidents of truancy ($M = 1.81$, $SD = 1.85$) among the clusters and was below the state mean score of 5.32 ($SD = 4.40$).

In the content area of mathematics, Cluster Five ($n = 6$) recorded the third highest student achievement score ($M = 80.89$, $SD = 2.87$) among each remaining cluster, which was slightly above the state mean score of 80.54 ($SD = 3.72$). On the CI, Cluster Five had the lowest number of students who received free and reduced lunch ($M = 23.06$, $SD = 4.91$) among the remaining clusters and was below the state mean score of 35.44 ($SD = 12.89$). Notably, Cluster Five had the highest incidents of truancy ($M = 12.65$, $SD = 10.06$) among the remaining clusters and was above the state mean score of 5.32 ($SD = 4.40$). Cluster Five had the third lowest incidents of disorderly conduct ($M = 15.12$, $SD = 8.34$) and vandalism ($M = 0.31$, $SD = 0.16$) among the clusters. While incidents of disorderly conduct were below the state mean score of 23.18 ($SD = 20.28$), incidents of vandalism were higher than the state mean score of 0.30 ($SD = 0.17$). Lastly, fights ($M = 1.87$, $SD = 1.35$) in Cluster Five was the second lowest among the clusters and was below the state mean score of 2.28 ($SD = 0.62$).

In summary, Cluster Three had the lowest achievement score ($M = 75.33$, $SD = 10.32$), whereas, Cluster Four had the highest achievement score ($M = 84.13$, $SD = 2.24$) in the content area of mathematics. Although Cluster Three had the lowest achievement score, it reported half the number of incidents of disorderly conduct ($M = 11.19$, $SD = 5.13$) than Cluster Four ($M = 26.17$, $SD = 3.89$). Moreover, Cluster Three reported less infractions of disorderly conduct when compared to the state mean score of 23.18 ($SD = 20.28$). However, it must be noted that both Cluster Three and Cluster Four reported a significantly lower number of incidents of disorderly conduct when

compared to Cluster One ($M = 57.03$, $SD = 33.29$), which had low student achievement in the content area of mathematics ($M = 78.48$, $SD = 7.49$). Cluster Two and Cluster Five both scored above the state mean score in the content area of mathematics ($M = 80.54$, $SD = 3.72$) and scored below the state mean score for infractions of disorderly conduct ($M = 23.18$, $SD = 20.28$).

Cluster One ($M = 3.10$, $SD = 2.51$) and Clusters Three ($M = 2.72$, $SD = 1.96$) reported the highest number of fights and were above the state mean score of 2.28 ($SD = 0.62$). In terms of student achievement, both Cluster One ($M = 78.48$, $SD = 7.49$) and Cluster Three ($M = 75.33$, $SD = 10.32$) scored below the state mean score of 80.54 ($SD = 3.72$) in the content area of mathematics. Additionally, Cluster One ($M = 42.78$, $SD = 13.95$) and Cluster Three ($M = 54.10$, $SD = 8.63$) had the highest number of students who received free and reduced lunch, which were nearly twice as high as those students who received free and reduced lunch from Cluster Four ($M = 25.77$, $SD = 19.05$) and were above the state mean score of 35.44 ($SD = 12.89$).

Cluster Five reported the most incidents of truancy ($M = 12.65$, $SD = 10.06$), which was more than twice the number of incidents of truancy reported by the remaining clusters. With the exception of Cluster Five, the remaining clusters reported fewer incidents of truancy than the state mean score of 5.32 ($SD = 4.40$). Lastly, each cluster reported a mean score of less than one incident of vandalism per 100 students.

Research Question 4

Is there a relationship between school division climate, as measured by the CI, and state accreditation in history/social science of school divisions in the Commonwealth of Virginia?

Results for this research question are presented in Table 10. The CI illustrates the mean score and standard deviation score for each cluster in the content area of history/social science, and for each discipline area (disorderly conduct, fights, vandalism, free and reduced lunch, and truancy). Incidents were based on infractions per 100 students. The number of students who received free and reduced lunch were also measured on a per-pupil scale of 100.

In the content area of history/social science, Cluster One ($n = 41$) recorded the second lowest student achievement score ($M = 75.80$, $SD = 7.18$) among each remaining cluster and was below the state mean score of 80.14 ($SD = 4.63$). On the CI, Cluster One had the highest number of disorderly conduct ($M = 57.03$, $SD = 33.29$) and fighting ($M = 3.10$, $SD = 2.51$) infractions when compared to the remaining clusters and was above the state mean score of 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. The number of students who received free and reduced lunch ($M = 42.78$, $SD = 13.95$) in Cluster One was the second highest among the clusters and above the state mean score of 35.44 ($SD = 12.89$). Vandalism ($M = 0.41$, $SD = 0.27$) in Cluster One was the second highest among the clusters and above the state mean score of 0.30 ($SD = 0.17$). Lastly, truancy ($M = 5.19$, $SD = 5.90$), in Cluster One was the second highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$).

In the content area of history/social science, Cluster Two ($n = 56$) recorded the second highest student achievement score ($M = 83.08$, $SD = 5.76$) among each remaining cluster and was above the state mean score of 80.14 ($SD = 4.63$). On the CI, Cluster Two reported the lowest number of disorderly conduct ($M = 6.38$, $SD = 4.66$) and fighting ($M = 1.58$, $SD = 1.08$) infractions compared to the remaining clusters and

Table10

History/social science: Climate Index Mean and Standard Deviation Score by Cluster Groups

	<u>Cluster 1</u>		<u>Cluster 2</u>		<u>Cluster 3</u>		<u>Cluster 4</u>		<u>Cluster 5</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
History/social science	75.80	7.18	83.08	5.76	74.58	10.06	84.86	3.03	82.40	2.76
Disorderly Conduct	57.03	33.29	6.38	4.66	11.19	5.31	26.17	3.89	15.12	8.34
Fighting	3.10	2.51	1.58	1.08	2.72	1.96	2.11	1.32	1.87	1.35
Vandalism	0.41	0.27	0.16	0.16	0.12	0.13	0.52	0.17	0.31	0.16
Free and Reduce	42.78	13.95	31.48	12.55	54.10	8.63	25.77	19.05	23.06	4.91
Truancy	5.19	5.90	4.99	6.13	2.61	2.23	1.81	1.85	12.65	10.06

Note. History/social science mean and standard deviation scores are based on the student pass percentage rate for each cluster. Mean and standard deviation scores for the CI are based on per-pupil scale of 100.

was below the state mean score 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. Vandalism ($M = 0.16$, $SD = 0.16$) in Cluster Two was the second lowest among the clusters and was below the state mean score of 0.30 ($SD = 0.17$). Truancy ($M = 4.99$, $SD = 6.13$) in Cluster Two was third highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$). Lastly, the number of students who received free and reduced lunch ($M = 31.48$, $SD = 12.55$) in Cluster Two was the third highest among the clusters but was below the state mean score of 35.44 ($SD = 12.89$).

In the content area of history/social science, Cluster Three ($n = 21$) recorded the lowest student achievement score ($M = 74.58$, $SD = 10.06$) among each remaining cluster and was below the state mean score of 80.14 ($SD = 4.63$). On the CI, Cluster Three reported the second lowest incidents of disorderly conduct ($M = 11.19$, $SD = 5.31$) among the clusters and was below the state mean score of 23.18 ($SD = 20.28$). Notably, Cluster Three had the highest number of students who received free and reduced lunch ($M = 54.10$, $SD = 8.63$) among the clusters and was above the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.72$, $SD = 1.96$) in Cluster Three was the second highest among the clusters and was higher than the state mean score of 2.28 ($SD = 0.62$). Truancy ($M = 1.96$, $SD = 2.23$) in Cluster Three was the second lowest among the clusters and was lower than the state mean score of 5.32 ($SD = 4.40$). Lastly, vandalism ($M = 0.12$, $SD = 0.13$) was the lowest among the clusters and was lower than the state mean score 0.30 ($SD = 0.17$).

In the content area of history/social science, Cluster Four ($n = 8$) recorded the highest student achievement score ($M = 84.86$, $SD = 3.03$) among each remaining cluster and was above the state mean score of 80.14 ($SD = 4.63$). On the CI, Cluster

Four had the second highest number of disorderly conduct ($M = 26.17$, $SD = 3.89$) infractions and the highest incidents of vandalism ($M = 0.52$, $SD = 0.17$) among the clusters and was above the above the state mean score of 23.18 ($SD = 20.28$) and 0.30 ($SD = 0.17$), respectively. The number of students who received free and reduced lunch ($M = 25.77$, $SD = 19.05$) in Cluster Four was the second lowest among the clusters and was below the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.11$, $SD = 1.32$) in Cluster Four was the third highest among the clusters but was below the state mean score of 2.28 ($SD = 0.62$). Lastly, Cluster Four had the lowest incidents of truancy ($M = 1.81$, $SD = 1.85$) among the clusters and was below the state mean score of 5.32 ($SD = 4.40$).

In the content area of history/social science, Cluster Five ($n = 6$) recorded the third highest student achievement score ($M = 82.40$, $SD = 2.76$) among each remaining cluster, which is slightly above the state mean score of 80.14 ($SD = 4.63$). On the CI, Cluster Five had the lowest number of students who received free and reduced lunch ($M = 23.06$, $SD = 4.91$) among the remaining clusters and was below the state mean score of 35.44 ($SD = 12.89$). Notably, Cluster Five had the highest incidents of truancy ($M = 12.65$, $SD = 10.06$) among the remaining clusters and was above the state mean score of 5.32 ($SD = 4.40$). Cluster Five had the third lowest incidents of disorderly conduct ($M = 15.12$, $SD = 8.34$) and vandalism ($M = 0.31$, $SD = 0.16$) among the clusters. While incidents of disorderly conduct were below the state mean score of 23.18 ($SD = 20.28$), incidents of vandalism were higher than the state mean score of 0.30 ($SD = 0.17$). Lastly, fights ($M = 1.87$, $SD = 1.35$) in Cluster Five was the second lowest among the clusters and was below the state mean score of 2.28 ($SD = 0.62$).

In summary, Cluster Three had the lowest achievement score ($M = 74.58$, $SD = 10.06$), whereas, Cluster Four had the highest achievement score ($M = 84.86$, $SD = 3.03$) in the content area of history/social science. Although Cluster Three had the lowest achievement score, it reported half the number of incidents of disorderly conduct ($M = 11.19$, $SD = 5.13$) than Cluster Four ($M = 26.17$, $SD = 3.89$). Moreover, Cluster Three reported less infractions of disorderly conduct when compared to the state mean score of 23.18 ($SD = 20.28$). However, it must be noted that both Cluster Three and Cluster Four reported a significantly lower number of incidents of disorderly conduct when compared to Cluster One ($M = 57.03$, $SD = 33.29$), which had low student achievement in the content area of history/social science ($M = 75.80$, $SD = 7.18$). Cluster Two and Cluster Five both scored above the state mean score in the content area of history/social science ($M = 80.14$, $SD = 4.63$) and scored below the state mean score for infractions of disorderly conduct ($M = 23.18$, $SD = 20.28$).

Cluster One ($M = 3.10$, $SD = 2.51$) and Clusters Three ($M = 2.72$, $SD = 1.96$) reported the highest number of fights and were above the state mean score of 2.28 ($SD = 0.62$). In terms of student achievement, both Cluster One ($M = 75.80$, $SD = 7.18$) and Cluster Three ($M = 74.58$, $SD = 10.06$) scored below the state mean score of 80.14 ($SD = 4.63$) in the content area of history/social science. Additionally, Cluster One ($M = 42.78$, $SD = 13.95$) and Cluster Three ($M = 54.10$, $SD = 8.63$) had the highest number of students who received free and reduced lunch, which were nearly twice as high as those students who received free and reduced lunch from Cluster Four ($M = 25.77$, $SD = 19.05$) and were above the state mean score of 35.44 ($SD = 12.89$).

Cluster Five reported the most incidents of truancy ($M = 12.65$, $SD = 10.06$), which was more than twice the number of incidents of truancy reported by the remaining clusters. With the exception of Cluster Five, the remaining clusters reported fewer incidents of truancy than the state mean score of 5.32 ($SD = 4.40$). Lastly, each cluster reported a mean score of less than one incident of vandalism per 100 students.

Research Question 5

Is there a relationship between school division climate, as measured by the CI, and state accreditation in science of school divisions in the Commonwealth of Virginia?

Results for this research question are presented in Table 11. The CI illustrates the mean score and standard deviation score for each cluster in the content area of science, and for each discipline area (disorderly conduct, fights, vandalism, free and reduced lunch, and truancy). Incidents were based on infractions per 100 students. The number of students who received free and reduced lunch was also measured on a per-pupil scale of 100.

In the content area of science, Cluster One ($n = 41$) recorded the second lowest student achievement score ($M = 77.05$, $SD = 7.54$) among each remaining cluster and was below the state mean score of 81.72 ($SD = 5.49$). On the CI, Cluster One had the highest number of disorderly conduct ($M = 57.03$, $SD = 33.29$) and fighting ($M = 3.10$, $SD = 2.51$) infractions when compared to the remaining clusters and was above the state mean score of 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. The number of students who received free and reduced lunch ($M = 42.78$, $SD = 13.95$) in Cluster One was the second highest among the clusters and above the state mean score of 35.44 ($SD = 12.89$). Vandalism ($M = 0.41$, $SD = 0.27$) in Cluster One was the second

Table 11

Science: Climate Index Mean and Standard Deviation Score by Cluster Groups

	<u>Cluster 1</u>		<u>Cluster 2</u>		<u>Cluster 3</u>		<u>Cluster 4</u>		<u>Cluster 5</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Science	77.05	7.54	85.25	4.77	74.77	8.80	87.40	2.46	84.14	3.87
Disorderly Conduct	57.03	33.29	6.38	4.66	11.19	5.31	26.17	3.89	15.12	8.34
Fighting	3.10	2.51	1.58	1.08	2.72	1.96	2.11	1.32	1.87	1.35
Vandalism	0.41	0.27	0.16	0.16	0.12	0.13	0.52	0.17	0.31	0.16
Free and Reduce	42.78	13.95	31.48	12.55	54.10	8.63	25.77	19.05	23.06	4.91
Truancy	5.19	5.90	4.99	6.13	2.61	2.23	1.81	1.85	12.65	10.06

Note. History/social science mean and standard deviation scores are based on the student pass percentage rate for each cluster. Mean and standard deviation scores for the CI are based on per-pupil scale of 100.

highest among the clusters and above the state mean score of 0.30 ($SD = 0.17$). Lastly, truancy ($M = 5.19$, $SD = 5.90$), in Cluster One was the second highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$).

In the content area of science, Cluster Two ($n = 56$) recorded the second highest student achievement score ($M = 85.25$, $SD = 4.77$) among each remaining cluster and was above the state mean score of 81.72 ($SD = 5.49$). On the CI, Cluster Two reported the lowest number of disorderly conduct ($M = 6.38$, $SD = 4.66$) and fighting ($M = 1.58$, $SD = 1.08$) infractions compared to the remaining clusters and was below the state mean score 23.18 ($SD = 20.28$) and 2.28 ($SD = 0.62$), respectively. Vandalism ($M = 0.16$, $SD = 0.16$) in = Cluster Two was the second lowest among the clusters and was below the state mean score of 0.30 ($SD = 0.17$). Truancy ($M = 4.99$, $SD = 6.13$) in Cluster Two was third highest among the clusters but was below the state mean score of 5.32 ($SD = 4.40$). Lastly, the number of students who received free and reduced lunch ($M = 31.48$, $SD = 12.55$) in Cluster Two was the third highest among the clusters but was below the state mean score of 35.44 ($SD = 12.89$).

In the content area of science, Cluster Three ($n = 21$) recorded the lowest student achievement score ($M = 74.77$, $SD = 8.80$) among each remaining cluster and is below the state mean score of 81.72 ($SD = 5.49$). On the CI, Cluster Three reported the second lowest incidents of disorderly conduct ($M = 11.19$, $SD = 5.31$) among the clusters and was below the state mean score of 23.18 ($SD = 20.28$). Notably, Cluster Three had the highest number of students who received free and reduced lunch ($M = 54.10$, $SD = 8.63$) among the clusters and was above the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.72$, $SD = 1.96$) in Cluster Three was the second highest

among the clusters and was higher than the state mean score of 2.28 ($SD = 0.62$). Truancy ($M = 1.96$, $SD = 2.23$) in Cluster Three was the second lowest among the clusters and was lower than the state mean score of 5.32 ($SD = 4.40$). Lastly, vandalism ($M = 0.12$, $SD = 0.13$) was the lowest among the clusters and was lower than the state mean score 0.30 ($SD = 0.17$).

In the content area of science, Cluster Four ($n = 8$) recorded the highest student achievement score ($M = 87.40$, $SD = 2.46$) among each remaining cluster and was above the state mean score of 81.72 ($SD = 5.49$). On the CI, Cluster Four had the second highest number of disorderly conduct ($M = 26.17$, $SD = 3.89$) infractions and the highest incidents of vandalism ($M = 0.52$, $SD = 0.17$) among the clusters and was above the above the state mean score of 23.18 ($SD = 20.28$) and 0.30 ($SD = 0.17$), respectively. The number of students who received free and reduced lunch ($M = 25.77$, $SD = 19.05$) in Cluster Four was the second lowest among the clusters and was below the state mean score of 35.44 ($SD = 12.89$). Fights ($M = 2.11$, $SD = 1.32$) in Cluster Four was the third highest among the clusters but was below the state mean score of 2.28 ($SD = 0.62$). Lastly, Cluster Four had the lowest incidents of truancy ($M = 1.81$, $SD = 1.85$) among the clusters and was below the state mean score of 5.32 ($SD = 4.40$).

In the content area of science, Cluster Five ($n = 6$) recorded the third highest student achievement score ($M = 84.14$, $SD = 3.87$) among each remaining cluster and is higher than the state mean score of 81.72 ($SD = 5.49$). On the CI, Cluster Five had the lowest number of students who received free and reduced lunch ($M = 23.06$, $SD = 4.91$) among the remaining clusters and was below the state mean score of 35.44 ($SD = 12.89$). Notably, Cluster Five had the highest incidents of truancy ($M = 12.65$, $SD =$

10.06) among the remaining clusters and was above the state mean score of 5.32 ($SD = 4.40$). Cluster Five had the third lowest incidents of disorderly conduct ($M = 15.12$, $SD = 8.34$) and vandalism ($M = 0.31$, $SD = 0.16$) among the clusters. While incidents of disorderly conduct were below the state mean score of 23.18 ($SD = 20.28$), incidents of vandalism were higher than the state mean score of 0.30 ($SD = 0.17$). Lastly, fights ($M = 1.87$, $SD = 1.35$) in Cluster Five was the second lowest among the clusters and was below the state mean score of 2.28 ($SD = 0.62$).

In summary, Cluster Three had the lowest achievement score ($M = 74.77$, $SD = 8.80$), whereas, Cluster Four had the highest achievement score ($M = 87.40$, $SD = 2.46$) in the content area of science. Although Cluster Three had the lowest achievement score, it reported half the number of incidents of disorderly conduct ($M = 11.19$, $SD = 5.13$) than Cluster Four ($M = 26.17$, $SD = 3.89$). Moreover, Cluster Three reported less infractions of disorderly conduct when compared to the state mean score of 23.18 ($SD = 20.28$). However, it must be noted that both Cluster Three and Cluster Four reported a significantly lower number of incidents of disorderly conduct when compared to Cluster One ($M = 57.03$, $SD = 33.29$), which had low student achievement in the content area of science ($M = 77.05$, $SD = 7.54$). Cluster Two and Cluster Five both scored above the state mean score in the content area of science ($M = 81.72$, $SD = 5.49$) and scored below the state mean score for infractions of disorderly conduct ($M = 23.18$, $SD = 20.28$).

Cluster One ($M = 3.10$, $SD = 2.51$) and Clusters Three ($M = 2.72$, $SD = 1.96$) reported the highest number of fights and were above the state mean score of 2.28 ($SD = 0.62$). In terms of student achievement, both Cluster One ($M = 77.05$, $SD = 7.54$) and

Cluster Three ($M = 74.77$, $SD = 8.80$) scored below the state mean score of 81.72 ($SD = 5.49$) in the content area of science. Additionally, Cluster One ($M = 42.78$, $SD = 13.95$) and Cluster Three ($M = 54.10$, $SD = 8.63$) had the highest number of students who received free and reduced lunch, which were nearly twice as high as those students who received free and reduced lunch from Cluster Four ($M = 25.77$, $SD = 19.05$) and were above the state mean score of 35.44 ($SD = 12.89$).

Cluster Five reported the most incidents of truancy ($M = 12.65$, $SD = 10.06$), which was more than twice the number of incidents of truancy reported by the remaining clusters. With the exception of Cluster Five, the remaining clusters reported fewer incidents of truancy than the state mean score of 5.32 ($SD = 4.40$). Lastly, each cluster reported a mean score of less than one incident of vandalism per 100 students.

Lastly, a cluster analysis was performed excluding free and reduced lunch to determine how school divisions would cluster based on infractions (disorderly conduct, fights, vandalism, and truancy) alone. Table 12 illustrates the number of school divisions that appear in each cluster when considering free and reduced lunch and the number of school divisions that appear in each cluster when excluding free and reduced lunch (Appendix L).

A comparison between the two-cluster analyses showed that a difference existed between the number of school divisions in each cluster when free and reduced lunch is excluded. The following differences were noted: Cluster One ($n = 1$), Cluster Two, ($n = 8$), Cluster Three ($n = 10$), Cluster Four ($n = 2$), and Cluster Five ($n = 5$). Findings from a comparison between the two-cluster analyses of school divisions clustered when free and reduced lunch was included and analyses of school divisions clustered when free

Table 12

Cluster Comparison: With Free and Reduced Lunch and Without Free and Reduced Lunch

Cluster	Cluster Group(s)	
	With Free and Reduced Lunch	Without Free and Reduced Lunch
1	41	40
2	56	64
3	21	11
4	8	6
5	6	11

and reduced lunch was excluded, can be found in Appendix F.

Conclusion

The purpose of this study was to determine the relationship between school division climate and student achievement of school divisions in the Commonwealth of Virginia. The population for this study was 132 public school divisions.

Results from the 2002 – 2003 Virginia SOL tests were used to measure student achievement. To assess school climate, a CI was created using preexisting data provided by individual school divisions to the VDOE. A Hierarchical Cluster method was used to categorize school divisions into five clusters according to the likeness and similarities of their climate. Clusters were analyzed to determine the relationship

between school climate and student achievement for school divisions in the Commonwealth of Virginia.

Analysis of each cluster revealed several findings. Cluster One ($n = 41$) and Cluster Three ($n = 21$) had the lowest student achievement rate in each reporting category when compared to the remaining clusters. Notably, both had a higher mean score in the category of fighting (Cluster One, $M = 3.10$, $SD = 2.51$; Cluster Three, $M = 2.72$, $SD = 1.96$) and the number of students who received free and reduced lunch (Cluster One, $M = 42.78$, $SD = 13.95$; Cluster Three, $M = 54.10$, $SD = 8.63$). Cluster One ranked significantly higher in the category of disorderly conduct ($M = 57.03$, $SD = 33.29$), which reported more than twice the number of disorderly conduct infractions than any of the remaining clusters.

Cluster Two ($n = 56$) and Cluster Four ($n = 8$) had the highest student achievement rate in each reporting category. Notably, both clusters reported a low number of students who received free and reduced lunch (Cluster Two, $M = 31.48$, $SD = 12.55$; Cluster Four, $M = 25.77$, $SD = 19.05$). Cluster Two ranked significantly lower in the category of disorderly conduct ($M = 6.38$, $SD = 4.66$) infractions when compared to the remaining clusters.

While Cluster Five reported the lowest number of students who received free and reduced lunch ($M = 23.06$, $SD = 4.91$), it had the highest infractions of truancy ($M = 12.65$, $SD = 10.06$). Results found that Cluster Five reported more than twice the number of truancy infractions than any of the remaining clusters.

Lastly, the CI that follows is a summation of findings and includes incidents of (a) disorderly conduct, (b) fights, (c) vandalism, and (d) truancy. Incidents were based

on infractions per 100 students. The number of students who received free and reduced lunch was also included and was measured on a per-pupil scale of 100. In addition, included were mean scores and standard deviation scores for student achievement in each content area for each cluster of school divisions ($N = 132$) in the Commonwealth of Virginia. The findings presented in the CI will serve as a base for a summary of this study, analysis of data, discussion of the findings, and recommendations for future studies, which will be presented in Chapter 5.

Table 13 is an illustration of the CI for incidents of disorderly conduct. Also included are mean scores and standard deviation scores for student achievement in each content area for each cluster.

Table 13

CI: Mean and Standard Deviation of Disorderly Conduct and Student Achievement by Cluster Groups

Cluster	<u>Disorderly Conduct</u>		<u>English/reading</u>		<u>Mathematics</u>		<u>History/social science</u>		<u>Science</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	57.03	33.29	78.72	6.31	78.48	7.49	75.80	7.18	77.05	7.54
2	6.38	4.66	84.93	4.98	83.87	5.65	83.08	5.76	85.25	4.77
3	11.19	5.31	77.11	7.86	75.33	10.32	74.58	10.06	74.77	8.80
4	26.17	3.89	85.24	1.69	84.13	2.24	84.86	3.03	87.40	2.46
5	15.12	8.34	81.07	3.57	80.89	2.87	82.40	2.76	84.14	3.87
Total	23.18	20.28	81.41	3.64	80.54	3.72	80.14	4.63	81.72	5.49

Table 14, is an illustration of the CI for incidents of fights. Also included are mean scores and standard deviation scores for student achievement in each content area for each cluster.

Table 14

CI: Mean and Standard Deviation of Fights and Student Achievement by Cluster Groups

<u>Cluster</u>	<u>Fights</u>		<u>English/reading</u>		<u>Mathematics</u>		<u>History/social science</u>		<u>Science</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	3.10	2.51	78.72	6.31	78.48	7.49	75.80	7.18	77.05	7.54
2	1.58	1.08	84.93	4.98	83.87	5.65	83.08	5.76	85.25	4.77
3	2.72	1.96	77.11	7.86	75.33	10.32	74.58	10.06	74.77	8.80
4	2.11	1.32	85.24	1.69	84.13	2.24	84.86	3.03	87.40	2.46
5	1.87	1.35	81.07	3.57	80.89	2.87	82.40	2.76	84.14	3.87
Total	2.28	0.62	81.41	3.64	80.54	3.72	80.14	4.63	81.72	5.49

Table 15, is an illustration of the CI for incidents of vandalism. Also included are mean scores and standard deviation scores for student achievement in each content area for each cluster.

Table 15

CI: Mean and Standard Deviation of Vandalism and Student Achievement by Cluster Groups

Cluster	<u>Vandalism</u>		<u>English/reading</u>		<u>Mathematics</u>		<u>History/social science</u>		<u>Science</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	0.41	0.27	78.72	6.31	78.48	7.49	75.80	7.18	77.05	7.54
2	0.16	0.16	84.93	4.98	83.87	5.65	83.08	5.76	85.25	4.77
3	0.12	0.13	77.11	7.86	75.33	10.32	74.58	10.06	74.77	8.80
4	0.52	0.17	85.24	1.69	84.13	2.24	84.86	3.03	87.40	2.46
5	0.31	0.16	81.07	3.57	80.89	2.87	82.40	2.76	84.14	3.87
Total	0.30	0.17	81.41	3.64	80.54	3.72	80.14	4.63	81.72	5.49

Table 16, is an illustration of the CI for students that received free and reduced lunch. Also included are mean scores and standard deviation scores for student achievement in each content area for each cluster.

Table 16

CI: Mean and Standard Deviation of Free and Reduced Lunch and Student Achievement by Cluster Groups

Cluster	<u>Free and Reduced Lunch</u>		<u>English/reading</u>		<u>Mathematics</u>		<u>History/social science</u>		<u>Science</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
	1	42.78	13.95	78.72	6.31	78.48	7.49	75.80	7.18	77.05
2	31.48	12.55	84.93	4.98	83.87	5.65	83.08	5.76	85.25	4.77
3	54.10	8.63	77.11	7.86	75.33	10.32	74.58	10.06	74.77	8.80
4	25.77	19.05	85.24	1.69	84.13	2.24	84.86	3.03	87.40	2.46
5	23.06	4.91	81.07	3.57	80.89	2.87	82.40	2.76	84.14	3.87
Total	35.44	12.89	81.41	3.64	80.54	3.72	80.14	4.63	81.72	5.49

Table 17, is an illustration of the CI for incidents of truancy. Also included are mean scores and standard deviation scores for student achievement in each content area for each cluster.

Table 17

CI: Mean and Standard Deviation of Truancy and Student Achievement by Cluster Groups

Cluster	Truancy		English/reading		Mathematics		History/social science		Science	
	M	SD	M	SD	M	SD	M	SD	M	SD
1	5.19	5.90	78.72	6.31	78.48	7.49	75.80	7.18	77.05	7.54
2	4.99	6.13	84.93	4.98	83.87	5.65	83.08	5.76	85.25	4.77
3	1.96	2.23	77.11	7.86	75.33	10.32	74.58	10.06	74.77	8.80
4	1.81	1.85	85.24	1.69	84.13	2.24	84.86	3.03	87.40	2.46
5	12.65	10.06	81.07	3.57	80.89	2.87	82.40	2.76	84.14	3.87
Total	5.32	4.40	81.41	3.64	80.54	3.72	80.14	4.63	81.72	5.49

CHAPTER 5

SUMMARY, CONCLUSION, DISCUSSION, AND RECOMMENDATIONS

“Positive school climate has become part of the effective school rhetoric and is advocated by educational practitioners and reformers as a specific means for improving student achievement (p.1)”

Hoy et al. (1991)

Introduction

Included in Chapter 5 are the following sections: (a) topic review of this inquiry, (b) findings, (c) summary of findings, and (d) implications. This chapter will end with recommendations for future studies, followed by personal reflections.

Literature suggests that a relationship exists between school climate and student achievement (Brookover et al., 1978; Bulach et al., 1995; Gayton, 1999). Hoy and Hannum (1997) found school climate to be an important aspect in effective schools. Though difficult to define, many definitions of school climate exist (Hoy et al., 1991; Shore, 1995). Halpin and Croft (1962) described school climate as “the organizational personality of a school; figuratively, personality is to the individual what climate is to the organization” (p. 1). School climate has also been defined as “a relatively enduring quality of the entire school that is experienced by members, describes their collective perceptions of routine behavior, and affects their attitudes and behavior in the school” (Hoy & Miskel, 1996, p). Lastly, Sackney (1988) referred to school climate as “...the perception that individuals have of various aspects of the internal environment of the school and that influences their behavior” (p. 16).

Theoretically, if educators are happy and feel a sense of importance to the school and their work, they will be productive teachers. Likewise, if students are happy and feel a sense of importance to their work and the school, they will achieve academically. If both are true, in theory, the climate of the school should be conducive to both teaching and learning. If both are not true, theoretically, the climate of the school will be poor and counterproductive to both teaching and learning. Therefore, it is important to identify factors associated with both a good school climate and a poor school climate. It is equally important to identify relationships between these factors and student achievement.

In the review of related literature, no studies were found that address the relationship between school climate and the behavior of students at the district level. The purpose of this study was to determine if there is a relationship between school division climate and student achievement of school divisions in the Commonwealth of Virginia. The population for this study was 132 public school divisions in the Commonwealth of Virginia. The population included 1,829 elementary, middle, and high schools. The following research questions guided this study:

1. Is there a relationship between school division climate, as measured by the Climate Index (CI), and student achievement in school divisions in the Commonwealth of Virginia?
2. Is there a relationship between school division climate, as measured by the CI, and state accreditation in English/reading of school divisions in the Commonwealth of Virginia?

3. Is there a relationship between school division climate, as measured by the CI, and state accreditation in mathematics of school divisions in the Commonwealth of Virginia?
4. Is there a relationship between school division climate, as measured by the CI, and state accreditation in history/social science of school divisions in the Commonwealth of Virginia?
5. Is there a relationship between school division climate, as measured by the CI, and state accreditation in science of school divisions in the Commonwealth of Virginia?

This study provides information regarding the relationship between school division climate and student achievement in school divisions across the Commonwealth of Virginia. A Hierarchical Cluster method was used to create a climate index from preexisting data resulting in five clusters of school divisions based on three reports provided by the Virginia Department of Education (VDOE). These reports include the:

- 1) Free and Reduced Lunch report,
- 2) Discipline, Crime, and Violence Incident report, and
- 3) Truancy report.

Results from the 2002 – 2003 Virginia Standards of Learning (SOL) tests were used to measure student achievement.

Because this study sought to describe the relationship among factors contributing to school climate and the level of student achievement of school divisions in the Commonwealth of Virginia, this study is descriptive in nature. To group school divisions according to like factors, the Hierarchical Cluster method was applied using the

Johnson Max process. Everitt (1974) described the Hierarchical Cluster method as a process of classifying groups and repeating the process at different levels creating a dendrogram. The Johnson Max is a process by which variables are stacked according to like factors or similarities. Five clusters were created forming a climate index inclusive of all 132-school divisions in the Commonwealth. Clusters were analyzed to determine the relationship between the climate in like school divisions and student achievement for school divisions in the Commonwealth of Virginia.

Findings

1. Based on the CI, there is a relationship between school division climate and student achievement in school divisions in the Commonwealth of Virginia.
2. Based on the CI, there is a relationship between school division climate, as measured by the CI, and state accreditation in English/reading of school divisions in the Commonwealth of Virginia. This is evident by data that show lower achieving school divisions have a higher number of incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch; whereas, higher achieving school divisions in English/reading have a lower number of incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch.
3. Based on the CI, there is a relationship between school division climate, as measured by the CI, and state accreditation in mathematics of school divisions in the Commonwealth of Virginia. This is evident by data that show lower achieving school divisions in mathematics have a higher number of incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch;

whereas, higher achieving school divisions in mathematics have a lower number of incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch.

4. Based on the CI, there is a relationship between school division climate, as measured by the CI, and state accreditation in history/social science of school divisions in the Commonwealth of Virginia. This is evident by data that show lower achieving school divisions in history/social science have a higher number of incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch; whereas, higher achieving school divisions in history/social science have a lower number of incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch.
5. Based on the CI, there is a relationship between school division climate, as measured by the CI, and state accreditation in science of school divisions in the Commonwealth of Virginia. This is evident by data that show lower achieving school divisions in science have a higher number of incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch; whereas, higher achieving school divisions in science have a lower number of incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch.
6. Based on the CI, there is a relationship between the number of disorderly conduct infractions and student achievement. This is evident by data that show lower achieving school divisions have a higher number of disorderly conduct

infractions, whereas, higher achieving school divisions have a lower number of disorderly conduct infractions.

7. Based on the CI, there is a relationship between the number of fights and student achievement. This is evident by data that show lower achieving school divisions have a higher number of fights, whereas, higher achieving school divisions have a lower number of fights.
8. Based on the CI, there is a relationship between the number of students who receive free and reduced lunch and student achievement. This is evident by data that show lower achieving school divisions have a higher number of students who receive free and reduced lunch, whereas, higher achieving school divisions have a lower number of students who receive free and reduced lunch.
9. Based on the CI, there is a relationship between truancy and student achievement. This is evident by data that shows lower achieving school divisions have a higher number of truancy infractions, whereas, higher achieving school divisions have a lower number of truancy infractions.
10. Based on the CI, incidents of disorderly conduct combined with the number of students who receive free and reduced lunch are the best predictors of student achievement. This is evident by data that show lower achieving school divisions have a higher number of disorderly conduct infractions and students who receive free and reduced lunch, whereas, higher achieving school divisions have a lower number of disorderly conduct infractions and students who receive free and reduced lunch.

Summary of Findings

Findings were based on the CI from this study and are supported by previously discussed findings from other studies in the area of school climate and students achievement.

In the content area of English/reading, mathematics, history/social science and science lower achievement scores were related to higher incidents of disorderly conduct, fights, truancy and students who receive free and reduced lunch. Higher achievement scores in the content area of English/reading were related to lower incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch. Based on these findings, school divisions that experience higher incidents of disorderly conduct, fights, truancy, and students who receive free and reduced lunch can expect the school division to have lower student achievement scores, whereas, school divisions that experience lower incidents of disorderly conduct, fights, truancy, and number of students who receive free and reduced lunch can expect the school division to have higher student achievement scores.

These findings support previous research (Berliner & Biddle, 1995; Colvin's et al., 1993; Kuperminc's et al., 2001; Sugai & Horner, 2001) that a safe environment free from violence and disruptive behavior must be provided if students are to achieve. These findings also support the notion that more emphasis placed on academics will have a positive influence on student behavior and improve student achievement (Goddard's et al., 2000; NCES, 2000). Furthermore, these findings are consistent with other research that found truancy linked to student achievement and school climate (Bell, Rosen, & Dynlacht, 1994; McCluskey et al., 2004; Mors & Moos, 1978; and Reid, 2003) and that other factors such as bullying may be the cause of truant students (Reid,

2003). Lastly these findings support Gayton's (1999) conclusion that schools that lack full accreditation status had at least 61% of students that received free and reduced lunch.

Implications

Based on the findings of this study, school divisions may improve the climate of their schools by addressing the following:

1. School divisions should initiate a plan that will allow for more focus on instruction in the content areas of English/reading, mathematics, history/social science, and science.
2. School divisions should initiate classroom management training that focuses on the development of a school-wide plan to prevent and manage incidents of disorderly conduct.
3. School divisions should initiate classroom management training that focuses on the development of a school-wide plan to prevent and manage incidents of fights.
4. School divisions should provide more instructional support and resources to those schools with a high number of students who receive free and reduced lunches.
5. School divisions should address truancy by developing a plan to promote attendance.

Recommendations for Future Studies

Based on the findings of this study, the recommendations for future studies in the area of school climate and student achievement are as follows:

1. It is recommended that this study be replicated using elementary schools in the Commonwealth of Virginia.
2. It is recommended that this study be replicated using middle schools in the Commonwealth of Virginia.
3. It is recommended that this study be replicated using high schools in the Commonwealth of Virginia.
4. It is recommended that this study be replicated within individual school divisions.
5. It is recommended that this study be replicated as a national study.
6. It is recommended that this study be replicated using different variables from the Discipline, Crime, and Violence Incident report such as substance abuse, bullying, theft, or weapons.
7. It is recommended that this study be replicated excluding the Free and Reduced Lunch Report from the CI. Instead, the Free and Reduced Lunch Report may be used as an independent variable along with student achievement scores.
8. It is recommended that this study be replicated using school divisions that are similar in size and SES.

Limitations

Generalizations drawn from this study should take into consideration the following limitations:

1. School division pass-proficiency rates represent every school within the school division. Therefore, it was possible for one school to have a high pass-proficiency rate whereas another school within the same division may have a low pass-

proficiency rate. By averaging all the schools in a district, individual school variations were not apparent.

2. As required, school divisions within the Commonwealth must report incidents of a serious nature to the VDOE. Therefore, it is possible for a school to have few behavioral incidents whereas another school within the same division may have many behavioral incidents. Individual schools may regard various incidents in a different manner; therefore there was the potential for discrepancies in the reporting numbers.
3. Each school division is responsible for the accuracy of the data submitted to VDOE. Incidents omitted by the school division were not reflected in the Commonwealth's DCVAR and, therefore, were not included in this study.
4. Local school divisions vary in the sophistication of their policies and their diligence when collecting and reporting data. For example, what may be considered "disrespect" in one division may be considered "insubordination" in another school division. Therefore, division policies may have skewed certain discipline reporting categories.
5. Reported cases of truancy were based on six unexcused accumulative absences for which conferences had been scheduled with parents. Therefore, truancy cases for which conferences were not scheduled and for cases of truancy that were less than six unexcused absences were not reflected in this study.
6. Each cluster reported a mean score of less than one incident of vandalism per 100 students. Therefore, it is difficult to draw conclusions because of the low rate of incidents.

7. Lastly, changes in reporting requirements and student conduct policies by localities posed potential limitations.

Reflections

Throughout this study two obstacles were encountered. The first obstacle was the lack of truancy data. While the Free and Reduced Lunch Report and the DCVIR were inclusive of all 132 public school divisions, twenty-eight school divisions were omitted from the 2002 – 2003 Truancy Report. As a result, a decision had to be made to use data from the 2001 – 2002 school year as it represents the most complete set of data for each report, or to validate the use of data from the 2001 – 2002 Truancy Report for the school divisions that were omitted ($n = 28$). Because data from 2002 – 2003 school year represent the most recent data, it was decided to validate the use of the 2001 – 2002 Truancy Report for those school divisions that were omitted ($n = 28$). The Pearson r , product moment correlation coefficient, was used to establish a relationship and to validate the use of these data. According to Gay (1992), a coefficient of .60 or greater is usually considered adequate for group prediction purposes and, therefore, considered acceptable for research. Results indicated that three of the four categories (free and reduced lunch, $r = .964$; disorderly conduct, $r = .922$; and fights, $r = .755$) have a coefficient of .60 or greater, and are significant at the .01 level. Because three of the four categories exceed the .60 coefficient level, a relationship has been established between the 2001 – 2002 data and the 2002 – 2003 data and therefore, validated the use of the 2001 – 2002 Truancy Report data for those school divisions that were omitted ($n = 28$) from the 2002 – 2003 Truancy Report.

The second obstacle was creating a common measuring stick with which to measure each cluster to account for variation in size of school divisions. Prior to running a cluster analysis, descriptive data for the CI were rescaled based on infractions per 100 students for each school division ($N = 132$). The number of students who received free and reduced lunch were also rescaled on a per-pupil scale of 100 for each school division ($N = 132$). Lastly, a state mean score was calculated for each area on the CI (disorderly conduct, fights, vandalism, free and reduced lunch, and truancy). In doing so, comparisons were made not only between clusters, but also clusters mean scores were compared to the state mean scores that were inclusive of all 132-school divisions.

Lastly, conducting this study was a positive experience because gaining familiarity with the wide-range of school divisions in the Commonwealth of Virginia was beneficial to the researcher as a school administrator. Analyzing the CI and student achievement scores of school divisions aided in gaining a perspective of each school division's challenges. While high achieving clusters experienced truancy issues, low achieving clusters experienced challenges with numerous incidents of disorderly conduct and fights. Furthermore, it should be noted that, although a school division may have ranked in a high achieving cluster, every school within the division may not be high achieving. Some school divisions that ranked in a low achieving cluster had schools that were high achieving. Every school division has schools that can improve and are susceptible to incidents of disorderly conduct, fights, vandalism, and truancy. In conclusion, this study hopes to help school divisions and individual schools use the CI to determine what behaviors affect their schools' climate. In doing so, school divisions

and individual schools can focus on these areas that most affect their climate in an effort to improve student achievement.

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APPENDIX A

Omitted School Divisions

Truancy Report 2002 – 2003

<u>School Divisions</u>	<u>Truancy</u>		
	Raw Score	Incident Per 100	Z-score
Alleghany County Public Schools	68	2.31	-0.58
Bland County Public Schools	3	0.33	-0.93
Brunswick County Public Schools	142	5.74	0.03
Buchanan County Public Schools	53	1.40	-0.74
Buena Vista City Public Schools	109	9.93	0.79
Carroll County Public Schools	624	15.27	1.74
Charles City County Public Schools	32	3.56	-0.36
Clarke County Public Schools	4	0.20	-0.96
Colonial Heights City Public Schools	129	6.78	0.22
Craig County Public Schools	1	0.14	-0.97
Dickenson County Public Schools	414	15.29	1.75
Essex County Public Schools	305	19.06	2.42
Floyd County Public Schools	202	9.94	0.79
Halifax County Public Schools	102	1.67	-0.69
Highland County Public Schools	18	5.96	0.07

<u>School Divisions</u>	<u>Truancy</u>		
	Raw Score	Incident Per 100	Z-score
King And Queen County Public Schools	0	0.00	-0.99
King George County Public Schools	329	10.77	0.94
King William County Public Schools	196	10.13	0.82
Lancaster County Public Schools	0	0.00	-0.99
Lexington City Public Schools	2	0.42	-0.92
Northampton County Public Schools	89	4.19	-0.24
Portsmouth City Public Schools	2360	13.75	1.47
Pulaski County Public Schools	328	6.58	0.19
Radford City Public Schools	14	0.93	-0.83
Salem City Public Schools	73	1.86	-0.66
Southampton County Public Schools	225	7.91	0.42
Surry County Public Schools	2	0.17	-0.96
Tazewell County Public Schools	69	0.97	-0.82

APPENDIX B

Virginia SOL Test Results

Cluster 1

2002 – 2003

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Accomack County Public Schools	73.92	79.58	71.75	69.83
Alleghany County Public Schools	82.57	84.71	75.14	85.00
Amelia County Public Schools	76.67	76.00	75.00	79.00
Amherst County Public Schools	78.50	74.80	70.80	78.00
Appomattox County Public Schools	72.75	74.00	76.50	75.50
Brunswick County Public Schools	70.17	68.50	56.17	60.50
Buckingham County Public Schools	75.67	78.33	80.80	66.75
Buena Vista City Public Schools	86.50	86.75	84.25	89.00
Campbell County Public Schools	84.57	81.86	80.25	81.25
Caroline County Public Schools	79.17	74.33	75.17	74.67
Charlotte County Public Schools	92.17	89.50	92.83	87.33

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Charlottesville City Public Schools	78.78	79.11	70.33	68.00
Chesapeake City Public Schools	82.77	86.09	80.66	82.34
Colonial Beach Public Schools	63.00	61.00	73.50	72.50
Covington City Public Schools	78.33	75.67	65.00	82.00
Culpeper County Public Schools	80.50	83.50	77.75	82.50
Cumberland County Public Schools	75.33	88.67	79.33	75.33
Dinwiddie County Public Schools	84.57	90.43	84.14	82.00
Fauquier County Public Schools	84.88	85.94	82.44	86.31
Fluvanna County Public Schools	78.00	78.60	80.00	83.25
Franklin City Public Schools	63.00	69.67	61.00	60.50

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Fredericksburg City Public Schools	74.00	79.00	69.50	74.00
Greene County Public Schools	78.33	65.50	72.83	73.50
Greensville County Public Schools	65.00	56.80	64.00	57.50
Hampton City Public Schools	82.40	82.23	78.06	79.17
King William County Public Schools	79.00	78.67	76.67	79.67
Lynchburg City Public Schools	80.94	79.56	77.56	80.13
Madison County Public Schools	86.00	86.00	83.20	85.20
Martinsville City Public Schools	80.50	76.33	69.67	73.33
Mecklenburg County Public Schools	80.91	85.18	85.55	80.55
				82.33
Middlesex County Public Schools	81.00	78.67	80.00	

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Montgomery County Public Schools	80.70	73.65	71.80	79.70
Newport News City Public Schools	75.83	76.83	80.00	77.20
Northampton County Public Schools	79.00	79.00	74.75	78.25
Portsmouth City Public Schools	76.71	73.47	74.08	66.42
Richmond City Public Schools	70.95	72.38	71.33	71.47
Roanoke City Public Schools	75.06	71.65	68.84	71.03
Smyth County Public Schools	83.54	85.31	85.08	83.85
Suffolk City Public Schools	82.00	77.56	70.50	75.72
Virginia Beach City Public Schools	88.36	87.39	83.37	85.45
Winchester City Public Schools	85.33	85.33	78.00	83.17

APPENDIX C

Climate Index

Cluster 1

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident	Z-score	Raw Score	Incident	Z-score
		Per 100			Per 100	
Accomack County Public Schools	2083	38.21	-0.57	245	4.49	0.56
Alleghany County Public Schools	2146	72.84	0.47	52	1.77	-0.53
Amelia County Public Schools	1770	103.03	1.38	26	1.51	-0.63
Amherst County Public Schools	1147	24.79	-0.97	94	2.03	-0.42
Appomattox County Public Schools	1383	58.48	0.04	88	3.72	0.25
Brunswick County Public Schools	2365	95.52	1.16	322	13.00	3.95
Buckingham County Public Schools	768	33.86	-0.70	69	3.04	-0.02
Buena Vista City Public Schools	372	33.88	-0.70	20	1.82	-0.51
Campbell County Public Schools	2891	32.27	-0.74	89	0.99	-0.84

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Caroline County Public Schools	868	24.04	-0.99	0	0.00	-1.23
Charlotte County Public Schools	641	28.45	-0.86	66	2.93	-0.07
Charlottesville City Public Schools	2953	66.34	0.28	79	1.77	-0.53
Chesapeake City Public Schools	13330	33.93	-0.69	267	0.68	-0.96
Colonial Beach Public Schools	385	66.04	0.27	12	2.06	-0.41
Covington City Public Schools	1814	202.00	4.35	10	1.11	-0.79
Culpeper County Public Schools	1068	25.04	-0.96	126	2.95	-0.06
Cumberland County Public Schools	1216	84.50	0.83	19	1.32	-0.71
Dinwiddie County Public Schools	1694	37.61	-0.58	292	6.48	1.35

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Fauquier County Public Schools	3621	35.76	-0.64	88	0.87	-0.89
Fluvanna County Public Schools	3355	103.81	1.40	107	3.31	0.08
Franklin City Public Schools	725	50.81	-0.19	62	4.34	0.50
Fredericksburg City Public Schools	1403	53.78	-0.10	50	1.92	-0.47
Greene County Public Schools	830	31.39	-0.77	103	3.90	0.32
Greensville County Public Schools	2660	98.59	1.25	58	2.15	-0.38
Hampton City Public Schools	9364	39.53	-0.53	475	2.01	-0.44
King William County Public Schools	1080	55.84	-0.04	56	2.90	-0.08
Lynchburg City Public Schools	8481	92.70	1.07	356	3.89	0.32

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Madison County Public Schools	710	38.61	-0.55	58	3.15	0.02
Martinsville City Public Schools	2017	72.87	0.48	152	5.49	0.95
Mecklenburg County Public Schools	2208	44.39	-0.38	139	2.79	-0.12
Middlesex County Public Schools	843	62.12	0.15	9	0.66	-0.97
Montgomery County Public Schools	5950	64.58	0.23	154	1.67	-0.57
Newport News City Public Schools	18495	59.12	0.06	1316	4.21	0.44
Northampton County Public Schools	1879	88.47	0.94	60	2.82	-0.11

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Portsmouth City Public Schools	4912	28.62	-0.85	420	2.45	-0.26
Richmond City Public Schools	14346	53.62	-0.10	3088	11.54	3.36
Roanoke City Public Schools	8691	62.31	0.16	610	4.37	0.51
Smyth County Public Schools	1772	34.72	-0.67	64	1.25	-0.73
Suffolk City Public Schools	3679	28.76	-0.85	441	3.45	0.14
Virginia Beach City Public Schools	39231	51.34	-0.17	2333	3.05	-0.02
Winchester City Public Schools	968	25.81	-0.94	117	3.12	0.01

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Accomack County Public Schools	13	0.24	-0.65	3,218	59.04	1.16
Alleghany County Public Schools	16	0.54	0.48	980	33.27	-0.68
Amelia County Public Schools	20	1.16	2.77	618	35.97	-0.49
Amherst County Public Schools	2	0.04	-1.37	1,605	34.70	-0.58
Appomattox County Public Schools	5	0.21	-0.75	855	36.15	-0.48
Brunswick County Public Schools	18	0.73	1.16	1,726	69.71	1.93
Buckingham County Public Schools	6	0.26	-0.55	1,242	54.76	0.86
Buena Vista City Public Schools	1	0.09	-1.19	341	31.06	-0.84
Campbell County Public Schools	15	0.17	-0.91	2,841	31.71	-0.79

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Caroline County Public Schools	5	0.14	-1.02	1,455	40.29	-0.18
Charlotte County Public Schools	10	0.44	0.11	1,154	51.22	0.60
Charlottesville City Public Schools	6	0.13	-1.03	2,113	47.47	0.34
Chesapeake City Public Schools	127	0.32	-0.34	10,053	25.59	-1.23
Colonial Beach Public Schools	4	0.69	1.01	255	43.74	0.07
Covington City Public Schools	8	0.89	1.76	321	35.75	-0.50
Culpeper County Public Schools	5	0.12	-1.10	1,450	33.99	-0.63
Cumberland County Public Schools	7	0.49	0.27	861	59.83	1.22
Dinwiddie County Public Schools	27	0.60	0.68	1,699	37.72	-0.36

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Fauquier County Public Schools	42	0.41	0.00	1,558	15.39	-1.96
Fluvanna County Public Schools	19	0.59	0.64	595	18.41	-1.75
Franklin City Public Schools	2	0.14	-1.01	912	63.91	1.51
Fredericksburg City Public Schools	6	0.23	-0.68	1,242	47.60	0.35
Greene County Public Schools	4	0.15	-0.97	704	26.63	-1.16
Greensville County Public Schools	3	0.11	-1.12	1,478	54.78	0.86
Hampton City Public Schools	129	0.54	0.48	9,680	40.87	-0.14
King William County Public Schools	8	0.41	0.00	535	27.66	-1.08
Lynchburg City Public Schools	31	0.34	-0.28	4,432	48.44	0.41

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Madison County Public Schools	5	0.27	-0.53	384	20.88	-1.57
Martinsville City Public Schools	15	0.54	0.47	1,419	51.26	0.61
Mecklenburg County Public Schools	16	0.32	-0.34	2,814	56.57	0.99
Middlesex County Public Schools	15	1.11	2.56	442	32.57	-0.73
Montgomery County Public Schools	74	0.80	1.44	3,048	33.08	-0.70
Newport News City Public Schools	120	0.38	-0.11	16,056	51.33	0.61
Northampton County Public Schools	11	0.52	0.38	1,428	67.23	1.75

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Portsmouth City Public Schools	58	0.34	-0.28	8,575	49.97	0.51
Richmond City Public Schools	204	0.76	1.29	18,879	70.56	1.99
Roanoke City Public Schools	77	0.55	0.51	8,158	58.49	1.13
Smyth County Public Schools	15	0.29	-0.44	2,251	44.11	0.10
Suffolk City Public Schools	20	0.16	-0.95	5,323	41.62	-0.08
Virginia Beach City Public Schools	355	0.46	0.19	23,984	31.39	-0.82
Winchester City Public Schools	10	0.27	-0.55	1,479	39.44	-0.24

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100		Z-score
Accomack County Public Schools	195	3.58	-0.27	5,451
Alleghany County Public Schools	68	2.31	-0.49	2,946
Amelia County Public Schools	43	2.50	-0.46	1,718
Amherst County Public Schools	142	3.07	-0.36	4,626
Appomattox County Public Schools	108	4.57	-0.11	2,365
Brunswick County Public Schools	142	5.74	0.09	2,476
Buckingham County Public Schools	13	0.57	-0.78	2,268
Buena Vista City Public Schools	109	9.93	0.80	1,098

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100		Z-score
Campbell County Public Schools	183	2.04	-0.53	8,959
Caroline County Public Schools	48	1.33	-0.65	3,611
Charlotte County Public Schools	68	3.02	-0.37	2,253
Charlottesville City Public Schools	1403	31.52	4.46	4,451
Chesapeake City Public Schools	848	2.16	-0.51	39,281
Colonial Beach Public Schools	99	16.98	2.00	583
Covington City Public Schools	1	0.11	-0.86	898
Culpeper County Public Schools	160	3.75	-0.24	4,266
Cumberland County Public Schools	49	3.41	-0.30	1,439

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100		Z-score
Dinwiddie County Public Schools	117	2.60	-0.44	4,504
Fauquier County Public Schools	454	4.48	-0.12	10,125
Fluvanna County Public Schools	240	7.43	0.38	3,232
Franklin City Public Schools	62	4.34	-0.14	1,427
Fredericksburg City Public Schools	288	11.04	0.99	2,609
Greene County Public Schools	124	4.69	-0.09	2,644
Greensville County Public Schools	116	4.30	-0.15	2,698
Hampton City Public Schools	126	0.53	-0.79	23,687
King William County Public Schools	196	10.13	0.84	1,934

<u>School Divisions</u>	<u>Raw Score</u>	<u>Truancy</u> Incident Per 100	<u>Z-score</u>	<u>Student Membership</u>
Lynchburg City Public Schools	972	10.62	0.92	9,149
Madison County Public Schools	34	1.85	-0.57	1,839
Martinsville City Public Schools	13	0.47	-0.80	2,768
Mecklenburg County Public Schools	83	1.67	-0.60	4,974
Middlesex County Public Schools	39	2.87	-0.39	1,357
Montgomery County Public Schools	13	0.14	-0.86	9,214
Newport News City Public Schools	1766	5.65	0.08	31,283

<u>School Divisions</u>	<u>Raw Score</u>	<u>Truancy</u> Incident Per 100	<u>Z-score</u>	<u>Student Membership</u>
Northampton County Public Schools	89	4.19	-0.17	2,124
Portsmouth City Public Schools	2360	13.75	1.45	17,162
Richmond City Public Schools	971	3.63	-0.26	26,755
Roanoke City Public Schools	1945	13.94	1.48	13,948
Smyth County Public Schools	11	0.22	-0.84	5,103
Suffolk City Public Schools	842	6.58	0.24	12,791
Virginia Beach City Public Schools	541	0.71	-0.76	76,415
Winchester City Public Schools	18	0.48	-0.80	3,750

APPENDIX D

Virginia SOL Test Results

Cluster 2

2002 – 2003

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Albemarle County Public Schools	88.72	86.28	84.40	87.56
Arlington County Public Schools	88.00	88.45	84.79	86.86
Augusta County Public Schools	80.95	82.60	84.70	85.85
Bath County Public Schools	85.33	92.67	83.67	88.00
Bedford County Public Schools	84.81	84.81	80.10	85.76
Bland County Public Schools	79.25	73.00	75.25	81.00
Carroll County Public Schools	73.80	76.80	74.20	77.70
Chesterfield County Public Schools	88.90	87.00	86.00	87.88
Clarke County Public Schools	89.00	86.20	80.80	85.60
Colonial Heights City Public Schools	86.60	87.40	89.80	92.80
Craig County Public Schools	87.50	81.00	88.50	86.50

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Dickenson County Public Schools	81.00	78.00	81.00	82.25
Essex County Public Schools	83.00	79.33	72.00	76.50
Fairfax County Public Schools	89.59	88.84	88.84	87.32
Falls Church City Public Schools	91.25	86.50	85.75	91.50
Floyd County Public Schools	83.20	89.00	83.80	87.40
Franklin County Public Schools	88.31	89.00	90.06	90.88
Galax City Public Schools	84.33	83.33	77.68	83.50
Giles County Public Schools	77.00	80.00	83.20	80.40
Goochland County Public Schools	88.80	83.80	92.80	85.60
				77.44
Grayson County Public Schools	71.00	68.60	71.00	

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Hanover County Public Schools	89.65	88.25	90.60	91.15
Harrisonburg City Public Schools	84.67	84.83	86.33	86.83
Henrico County Public Schools	89.61	90.47	90.95	90.00
Henry County Public Schools	84.10	82.80	82.30	81.45
Highland County Public Schools	90.00	85.00	89.00	90.00
Isle Of Wight County Public Schools	84.50	78.75	80.63	83.88
Lancaster County Public Schools	83.67	79.00	74.50	78.50
Lexington City Public Schools	88.00	89.00	90.50	93.00
Loudoun County Public Schools	89.05	88.22	88.66	90.75
				80.20
Louisa County Public Schools	82.80	84.00	79.20	

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Manassas City Public Schools	89.71	86.14	84.29	85.43
Manassas Park City Public Schools	86.50	85.50	83.00	81.67
Mathews County Public Schools	87.00	84.00	83.33	86.50
Nelson County Public Schools	78.00	73.75	73.25	81.25
New Kent County Public Schools	83.25	82.50	80.50	85.25
Norton City Public Schools	81.50	82.00	82.00	77.50
Orange County Public Schools	85.71	86.86	81.16	81.83
Page County Public Schools	86.14	87.57	86.00	86.00
Patrick County Public Schools	88.43	92.14	88.33	88.16
				91.50
Poquoson City Public Schools	93.25	90.50	88.25	

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Prince George County Public Schools	82.90	84.50	82.50	86.50
Pulaski County Public Schools	79.36	75.00	71.73	77.82
Radford City Public Schools	83.50	85.00	80.33	85.33
Richmond County Public Schools	91.33	89.33	86.33	85.00
Roanoke County Public Schools	90.11	88.66	87.96	91.44
Rockingham County Public Schools	86.70	87.65	88.35	90.30
Salem City Public Schools	90.67	90.50	91.83	93.83
Southampton County Public Schools	76.00	69.50	76.67	76.83
Staunton City Public Schools	79.50	79.33	78.83	80.33
				81.63
Tazewell County Public Schools	78.31	73.88	76.19	

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Warren County Public Schools	82.38	81.00	78.63	80.50
Washington County Public Schools	83.20	82.53	81.80	87.07
West Point Public Schools	94.33	93.33	92.33	93.33
Williamsburg-James City County Public Schools	86.42	84.17	84.25	85.67
Wythe County Public Schools	75.58	78.42	73.83	79.25

APPENDIX E

Climate Index

Cluster 2

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Albemarle County Public Schools	233	1.89	-0.96	67	0.54	-0.96
Arlington County Public Schools	351	1.98	-0.94	102	0.58	-0.93
Augusta County Public Schools	527	4.86	-0.33	71	0.66	-0.86
Bath County Public Schools	38	4.76	-0.35	4	0.50	-1.00
Bedford County Public Schools	1291	12.05	1.22	182	1.70	0.11
Bland County Public Schools	35	3.85	-0.54	27	2.97	1.29
Carroll County Public Schools	26	0.64	-1.23	75	1.84	0.23
Chesterfield County Public Schools	6790	17.84	2.46	1150	3.02	1.33
Clarke County Public Schools	34	1.68	-1.01	6	0.30	-1.19

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Colonial Heights City Public Schools	104	5.46	-0.20	34	1.79	0.19
Craig County Public Schools	36	5.14	-0.27	6	0.86	-0.67
Dickenson County Public Schools	110	4.06	-0.50	46	1.70	0.11
Essex County Public Schools	217	13.56	1.54	19	1.19	-0.37
Fairfax County Public Schools	18040	11.36	1.07	1773	1.12	-0.43
Falls Church City Public Schools	8	0.44	-1.28	4	0.22	-1.26
Floyd County Public Schools	80	3.94	-0.52	47	2.31	0.68
Franklin County Public Schools	558	7.64	0.27	97	1.33	-0.24
Galax City Public Schools	79	5.89	-0.11	37	2.76	1.09

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Giles County Public Schools	88	3.47	-0.63	16	0.63	-0.88
Goochland County Public Schools	126	6.12	-0.06	49	2.38	0.74
Grayson County Public Schools	170	7.43	0.22	56	2.45	0.80
Hanover County Public Schools	1234	10.16	0.81	499	4.11	2.34
Harrisonburg City Public Schools	177	4.31	-0.45	76	1.85	0.25
Henrico County Public Schools	1232	4.17	-0.47	347	1.18	-0.38
Henry County Public Schools	992	11.68	1.14	104	1.22	-0.33
Highland County Public Schools	51	16.89	2.26	1	0.33	-1.16
Isle Of Wight County Public Schools	176	3.48	-0.62	35	0.69	-0.82

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Lancaster County Public Schools	21	1.40	-1.07	26	1.73	0.14
Lexington City Public Schools	4	0.85	-1.19	0	0.00	-1.47
Loudoun County Public Schools	34	0.10	-1.35	248	0.71	-0.81
Louisa County Public Schools	369	8.61	0.48	108	2.52	0.87
Manassas City Public Schools	1	0.02	-1.37	28	0.45	-1.05
Manassas Park City Public Schools	198	8.60	0.48	39	1.69	0.10
Mathews County Public Schools	34	2.58	-0.82	8	0.61	-0.90
Nelson County Public Schools	133	6.56	0.04	24	1.18	-0.37
New Kent County Public Schools	110	4.47	-0.41	32	1.30	-0.26
Norton City Public Schools	81	11.23	1.04	18	2.50	0.85

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Orange County Public Schools	41	0.99	-1.16	68	1.64	0.05
Page County Public Schools	334	9.16	0.60	64	1.75	0.16
Patrick County Public Schools	103	3.92	-0.53	25	0.95	-0.58
Poquoson City Public Schools	94	4.00	-0.51	14	0.60	-0.91
Prince George County Public Schools	845	17.87	2.47	138	2.92	1.24
Pulaski County Public Schools	220	4.42	-0.42	178	3.57	1.84
Radford City Public Schools	39	2.59	-0.81	15	1.00	-0.54
Richmond County Public Schools	128	10.46	0.87	6	0.49	-1.01
Roanoke County Public Schools	408	2.89	-0.75	77	0.55	-0.96
Rockingham County Public Schools	484	4.33	-0.44	159	1.42	-0.15

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Salem City Public Schools	323	8.21	0.39	42	1.07	-0.48
Southampton County Public Schools	362	12.73	1.36	38	1.34	-0.23
Staunton City Public Schools	153	5.46	-0.20	119	4.24	2.46
Tazewell County Public Schools	288	4.05	-0.50	94	1.32	-0.24
Warren County Public Schools	700	13.94	1.62	226	4.50	2.70
Washington County Public Schools	525	7.31	0.20	139	1.93	0.33
West Point Public Schools	57	7.26	0.19	27	3.44	1.72
Williamsburg-James City County Public Schools	935	15.33	1.92	140	2.30	0.66
Wythe County Public Schools	142	3.30	-0.66	31	0.72	-0.80

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Albemarle County Public Schools	24	0.20	0.23	2,223	18.06	-1.07
Arlington County Public Schools	7	0.04	-0.76	7,246	40.88	0.75
Augusta County Public Schools	9	0.08	-0.49	2,746	25.34	-0.49
Bath County Public Schools	0	0.00	-1.02	250	31.29	-0.02
Bedford County Public Schools	35	0.33	1.07	2,947	27.51	-0.32
Bland County Public Schools	0	0.00	-1.02	338	37.22	0.46
Carroll County Public Schools	4	0.10	-0.39	2,021	49.46	1.43
Chesterfield County Public Schools	86	0.23	0.43	8,056	21.17	-0.82
Clarke County Public Schools	0	0.00	-1.02	283	13.97	-1.40

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Colonial Heights City Public Schools	2	0.11	-0.35	413	21.69	-0.78
Craig County Public Schools	0	0.00	-1.02	174	24.86	-0.53
Dickenson County Public Schools	3	0.11	-0.31	1,543	57.00	2.03
Essex County Public Schools	0	0.00	-1.02	885	55.31	1.90
Fairfax County Public Schools	309	0.19	0.22	31,885	20.07	-0.91
Falls Church City Public Schools	0	0.00	-1.02	153	8.40	-1.84
Floyd County Public Schools	15	0.74	3.69	685	33.71	0.18
Franklin County Public Schools	17	0.23	0.47	2,847	38.96	0.60

Vandalism

Free and Reduced Lunch

School Divisions

	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Galax City Public Schools	4	0.30	0.89	638	47.54	1.28
Giles County Public Schools	2	0.08	-0.51	817	32.20	0.06
Goochland County Public Schools	2	0.10	-0.40	447	21.71	-0.78
Grayson County Public Schools	8	0.35	1.21	1,182	51.64	1.61
Hanover County Public Schools	77	0.63	3.03	1,516	12.48	-1.51
Harrisonburg City Public Schools	21	0.51	2.24	1,915	46.58	1.20
Henrico County Public Schools	68	0.23	0.45	8,752	29.64	-0.15
Henry County Public Schools	19	0.22	0.41	3,654	43.01	0.92
Highland County Public Schools	0	0.00	-1.02	143	47.35	1.26
Isle Of Wight County Public Schools	10	0.20	0.25	1,573	31.14	-0.03

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Lancaster County Public Schools	2	0.13	-0.17	757	50.37	1.50
Lexington City Public Schools	0	0.00	-1.02	84	17.80	-1.09
Loudoun County Public Schools	19	0.05	-0.67	4,339	12.47	-1.51
Louisa County Public Schools	3	0.07	-0.57	1,459	34.05	0.20
Manassas City Public Schools	12	0.19	0.22	1,568	25.38	-0.49
Manassas Park City Public Schools	11	0.48	2.03	704	30.58	-0.07
Mathews County Public Schools	1	0.08	-0.53	321	24.39	-0.56
Nelson County Public Schools	4	0.20	0.24	787	38.83	0.59
New Kent County Public Schools	2	0.08	-0.50	414	16.83	-1.17
Norton City Public Schools	0	0.00	-1.02	324	44.94	1.07

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Orange County Public Schools	10	0.24	0.52	1,193	28.76	-0.22
Page County Public Schools	5	0.14	-0.14	1,368	37.51	0.48
Patrick County Public Schools	2	0.08	-0.53	1,163	44.29	1.02
Poquoson City Public Schools	5	0.21	0.34	140	5.95	-2.03
Prince George County Public Schools	10	0.21	0.33	1,472	31.13	-0.03
Pulaski County Public Schools	5	0.10	-0.38	1,838	36.89	0.43
Radford City Public Schools	1	0.07	-0.59	356	23.64	-0.62
Richmond County Public Schools	3	0.25	0.55	437	35.70	0.34
Roanoke County Public Schools	10	0.07	-0.56	2,287	16.20	-1.22
Rockingham County Public Schools	15	0.13	-0.16	3,107	27.81	-0.29

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Salem City Public Schools	0	0.00	-1.02	791	20.11	-0.91
Southampton County Public Schools	0	0.00	-1.02	1,185	41.68	0.81
Staunton City Public Schools	4	0.14	-0.11	1,102	39.30	0.62
Tazewell County Public Schools	7	0.10	-0.39	3,486	49.00	1.40
Warren County Public Schools	8	0.16	0.00	1,160	23.11	-0.67
Washington County Public Schools	9	0.13	-0.22	2,692	37.47	0.48
West Point Public Schools	3	0.38	1.42	117	14.90	-1.32
Williamsburg-James City County Public Schools	9	0.15	-0.08	1,566	25.67	-0.46
Wythe County Public Schools	5	0.12	-0.27	1,719	39.98	0.68

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100		Z-score
Albemarle County Public Schools	91	0.74	-0.69	12,306
Arlington County Public Schools	456	2.57	-0.39	17,725
Augusta County Public Schools	1282	11.83	1.12	10,835
Bath County Public Schools	29	3.63	-0.22	799
Bedford County Public Schools	328	3.06	-0.31	10,712
Bland County Public Schools	3	0.33	-0.76	908
Carroll County Public Schools	624	15.27	1.68	4,086
Chesterfield County Public Schools	229	0.60	-0.72	38,060
Clarke County Public Schools	4	0.20	-0.78	2,026

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100	Z-score	
Colonial Heights City Public Schools	129	6.78	0.29	1,904
Craig County Public Schools	1	0.14	-0.79	700
Dickenson County Public Schools	414	15.29	1.68	2,707
Essex County Public Schools	305	19.06	2.30	1,600
Fairfax County Public Schools	1207	0.76	-0.69	158,855
Falls Church City Public Schools	8	0.44	-0.74	1,821
Floyd County Public Schools	202	9.94	0.81	2,032
Franklin County Public Schools	762	10.43	0.89	7,308
Galax City Public Schools	160	11.92	1.13	1,342

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100		Z-score
Giles County Public Schools	163	6.42	0.23	2,537
Goochland County Public Schools	39	1.89	-0.50	2,059
Grayson County Public Schools	95	4.15	-0.14	2,289
Hanover County Public Schools	185	1.52	-0.57	12,146
Harrisonburg City Public Schools	114	2.77	-0.36	4,111
Henrico County Public Schools	18	0.06	-0.80	29,530
Henry County Public Schools	188	2.21	-0.45	8,495
Highland County Public Schools	18	5.96	0.16	302
Isle Of Wight County Public Schools	80	1.58	-0.56	5,052
Lancaster County Public Schools	0	0.00	-0.81	1,503

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100		Z-score
Lexington City Public Schools	2	0.42	-0.74	472
Loudoun County Public Schools	477	1.37	-0.59	34,788
Louisa County Public Schools	222	5.18	0.03	4,285
Manassas City Public Schools	252	4.08	-0.15	6,177
Manassas Park City Public Schools	81	3.52	-0.24	2,302
Mathews County Public Schools	39	2.96	-0.33	1,316
Nelson County Public Schools	117	5.77	0.13	2,027
New Kent County Public Schools	83	3.37	-0.26	2,460
Norton City Public Schools	79	10.96	0.97	721
Orange County Public Schools	265	6.39	0.23	4,148

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100		Z-score
Page County Public Schools	488	13.38	1.37	3,647
Patrick County Public Schools	177	6.74	0.29	2,626
Poquoson City Public Schools	20	0.85	-0.67	2,352
Prince George County Public Schools	164	3.47	-0.25	4,729
Pulaski County Public Schools	328	6.58	0.26	4,982
Radford City Public Schools	14	0.93	-0.66	1,506
Richmond County Public Schools	430	35.13	4.92	1,224
Roanoke County Public Schools	86	0.61	-0.71	14,116
Rockingham County Public Schools	164	1.47	-0.57	11,171
Salem City Public Schools	73	1.86	-0.51	3,934

<u>School Divisions</u>	<u>Raw Score</u>	<u>Truancy</u> Incident Per 100	<u>Z-score</u>	<u>Student Membership</u>
Southampton County Public Schools	225	7.91	0.48	2,843
Staunton City Public Schools	70	2.50	-0.41	2,804
Tazewell County Public Schools	69	0.97	-0.66	7,115
Warren County Public Schools	408	8.13	0.51	5,020
Washington County Public Schools	37	0.52	-0.73	7,184
West Point Public Schools	2	0.25	-0.77	785
Williamsburg-James City County Public Schools	265	4.34	-0.10	6,100
Wythe County Public Schools	3	0.07	-0.80	4,300

APPENDIX F

Virginia SOL Test Results

Cluster 3

2002 – 2003

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Alexandria City Public Schools	83.38	84.38	78.50	77.88
Bristol City Public Schools	85.83	82.17	82.17	82.83
Buchanan County Public Schools	69.20	61.50	60.30	70.50
Charles City County Public Schools	69.33	68.67	74.67	72.33
Danville City Public Schools	76.31	74.31	69.81	71.13
Halifax County Public Schools	84.13	87.26	79.35	79.35
Hopewell City Public Schools	79.40	84.20	82.40	83.00
King And Queen County Public Schools	83.00	74.00	79.67	78.33
Lunenburg County Public Schools	72.75	72.25	80.75	74.75

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Norfolk City Public Schools	79.14	75.88	75.39	74.18
Northumberland County Public Schools	84.00	84.67	83.33	79.67
Nottoway County Public Schools	79.33	83.17	72.67	76.33
Petersburg City Public Schools	57.40	58.80	57.75	51.90
Pittsylvania County Public Schools	78.17	75.33	77.22	77.64
Prince Edward County Public Schools	78.33	79.00	58.00	68.00
Russell County Public Schools	79.83	79.75	85.27	86.81
Scott County Public Schools	89.15	90.46	88.85	89.90
Surry County Public Schools	81.00	78.33	76.00	69.50
Sussex County Public Schools	63.60	52.80	67.00	61.60

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Waynesboro City Public Schools	78.33	77.83	84.00	81.50
Westmoreland County Public Schools	67.75	57.25	53.00	63.00

APPENDIX G

Climate Index

Cluster 3

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident	Z-score	Raw Score	Incident	Z-score
		Per 100			Per 100	
Alexandria City Public Schools	2226	20.28	1.71	220	2.00	-0.37
Bristol City Public Schools	251	10.32	-0.16	67	2.75	0.02
Buchanan County Public Schools	380	10.04	-0.22	245	6.47	1.91
Charles City County Public Schools	189	21.00	1.85	35	3.89	0.60
Danville City Public Schools	946	12.59	0.26	158	2.10	-0.32
Halifax County Public Schools	900	14.71	0.66	101	1.65	-0.55
Hopewell City Public Schools	167	4.06	-1.34	89	2.16	-0.29
King And Queen County Public Schools	98	11.12	-0.01	37	4.20	0.75

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Lunenburg County Public Schools	175	9.53	-0.31	33	1.80	-0.47
Norfolk City Public Schools	4436	11.63	0.08	889	2.33	-0.20
Northumberland County Public Schools	206	13.73	0.48	19	1.27	-0.74
Nottoway County Public Schools	319	12.35	0.22	77	2.98	0.13
Petersburg City Public Schools	764	13.45	0.42	356	6.27	1.81
Pittsylvania County Public Schools	1630	18.14	1.31	174	1.94	-0.40
Prince Edward County Public Schools	38	1.40	-1.85	11	0.41	-1.18
Russell County Public Schools	223	5.39	-1.09	109	2.64	-0.04
Scott County Public Schools	221	5.94	-0.99	10	0.27	-1.25

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Surry County Public Schools	139	11.97	0.15	10	0.86	-0.95
Sussex County Public Schools	224	16.08	0.92	105	7.54	2.45
Waynesboro City Public Schools	238	7.83	-0.63	34	1.12	-0.82
Westmoreland County Public Schools	69	3.45	-1.46	50	2.50	-0.11

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Alexandria City Public Schools	13	0.12	-0.01	5,512	50.22	-0.45
Bristol City Public Schools	2	0.08	-0.29	1,118	45.97	-0.94
Buchanan County Public Schools	16	0.42	2.30	2,591	68.45	1.66
Charles City County Public Schools	0	0.00	-0.91	407	45.22	-1.03
Danville City Public Schools	20	0.27	1.11	4,482	59.66	0.64
Halifax County Public Schools	10	0.16	0.33	3,278	53.56	-0.06
Hopewell City Public Schools	1	0.02	-0.73	2,480	60.24	0.71
King And Queen County Public Schools	4	0.45	2.54	502	56.98	0.33

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Lunenburg County Public Schools	4	0.22	0.74	1,103	60.08	0.69
Norfolk City Public Schools	32	0.08	-0.27	22,202	58.21	0.48
Northumberland County Public Schools	0	0.00	-0.91	716	47.73	-0.74
Nottoway County Public Schools	0	0.00	-0.91	1,262	48.86	-0.61
Petersburg City Public Schools	2	0.04	-0.64	3,960	69.69	1.81
Pittsylvania County Public Schools	17	0.19	0.53	3,505	39.01	-1.75
Prince Edward County Public Schools	4	0.15	0.21	1,716	63.25	1.06
Russell County Public Schools	4	0.10	-0.18	1,986	48.03	-0.70
Scott County Public Schools	5	0.13	0.11	1,901	51.06	-0.35

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Surry County Public Schools	0	0.00	-0.91	568	48.92	-0.60
Sussex County Public Schools	0	0.00	-0.91	933	66.98	1.49
Waynesboro City Public Schools	1	0.03	-0.66	1,310	43.09	-1.28
Westmoreland County Public Schools	1	0.05	-0.53	1,018	50.95	-0.37

<u>School Divisions</u>	<u>Truancy</u>		<u>Student Membership</u>	
	Raw Score	Incident Per 100		Z-score
Alexandria City Public Schools	500	4.56	0.87	10,975
Bristol City Public Schools	81	3.33	0.32	2,432
Buchanan County Public Schools	53	1.40	-0.54	3,785
Charles City County Public Schools	32	3.56	0.42	900
Danville City Public Schools	89	1.18	-0.64	7,513
Halifax County Public Schools	102	1.67	-0.42	6,120
Hopewell City Public Schools	292	7.09	2.01	4,117
King And Queen County Public Schools	0	0.00	-1.17	881

<u>School Divisions</u>	<u>Raw Score</u>	<u>Truancy</u> Incident Per 100	<u>Z-score</u>	<u>Student Membership</u>
Lunenburg County Public Schools	131	7.14	2.03	1,836
Norfolk City Public Schools	324	0.85	-0.79	38,139
Northumberland County Public Schools	13	0.87	-0.78	1,500
Nottoway County Public Schools	64	2.48	-0.06	2,583
Petersburg City Public Schools	370	6.51	1.75	5,682
Pittsylvania County Public Schools	147	1.64	-0.44	8,985
Prince Edward County Public Schools	42	1.55	-0.48	2,713
Russell County Public Schools	194	4.69	0.93	4,135
Scott County Public Schools	85	2.28	-0.15	3,723

<u>School Divisions</u>	<u>Truancy</u>			<u>Student Membership</u>		
	Raw Score	Incident Per 100	Z-score			
Surry County Public Schools	2	0.17	-1.10		1,161	
Sussex County Public Schools	35	2.51	-0.04	1,393	35	2.51
Waynesboro City Public Schools	40	1.32	-0.58	3,040	40	1.32
Westmoreland County Public Schools	1	0.05	-1.15	1,998	1	0.05

APPENDIX H

Virginia SOL Test Results

Cluster 4

2002 – 2003

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Botetourt County Public Schools	85.64	79.64	85.73	89.27
Frederick County Public Schools	84.53	85.33	85.20	87.87
Lee County Public Schools	83.77	82.46	79.08	86.00
Powhatan County Public Schools	86.50	86.50	83.75	89.25
Prince William County Public Schools	84.82	84.68	86.37	83.13
Stafford County Public Schools	88.54	86.13	83.58	87.42
Wise County Public Schools	83.13	84.80	85.33	85.50
York County Public Schools	85.00	83.47	89.84	90.79

APPENDIX I

Climate Index

Cluster 4

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Botetourt County Public Schools	1014	21.42	-1.22	46	0.97	-0.86
Frederick County Public Schools	3018	27.52	0.35	149	1.36	-0.57
Lee County Public Schools	980	25.86	-0.08	157	4.14	1.55
Powhatan County Public Schools	765	20.32	-1.50	39	1.04	-0.82
Prince William County Public Schools	17908	25.72	-0.11	825	1.19	-0.70
Stafford County Public Schools	6385	26.76	0.15	515	2.16	0.04
Wise County Public Schools	2050	29.76	0.92	284	4.12	1.53
York County Public Schools	3749	31.99	1.50	221	1.89	-0.17

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Botetourt County Public Schools	32	0.68	0.93	625	13.20	-0.66
Frederick County Public Schools	43	0.39	-0.73	1,981	18.07	-0.40
Lee County Public Schools	25	0.66	0.84	2,347	61.93	1.90
Powhatan County Public Schools	13	0.35	-1.00	487	12.93	-0.67
Prince William County Public Schools	267	0.38	-0.78	15,361	22.06	-0.19
Stafford County Public Schools	75	0.31	-1.18	3,248	13.61	-0.64
Wise County Public Schools	49	0.71	1.14	3,418	49.62	1.25
York County Public Schools	76	0.65	0.77	1,728	14.75	-0.58

<u>School Divisions</u>	<u>Raw Score</u>	<u>Truancy</u> Incident Per 100	<u>Z-score</u>	<u>Student Membership</u>
Botetourt County Public Schools	49	1.04	-0.42	4,734
Frederick County Public Schools	19	0.17	-0.89	10,965
Lee County Public Schools	169	4.46	1.43	3,790
Powhatan County Public Schools	40	1.06	-0.41	3,765
Prince William County Public Schools	272	0.39	-0.77	69,620
Stafford County Public Schools	286	1.20	-0.33	23,863
Wise County Public Schools	345	5.01	1.73	6,888
York County Public Schools	137	1.17	-0.35	11,719

APPENDIX J

Virginia SOL Test Results

Cluster 5

2002 – 2003

<u>School Division</u>	<u>English/reading</u>	<u>Mathematics</u>	<u>History/social sciences</u>	<u>Science</u>
Gloucester County Public Schools	84.30	82.40	85.60	85.80
King George County Public Schools	76.25	77.50	80.25	76.75
Rappahannock County Public Schools	84.50	80.50	82.50	88.00
Rockbridge County Public Schools	77.38	78.88	78.50	85.50
Shenandoah County Public Schools	83.22	85.67	85.22	85.00
Spotsylvania County Public Schools	80.76	80.38	82.30	83.80

APPENDIX K

Climate Index

Cluster 5

<u>School Divisions</u>	<u>Disorderly Conduct</u>			<u>Fights</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Incident Per 100	Z-score
Gloucester County Public Schools	834	19.60	0.54	38	0.89	-0.72
King George County Public Schools	719	23.53	1.01	60	1.96	0.07
Rappahannock County Public Schools	167	16.07	0.11	12	1.15	-0.53
Rockbridge County Public Schools	121	4.00	-1.33	137	4.53	1.97
Shenandoah County Public Schools	1250	21.78	0.80	73	1.27	-0.44
Spotsylvania County Public Schools	1209	5.73	-1.13	297	1.41	-0.34

<u>School Divisions</u>	<u>Vandalism</u>			<u>Free and Reduced Lunch</u>		
	Raw Score	Incident Per 100	Z-score	Raw Score	Students Per 100	Z-score
Gloucester County Public Schools	15	0.35	0.30	1,138	26.75	0.75
King George County Public Schools	9	0.29	-0.07	670	21.92	-0.23
Rappahannock County Public Schools	3	0.29	-0.11	174	16.75	-1.29
Rockbridge County Public Schools	17	0.56	1.63	878	29.03	1.22
Shenandoah County Public Schools	15	0.26	-0.28	1,472	25.65	0.53
Spotsylvania County Public Schools	16	0.08	-1.47	3,848	18.24	-0.98

<u>School Divisions</u>	<u>Raw Score</u>	<u>Truancy</u> Incident Per 100	<u>Z-score</u>	<u>Student Membership</u>
Gloucester County Public Schools	263	6.18	-0.64	4,255
King George County Public Schools	329	10.77	-0.19	3,056
Rappahannock County Public Schools	52	5.00	-0.76	1,039
Rockbridge County Public Schools	979	32.37	1.96	3,024
Shenandoah County Public Schools	718	12.51	-0.01	5,739
Spotsylvania County Public Schools	1910	9.05	-0.36	21,099

APPENDIX L

Cluster Comparison

With and Without Free and Reduced Lunch

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Accomack County Public Schools	1	1	
Albemarle County Public Schools	2	2	
Alexandria City Public Schools	3	2	*
Alleghany County Public Schools	1	3	*
Amelia County Public Schools	1	3	*
Amherst County Public Schools	1	2	*
Appomattox County Public Schools	1	1	
Arlington County Public Schools	2	2	
Augusta County Public Schools	2	2	
Bath County Public Schools	2	2	
Bedford County Public Schools	2	1	*
Bland County Public Schools	2	2	

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Botetourt County Public Schools	4	1	*
Bristol City Public Schools	3	2	*
Brunswick County Public Schools	1	4	*
Buchanan County Public Schools	3	4	*
Buckingham County Public Schools	1	1	
Buena Vista City Public Schools	1	1	
Campbell County Public Schools	1	1	
Caroline County Public Schools	1	1	
Carroll County Public Schools	2	5	*
Charles City County Public Schools	3	2	*
Charlotte County Public Schools	1	1	
Charlottesville City Public Schools	1	5	*

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Chesapeake City Public Schools	1	1	
Chesterfield County Public Schools	2	2	
Clarke County Public Schools	2	2	
Colonial Beach Public Schools	1	3	*
Colonial Heights City Public Schools	2	2	
Covington City Public Schools	1	3	*
Craig County Public Schools	2	2	
Culpeper County Public Schools	1	2	*
Cumberland County Public Schools	1	3	*
Danville City Public Schools	3	1	*
Dickenson County Public Schools	2	5	*
Dinwiddie County Public Schools	1	4	*

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Essex County Public Schools	2	2	
Fairfax County Public Schools	2	2	
Falls Church City Public Schools	2	2	
Fauquier County Public Schools	1	1	
Floyd County Public Schools	2	1	*
Fluvanna County Public Schools	1	3	*
Franklin City Public Schools	1	1	
Franklin County Public Schools	2	5	*
Frederick County Public Schools	1	1	
Fredericksburg City Public Schools	4	1	*
Galax City Public Schools	2	5	*
Giles County Public Schools	2	2	

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Gloucester County Public Schools	5	2	*
Goochland County Public Schools	2	2	
Grayson County Public Schools	2	1	*
Greene County Public Schools	1	1	
Greenville County Public Schools	1	1	
Halifax County Public Schools	3	2	*
Hampton City Public Schools	1	1	
Hanover County Public Schools	2	1	*
Harrisonburg City Public Schools	2	1	*
Henrico County Public Schools	2	2	
Henry County Public Schools	2	2	
Highland County Public Schools	2	2	

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Hopewell City Public Schools	3	2	*
Isle Of Wight County Public Schools	2	2	
King And Queen County Public Schools	3	1	*
King George County Public Schools	5	5	
King William County Public Schools	1	1	
Lancaster County Public Schools	2	2	
Lee County Public Schools	4	1	*
Lexington City Public Schools	2	2	
Loudoun County Public Schools	2	2	
Louisa County Public Schools	2	2	
Lunenburg County Public Schools	3	2	*

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Lynchburg City Public Schools	1	1	
Madison County Public Schools	1	1	
Manassas City Public Schools	2	2	
Manassas Park City Public Schools	2	1	*
Martinsville City Public Schools	1	3	*
Mathews County Public Schools	2	2	
Mecklenburg County Public Schools	1	1	
Middlesex County Public Schools	1	3	*
Montgomery County Public Schools	1	3	*
Nelson County Public Schools	2	2	
New Kent County Public Schools	2	2	
Newport News City Public Schools	1	1	

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Norfolk City Public Schools	3	2	*
Northampton County Public Schools	1	3	*
Northumberland County Public Schools	3	2	*
Norton City Public Schools	2	2	
Nottoway County Public Schools	3	2	*
Orange County Public Schools	2	2	
Page County Public Schools	2	5	*
Patrick County Public Schools	2	2	
Petersburg City Public Schools	3	4	*
Pittsylvania County Public Schools	3	2	*
Poquoson City Public Schools	2	2	*

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Portsmouth City Public Schools	1	5	*
Powhatan County Public Schools	4	1	*
Prince Edward County Public Schools	3	2	*
Prince George County Public Schools	2	2	
Prince William County Public Schools	4	1	*
Pulaski County Public Schools	2	2	
Radford City Public Schools	2	2	
Rappahannock County Public Schools	5	2	*
Richmond City Public Schools	1	4	*
Richmond County Public Schools	2	5	*
Roanoke City Public Schools	1	1	
Roanoke County Public Schools	2	2	

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Rockbridge County Public Schools	5	5	
Rockingham County Public Schools	2	2	
Russell County Public Schools	3	2	*
Salem City Public Schools	2	2	
Scott County Public Schools	3	2	*
Shenandoah County Public Schools	5	5	
Smyth County Public Schools	1	1	
Southampton County Public Schools	2	2	
Spotsylvania County Public Schools	5	2	*
Stafford County Public Schools	4	1	*
Staunton City Public Schools	2	2	
Suffolk City Public Schools	1	1	

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Surry County Public Schools	3	2	*
Sussex County Public Schools	3	4	*
Tazewell County Public Schools	2	2	
Virginia Beach City Public Schools	1	3	*
Warren County Public Schools	2	2	
Washington County Public Schools	2	2	
Waynesboro City Public Schools	3	2	*
West Point Public Schools	2	1	*
Westmoreland County Public Schools	3	2	*
Williamsburg-James City County Public Schools	2	2	
Winchester City Public Schools	1	1	

<u>School Division</u>	<u>Cluster No. With Free and Reduced Lunch</u>	<u>Cluster No. Without Free and Reduced Lunch</u>	<u>* Appear in Different Cluster</u>
Wise County Public Schools	4	1	*
Wythe County Public Schools	2	2	
York County Public Schools	4	1	*
