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ADOLESCENTS' BONDING TO SCHOOL: THE IMPACT OF PERCEIVED SCHOOL CLIMATE PATHWAYS ON MIDDLE SCHOOL STUDENTS' BONDING TO SCHOOL

By

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ABSTRACT

ADOLESCENTS' BONDING TO SCHOOL: THE IMPACT OF PERCEIVED SCHOOL CLIMATE PATHWAYS ON MIDDLE SCHOOL STUDENTS' BONDING TO SCHOOL

By

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This study investigated the impact of school climate on students' bonding to school among a sample of middle school students from two schools in an urban district in Michigan, with a high percentage of minority and economically disadvantaged population. The variables of interests in this study consisted of five constructs of school climate measuring students' perceptions of the environment of their school and four constructs of school bonding that measured the extend of students' bonding to school. Data for this study were collected during Spring 2003 as part of a larger project (Michigan Character Education Project, MCEP).

The main research questions in this study were posed to determine a) how sub-groups as identified by gender, race/ethnicity, grade level and school varied in their bonding to school and b) the pathways that linked students' perceptions of school climate to students' bonding to school and to find out whether or not there were any differences among students by gender, race/ethnicity and school. Multivariate Analysis of Covariance (MANCOVA) was employed to analyze test the research hypotheses relevant to school bonding, controlling for students background characteristics. Structural Equation Modeling (SEM) technique was used to examine the research hypotheses related to pathways that linked the indicators of school climate to students' bonding to school.

Results showed significant differences among sub-groups for both sets of hypotheses. Major findings of the study indicated a steady decrease in students' bonding to school from grade 6th to grade 8th. Perceived support and care for teachers and staff in school as well as respect for all members of the school and for school property were major contributors to students' bonding to school. Sub-group differences and estimates of the pathways were discussed. Findings seemed to point and encourage school characteristics that provide a healthy context in which students can develop healthy attachment to adults, students and to school.

Limitations of the study included a non-random sample and small sample sizes for some of the sub-group analyses. Future directions included addressing the methodological limitations of the study by drawing random sample and including a larger sample for sub-group by race/ethnicity. Furthermore, future research should conduct grade level by gender comparisons for school bonding.

DEDICATION

I dedicate this dissertation to my parents, Hassan and Fatemeh Ziazi, who taught me the value of education and high ideals in life; to my daughters Saqi and Dina Salehi, who encouraged me to continue even when things were difficult; and to all children and youth who have suffered through an imperfect education system.

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CHAPTER 1

INTRODUCTION

This study investigated the impact of perceived school climate on students' bonding to school among a sample of middle school students from two schools in an urban district in Michigan, with a high percentage of minority students. The variables of interest in this study consisted of five constructs of school climate measuring students' perceptions of the environment of their school and four constructs of school bonding that measured the extent of students' bonding to school. Data for this study were collected during the spring of 2003, as part of a larger grant study (Michigan Character Education Project, MCEP). To examine the research hypotheses, several techniques for analysis were utilized in this study. These included descriptive methods, reliability analysis, the Multivariate Analysis of Covariance (MANCOVA), and the Structural Equation Modeling (SEM) technique. The main research questions in this study were posed in order to determine the pathways that links students' perceptions of school climate to students' bonding to school and to find out whether or not there were any differences among the students by gender, race/ethnicity, and schools to which they were enrolled. Differences among students by gender, race/ethnicity, grade level, and school on measures of school bonding, were also examined.

Convincing evidence in the literature has identified bonding to school as a significant protective factor against risks for adolescents. Studies have indicated that positive and strong bonding to school increases students' positive outcomes such as physical and mental health, achievement, increased motivation and self-esteem, while

decreasing the likelihood of adolescents' involvement with anti-social behavior (i.e., drug abuse, smoking, drinking and sexual activities) (McBride, Curry, Cheadle, Anderman, Wagner, Diehr & Psaty, 1995). Bonding to school has also been associated with a decrease in school violence (Simons-Morton, Crump, Haynie & Saylor, 1999). Najaka (2001) reported school bonding as the most convincing evidence of a relationship between risk and problem behavior. Positive changes in bonding and commitment to school were consistently related to positive changes, or decreases, in problem behavior. Weak or low bonding to school, however, is associated with negative school outcomes for youth. In addition, it has been reported as a risk factor for adolescent substance abuse.

Bonding to school as a protective factor is especially important during adolescence. This is because during this stage of life many individuals have difficulty dealing with turmoil and conflicts that are caused by internal and external factors such as psychological, physical and social changes, as well as changes in the roles and expectations (Lerner, Lerner, von Eye, Ostrom, Nitz, Talwar-Soni, & Tubman, 1996; Lanni, & Orr, 1996). These factors, in turn, add to the vulnerability of the adolescents to potential risks in their environment, particularly for those who do not have the internal stamina or do not receive the necessary support from their families and social circle to buffer these risks (Anson, 1995). Therefore, bonding to school can serve an important role in protecting the youth from potential risk factors.

Among several other factors, school climate has been reported as a significant predictor of students' bonding to school. Previous literature has indicated that social opportunities for students to feel a sense of belonging to participate in their social

environment can act as a protective factor against stress and decreases adolescents' risk taking behavior (Hawkins, Catalano & Miller, 1992; Jessor, 1994). Following past studies, McBride et al. (1995) conducted an investigation and found that pro-social bonding environment was associated with a significant increase in bonding among ninth grade students and a reduced likelihood of their engaging in risk-taking behaviors. Several other studies have also confirmed the association between school climate and school bonding and a few studies have investigated the impact of school climate on students' bonding among adolescents (e.g., Anson, 1995; Kumpfer & Turner, 1990-1991). While these studies have provided valuable information, there still remain a number of important areas that are not addressed and need further investigation.

First, given the significance of school bonding as a protective factor for adolescents, and the impact it has in increasing positive outcomes and decreasing the negative outcomes, it is important that this construct be fully understood. However, studies on school bonding have not addressed differences among students by demographic variables of gender, race/ethnicity, grade level or school. Second, pathways from students' perceptions of school climate to students' bonding are not well understood and to date only few studies have indicated how school climate variables measured at the individual level (i.e., individual's perceptions of school climate) affect variables of students' bonding to school. Third, very few studies have considered how pathways of school climate to school bonding may differ in student sub-groups as identified by gender, race/ethnicity and school. Fourth, only few of these studies have been conducted on samples of students from urban areas or included middle school students. Therefore, this study seeks to extend and improve the previous literature by addressing the following

questions:

Question 1. What are the differences between students by gender, race/ethnicity, grade level and school on measures of school bonding?

Question 2. What are the pathways from perceived school climate to school bonding?

Question 3. Are sub-groups of students as identified by students' gender, race/ethnicity and school different with respect to the pathways that links perceived school climate to school bonding? And if so how are the sub-groups different?

Social Significance of the Study

The value of this study contributes to the field of positive youth development in several ways. First, this study will include comparisons between several minority groups and their Caucasian counterparts, particularly those economically disadvantaged from an urban district, who are most underserved and are generally underrepresented in the population. Evidence suggests that minority students are also underrepresented in this area of research as to date, only few studies concerning students' perceptions of school climate and students' bonding have included a comparison between minority and other students (e.g., Chase, 2000) and there is a need for further investigation. Second, this research seeks to determine if race, gender, or school impacts the relationship between perceptions of school climate and school bonding. The potential differences have not been fully understood previously. Third, the results of this study can help to add to the knowledge base a) from which interventions can be further developed such as programs to improve those aspects of school climate that significantly contribute to students' positive bonding to school, thus increasing positive school outcomes while decreasing the

likelihood of students' involvement in anti-social and negative behaviors; b) to inform school practitioners to put forth more efforts and to invest more resources in developing the aspects of school climate that lead to students' positive bonding to their schools thus serves for allocation of resources for greatest student outcomes.

Underlying Theories

The theoretical foundation of this research is rooted in Bronfenbrenner's ecological system's theory (1979), and Hirschi's Social Control Theory (1969). Bronfenbrenner's theory holds that human development is affected by the interactions of person and the context or environment over time. Growth of an individual cannot be separated from the context but it must be examined within the environment in which the developing individual grows. The growing individual's development is affected by a set of inter-related, nested structures (micro, meso, exo and macro systems).

Hirschi's Social Control Theory asserts that feelings of attachment to school and teachers have an important role to play in decreasing deviance and delinquency. Furthermore, it refers to attachment to family and school as one of the primary elements of establishing a social bond. From this perspective, other elements are commitment to conventional pathways of achievement and beliefs in the legitimacy of societal order. Hirschi's theory originated from Bowlby's Attachment Theory (1979), which was concerned about the importance of the attachment bond between infants and young children and their primary care takers in their healthy development. This idea of attachment has been extended from primary caretakers and family environments to include other social and religious institutions such as schools and churches.

In formulating the research topic presented in this thesis, both of these theories seem to be most appropriate to consider. Hirschi's theory provided the grounds for extension of the concept of attachment to schools, allowing for studying school bonding. To address the impact of school climate on students' bonding to school, Bronfenbrenner's theory allowed for an examination of the climate of the school micro-system and how it affected the growing individual (i.e., the middle school students). As a context, middle schools have a potential to impact students' development towards positive pathways that lead to success or failure. Schools can impact students' development towards positive trajectories by providing accepting and affirming climate in which students can grow in positive self-regard and self-esteem (Garbarino, 1985). Students' perceptions of school climate impacts their attitude and behavior, and consequently it affects their outcomes. Supportive and caring school environments can provide the appropriate context and opportunity for positive growth of students while serving as a protective factor against potential risks. While the role of middle schools are very important in creating a positive climate for development, a student's character and development is also important in responding to the conditions in schools.

Thus in understanding and examining the impact of school as a context for middle school students' bonding to school both students' perception of school climate as well as individual's characteristics must be considered which are addressed in this study.

CHAPTER 2

LITERATURE REVIEW

Purpose of the Study—Statement of the Problem

Using Bronfenbrenner's (1979) ecological model of human development and Hirschi's (1969) Social Control Theory as the theoretical frameworks, this study seeks to extend and improve on previous research by considering a) the differences in school bonding by students' characteristics of gender, race/ethnicity, and grade level as well as school to which they belong, b) the dimensions of perceived school climate that contributes to students' bonding to school among a sample of middle school students from an urban district Michigan, and c) pathways of perceived school climate to student bonding among students for subgroups of students as identified by students' gender, race/ethnicity and school.

Rationale for the Study

Adolescents are vulnerable to potential risks due to many factors that impact their lives during this transitional stage. The importance of bonding to school as a protective factor against many risks, especially for adolescents has been well documented. It is shown that bonding to school contributes to students' positive outcomes such as achievement, motivation, self-esteem physical and mental health, while decreasing negative outcomes such as smoking, drinking, drug use and sexual activities.

Furthermore, the significance of school climate in relation to students' bonding to school has been established. Previous literature has indicated school climate as one of the significant predictors of students' bonding to school. It is important to consider the

environment of school when studying school bonding because it has been documented that student-school bonding can be highly increased by improving the climate of the school.

Focus of Literature Review

A comprehensive electronic search of two major databases, "PSYCHINFO" and "ERIC," was conducted between the years 1992 to 2004 in order to find the relevant literature on the topic of this study. While the search was limited to including only studies from the past 12 years (in order to avoid studies that were out-dated), when resources were limited, the search was extended to identify studies that were conducted prior to 1992 as well (i.e., from 1966 to 1992).

Two separate literature searches were conducted to identify the studies relevant to the topic of interest for this investigation. First, a search was undertaken to identify studies that linked school bonding to school climate. The key terms used were school climate, school bonding, school belonging, attachment, school environment or some combination of these terms such as school environment and attachment. Result of the search yielded only 45 studies on the topic. These studies were further filtered out so that only those with school climate as an independent variable and school bonding as a dependent variable were kept. Second, a broad search was conducted to identify studies related to school bonding using the key terms school bonding, attachment to school, attachment, and school belonging. This search was further narrowed to include only studies that predicted school bonding. Both of these groups of studies are summarized in the literature review section of this study.

Definition and Measurement of School Climate

There are various opinions in the literature as to how the term school climate is defined and at what level it is actually measured. Tagiuri (1968) defined school climate as the total environmental quality within an organization and stated that it is consists of four dimensions: ecology, milieu, culture, and social system. A more recent definition of the term has referred to school climate as the sum of the values, cultures, safety practices, and organizational structures within a school that cause it to function and react in particular ways (McBrien & Brandt, 1997). These definitions reflect an aggregate definition of school climate and suggest that both physical and social aspects of the climate are important.

Although school climate may be conceptualized as the aggregation of the physical and social aspects at the school level, several studies (e.g., Chase, 2002; Simons-Morton, et al., 1999; Kumpfer, & Turner, 1990-1991) have measured school climate at the individual level. That is, they have assessed perceptions of the research participants about the climate of their school when studying topics relevant to school climate. Fewer studies (e.g., Anson, 1995) have used an aggregate measure to reflect the school level climate of school, particularly given the large sample of schools needed in order to conduct powerful statistical analyses at the building level.

In addition to differences in the level (individual vs. school) at which school climate is measured, differences also exist in what is included in a school level analysis. For some studies (e.g. Partnership for Academic and Career Education, 1992), measuring school climate at the school level includes inventory of school level materials and activities that impacts or reflects the climate of the school, such as activities to involve

parents, career planning guides, award ceremonies and other recognition activities to celebrate success in school, etc. While other studies (e.g., Welsh, Wayne, Jenkins, & Greene, 1998) have measured school culture as part of the school level climate. Still others (e.g., Gonder & Hymes, 1994) have emphasized the importance of distinguishing between school culture and school climate. They have argued that school climate and school culture are two different concepts and should be measured separately. Similarly some individuals (e.g., Johnson, 1998-1999) have suggested a distinction between affective and experiential features of the setting (such as respect, high morale, caring, and trust) and the cognitive and managerial components (such as opportunity for input, continuous academic and social growth, cohesiveness, and school renewal) of school climate.

Measurement of school climate has also varied in how it is collected. One type of aggregate school level assessments includes self-assessments. These assessments have been designed to measure organizational or managerial climate of school and are intended for internal organizational improvement. These are designed to be filled at the district or school level by key informants within the school and are school building level observational ratings. (e.g. 'Self-Assessment Inventory', Partnership for Academic and Career Education, 1992). However, a large number of school climate assessment tools have been developed to assess students' perceptions of their personal learning environment, and many of them are designed and used primarily for research purposes (e.g. Classroom Environment Scale (CES), Moos & Trickett, 1995; CFK, Ltd School Climate Profile, Howard, Howell, & Brainard, 1987; Education, Training, Research Character Education Survey, ETR Associates, 2000). These surveys include items about

students' perceptions of the "actual" school climate as it exists, or about their "preferred" climate as they would like it to be (e.g., Individualized Classroom Environment Questionnaire (ICEQ), Fraser, 1990). Still other assessments rely on the individual perceptions of not only students, but also teachers, parents and others (Huber & Baraily, 2002) such as 'Comprehensive Assessment of School Environments' "CASE" (National Association of Secondary School Principals, 1987). These authors claim that this method of collecting perceptions of climate from all groups (students, parents, teachers, and staff) tends to be persistent and stable over time. It should be noted that although many different surveys are designed to assess individuals' personal experience of the climate and are usually analyzed at the individual level, these type of surveys have also been used to assess school level climate at a higher level through use of school-level or classroom level mean perceptions. However, the individual level of analysis is a more common use of the survey data (Huber & Baraily, 2002).

In this study, school climate referred to each individual student's perceptions of the environment of the school as they experienced it for themselves and as they observed it in other fellow students or adults in school. Therefore, the items included in the school climate survey inquire about individual's perceptions of their own experience in the school as well as that of other individuals in the school. The term perceived school climate is preferred in this study as it captures the essence of what this construct actually measures.

School Bonding

Importance of Understanding School Bonding

Positive bonding to school has been identified as a significant protective factor against many risks, especially during the adolescent stage of development (Simons-Morton, et al., 1999). This period of growth is considered to be a time of risk and upheaval and a dramatic increase in occurrence of problem behavior which is rare prior to transition to middle school (Eccles, Lord & Buchanan, 1996). Although currently there is consensus that adolescence is not a time of extreme psychological turmoil as research shows that only 5 to 20 percent of youth go through severe emotional disturbance, a great deal of research shows that adolescence period is filled with emotional tension, conflict and turmoil especially with parents, siblings and peers (Smentana, 1995). During this period of development most individuals also experience internal and external shifts such as physical, and psychological changes of puberty, transition from elementary school to middle school, or the new role demands by parents, peers and teachers, which adds to their tension and make them vulnerable to potential risks in their environment. Therefore, positive bonding to school can have an important buffering effect against the risk factors adolescents may face.

Background on School Bonding

Roots in Attachment Theory

The school bonding literature is an extension of attachment theory. The concept of attachment was originally referred to the relationship between caretaker and child (Bowlby, 1969). It suggests that infants establish strong affectionate bonds, or

attachment, to the caretaker(s) who meets the needs of the child (Ainsworth, 1989, Bronfenbrenner, 1979). This bond provides the context in which dramatic development occurs, allowing the infant to gradually move towards increasing separateness and individuation within the context of a meaningful and secure relational base. Attachment theory is based on the collaborative work of John Bowlby and Mary Salter Ainsworth. In their joint work together, Bowlby came up with the idea, while Ainsworth contributed by developing a way to measure infant-mother's attachment (Ainsworth, 1989).

Expanded Use of Attachment Theory

Over the years, the concept of attachment has been expanded to include other attachment relationships besides mother-infant (e.g., adolescent peer relationship) and other social settings such as schools, churches, and other adults such as teachers (Anson, 1995). Therefore, an attachment process similar to the one occurs with the primary caretaker may occur with other family members, special friends, and kin which serves to socialize children. Since then researchers have explored the notion of attachment to school and have conducted studies to inquire the impact of student's feelings of attachment or bonding to school.

Definition and Use of the Term 'School Bonding'

The concept of students' bonding to school has been defined and used in the literature inconsistently by various authors. Some studies have referred to this concept as school attachment or attachment to school (Hoppe, Wells, Haggerty, Simpson, Gainey & Catalano, 1998; Anson, 1995), while others have used the terms school bonding (e.g., Simons-Morton, et al., 1999; Kumpfer & Turner, 1990-19991), social bonding (McBride et al., 1995), or school belonging (Goodenow, 1991).

School attachment has been defined as a sense of belonging at school (Dworkin, 1987; Goodenow, 1991), a network of relationships with peers and other school personnel (Valverde, 1987; Williams, 1987); and a sense of inherent value for the learning process as it relates to students' lives (Dworkin, 1987).

With regard to school bonding, Hawkins and Weis (1985) defined this concept as attachment to pro-social peers, commitment to conventional academic and social activities at school and belief in the established norms fro school behavior. They viewed bonding to school through Hirschi's Social Control Theory (1969). Moreover, McBride et al. (1995) identified key elements of social bonding as: "attachment, the quality of affective relationships that the adolescent has with family and friends; commitment, the degree to which adolescents' aspire to pro-social goals; and involvement, the degree to which the adolescent is integrated in conventional social activities" (p. 63).

For the ease of reading, in this study the term "school bonding" is chosen as the preferred term to refer to the concept of students' feelings of attachment to school. "School bonding" is also used in this document to refer to what other studies might have referenced as "attachment to school", "social bonding", "belonging to school" or other similar terms.

Importance of School Bonding in Promoting Positive Student Outcomes

Previous literature has indicated that positive bonding to school is associated to positive student outcomes. For example, Anson (1995) reported that in a sample of middle schools students' positive bonding to school promoted their pro-social behaviors and positive mental health as well as contributing to their academic achievement. Mouton, Hawkins, McPherson and Copley (1996) also found an association between

positive bonding and students' to academic achievement. In addition, these authors showed that positive school bonding was related to student's self-esteem and motivation.

Furthermore, there has been theoretical evidence to show that students' bonding to school is related to reducing negative student outcomes. Social Control Theory (Hirschi, 1969) asserts that feelings of bonding to school play an important role in decreasing deviance and delinquency. Researchers (e.g., Hawkins & Weis, 1985) have applied this theory to their studies in which they indicated that youth who bond to pro-social institutions such as home and schools are less vulnerable to negative peer influences and negative outcomes. Kirby (2002) reviewed several studies and found school bonding to be significantly related to less sexual behavior and lower pregnancy rates among adolescents. School programs, that were designed to increase school bonding, delayed students' sexual activities or reduced pregnancy rates even when they did not address sexuality. School bonding has also been associated with reduced school violence and decreased drug use among adolescents (Simon-Morton, et al., 1999). Another study Hoppe, Wells, Haggerty, Simpson, Gainey, & Catalano, 1998) revealed that bonding to school decreased the odds of smoking and drinking in youth. In these studies, school bonding, as a single variable, was important in reducing risk behaviors in adolescents.

Additional studies have demonstrated the importance of school bonding in reducing these risk behaviors, even when multiple predictors are considered. In some cases, school bonding is a direct predictor and in other cases it is a mediator. Bryant, Schulenberg, Bachman, O'Malley, and Johnston (2000) reported that school bonding, as one of several indicators of school experience, had an impact on decreasing cigarette use

among the students of eighth through twelfth grades. School bonding contributed to a decrease in cigarette use and acted as a buffer against cigarette smoking. In another study (Hawkins, Graham, Maguin, Abbott, Hill & Catalano, 1997) authors found that school bonding, among other factors, mediated the relationship between alcohol-use at younger age (10-11) to a higher level of alcohol misuse at age 17-18. Finally, Najaka (2001) conducted a meta-analysis and found school bonding to be the most convincing evidence of a relationship between risk and problem behavior. Positive changes in bonding and commitment to school were consistently related to positive changes, or decrease in problem behavior. These three studies indicate the importance of school bonding in reducing risk behaviors, even when other possible predictors are considered.

Additionally, the degree of bonding to school, identified as strong or high and weak or low was investigated by some authors. It is indicated that strong bond to school decreases negative outcomes in youth. For example, McBride, et al. (1995) reported that in a sample of ninth grade students, individuals with high level of bonding to school were less likely to exhibit high-risk behavior such as smoking, substance abuse, and sexual activities. Low or weak bonding to school is associated with negative school outcomes for youth. Results of a study (Hallfors & Van-Dorn, 2002) showed that low school bonding was a risk factor for adolescence substance abuse.

Some authors have focused on examining school bonding by students' characteristics such as grade level and gender. One study (Simons-Morton, et al., 1999) compared middle school students' bonding to school by their grade level. School bonding was significantly higher among 6^{th} graders than for 7^{th} graders and 8^{th} graders. Similarly, 7^{th} graders had a higher score on school bonding than their peers in 8^{th} grade.

Authors reported that students in higher grades liked school less, and felt less closely affiliated with school. Furthermore, this study also reported significant gender differences on measures of school bonding and found a higher bonding to school for females than the male students. McDonald and Wright (2002) investigated gender differences in relation to low school bonding and showed that female students who smoked cigarettes were more likely to feel less bonded or attached to school than either males or nonsmoking females. The relationship between low school bonding and poor student outcomes has been observed among students from a variety of backgrounds. Storino (2001) showed that weak school bonding was a significant predictor of problem behaviors in a sample of Hispanic students. Robertson, Harding and Morrison (1998) also reported that low school bonding was among the variables that contributed to poor peer self-concept and alienation among at-risk Latino youth with learning disabilities. Low levels of school bonding appear to be linked to problem behaviors at school as well as feelings of alienation and poor self-image for these students of color.

Low levels of school bonding appear to be connected to feelings of isolation for other students as well. Another study with a sample of mostly Caucasian students (Mouton, et al., 1996) also revealed that adolescents who had low bonding to school described their lives in school as lonely and isolated and saw themselves as being alienated from school community. They perceived a low level of support and encouragement from the school personnel and from their peers.

Based on the evidence shown in the above, it is clear that bonding to school plays a significant role in the success or failure of students. Positive or strong bonding increases positive outcomes in youth and therefore contributes to success of students.

Bonding to school promotes adolescents' pro-social behaviors and academic achievement in addition to contributing to their physical and mental health. Also, it is shown that positive bonding to school increases students' self-esteem and motivation. It acts as a buffer against adolescents' risk behaviors and is associated with reducing negative student outcomes such as drug use, smoking, drinking, and sexual activities. Moreover, bonding to school decreases the likelihood of students' involvement in anti-social behaviors and is effective in preventing school violence. Youth who bond to school are less vulnerable to negative peer influences and are less likely to engage in high-risk behaviors.

Summary of Importance of School Bonding in Student Outcomes

While positive and strong bonding is associated with positive outcomes, weak or low bonding to school is shown to increase negative outcomes and contribute to students' failure. Evidence indicated that low school bonding is also a risk factor for adolescent substance abuse and appear to be connected to feelings of isolation and poor self- concept and low self- image for students.

The above literature also indicated that students' bonding to school varies based on students' characteristics. There were some indications that school bonding may affect female students differently than the male students. Also, students in higher grades showed a lower bonding to school than those in lower grades. However, with regard to race/ethnicity it was shown that school bonding might impact minority and other students similarly. In sum, bonding to school is identified to be the most convincing evidence of a relationship between risk and problem behaviors during adolescence. Given the

importance of school bonding presented here, it is reasonable to explore factors that may impact students' bonding to schools.

Predictors of School Bonding

Given the significance of school bonding in predicting student outcomes, it is important to understand what factors might help to promote school bonding. While several variables such as parent-school bonding (Pryor, 1994), positive attachment to parents (Anson, 1995), and school misbehavior (e.g., Bryant, et al., 2000) are referred to as having an impact on school bonding, studies have indicated school climate as one of the significant predictors of students' bonding to school (e.g., McBride, et. al., 1995; Anson, 1995; Kumpfer & Turner, 1990-1991; Pyper, Freiberg, Ginsburg, & Spuck, 1987). Some authors (e.g., Anson, 1995; Hawkins, & Catalano, 1990; Schaps, & Battistich, 1991) revealed that student-school bonding can be highly increased by improving school climate, developing social skills and social competence and encouraging authoritative parenting practices. Students, who like their classmates, believe their teachers are supportive and fair, have good peer relations, and accept their school's mission, values and standards are more likely to bond to the school. Also, student bonding to school may be improved by establishing school policies and practices that are fair, increasing opportunities for students to participate in school activities and cultivating positive culture in school (Gottfredson, 1986) that in turn affect students' experience and perceptions of school climate.

Some authors have conducted correlation and regression studies to investigate the relationship between school bonding and school climate. For example, Simons-Morton, et al. (1999) indicated a significant positive association between perceived school climate

and school bonding among a sample of middle school students. They also examined the relationship between these variable and several other variables and concluded that schools can improve students' bonding by improving classroom climate and by modifying school environment. In addition, Anson (1995) used hierarchical multiple regression in examining the impact of school climate on students' bonding in middle schools. She reported that teacher support for achievement, caring behavior of non-teaching staff, behavior patterns of students and students' level of social comfort were important contributors to middle school students' bonding to school. Furthermore, schools with larger populations had students with lower attachment scores.

Other researchers have developed models to examine the relationship between school climate and school bonding. For example, McBride et al. (1995) investigated the availability of social opportunities in the school environment as predictor of social bonding among high school students by proposing a heuristic model. In their model they tested the influence of the bonding environment on 9th grade students' social bonding and risk taking behaviors. Furthermore, aggregated levels of attachment, commitment and involvement in school were used as indicators of the availability of bonding opportunities in the school environment. Their results showed that pro-social bonding environments were associated with a significant increase in bonding among ninth grade male and female students and a reduced likelihood of their engagement in risk-taking behavior. Kumpfer and Turner (1990-1991) also developed a model to explore the relationship between school climate and school bonding. In their Social Ecology Model family and school climate were depicted as two major ecological influences of school bonding. Their findings confirmed that in a sample of high school students, school bonding was

significantly predicted by the latent variables of school and family climate. Students with poor family or school climate did not appear to bond to their school. Furthermore, they indicated that youth are more likely to choose pro-social peers if they are involved in schools with positive climate.

Some researchers have compared students by race/ethnicity when looking at the relationship between school climate and school bonding. Chase (2000) explored differences in race/ethnicity in examining the relationship between school bonding and school climate and noted that bonding to school may be impacted by individual's race/ethnicity. The author compared bonding of African American students to school with that of the Caucasian students. It was found that African American students exhibited distrustful feelings about individuals in their schools and indicated having a negative perception of school climate, which contributed to their lack of positive bonding to school. Kester (1994) conducted a study on a sample of 10 African American students (five who had been with the same teacher for 2 years and five students who were new to school). Interviewing these students, the author explored the effects of school structure and peer group on students' bonding to school. In particular, this study examined whether students who have the same teacher for all three years of the middle school develop a stronger connection to school or not. Results indicated that students in two groups had different loyalty to their peer group and their homeroom teacher. Those who had one teacher for a long period of time with whom they developed a close relationship seemed to have greater bond to school than students who were new to school. Anson (1995) compared African American, Hispanic, and Asian students with Caucasian students and found that African American and Hispanic students felt less attached than

did their Caucasian and Asian peers. Furthermore, she indicated a link between higher percentage of African Americans in a school and a higher school bonding for African American students.

Gender differences were also examined in the interactions between school climate and school bonding (e.g., Kumpfer, & Turner, 1990-1991). The authors tested their ecological model and found a better fit of the model for males than females. Anson (1995) also examined gender differences when looking at school climate and school bonding and found that females reported higher bonding to school.

In sum, school climate has been identified as one of the significant predictors of students' bonding to school. Studies have indicated that student-school bonding can be highly increased by improving school climate. Research has shown that pro-social bonding environments were associated with a significant increase in bonding. Also, family and school climate were indicated as two major ecological influences that predicted school bonding and their findings indicated that school bonding was significantly predicted by the latent variable of school climate.

Previous literature examining the interactions between school climate and school bonding has also explored differences among students by demographic variables of race/ethnicity and gender. In examining differences on race/ethnicity it was indicated that African American students had lower bonding to school than Caucasian students due to their negative perceptions of school climate and feelings of mistrust. Results on gender differences showed that the model describing the relationship between school climate and school bonding was significantly different for female students than for male students.

Limitation of Previous Research

Despite the evidence revealing the importance of school climate on school bonding, the number of studies focusing on the impact of school climate on students' bonding to school is sparse and this area of research is not completely understood. A literature search on the topic of school climate and school bonding since 1992 yielded only 45 studies, of which, only a few closely related research were found addressing the relationship between school climate and students' bonding (e.g., Kumpfer, & Turner, 1991; Anson, 1995).

Moreover, pathways to school bonding are not well known and further research to understand how school climate variables impact students' bonding to school is needed. In particular, how various aspects of school climate as perceived by students contribute to school bonding has not received the attention it deserves. In addition, only a few studies have focused on gender issues when considering the relationship between school climate and school bonding. Only one had an ethnically diverse sample and the rest had included samples with mostly Caucasian students. This limits the generalizability of the results to other minority population. Also, differences among students by race/ethnicity background or by school in relation to this topic are not well investigated. Only few studies have addressed the race/minority differences and their samples have only included African American and Caucasian population. Only one study made comparisons with other minority students. Furthermore, only one study investigated the differences by school and had indicated that schools with larger populations had students with lower bonding to school. Comparison of schools is an important area to be considered since schools with various demographic compositions and different school

climate create different bonding environment for students. This in turn impacts how school climate affects students' bonding to school.

Addressing Gaps in the Literature

More studies need to be conducted to explore the effects of gender, race/ethnicity and school differences in examining school bonding and pathways of perceived school climate to students' bonding to school, particularly for schools in urban areas with high percentage minority students. The reason for this claim is because evidence presented in this document revealed a) the vulnerability of students during middle school years especially the underserved population, b) the importance of school bonding in protecting adolescents against risk factors, c) perceptions of school climate as one of the significant factors to be considered for improving students' bonding to school, d) that few studies have investigated how school bonding varies by students' gender, race/ethnicity, grade level and school, and studies that have addressed these issues are limited in terms of their sample or the comparisons they have made, e) that to date few studies have explored the impact of school climate perceptions on school bonding, especially, among the middle school population, in urban areas with high percentage of minority population, and f) that only few studies have explored differences among students by gender, race/ethnicity and school in examining the impact of school climate perceptions on school bonding. Therefore, the present study attempts to close these existing gaps by shedding light on the perceived school climate pathways to school bonding.

Research Hypotheses

The following research hypotheses will be addressed in this study:

Research Hypotheses Related to School Bonding

Hypothesis #1. There are significant differences between male students and female students on their perceptions of school bonding.

The first hypothesis in this study will address gender differences on school bonding. Previous research on gender differences was inconclusive. One study (McDonald, & Wright, 2002) showed that female students who smoked had a lower bonding to school than the non-smoker females and the male students in the sample. Another study (Simons-Morton, et al., 1999) found a higher bonding to school for females than the male students.

Hypothesis #2. There are significant differences between Caucasian students, African American students and Hispanic/Latino students on their perceptions of school bonding.

With respect to race/ethnicity, previous studies that had reported the racial composition of their sample were conducted either on a sample of Latino or Hispanic students (Storino, 2001; Robertson, Harding, & Morrison, 1998) or on a sample where the majority of students were Caucasian (e.g., Mouton, et al., 1996). Only one study (Anson, 1995) made a comparison between students from various racial backgrounds. The following research hypothesis will add to previous knowledge by comparing school bonding among a sample of middle school students from three various racial/ethnic backgrounds: Black/African American students, Mexican/Latino/Hispanic students and White/Caucasian students.

Hypothesis #3. There are significant differences between students in grades 6th, 7th and 8th on their perceptions of school bonding.

Previous research has found that perceptions of school bonding vary by grade level (Mouton, et al., 1996; Simons-Morton, et al., 1999). However, only one of the two studies was conducted on a sample of middle school students. Furthermore, this study used an index of school bonding that measured only school commitment. They did not include other dimensions of school bonding in their measurement. Therefore, the third research hypotheses in this section will extend previous literature with regard to grade level differences in middle school by considering measures of school bonding that includes several constructs. Because this study will utilize multiple dimensions of school bonding, and will be conducted on a sample of middle school students, it will contribute to the research on school bonding by adding new information about how middle school students in different grade levels vary on measures of school bonding.

Hypothesis # 4. There are significant differences between students in one of the middle schools in the sample (school A) and students in the other middle school in the sample (school B) on their perceptions of school bonding.

Gottfredson, (1986) indicated that student bonding to school is affected by the culture, policies and practices of school. When these are positively defined, rules and policies are fair, and opportunities for students to participate in school activities are increased, students' bonding to school can be improved. Previous research has also shown that student-school bonding is impacted by school structure (Kester, 1994) and school climate (McBride, et al., 1995; Kumpfer & Turner, 1990-1991). Although, these studies have indicated the impact schools can have on students' bonding to school, none

have made a comparison among schools on the measure of students' bonding to school. This hypothesis will extend the previous research by providing such a comparison.

Research Hypotheses Related to Perceived School Climate as Predictor of School Bonding

Hypothesis # 5. There are significant pathways from perceived school climate to middle school students' bonding to school for the entire sample.

School climate has been identified as one of the significant predictors of students' bonding to school (McBride, et. al., 1995; Anson, 1995; Kumpfer, & Turner, 1990-1991; Pyper, Freiberg, Ginsburg, & Spuck, 1987). However, most of these studies had considered a narrow aspect of school environment such as organization of classroom (Kester, 1994) or bonding opportunities in the school environment (McBride et al., 1995) in relation to school bonding in their studies. Two studies (Kumpfer & Turner, 1991; Anson, 1995) examined several dimensions of school environment. Only one of the two was done on a sample of middle school students. This research question will add to previous studies by examining the impact of perceived school climate on middle school students' bonding to school by considering a broader range of school environment, some of which are different from previous studies.

Hypothesis # 6. Pathways of perceived school climate to students' bonding to school are predicted to be different for male students than those for female students.

How students' gender impacts students' bonding to school is not clear. Previous evidence concerning gender differences has been vague and unsettling. Kumpfer and Turner (1990-1991) examined gender differences in relationship between school climate and school bonding. They tested their ecological model and found a better fit of the

model for males than females. Anson (1995) also explored gender differences when looking at school climate and school bonding and found that females reported higher bonding to school than did male students. This hypothesis will provide further information by examining the differences among male and female students in linking school climate to school bonding.

Hypothesis # 7. Pathways of perceived school climate to students' bonding to school are predicted to be different for each subgroup of students as identified by race/ethnicity: Black/African American students, Mexican/Latino/Hispanic students and Caucasian students.

Only few studies have explored differences in race/ethnicity of students when examining the relationship between perceived school climate and school bonding, and comparisons were mostly made on differences between African American students and Caucasian students. Of three studies on this topic, two (Chase, 2000; Kester, 1994) compared the bonding of African American students to school with that of the Caucasian students. Chase (2000) indicated that African American students lacked positive bonding to school due to a negative perception of school climate and distrustful feelings towards other individuals in their school. Kester (1994) used a very small sample (10 students) and conducted an interview and a survey to explore the effects of school structure and peer group on students' bonding to school. It was found that African American students had a different loyalty to their peer group and their homeroom teacher than the Caucasian students. Only one study (Anson, 1995) included other minority groups (Hispanic and Asian students) in addition to African American students in the sample. This study showed that African American and Hispanic students were less attached to their school.

The author used regression methodology to make the comparisons between different groups. This hypothesis will add to previous research by employing a multivariate technique (SEM analysis) and including a sample consist of three minority groups (Black/African American students, Mexican/Latino/Hispanic students, and White/Caucasian students) to examine if the pathways of perceived school climate to school bonding remain the same or not for these three subgroups.

Hypothesis # 8. Pathways of perceived school climate to students' bonding to school are significantly different for each subgroup of students as identified by school variable: School A, School B.

With regard to schools, each school has a different climate unique to itself as determined by many factors that impact its climate (Rutter, 1979). This can be impacted by measures of socio-economic background of students attending the school and other student demographic variables as well as school level variables. These factors determine the climate of each school, which in turn impact students' perceptions of school climate at the school level (Rutter, 1979) and student outcomes (Smey-Richman, 2001; Wang, 2000). Similarly, students' bonding to school may vary depending on the school composition such as percentage of minority students in school (Anson, 1995). Therefore, it is expected that the two schools in this sample would be different with regard to perceived school climate variables that link to students' bonding to school.

CHAPTER 3

METHODOLOGY

Participant Recruitment

This study used secondary data (from wave 4 of 4), collected for a larger project, the "Michigan Model Partnership for Character Education" (MMPCE), and recruited the participants used in the analysis from two middle schools in the sample. In that larger study, a convenience sample of three school districts was recruited for their participation in a two-year study. One of the middle schools in this study was selected as a control group for the larger project while the other was considered for a full implementation of the intervention. To recruit the schools, the district superintendent of each school was contacted and asked to select two fairly comparable schools within their district to participate. One school (the experimental or intervention group) would receive comprehensive programming and additional funds (school climate and Character Education interventions) while the other school (the control group) would receive Character Education (CE) programming alone and lesser funds. Each superintendent assigned a convenience sample of two schools to participate in the study. The school principals selected the classrooms and teachers that would participate in the CE programs. Principals were asked to coordinate within school districts to provide comparable CE programming. Attempts were made to coordinate the delivery of the CE curriculum in terms of which grade level would be targeted for the CE curriculum and in which class period it would be delivered.

Participants

The sample in this research includes students in two middle schools from an urban district in Michigan with high level of poverty and a high percentage of minorities (drawn from the larger study—MMPCE as stated above). Table 3.1 below shows the profile of the community and middle school students in the district from which the two schools in the sample were selected at the beginning of the project. A majority of students in the district were eligible for free and reduced lunch. Also, a majority of students scored below the passing rate on MEAP scores across subjects and their absence rate was high.

Table 3.1

Characteristics of the Community and Middle School Students in the District[1]

Community characteristics of school district	Percent Reported
Percent of population residing in school district that is non-white alone	38
Percent of population residing in school district in owner occupied housing	60
Percent of adults in the community with low SES	75
Characteristics of students in middle schools in the district	
Percent students qualified for Free/reduced lunch	76
Percent Absent more than 12 days per year	45
MEAP passing rate in Reading	38
MEAP passing rate in Math	34
MEAP passing rate in Writing	48
MEAP passing rate in Science	44
Percent Caucasian	34
Percent African American	44
Percent Hispanic	19
Percent Asian	2
Percent Native American	1

[1] NCES-CCD Based on 2000 Census * Character Education Report 2001

Table 3.2 below indicates the profile of the overall schools at the building level at the beginning of the project. The schools from which the sample population was drawn were similar on levels of economic advantage, academic achievement, gender composition, and different on racial composition of students, and staffing ratio. Both schools had ethnically diverse populations with a large percentage of students from both African-American and Caucasian backgrounds. However school B had a considerable larger population of African American students than the other.

Table 3.2

Characteristics of Participating Schools During 2000 to 2001[2]

	School A	School B
Student demographics		
Percent of students economically disadvantaged	73	77
Student Achievement Data		
MEAP passing rate	18	25
MEAP participation rate	60	68
Staffing Ratio		
Student per teacher	30	14
Gender		
Female	48	48
Male	52	52
Race/Ethnicity		
Caucasian	45	22
African American	35	68
Hispanic	17	
Native American	2	2
Asian Pacific Islander	1	2

[2] Sources of data: NCES-CCD & Standard and Poors 2001

Of approximately 1,272 students in grades 6th through 8th from the two middles schools, 763 students completed the questionnaires for this study. The background characteristics of students in the research sample are indicated in Table 3.3 below. Based on the data from students who filled out the surveys, the proportion of male students is slightly higher than the females in the sample. While there are more 7th graders in the sample, equal proportion of students are in 6th and 8th grades. With regard to race/ethnicity the sample is diverse and the majority of the students are African American, Caucasian and Hispanic. Data also shows that the two schools are similar with regard to the proportion of male and female students as well as the distribution of students in each grade. However, with respect to race/ethnicity, majority of the students in school B are African Americans while in school B the majority are Caucasians.

Table 3.3

Demographic characteristics of the participants for the entire sample and by school

	Entire Sample		School A		School B	
	N	%[3]	N	%	N	%
Gender						
Female	350	46	186	44	163	48
Male	408	54	233	56	174	52
Not reported	5	---	2	---	3	---
Total	763	100	421	100	340	100
Grade						
6th	235	31	130	32	105	31
7th	283	38	163	40	120	36
8th	230	31	118	29	112	33
Not reported	15	---	10	---	3	---
Total	763	100	421	100	340	100

[3] The number of cases that did not report is not considered in calculation of percentage in this table.

Race/Ethnicity

Caucasian	213	30	162	40	51	17
African American	270	38	93	23	177	58
Hispanic	104	15	57	14	47	16
Asian	9	1	7	2	2	1
American Indian or Alaska Native	14	2	8	2	6	2
Pacific Islander	0	0	0	0	0	0
Other	105	15	84	20	21	7
Not reported	47	---	9	----	36	---
Total	763	100	421	100	340	100

Data Collection Procedure

Students in both middle schools were given self-administered paper and pencil surveys at the end of the 2003-2004 school year. This survey included items assessing individual student's perception of school climate, student's perception of bonding to school as well as their demographic data on gender, race/ethnicity, and grade level.

Students were presented with forty-three statements and were asked to rate the degree to which each sentence described what was occurring in their school. This survey was administered to students during their class period as decided by their teachers in agreement with the school principal. It took approximately twenty minutes to complete the survey. Students were given an option to either participate in completing the survey or to refuse. Those who chose to participate were given instructions as to how to respond to the items (usually read to them by their teacher). For confidentiality purposes students were provided with envelopes to place their completed surveys, or empty surveys if they refused to participate. Prior to implementation of the larger project (MMPCE), teachers had received training, as to how to administer the survey to their students, during a one

day in-service at the beginning of the school year. In addition, instruction sheets regarding the implementation of the survey were made available to them at the time of training for future references.

Measurements

School Bonding

Latent construct of school bonding is the outcome or dependent variable in this study. This construct will be assessed by eighteen items from the Survey of School Climate (Anson, 1995) measuring four domains on a five point Likert scale ranging from none to all (1= None or Not at All for some questions to 5= All or Very for some questions). A description of the four domains, number of items, examples of the items, and the reliability data reported in a previous study (Anson, 1995) are as follows (see Appendix B for the full description of items):

1. Personal attachment to school. Refers to student's enjoyment and seeing contact with school, its inhabitants and its environment including 6 items with alpha reliability of 0.87.

   (Examples of items: If you had to stop going to school, how much would you miss your teachers?; If you had to stop going to school, how much would you miss the principal?; If you had to stop going to school, how much would you miss the sense of school spirit?)
2. Pride in school. Refers to student's report on feelings of pride for both themselves and as they perceive it in others with 6 items and alpha reliability of 0.83.

(Examples of items: How proud do you feel of your school?; How many students feel proud of this school?; How many teachers feel proud of this school?)

3. Fairness of school rules/punishment. Highlights the importance early adolescents place on feeling that adults are being fair and that policies are carried out in a just way. This is an important construct in measuring early adolescents' positive feelings towards school and includes 3 items with alpha reliability of 0.70. (Examples of items: How clearly stated are the school rules?; How fair are the school rules?; When students are punished at school, how fair is the punishment?)
4. Personal dislike of school. Contains items indicating each student's feelings about school or going to school. Reverse coded, a high value indicates positive feelings towards school and it includes 3 items with alpha reliability of 0.63. (Examples of items: When I wake up in the morning, I often don't feel like going to school; School is boring; sometimes I pretend to be sick so I don't have to go to school).

School Climate

In this study climate constructs are measured by the School as a Caring Community Profile –II instrument (SCCP-II; Center for 4th and 5th R's, 2000), developed to help schools assess themselves as a caring community, and measure students' perceptions of climate of the school. This 45-item instrument includes five scales (See Appendix A for the full description of items) that are arranged on a five point Likert scale from "Almost Never" to "Almost Always" (1=almost never, 2=sometimes, 3=as often as not 4=frequently, 5=almost always). The five scales are listed below:

1. Perceptions of student respect. Measures respect for other students, staff and school property and includes nine items with the reported reliability of 0.88.

   (Examples of items: Students treat classmates with respect; Students respect the personal property of others; Students refrain from put-downs).

2. Perceptions of student friendship and belonging. Measures student caring, respect, and kindness for one another including 9 items with a reported reliability of 0.87.

   (Examples of items: Students exclude other students because they are different; Students help each other, even if they are not friends; Students work well together).

3. Perceptions of students' shaping of their environment. Measures students' attempts to influence the behavior and actions of others and the overall well-being of the school which includes 7 items with the reported reliability of 0.90.

   (Examples of items: Students help to improve the school; Students try to have a positive influence on the behavior of other students; Students resolve conflicts without fighting, insults, or threats).

4. Perceptions of support and care by and for faculty/staff. Measures caring and respect students, parents and other faculty, staff, have toward faculty and staff. It includes 10 items with reported reliability of 0.82.

   (Examples of items: Teachers go out of their way to help students who need extra help; Students can talk to their teachers about problems that are

bothering them; Teachers go out of their way to help students who need extra help).

5. Perceptions of support and care by and for parents. Measures the caring and respect that the school, teachers, students, and other parents show parents including 7 items with reported reliability of 0.73.
   (Examples of items: Parents show that they care about their child's education and school behavior; Teachers treat parents with respect; this school cares about the thoughts and feelings of parents).

Demographic Variables

Student's grade, gender, and race/ethnicity, school as well as background variables of educational aspiration, self-reported grades obtained in school, are included in this study. Categorical variables of gender, race/ethnicity and school are coded as follow: Gender, 1=female, 2=male; Race, 1=White/Caucasian, 2=Black/African American, 3=Mexican/Latino/Hispanic, and; School, 1=middle school A, 2=middle school B.

CHAPTER 4

ANALYSIS

This section includes two sets of analyses. First, the background analyses are presented including descriptive analysis of both dependent and independent variables, and correlation matrix for dependent and independent variables. Secondly, Multivariate Analysis of Covariance (MANCOVA) and Structural Equation Modeling (SEM) analyses are presented which include testing of all research hypotheses in this study.

Background Analyses

The analyses plans in this section include preliminary analyses. Their purpose is to provide background information concerning the measures and variables that are included in this study and are not performed for testing of the hypotheses.

Descriptive Analyses

Descriptive analyses are utilized to report the mean, standard deviation and the number of students rating each measure of the dependent and independent variables in this study. These results are indicated in Tables 4.1. Both school climate and school bonding items were scored on a range from 1 to 5 with 5 indicating high scores.

School Climate Descriptive Analysis

Results for the school climate measures showed that perception of support and care by and for parents and those for faculty/staff had mean values slightly above 3, revealing that all together, students perceived these two aspects of the climate in their school as slightly above average. However, the values for measures of student respect,

student friendship and belonging, and student shaping of their environment were between 2.3 to 2.6 indicating that overall students perceived these aspects of school climate as slightly below average (See Table 4.1).

School Bonding Descriptive Analysis

Similarly, for the school bonding variables the mean values for student attachment to school, pride in school and personal dislike of school were around 2.6 showing that on the average students reported these items as slightly below average, while the mean ratings for fairness of school rules/punishment was around 3.0 which shows students rated the items for this measure as average (See Table 4.1).

Table 4.1

Distribution of School Climate and School Bonding for the Sample

Variable	Mean	SD	N
School Climate			
Perceptions of Student Respect	2.61	0.64	715
Perceptions of student friendship and belonging	2.63	0.60	683
Perceptions of students' shaping of their environment	2.31	0.74	731
Perceptions of support and care by and for faculty/staff	3.11	0.85	706
Perceptions of support and care by and for parents	3.33	0.86	685
School Bonding			
Personal Attachment to School	2.61	0.96	697
Pride in School	2.68	0.83	708
Fairness of School Rules/Punishment	3.03	0.95	687
Personal Dislike of School	2.62	0.95	733

Correlation Matrix

Spearman rank correlations of all research variables are shown in Table 4.2. Means and standard deviations are presented in the first columns and reliabilities of the measures are indicated on the diagonal.

Overall, the independent variables representing school climate had moderate to high correlation with all four constructs of the dependent variable and they were all statistically significant ($p < 0.01$). Two independent variables of perceptions of support and care by and for faculty/staff and perceptions of support and care by and for parents had a relatively moderate to high correlation with the four dependent variables. Perception of student respect, perceptions of student friendship and belonging as well as perceptions of students' shaping of their environment had moderate correlations with the school bonding variables of personal attachment to school and pride in school, and low-moderate correlations with fairness of school rules and punishment and personal dislike of school. The highest correlation between dependent and independent variables was found among fairness of school rules/punishment and perceptions of support and care by and for faculty/staff, and the lowest correlation existed between fairness of school rules/punishment and perceptions of student respect.

An examination of correlations among the school climate variables in Table 4.2 indicates that most of the school climate variables had moderate to high correlations with one another, although a few had low correlations. All of these measures had positive correlations with one another. The highest correlation was found between perceptions of support and care by and for parents and perceptions of support and care by and for faculty. Students' perception of friendship and belonging was also highly correlated with perceptions of student respect. High correlation also was found between perceptions of students' shaping of their environment and perception of student respect as well as perception of student friendship and belonging. The lowest correlation existed between perceptions of support and care by and for parents and perceptions of student respect.

Perception of student respect also had low correlation with perception of support and care by and for faculty/staff. In addition, low correlation was found (a) between perceptions of support and care by and for parents and (b) perception of students' shaping of their environment.

Table 4.2
Correlation Matrix of Key Research Variables[1]

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Perceptions of student respect	2.61	0.64	0.69								
2. Perceptions of student friendship and belonging	2.63	0.60	0.512** (654)	0.69							
3. Perceptions of students' shaping of their environment	2.31	0.74	0.515** (694)	0.685** (667)	0.77						
4. Perceptions of support and care by and for faculty/staff	3.11	0.85	0.231* (675)	0.367** (645)	0.402** (685)	0.84					
5. Perceptions of support and care by and for parents	3.33	0.86	0.188** (649)	0.309** (622)	0.290** (665)	0.806** (655)	0.76				
6. Personal Attachment to School	2.61	0.96	0.290** (660)	0.336** (630)	0.384** (675)	0.418** (658)	0.326** (639)	0.82			
7. Pride in School	2.68	0.83	0.350** (667)	0.382** (644)	0.390** (686)	0.477** (664)	0.454** (649)	0.611** (672)	0.82		
8. Fairness of School Rules/Punishment	3.03	0.95	0.212** (652)	0.235** (620)	0.242** (664)	0.512** (645)	0.442** (624)	0.484** (647)	0.591** (659)	0.72	
9. Personal Dislike of School	2.62	0.95	0.255** (693)	0.323** (662)	0.248** (710)	0.353** (689)	0.282* (666)	0.389** (687)	0.386** (697)	0.372** (673)	0.60

[1] Sample sizes are presented in parentheses and reliabilities of the variables are shown on the diagonal.

Reliability Analysis

Reliabilities of the measures for the sample in this study are calculated and reported in Table 4.3 below. As indicated, reliability of the items for all constructs of school climate and school bonding in this study are between 0.69 and 0.84. Among the measures of school climate, perceptions of support and care by and for faculty/staff, perceptions of student shaping of their environment, and perceptions of support and care by and for parents had the highest reliabilities while for school bonding domains, pride in School, personal attachment to school, and fairness of school rules and punishment had the highest reliabilities. Similarly, the school bonding constructs had reliabilities between 0.60 and 0.83 for the sample in this study. Pride in school had the highest reliability while personal dislike of school had the lowest reliability among the school bonding measures.

Table 4.3

Comparison of Scale Reliability for the School Climate and School Bonding Variables Based on the Study Sample to Previously Reported Studies

Scale Items	No. of Items	Standardized Item alpha (Previously reported for this study)	Standardized Item alpha
School Climate			
Perceptions of Student Respect	9	0.88	0.69
Perceptions of Student Friendship & Belonging	9	0.87	0.69
Perceptions of Student Shaping of their Environment	7	0.90	0.77
Perceptions of Support and Care by and for Faculty/Staff	10	0.82	0.84
Perceptions of Support and Care by and for Parents	7	0.73	0.76
School Bonding			
Personal Attachment to School	6	0.87	0.82
Pride in School	6	0.83	0.83
Fairness of School Rules and Punishment	3	0.70	0.72
Personal Dislike of School	3	0.63	0.60

The reliabilities found in the study were comparable to those reported by the measurement authors. Compared to the reliability of school climate measures reported by the instrument developer (Center for 4th and 5th R's, 2000), item reliabilities based on the sample in the present study are higher for two measures (i.e., support and care by and for faculty/staff; support and care by and for parents) and lower for three measures (i.e., student respect, student friendship and belonging, and student shaping of their environment) than those reported previously.

Similarly, the measures of school bonding for the sample in this study were comparable to those reported previously (Anson, 1995). Personal attachment to school and personal dislike of school had slightly lower reliabilities than those reported previously. Fairness of school rules and punishment had a slightly higher reliability than the prior study while the reliability of pride for school was exactly the same for both samples.

Testing Research Hypotheses

In this section two sets of analyses will be conducted to test the research hypotheses. The first analyses examine potential group differences on the key research outcome variable of school bonding. The second analyses examine the relationships between the school climate predictor variables and the school bonding outcome variables for different groups of students.

Analysis of Group Differences

To examine the research hypotheses (1 through 4) relevant to group differences on indicators of school bonding, several Multivariate Analysis of Covariance (MANCOVA) were conducted. These analyses simultaneously examined the

relationship of a single student background characteristic on all the school bonding outcomes, while controlling for the remaining student background characteristics. The MANCOVA test is based on the assumption that the covariates have linear relationships with the outcome variables. Therefore, preliminary analyses (not shown here) were conducted to first determine whether each of the proposed covariates demonstrated a linear relationship to the outcome variables. While existence of a linear relationship is generally best demonstrated by scatter plots of the variables, here scatter plots did not seem to be the best determinant of linear relationships between covariates and the outcome variables. This was due to the fact that both the covariates and the outcome variables were ordinal variables ranging from values of 1 to 5. Therefore, Spearman rank correlation coefficients were used to determine linearity between covariates and the outcomes (personal attachment to school, pride in school, fairness of school rules/punishment and personal dislike of school). Only those background variables that had significant linear relationships with at least three of the four dependent variables. Using this decision rule, all of the initially proposed student background variables were used in MANCOVA analyses because all met the assumption of linearity. These proposed background variables included students' gender, grade level, self-reported grade obtained in school, and educational aspirations. The MANCOVA results for hypotheses 1 through 4 are reported in Tables 4.4 through 4.31.

Interpretation of MANCOVA Tables

The MANCOVA analysis involved four steps once the assumptions of linearity were tested. (1) The omnibus test was conducted to determine if there were any significant differences between groups of students (e.g. by race, gender, school and grade level) on the entire set of school bonding scales once student background characteristics were controlled. Background characteristics included race, gender, grade level, self-reported grades, and educational aspirations. Wilks' lambda was used for this omnibus test since the assumptions appeared to be met. The Wilks' lambda test has been described as a good balance between power and assumptions when assumptions are met (Olson, 1973). (2) If the Wilks' lamda was significant, indicating group differences did occur, then the second step was to conduct a univariate analysis to determine on which of the school bonding scales significant group differences occurred. This analysis yielded an F score which was again examined for significance. A significant F value for a particular scale indicated that group differences existed on that scale. (3) For those scales in which group differences were present, the mean values of the scales were examined for each group to determine which group had a significantly higher value than the other group. (4) When more than two groups of students were analyzed for mean values on their outcome variables, additional post-hoc contrasts were needed to determine which of the student groups differed from each other on a particular measure.

Presentation of MANCOVA Analyses

For each of the following four hypotheses one table will be presented. The results of the multivariate analysis (described in step one above) will be presented in the text. The key information for the results of the above steps two, three and four (if applicable)

will be presented in one table. The full details of each step in the analysis will be presented in the appendices.

Hypothesis #1

There are significant differences between male students and female students on their perceptions of school bonding.

For this hypothesis a between-subjects MANCOVA was performed on four dependent variables: (1) personal attachment to school, (2) pride in school, (3) fairness of school rules/ punishment, and (4) personal dislike of school. The results were controlled for students' (1) grade level, (2) self-reported grade obtained in school, and (3) educational aspirations which had all been previously tested and found to have met the assumption of linearity. That is, the model tested the hypothesis that males and females did not differ on the four variables of school bonding after accounting for differential effects of the covariates.

Multivariate tests revealed a significant main effect for gender (Wilks's lambda = 0.984, $\underline{F}$ = 2.74 (4, 676), $\underline{p}$ = .028). The univariate tests (see Appendix C for full details of this analysis) showed that the differences between males and females were significant for only one of the four measures of school bonding: fairness of school rules/punishment ($\underline{F}$ = 10.87, $\underline{p}$= 0.00). No significant differences were observed between male and female students for measures of personal attachment to school, pride in school or personal dislike of school. Furthermore, the female students had higher average than their male counterparts on all four measures of school bonding, although only one of the differences was significant. Differences between males and females on measures of school bonding are indicated in Table 4.4.

Table 4.4

Comparison of School Bonding Measures (Scales) Mean Values by Gender

		Descriptive Statistics			Univariate test name
Variable	Group	Mean	SD	n	F (df=1,679)
Personal Attachment to school	Male	2.54	0.98	375	1.90
	Female	2.68	0.88	309	
Pride in School	Male	2.62	0.83	375	2.46
	Female	2.75	0.79	309	
Fairness of Rules/Punishment	Male	2.92	0.93	375	10.87**
	Female	3.17	0.85	309	
Personal Dislike of School	Male	2.57	0.95	375	0.83
	Female	2.68	0.89	309	

* $p<0.05$ ** $p<0.01$

Hypothesis #2

There are significant differences between Caucasian students, African American students and Hispanic/Latino students on their perceptions of school bonding.

For hypotheses 2, Multivariate one-way Analysis of Covariance (MANCOVA) was conducted to detect group differences on indicators of school bonding by students' race/ethnicity (African American and Caucasian, Hispanic), controlling for several students' background characteristics. The between-subjects MANCOVA was performed on four dependent variables: (1) personal attachment to school, (2) pride in school, (3) fairness of school rules/ punishment, and (4) personal dislike of school. The results were

controlled for students' (1) grade level, (2) gender (3) self-reported grade obtained in school, and (3) educational aspirations which had all been previously tested and found to have met the assumption of linearity. The model tests the hypothesis that African American, Caucasian, and Hispanic students did not differ on the four variables of school bonding after accounting for differential effects of the covariates. That is, students' grade level, gender, self-reported grade obtained in school, and aspirations were entered as covariates in the model. Summary results for this hypothesis are shown in Table 4.5.

Table 4.5

Comparison of School Bonding Measures (Scales) Mean Values by Race

			Descriptive Statistics			Univariate test name	Significant Post hoc contrasts
Variable	Group		Mean	SD	n	F (2, 557)	
Personal Attachment to school	1	African American	2.70	0.96	255	3.74*	1-3**
	2	Hispanic/ Latino	2.55	0.97	99		
	3	Caucasian	2.47	0.92	210		
Pride in School	1	African American	2.68	0.77	255	1.88	
	2	Hispanic/ Latino	2.75	0.89	99		
	3	Caucasian	2.61	0.81	210		
Fairness of Rules/Punishment	1	African American	3.02	0.85	255	0.03	
	2	Hispanic/ Latino	3.05	0.88	99		
	3	Caucasian	3.06	0.96	210		
Personal Dislike of School	1	African American	2.73	0.88	255	6.22**	1-3** 2-3**
	2	Hispanic/ Latino	2.66	0.90	99		
	3	Caucasian	2.47	0.93	210		

* $p<0.05$ ** $p<0.01$ ***$p<0.001$

Results of the multivariate tests indicated that overall significant differences existed among the sub-groups by race/ethnicity on measures of school bonding when

student background characteristics were controlled (Wilks' lambda =0.96, F=2.91(8,1108), p=0.003). The univariate tests (see Appendix C for full details) revealed that the sub-groups were significantly different on two of the four measures of school bonding. These were personal attachment to school (F=3.74, p=0.024), and personal of dislike of school (F=6.22, p=0.002). There were no significant differences between students by race/ethnicity on variables of pride in school or fairness of school rules/punishment.

Post-hoc contrasts among the three sub-groups, indicated that when African American students were compared to Caucasian students significant differences were found on measures of personal attachment to school (p= 0.006) and personal dislike of school (p=0.001) (See Appendix C for full details of this analysis). African American students had a higher average on both of these measures than did the Caucasian students as indicated in Table 4.5. No significant differences were found between these two sub-samples on measures of pride in school or fairness of school rules/punishment. Differences between Hispanic/Latino students and their Caucasian counterparts were significant only on measure of personal dislike of school (p=0.026) and the average was higher for Hispanic/Latino students. Finally, Hispanic/Latino students and African Americans did not significantly differ on any of the measures of school bonding.

Hypothesis #3

There are significant differences between students in grades 6^{th}, 7^{th} and 8^{th} on their perceptions of school bonding.

A Multivariate One-Way Analysis of Covariance (MANCOVA) was employed to examine group differences on indicators of school bonding by students' grade level,

while controlling for students' background characteristics as covariates in the model. The between-subjects MANCOVA was performed on four dependent variables: (1) personal attachment to school, (2) pride in school, (3) fairness of school rules/ punishment, and (4) personal dislike of school. The results were controlled for students' (1) gender (2) self-reported grade obtained in school, and (3) educational aspirations which had all been previously tested and found to have met the assumption of linearity. The model tests the hypothesis that African American, Caucasian, and Hispanic students did not differ on the four variables of school bonding after accounting for differential effects of the covariates. Results for this hypothesis are shown in the table below (Table 4.6)

Table 4.6

Comparison of School Bonding Measures (Scales) Mean Values by Grade Level

			Descriptive Statistics			Univariate test name	Significant Post hoc contrasts
Variable	Group		Mean	SD	n	F (2, 678)	
Personal Attachment to school	1	6th grade	2.80	0.94	212	7.67**	1-2** 1-3***
	2	7th grade	2.56	0.96	262		
	3	8th grade	2.45	0.86	210		
Pride in School	1	6th grade	2.95	0.78	212	17.08***	1-2*** 1-3***
	2	7th grade	2.60	0.85	262		
	3	8th grade	2.52	0.74	210		
Fairness of Rules/Punishment	1	6th grade	3.21	0.92	212	5.81**	1-2** 1-3**
	2	7th grade	2.96	0.89	262		
	3	8th grade	2.94	0.88	210		
Personal Dislike of School	1	6th grade	2.79	0.91	212	4.73**	1-2** 1-3**
	2	7th grade	2.55	0.92	262		
	3	8th grade	2.54	0.93	210		

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Results of the multivariate tests indicated that overall significant differences existed among the sub-groups by grade level on measures of school bonding when controlling for students' background characteristics Results of the multivariate tests indicated that overall significant differences existed among the sub-groups by race/ethnicity on measures of school bonding (Wilks' lambda =0.96, $F=2.91(8,1108)$, $p=0.003$).

Results of the univariate tests (see Appendix C for full details) showed that students' grade level were significant for all four measures of school bonding. The post-hoc contrasts (see Appendix C for full details) comparing students by grade level showed that those in sixth grade were significantly different on all measures of bonding to school than their counterparts in seventh grade (p=0.007, 0.000, 0.004 and 0.008 for variables of personal attachment to school, pride in school, fairness of school rules/punishment and personal dislike of school respectively). Also significant differences were found on all measures of bonding between students in sixth grade and those in eighth grade (p=0.000, 0.000, 0.003, and 0.007 for variables of personal attachment to school, pride in school, fairness of school rules/punishment and personal dislike of school respectively). However, seventh and eighth graders were not significantly different on any of the measures of bonding to school.

Comparison of the mean value for measures of school bonding (Table 4.6) indicated that sixth graders had a higher score on all variables of school bonding than the seventh or eighth graders.

Hypothesis # 4

There are significant differences between students in one of the middle schools in the sample (school A) and students in the other middle school in the sample (school B) on their perceptions of school bonding.

For this hypothesis, a two group between-subjects MANCOVA was performed on four dependent variables, controlling for students' grade level, gender, self-reported grade obtained in school, and aspirations as covariates. The analysis was performed on four dependent variables: (1) personal attachment to school, (2) pride in school, (3)

fairness of school rules/ punishment, and (4) personal dislike of school. The results were controlled for students' (1) grade level, (2) gender (3) self-reported grade obtained in school, and (4) educational aspirations which had all been previously tested and found to have met the assumption of linearity. The analysis tests the hypothesis that students in school A are not different from their counterparts in school B on the four measures of school bonding. Results are presented below in Table 4.7.

Table 4.7

Comparison of School Bonding Measures (Scales) Mean Values by School

		Descriptive Statistics			Univariate test name
Variable	Group	Mean	SD	n	F (1, 678)
Personal Attachment to school	School A	2.57	0.94	398	1.45
	School B	2.64	0.93	286	
Pride in School	School A	2.77	0.81	398	10**
	School B	2.55	0.80	286	
Fairness of Rules/Punishment	School A	2.99	0.92	398	2.38
	School B	3.08	0.88	286	
Personal Dislike of School	School A	2.56	0.92	398	5.91**
	School B	2.70	0.93	286	

* p<0.05 ** p<0.01 *** p<0.001

Results of the multivariate test indicated that significant differences existed between students in school A and those in school B on measures of school bonding (Wilks's lambda = 0.938, F(4,675) = 11.15, p =0.000). Results of the univariate tests (see Appendix C for full details) showed that students in school A were significantly

different than those in school B on pride in school and personal dislike of school (See Table 4.7). The two schools were not significantly different on personal attachment to school or fairness of school rules/punishment.

Comparison of the mean values for measures of school bonding between the two schools indicated that the average for students in school A was higher on measure of pride in school than the average for students in school B. However, for personal dislike of school, students in school B had a higher mean value than their counterparts in school A. These differences are shown in Table 4.7.

Research hypotheses (5 through 8) are related to the impact of school climate on students' bonding to school. Each hypothesis tests the same model, but on different samples. The model hypothesizes that school climate variables predict school bonding variables. This model was tested for the overall sample and again separately for subgroups of students based on grade level, gender, and race.

Structural Equation Modeling (SEM) Analysis

Structural Equation Modeling (SEM) was conducted to test each hypothesis. The best fitting model was determined in several steps: (1) The initial hypothesized model was tested. Chi-square value and goodness of fit statistics were examined to determine if revisions to the model were needed. (2) The magnitude of path coefficients and their significance levels in the initial hypothesized model were examined. Paths with the lowest coefficients were removed from the model in a step-wise fashion and the revised model was analyzed. (3) Modification indices were also simultaneously examined to determine if the chi-square value of the model could be improved with the addition of

pathways between variables not already linked. (4) At each step in the addition or subtraction of pathways, the chi-square value and goodness of fit statistics were examined. The initial model was revised until the chi-square value and goodness of fit statistics could not be improved.

Interpretation of the SEM Analyses

Chi-square values and goodness of fit statistics were used to interpret the SEM results. A significant chi-square indicated that the hypothesized model was significantly different than the actual relationships present in the data. The goodness of fit statistics examined including the Bentler-Bonnett Normed Fit Index (NFI; Bentler & Bonett, 1980), CFI and RMSEA. While the scale of the fit for NFI indices are not easily interpretable and experience is required to establish values of indices that are related to various degrees of meaningfulness of results, authors of NFI indices suggest that models with overall fit indices of less than 0.9 can usually be improved substantially (Bentler & Bonett, 1980). A value of 0.05 or less for RMSEA indicates a close fit of the model. A value of 0.1 or more indicates a lack of fit of the model.

Presentation of SEM Analyses

The SEM analyses are presented as follows: (1) The graphic of the initial hypothesized model for each hypothesis or sub-group are presented with coefficients represented on the pathways. (2) The statistics associated with the hypothesized model, the chi-square value of the overall model, the goodness of fit statistics for the overall model, the statistics related to path coefficients, and significance levels of the path coefficients are presented. (3) The hypothesized model is modified based on the significance levels of the path coefficients and the modification indices, and results are

presented. For hypotheses related to sub-groups (hypotheses 6-8), the best-fitting model for one sub-group is examined against the other sub-group (s) in order to ascertain whether group differences exist or not. If findings support that sub-groups are different, the best-fitting model for the other sub-group (s) are determined and results are presented. (4) The graphic of the final revised model are presented with coefficients represented on the pathways. (5) The chi-square value of the overall model and the goodness of fit statistics for the final model are presented and compared to the hypothesized model. The statistics associated with the final revised model, including path coefficients and the significance levels of the path coefficients are presented. (6) Finally, the sub-groups are compared based on their chi-square values and their goodness of fit statistics and results are indicated.

Initial Hypothesized Model for all Analyses

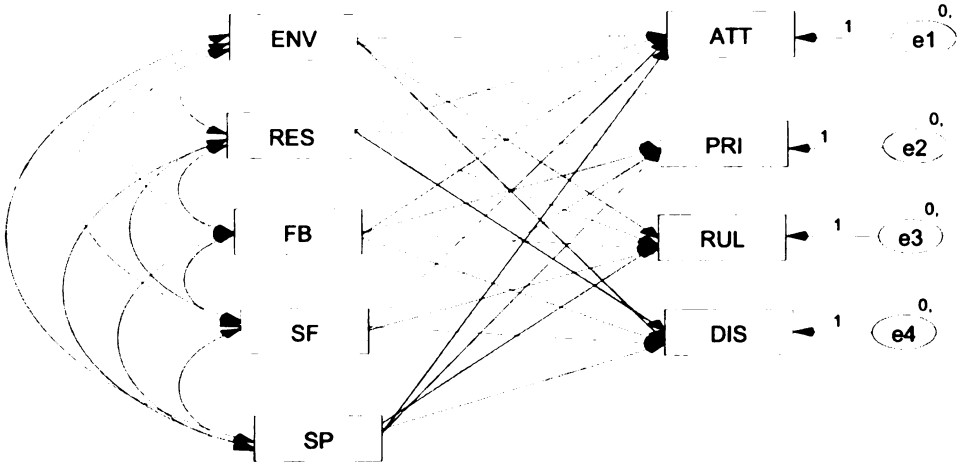
The initial model (Figure 1) shows the hypothesized pathways that link the indicators of students' perceptions of school climate to the indicators of students' perceptions of school bonding. The levels of five school climate scales (Student Respect, "RES"; Friendship and belonging, "FB"; Shaping of the environment, "Env"; Support and Care for and by faculty and staff, "SF"; Support and Care for and by parents," SP") are expected to contribute to the students' levels of four dimensions of school bonding (Personal dislike of school, "Dis"; Fairness of school rules/punishment, "Rul"; Pride in school, "Pri"; and Personal attachment to school, "Att"). In each of these hypothesized models each indicator of the observed exogenous variable (school climate) has a direct path to each indicator of the observed endogenous variable (school bonding). Also, each

of the five indicators of school climate is assumed to be correlated with one another as indicated by two headed arrows in the model.

These models will be analyzed using the full sample of students and then again separately for subgroups of the sample by race, gender, and school. The subgroup analyses are based on the hypothesis that students' race, gender, and the middle school they attended would affect the pathways of school climate that leads to school bonding outcomes.

Figure 4.1

Initial Hypothesized SEM Model for All Analyses



Key for Abbreviated Terms in Figure 4.1

Perceived School Climate Measures:
ENV=Perceptions of student shaping of their environment
RES=Perceptions of student respect
FB=Perceptions of student friendship and belonging
SF=Perceptions of support and care for and by faculty/staff
SP=Perceptions of support and care for and by parents

School Bonding Measures:
ATT=Personal attachment to school
PRI=Pride in school
RUL=Fairness of rules/punishment
DIS=Personal dislike of school

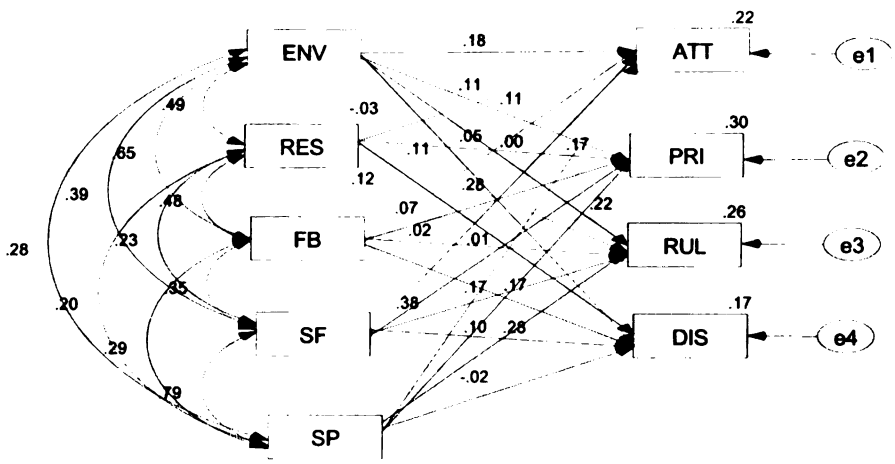
Hypothesis #5

There are significant pathways from school climate to middle school students' bonding to school for the entire sample.

Step 1: Examination of the Hypothesized Model's Fit for Total Sample. Figure 4.2 below illustrates the Hypothesized SEM model that was tested for the entire sample to find pathways of school climate that lead to school bonding (hypothesis #5). The fit indices in Table 4.8 revealed that the fit for the hypothesized model was not satisfactory (chi-square = 406.83, df =6 and $p<.05$). The NFI value of 0.84 indicated that the model did not fit well and could be improved substantially. Furthermore, the RMSEA value 0.31 confirmed what the other indices had revealed. That is, the model needed to be improved. The regression estimates and significance levels for these pathways are provided in Table 4.9. Of the twenty pathways hypothesized in the initial model, eight were not significant.

Figure 4.2

Results of Hypothesized SEM Model for the Entire Sample[3]



[3] The numbers (estimates) illustrated on pathways are also presented in Table 4.9.

Table 4.8

Fit Indices of the Hypothesized Models for the Entire Middle School Sample

Model	N	χ^2	df	NFI[4]	CFI[5]	RMSEA[6]
Hypothesized	706	406.83***	6	0.84	0.84	0.308

***p<0.001

Table 4.9

Significant Standardized (in Italics) and Un-standardized Regression Coefficients of the Hypothesized Model for the Entire Sample

Regression Path	B	S.E.	C.R.[7]
Environment to Attachment	0.23 (*0.18*)***	0.06	3.81
Environment to Pride	0.12 (*0.11*)*	0.05	2.49
Respect to Attachment	0.16 (*0.11*)*	0.06	2.68
Respect to Pride	0.23 (*0.17*)***	0.05	4.60
Respect to Rule	0.16 (*0.11*)**	0.06	2.87
Respect to Dislike	0.18 (*0.12*)**	0.06	2.94
Friendship to Dislike	0.28 (*0.17*)***	0.08	3.64
Support for Staff to Attachment	0.32 (*0.28*)***	0.06	5.02
Support for Staff to Pride	0.22 (*0.22*)***	0.05	4.12
Support for Staff to Rule	0.41 (*0.38*)***	0.06	6.87
Support for Staff to Dislike	0.32 (*0.28*)	0.07	4.86
Support for Parents to Pride	0.18 (0.17)	0.05	3.40

* p<0.05 ** p<0.01 ***p<0.001

[4] Note: NFI= The Bentler-Bonett (Bentler & Bonett, 1980) Normed Fit Index. While the scale of the fit for NFI indices are not easily interpretable and experience is required to establish values of indices that are related to various degrees of meaningfulness of results, authors of NFI indices suggest that models with overall fit indices of less than 0.9 can usually be improved substantially (Bentler & Bonett, 1980).

[5] CFI=Comparative Ft Index

[6] RMSEA=Root Mean Square Error of Approximation. Value of 0.05 or less for RMSEA indicates a close fit of the model—value of 0.1 or more indicates a lack of fit of the model.

[7] C.R. =Critical Ratio and is calculated by dividing the estimated value of B coefficient by its Standard Error (S.E.).

Step 2: Modification of the Hypothesized Model for Total Sample. The model was modified several times by removing each non-significant path from the model one at a time, and comparing the value of chi-square to chi-square value prior to removal of the path. If the change was large, the path was placed back into the model. In other word, non-significant paths were removed from the model when the change in chi-square value was not substantial. Furthermore, based on the results of the modification indices from AMOS output, errors for three of the measures of school bonding were correlated. These modifications reduced the chi-square value substantially from the hypothesized model and allowed for construction of the most parsimonious model. Figure 4.3 shows the final model with the best degree of fit of the data and the significant paths linking indicators of school climate to those of school bonding. Table 4.10 reveals the fit indices of both the hypothesized and modified models and Table 4.11 indicates significant regression paths for the final model.

Figure 4.3

Final Modified Model for the Entire Sample

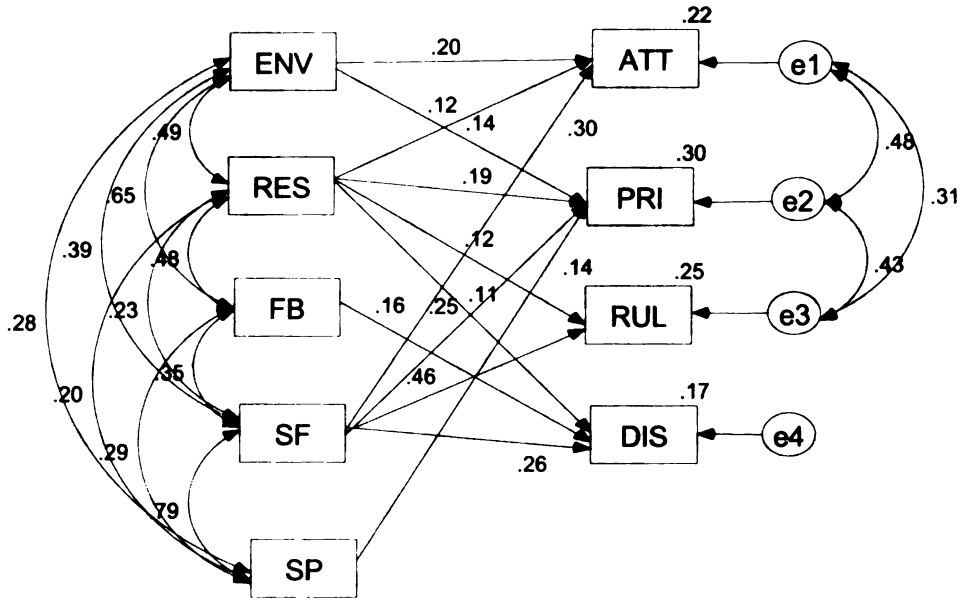


Table 4.10

Fit Indices of the Final Model in Comparison to the Hypothesized Model for the Entire Middle School Sample

Model	N	χ^2	df	NFI	CFI	RMSEA
Hypothesized	706	406.83***	6	0.84	0.84	0.31
Final	706	74.95***	11	0.97	0.98	0.091

***p<0.001

Comparing the fit indices of final model and those of the hypothesized model (Table 4.10) it is clear that the model greatly improved. The chi-square value was reduced from the value of 406.83 to 74.95, and values of NFI (from 0.84 to 0.97) and RMSEA (from 0.31 to 0.091) also confirmed that the final model had a better fit than the hypothesized model.

The regression paths from students' perceptions of respect as well as their perceptions of support and care for staff to all measures of school bonding were significant in the final model. Furthermore, paths from students' shaping of their environment to personal attachment and pride in school were significant. The path from students' friendship and belonging was significant for personal dislike of school but not for pride in school, although the latter was kept in the model due to its impact on the overall model (i.e., significant change in chi-square value was observed when this path was removed). Similarly, the only significant path from students' perceptions of respect and care for parents was the one to pride in school. The path from students' respect and care for parents to fairness of school rules/punishment was insignificant but was kept in the final model due to its contribution to the overall model. These are reflected in Table 4.11.

Table 4.11

Standardized (in Italics) and Un-standardized Regression Coefficients of the Final Model for the Entire Sample

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.25 (*0.20*)***	0.05	5.14
Environment to Pride	0.16 (*0.14*)***	0.04	4.12
Respect to Attachment	0.18 (*0.12*)**	0.06	3.08
Respect to Pride	0.25 (*0.19*)***	0.05	5.32
Respect to Rule	0.18 (*0.12*)***	0.05	3.62
Respect to Dislike	0.17 (*0.11*)**	0.06	2.87
Friendship to Dislike	0.25 (*0.16*)***	0.07	3.81
Support for Staff to Attachment	0.34 (*0.30*)***	0.04	8.25
Support for Staff to Pride	0.25 (*0.25*)***	0.05	5.28
Support for Staff to Rule	0.51 (*0.46*)***	0.04	13.70
Support for Staff to Dislike	0.30 (*0.26*)***	0.04	7.17
Support for Parents to Pride	0.14 (0.14)***	0.04	3.38

* p<0.05 ** p<0.01 ***p<0.001

Hypothesis # 6. Pathways of school climate to students' bonding to school are predicted to be different for female students than those for male students.

Step 1: Examination of the Fit of the Hypothesized Model for Sub-Groups. To explore the hypothesis that the pathways from school climate to school bonding are different for males and females, SEM model was tested once for females and once for males in the sample to see if the same constructs and/or indicators remained in the model. Figure 4.4 and 4.5 indicates the hypothesized models for the two sub-groups by gender.

Figure 4.4

Hypothesized SEM Model for Sub-Group of Female Students

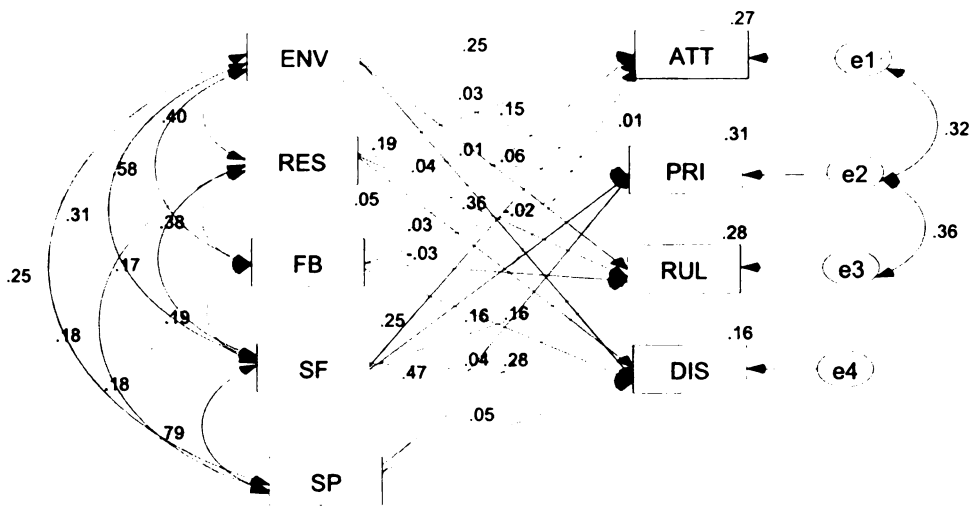


Figure 4.5

Hypothesized SEM Model for Sub-Group of Male Students

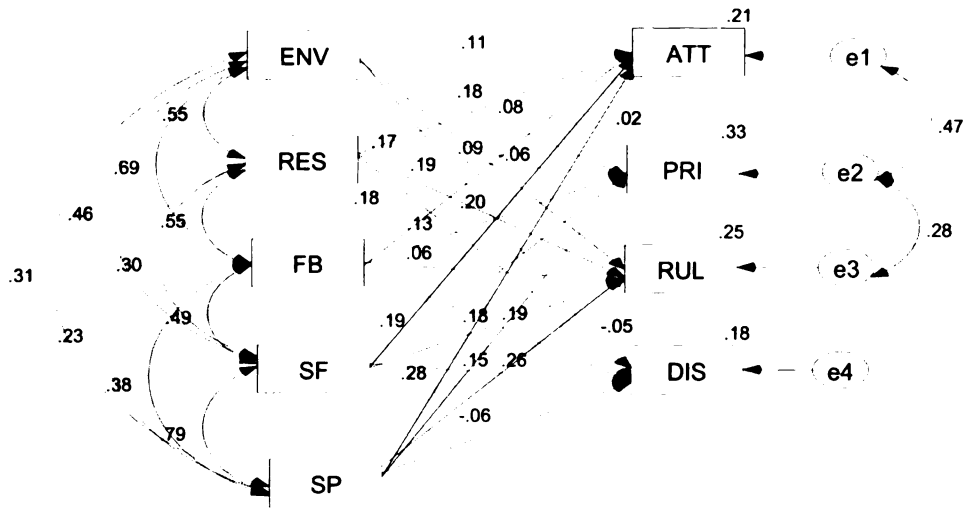


Table 4.12

Fit Indices of the Hypothesized Models for Sub-Groups by Gender

Sub-Group	N	χ^2	df	NFI	CFI	RMSEA
Males	383	258.03***	6	0.84	0.84	0.33
Females	323	147.95***	6	0.86	0.86	0.27

***p<0.001

As the fit indices in Table 4.12 reveals the fit for the hypothesized models were not adequate for either of the sub-groups although it seemed to have a better fit for female sub-group (chi-square = 147.95, df =6 and p<.05) than for male sub-group (chi-square = 258.03, df = 6 and p<.05). Both the NFI values (0.84 and 0.86) and RMSEA values (0.33 and 0.27) showed that the model could be greatly improved for both groups. For the male sample, half of the regression estimates were significant (10 of the 20). Similarly

for the female sub-group 9 of the 20 paths from school climate to school bonding were significant in the hypothesized model (See Tables 4.13 and 4.14).

Table 4.13

Significant Standardized (in Italics) and Un-standardized Regression Coefficients of the Hypothesized Model for Females

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.31 (*0.25*)***	0.08	4.01
Environment to Pride	0.16 (*0.15*)*	0.07	2.41
Respect to Pride	0.26 (*0.19*)***	0.07	3.64
Friendship to Dislike	0.27 (*0.16*)*	0.11	2.53
Support for Staff to Attachment	0.37 (*0.36*)***	0.08	4.54
Support for Staff to Pride	0.23 (*0.24*)**	0.07	3.15
Support for Staff to Rule	0.49 (*0.47*)***	0.08	6.08
Support for Staff to Dislike	0.30 (*0.28*)***	0.09	3.33
Support for Parents to Pride	0.16 (0.16)**	0.08	2.12

* $p<0.05$ ** $p<0.01$ ***$p<0.001$

Table 4.14

Significant Standardized (in Italics) and Un-standardized Regression Coefficients of the Hypothesized Model for Males

Regression Path	B	S.E.	C.R.
Respect to Attachment	0.27 (*0.18*)**	0.09	3.13
Respect to Pride	0.21 (*0.16*)**	0.07	3.09
Respect to Rule	0.28 (*0.19*)***	0.08	3.52
Respect to Dislike	0.27 (*0.18*)***	0.09	3.13
Friendship to Dislike	0.30 (*0.19*)**	0.11	2.67
Support for Staff to Attachment	0.24 (*0.20*)*	0.10	2.49
Support for Staff to Pride	0.19 (*0.19*)*	0.08	2.49
Support for Staff to Rule	0.32 (*0.28*)***	0.09	3.55
Support for Staff to Dislike	0.31 (*0.26*)**	0.10	3.23
Support for Parents to Pride	0.18 (0.18)*	0.07	2.57

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Step 2: Examination of Group Differences. To examine whether the groups were different with regard to pathways that linked school climate to school bonding, first the model was modified for female sub-sample, following the same procedure as those explained previously for the entire sample. The best model for females (see Table 4.15) was then tested for the male sample. Results showed that the best model for female sub-group did not fit well for the male subgroup (chi-square = 92.47, df=14, $p<.05$; NFI= 0.94, CFI= 0.95, and RMSEA=0.121), indicating that there was indeed a significant difference between the two groups.

Step 3: Modification of the Hypothesized Model for Sub-Group. Further analysis was conducted by modifying the hypothesized model for male sample in order to find the best fitting model for the males. Figures 4.6 and 4.7 show the final model with the best

degree of fit of the data and the significant paths linking indicators of school climate to those of school bonding for each sub-group.

Table 4.15 reveals the fit indices of the final modified models for females and males. The regression paths of the final model for each sample are indicated in Tables 4.16 and 4.17.

Figure 4.6

Final SEM Model for Sub-Group of Female Students

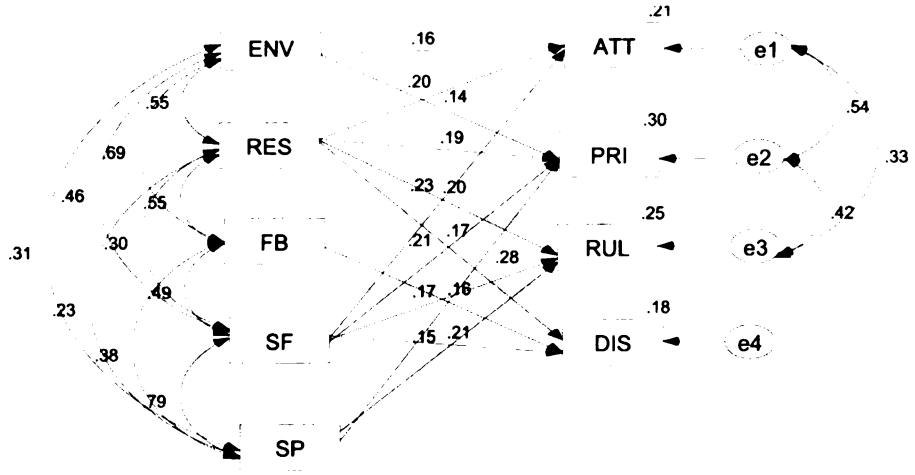


Figure 4.7

Final SEM Model for Sub-Group of Male Students

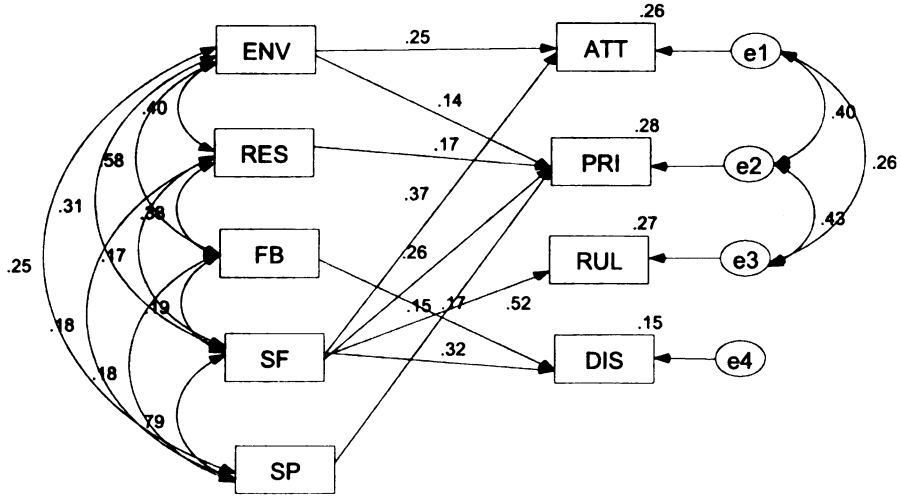


Table 4.15

Fit Indices of the Final Models in Comparison to the Hypothesized Models for Sub-Groups by Gender

Sub-Group	N	χ^2	df	NFI	CFI	RMSEA
						Hypothesized Model
Females	323	147.95***	6	0.86	0.86	0.27
Males	383	258.03***	6	0.84	0.84	0.33
Final Model						
Females	323	25.15*	14	0.98	0.99	0.05
Males	383	55.56***	10	0.97	0.97	0.11

* $p<0.05$ *** $p<0.001$

As is shown in Table 4.15, the modified models for both samples were greatly improved compared to the hypothesized models. For the female sub-group, the chi-square value was reduced to 25.15 from the value of 147.95 and for the male sample it was reduced from 258.03 to 55.56. Values of NFI and RMSEA also indicated that the fit of the final models were improved significantly from the hypothesized models. In addition, comparing the final models for females and males suggested that the model for females had a better fit than that for the male sample as the chi-square value of the final model for females was lower than that for males. Comparison of the path diagrams of the final models for the two sub-samples (Figures 4.6 and 4.7) showed that the two groups differed slightly. For males, the final model included a path from perceptions of support and care for parents to fairness of school rules/punishment and it was significant (See Tables 4.16), whereas the final model for females did not include this path.

Table 4.16

Standardized (in Italics) and Un-standardized Regression Coefficients of the Final Model for females

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.31 (*0.25*)***	0.06	5.19
Environment to Pride	0.16 (*0.14*)**	0.05	3.03
Respect to Pride	0.24 (0.17)***	0.06	3.98
Friendship to Dislike	0.28 (*0.17*)***	0.09	3.32
Support for Staff to Attachment	0.39 (*0.37*)***	0.05	7.40
Support for Staff to Pride	0.25 (*0.26*)***	0.07	3.74
Support for Staff to Rule	0.54 (*0.52*)***	0.05	10.95
Support for Staff to Dislike	0.34 (*0.32*)*	0.06	6.12
Support for Parents to Pride	0.15 (*0.15*)	0.06	2.28

* p<0.05 ** p<0.01 ***p<0.001

Table 4.17

Standardized (in Italics) and Un-standardized Regression Coefficients of the Final Model for Males

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.20 (*0.16*)**	0.07	2.82
Environment to Pride	0.16 (*0.15*)**	0.06	2.88
Respect to Attachment	0.30 (*0.20*)***	0.08	3.61
Respect to Pride	0.25 (*0.19*)***	0.07	3.75
Respect to Rule	0.28 (*0.20*)***	0.07	4.25
Respect to Dislike	0.25 (*0.17*)**	0.08	3.03
Friendship to Dislike	0.26 (*0.16*)**	0.10	2.64
Support for Staff to Attachment	0.28 (*0.23*)***	0.06	4.48
Support for Staff to Pride	0.22 (*0.21*)**	0.07	3.14
Support for Staff to Rule	0.32 (*0.28*)***	0.08	3.98
Support for Staff to Dislike	0.25 (*0.21*)***	0.06	3.91
Support for Parents to Pride	0.18 (0.17)**	0.06	2.98
Support for Parents to Rule	0.16 (0.15)*	0.08	2.16

* p<0.05 ** p<0.01 ***p<0.001

Hypothesis # 7. Pathways of school climate to students' bonding to school are predicted to be different for each subgroup of students as identified by race/ethnicity: Black/African American students, Mexican/Latino/Hispanic students and Caucasian students.

Step 1: Examination of the Hypothesized Model's Fit for Sub-Groups. Similarly, to examine the hypothesis that the model is different for White/Caucasian students than for their Black/African American and Mexican/Hispanic/Latino counterparts, SEM model was employed once for each subgroup to see if different indicators remained in the model. It is imperative to note that due to the small degrees of freedom for the three sub-groups by race, comparisons between the sub-groups in hypothesis #7 were done as exploratory analyses.

Figure 4.8

Hypothesized SEM Model for Sub-Group of African American Students

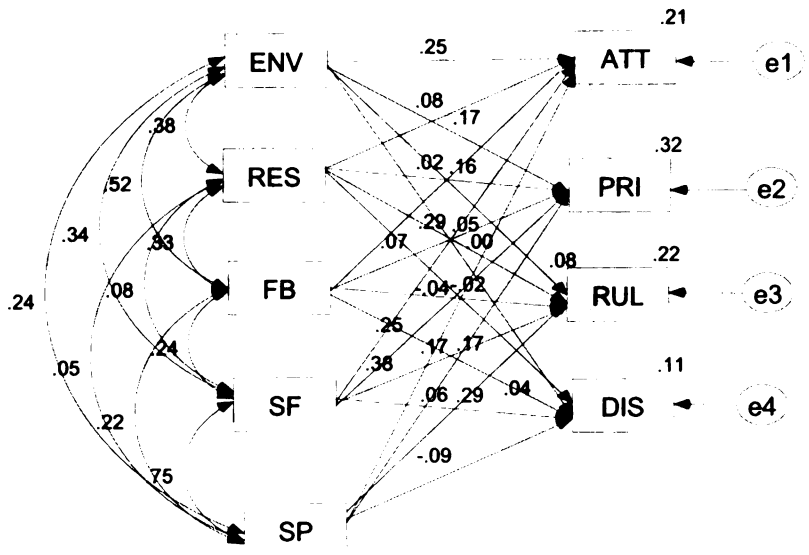


Figure 4.9

Hypothesized SEM Model for Sub-Group of Hispanic/Latino Students

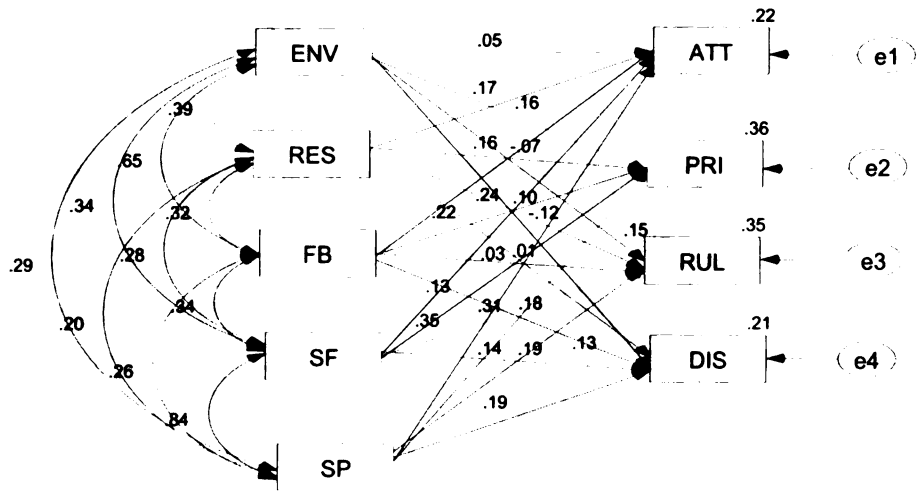
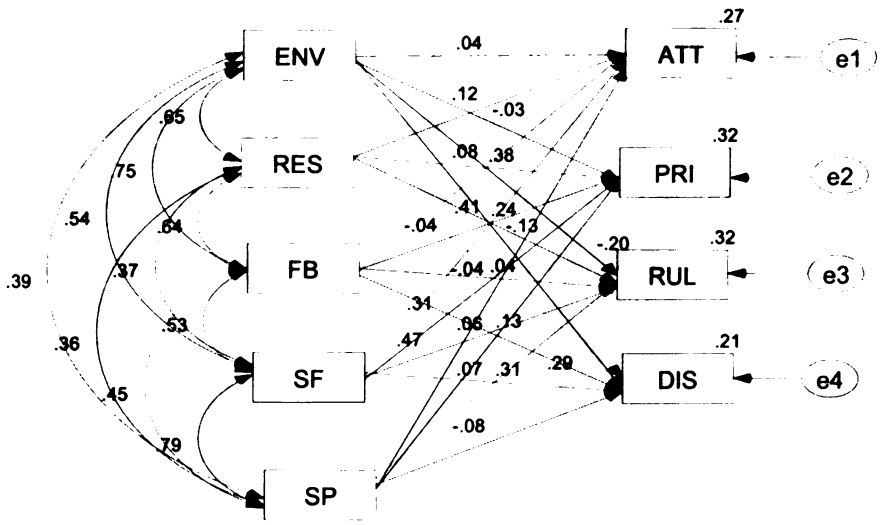


Figure 4.10

Hypothesized SEM Model for Sub-Group of Caucasian Students



Figures 4.8 to 4.10, above illustrate the Hypothesized SEM models that were tested for the sub-samples by race to find pathways of school climate that lead to school bonding (hypothesis #7).

Table 4.18

Fit Indices of the Hypothesized Models for Sub-Groups by Race

Sub-Group	N	χ^2	df	NFI	CFI	RMSEA
African American	267	109.43***	6	0.86	0.86	0.26
Hispanic/Latino	102	50.58***	6	0.87	0.88	0.27
Caucasian	212	222.57***	6	0.80	0.80	0.41

***$p<0.001$

The fit indices in Table 4.18 revealed the fit for the hypothesized models were not satisfactory (chi-square =109.43, 50.58 and 222.57 for African Americans, Hispanics and Caucasians respectively, df =6 and $p<.05$ for all three sub-groups). The NFI values for each of the three subgroups indicated that the models did not fit well and could be improved substantially. Furthermore, the RMSEA values confirmed what the other indices had revealed. That is, the models needed improvement. The regression estimates and significance levels for these pathways are provided in Tables 4.19 to 4.21.

Table 4.19

Significant Standardized (in Italics) and Un-standardized Regression Coefficients of the Hypothesized Model for African Americans

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.35 (*0.25*)***	0.10	3.58
Environment to Pride	0.20 (*0.17*)**	0.07	2.67
Respect to Pride	0.23 (*0.17*)**	0.08	2.98
Friendship to Dislike	0.31 (*0.18*)*	0.12	2.52
Support for Staff to Attachment	0.35 (*0.29*)***	0.10	3.45
Support for Staff to Pride	0.25 (*0.25*)**	0.08	3.24
Support for Staff to Rule	0.40 (*0.38*)***	0.09	4.47
Support for Staff to Dislike	0.33 (*0.29*)**	0.10	3.25
Support for Parents to Pride	0.17 (*0.17*)*	0.08	2.22

* $p<0.05$ ** $p<0.01$ ***$p<0.001$

Table 4.20

Significant Standardized (in Italics) and Un-standardized Regression Coefficients of the Hypothesized Model for Hispanic/Latino Sub-Group

Regression Path	B	S.E.	C.R.
Friendship to Pride	0.35 (*0.22*)*	0.17	2.05
Support for Staff to Rule	0.37 (*0.35*)*	0.16	2.29
Support for Parents to Pride	0.31 (*0.31*)*	0.15	2.13

* $p<0.05$ ** $p<0.01$ ***$p<0.001$

Table 4.21

Significant Standardized (in Italics) and Un-standardized Regression Coefficients of the Hypothesized Model for Caucasians

Regression Path	B	S.E.	C.R.
Environment to Rule	-0.25 (*-0.20*)*	0.12	-2.10
Respect to Pride	0.42 (*0.38*)***	0.09	4.76
Respect to Rule	0.32 (*0.24*)**	0.10	3.03
Respect to Dislike	0.37 (*0.29*)***	0.11	3.40
Support for Staff to Attachment	0.45 (*0.41*)***	0.12	3.90
Support for Staff to Pride	0.30 (*0.31*)**	0.10	3.02
Support for Staff to Rule	0.53 (*0.47*)***	0.12	4.61
Support for Staff to Dislike	0.34 (*0.31*)**	0.12	2.82

* $p<0.05$ ** $p<0.01$ ***$p<0.001$

Step 2: Examination of Group Differences. To examine whether the three sub-groups were different with regard to pathways that linked school climate to school bonding, first the model was modified for African American sub-group, following the same procedure as those explained previously for the entire sample. The best model for African American sub-group (See Table 4.22) was then tested for the Hispanic/Latino sub- sample and for Caucasians. Results showed that the best model for African American sub-group did not fit well for the other two subgroups (chi-square =25.21, 68.77, for Hispanic/Latino sample and Caucasians respectively, df=14, $p<.05$ for each of the two sub-groups; NFI= 0.94, 0.94, CFI= 0.97, 0.95 and RMSEA=0.09, 0.14 for Hispanic/Latino and Caucasian sub-groups respectively). These data revealed that significant differences existed between the three sub-groups by race.

Step 3: Modification of the Hypothesized Model for Sub-Groups. Further analyses were conducted by modifying the hypothesized model in order to find the best fitting

models for the Hispanic/Latino and the Caucasian samples. For each sub sample, the model was modified following the same procedure as those explained previously for the entire sample. Figures 4.11 through 4.13 show the final models with the best degree of fit of the data and the significant paths linking indicators of school climate to those of school bonding. Tables 4.22 reveals the fit indices of the final models compared to the hypothesized models for African Americans, Hispanic/Latino sample and Caucasians.

Figure 4.11

Final SEM Model for Sub-Sample of African American Students

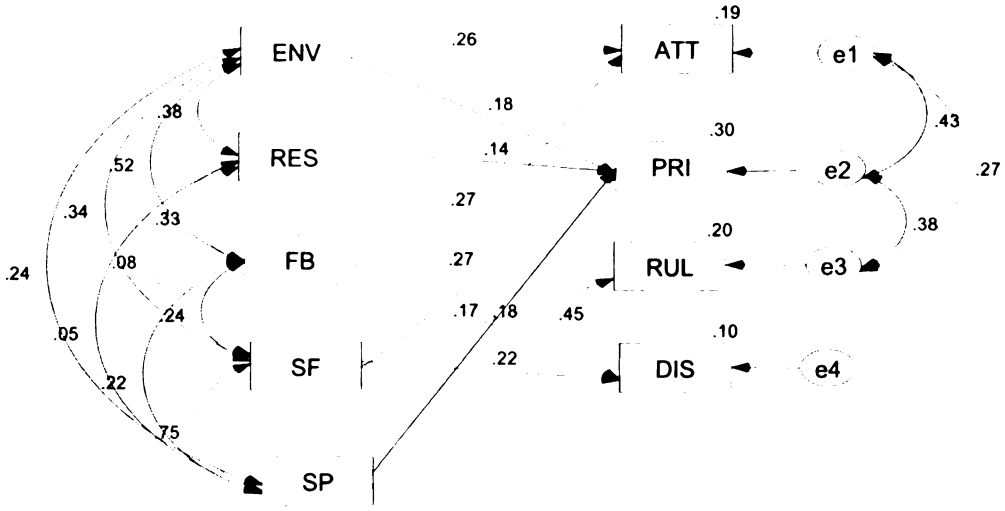


Figure 4.12

Final SEM Model for Sub-Group of Hispanic/Latino Students

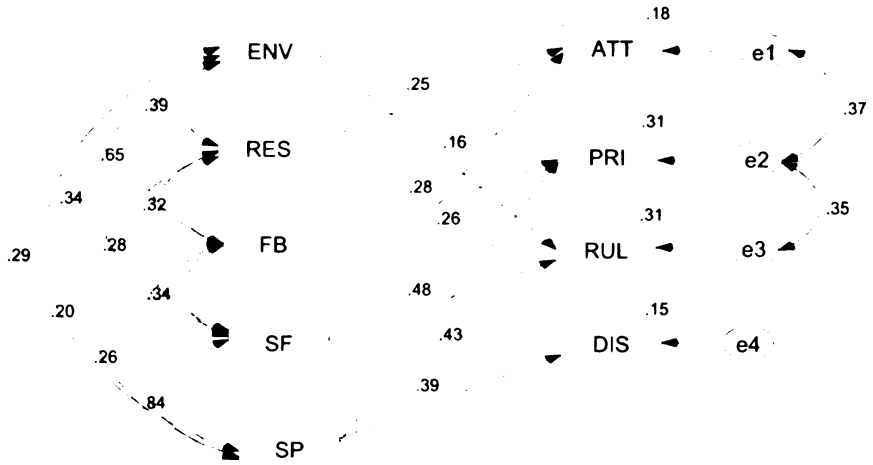


Figure 4.13

Final SEM Model for Sub-Group of Caucasian Students

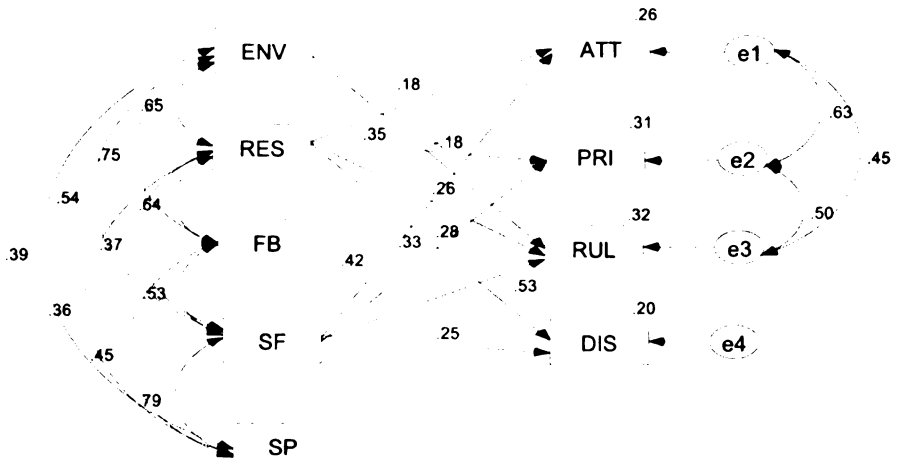


Table 4.22

Fit Indices for the Final Models in Comparison to the Hypothesized Models for Sub-Groups by Race

Sub- Groups	N	χ^2	df	NFI	CFI	RMSEA
				Hypothesized Models		
African American	267	109.43***	6	0.86	0.86	0.26
Hispanic/Latino	102	50.58***	6	0.87	0.88	0.27
Caucasian	212	222.57***	6	0.80	0.80	0.41
Final Models						
African American	267	19.46	14	0.97	0.99	0.04
Hispanic/Latino	102	31.12*	17	0.92	0.96	0.09
Caucasian	212	52.67***	14	0.95	0.96	0.11

* $p<0.05$ *** $p<0.001$

Comparison of the final models with the hypothesized models for each of the three sub-groups showed significant improvement for the final models. The value of chi-square was reduced significantly for each sub-group (from 109.46 to 19.46 for African Americans, from 50.58 to 31.12 for Hispanic/Latino sample and from 222.57 to 52.67 for Caucasians). In addition, values of NFI and RMSEA indicated a significant improvement of the fit for the final models from the hypothesized models for all three sub-groups. Furthermore, comparing chi-square values of the final models for the three sub-groups seemed to suggest that the model fitted the best for African Americans since the chi-square value of the final model for this sub-group was statistically non-significant indicating a good fit of the model. Also, comparing the chi-square values of the final models and the critical values of goodness of fit for the sub-samples, the model seemed to have a better fit for Hispanic/Latino sub-group than for Caucasian.

The regression paths of the final model for each group are indicated in Tables 4.23 through 4.25

Table 4.23

Standardized (in Italics) and Un-standardized Regression Coefficients of the Final Model for African Americans

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.37 (*0.27*)***	0.08	4.69
Environment to Pride	0.21 (*0.19*)***	0.06	3.44
Respect to Pride	0.19 (*0.14*)**	0.07	2.91
Friendship to Dislike	0.3 3(*0.18*)**	0.11	3.06
Support for Staff to Attachment	0.33(*0.27*)***	0.07	4.67
Support for Staff to Pride	0.2 6(*0.27*)***	0.07	3.65
Support for Staff to Rule	0.48 (*0.45*)***	0.06	8.27
Support for Staff to Dislike	0.25 (*0.22*)***	0.07	3.75
Support for Parents to Pride	0.17 (*0.17*)**	0.06	2.63

* p<0.05 ** p<0.01 ***p<0.001

Table 4.24

Standardized (in Italics) and Un-standardized Regression Coefficients of the Final Model for Hispanic/Latino Sub-Group

Regression Path	B	S.E.	C.R.
Environment to Rule	0.21 (*0.17*)*	0.11	1.98
Respect to Attachment	0.43 (*0.25*)**	0.15	2.90
Friendship to Pride	0.41 (*0.26*)***	0.12	3.48
Support for Staff to Attachment	0.33 (*0.28*)**	0.11	3.05
Support for Staff to Rule	0.50 (*0.48*)***	0.09	5.57
Support for Parents to Pride	0.41 (*0.43*)***	0.08	5.34
Support for Parents to Dislike	0. 40 (*0.39*)***	0.10	4.27

* p<0.05 ** p<0.01 ***p<0.001

Table 4.25

Standardized (in Italics) and Un-standardized Regression Coefficients of the Final Model for Caucasians

Regression Path	B	S.E.	C.R.
Environment to Rule	-0.24 (*-0.21*)**	0.09	-2.92
Respect to Attachment	0.22 (*0.18*)**	0.08	2.75
Respect to Pride	0.45 (*0.40*)***	0.08	5.82
Respect to Rule	0.36 (*0.27*)***	0.09	3.81
Respect to Dislike	0.36 (*0.28*)***	0.09	4.25
Support for Staff to Attachment	0.46 (*0.42*)***	0.07	6.61
Support for Staff to Pride	0.31 (*0.31*)***	0.08	3.81
Support for Staff to Rule	0.61 (*0.54*)***	0.08	8.14

* $p<0.05$ ** $p<0.01$ ***$p<0.001$

Hypothesis #8

Pathways of school climate to students' bonding to school are significantly different for each subgroup of students as identified by school variable: School A, School B.

Step 1: Examination of the Fit of the Hypothesized Model for Sub-Groups. To test the school effect, the hypothesized model was tested once for the sample in middle school A and once for students in middle school B. These analyses were done to investigate whether or not the indicators in the model were different for students from each school.

Figure 4.14

Hypothesized SEM Model for Sub- Group of Students in School A

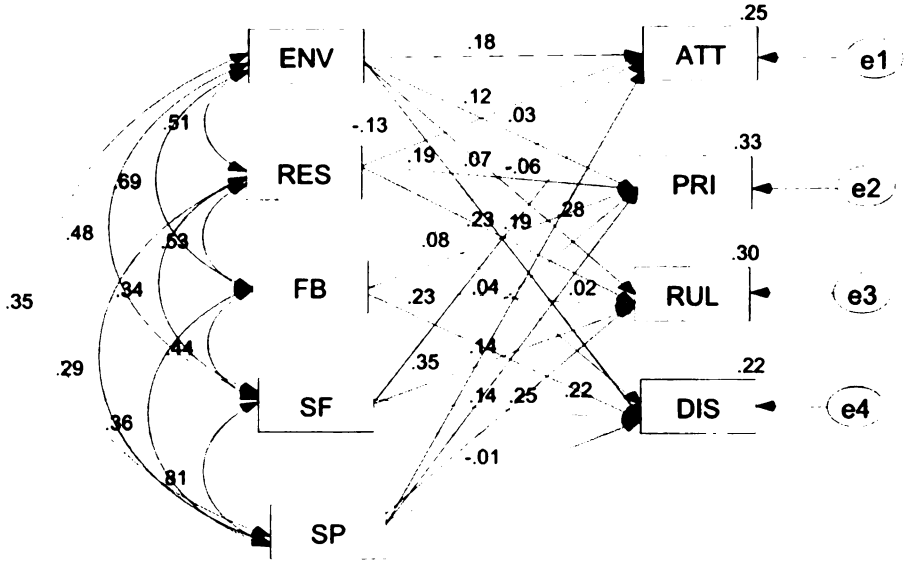
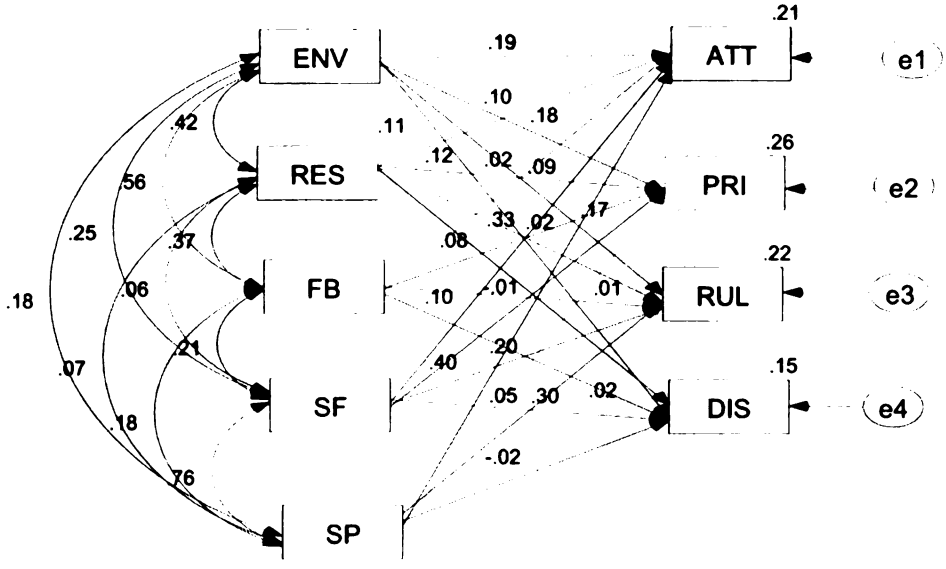


Figure 4.15

Hypothesized SEM Model for Sub- Group of Students in School B



Figures 4.14 and 4.15 above, illustrate the Hypothesized SEM model that was tested for the sub- samples by school to find pathways of school climate that leads to school bonding (hypothesis #8).

Table 4.26

Fit Indices for the Hypothesized Models for Sub-Groups by School

Sub- Group	N	χ^2	df	NFI	CFI	RMSEA
School A	406	261.40***	6	0.85	0.85	0.32
School B	300	172.11***	6	0.81	0.81	0.30

***p<0.001

The fit indices in Table 4.26 revealed the fit for the hypothesized models were not satisfactory (chi-square = 261.40, an 172.11 for school A and School B respectively, and df =6 and p<.05 for each school). The NFI and RMSEA values also indicated that the model did not fit well and could be improved substantially. The regression estimates and significance levels for these pathways are provided in Tables 4.27 to 4.28.

Table 4.27

Significant Standardized (in Italics) and Un-standardized Regression Coefficients of the Hypothesized Model for Students in School A

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.22 (*0.18*)**	0.08	2.79
Respect to Attachment	0.18 (*0.12*)*	0.08	2.34
Respect to Pride	0.25 (*0.19*)***	0.06	3.88
Respect to Rule	0.27 (*0.19*)***	0.07	3.68
Respect to Dislike	0.32 (*0.22*)***	0.08	4.05
Friendship to Dislike	0.35 (*0.23*)***	0.10	3.62
Support for Staff to Attachment	0.26 (*0.23*)**	0.09	2.93
Support for Staff to Pride	0.28 (*0.29*)***	0.07	3.84
Support for Staff to Rule	0.39 (*0.35*)***	0.08	4.60
Support for Staff to Dislike	0.28 (*0.25*)**	0.09	3.18

* p<0.05 ** p<0.01 ***p<0.001

Table 4.28

Significant Standardized (in Italics) and Un-standardized Regression Coefficients of the Hypothesized Model for Students in School B

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.26 (*0.19*)**	0.09	2.91
Environment to Pride	0.20 (*0.18*)**	0.07	2.77
Respect to Pride	0.17 (*0.12*)*	0.08	2.20
Support for Staff to Attachment	0.37 (*0.33*)***	0.09	4.05
Support for Staff to Pride	0.17 (*0.18*)*	0.08	2.26
Support for Staff to Rule	0.43 (*0.40*)***	0.09	5.00
Support for Staff to Dislike	0.34 (*0.30*)***	0.10	3.57
Support for Parents to Pride	0.20 (*0.20*)*	0.08	2.64

* p<0.05 ** p<0.01 ***p<0.001

Step 2: Examination of Group Differences. To examine whether the schools were different with regard to pathways that linked school climate to school bonding, first the model was modified for school B as the hypothesized model seemed to have a better fit for school B. The modification was done following the same procedure as those explained previously for the entire sample. The best model for school B (see Table 4.29) was then tested for school A. Results showed that the best model for school B did not fit well for school A (chi-square = 80.84, df=13, p<.05; NFI= 0.95, CFI= 0.96, and RMSEA=0.11), indicating that there was indeed a significant difference between the two groups.

Step 3: Modification of the Hypothesized Model for Sub-Groups. Further analysis was conducted by modifying the hypothesized model for school A in order to find the best fitting model for the subgroup of school A. Figures 4.16 and 4.17 show the final model with the best degree of fit of the data and the significant paths linking indicators of school climate to those of school bonding for each sub-group by school. Table 4.129 revealed the fit indices of the final modified models for each school. The regression paths of the final model for each sample are indicated in Tables 4.30 and 4.31.

Figure 4.16

Final SEM Model for Sub-Group of Students in School A

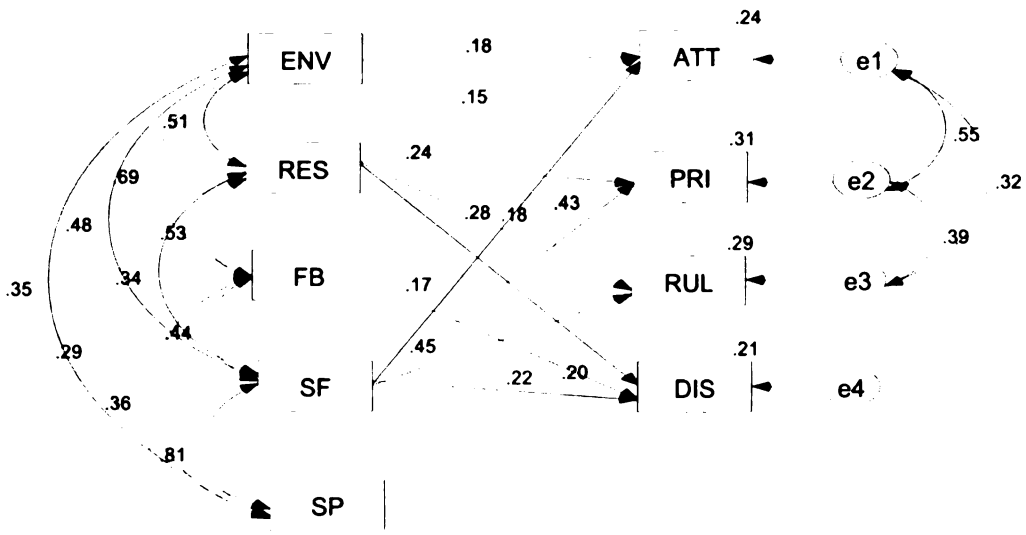


Figure 4.17

Final SEM Model for Sub-Group of Students in School B

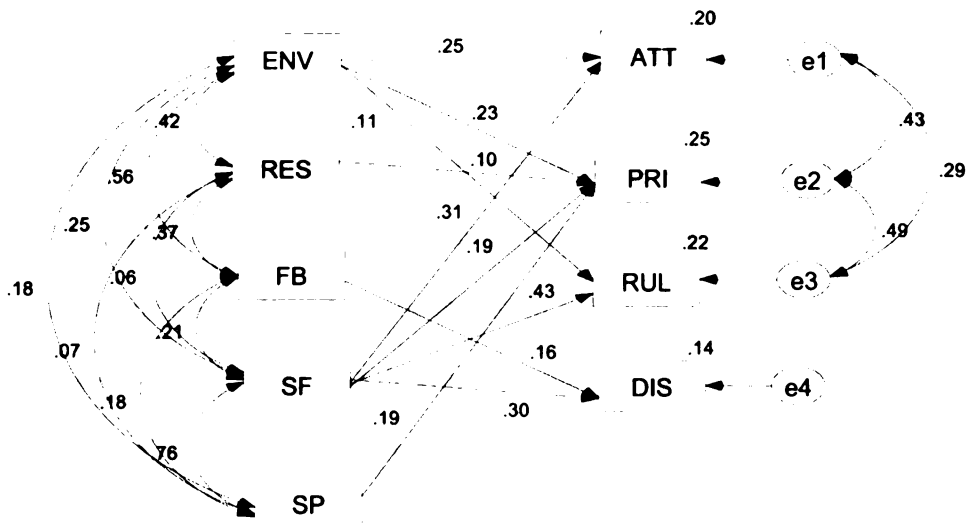


Table 4.29

Fit Indices for the Final Models Compared to Hypothesized Models for Sub-Groups by School

Sub-Group	N	χ^2	df	NFI	CFI	RMSEA
					Hypothesized Model	
School A	406	261.40***	6	0.85	0.85	0.32
School B	300	172.11***	6	0.81	0.81	0.30
Final Model						
School A	406	55.83***	13	0.97	0.98	0.09
School B	300	36.49***	13	0.96	0.97	0.08

***$p<0.001$

As it is shown in Table 4.29 above, the modified models for both samples were improved compared to the hypothesized model. For school A, the chi-square value was reduced from the value of 261.40 to 53.83 and for school B it was reduced from 172.11 to 36.49. Values of NFI and RMSEA also indicated that the fit of the final models were improved significantly from the hypothesized models.

In addition, comparing the final models of the two schools suggested that the model had a better fit for school B than for school A as indicated by chi-square value of the final models as well as the goodness of fit indices of the two sub-samples.

Comparison of the path diagrams for the two sub-samples (Figures 4.16 and 4.17) showed that the two groups differed with regard to some of the pathways in the final model. These results are shown in Tables 4.30 and 4.31 below.

Table 4.30

Standardized (in Italics) and Un-standardized Regression Coefficients of the Final Model for Students in School A

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.23 (*0.18*)***	0.06	4.03
Respect to Attachment	0.22 (*0.15*)**	0.07	3.07
Respect to Pride	0.31 (*0.24*)***	0.06	5.52
Respect to Rule	0.26 (*0.18*)***	0.06	3.95
Respect to Dislike	0.28 (*0.20*)***	0.08	3.71
Friendship to Dislike	0.25 (*0.17*)**	0.08	3.03
Support for Staff to Attachment	0.32 (*0.28*)***	0.06	5.78
Support for Staff to Pride	0.42 (*0.43*)***	0.04	9.77
Support for Staff to Rule	0.50 (*0.45*)***	0.08	5.39
Support for Staff to Dislike	0.25 (*0.22*)***	0.06	4.48

* p<0.05 ** p<0.01 ***p<0.001

Table 4.31

Standardized (in Italics) and Un-standardized Regression Coefficients of the Final Model for Students in School B

Regression Path	B	S.E.	C.R.
Environment to Attachment	0.33 (*0.25*)***	0.07	4.59
Environment to Pride	0.27 (*0.17*)***	0.06	4.23
Environment to Rule	0.14 (*0.23*)*	0.07	2.05
Respect to Pride	0.13 (*0.10*)*	0.06	2.11
Friendship to Dislike	0.31 (*0.16*)**	0.10	2.99
Support for Staff to Attachment	0.36 (*0.31*)***	0.06	5.87
Support for Staff to Pride	0.19 (*0.19*)**	0.07	2.71
Support for Staff to Rule	0.47 (*0.43*)***	0.06	8.23
Support for Staff to Dislike	0.34 (*0.30*)***	0.06	5.43
Support for Parents to Pride	0.19 (*0.19*)**	0.06	3.02

* p<0.05 ** p<0.01 ***p<0.001

Power Analysis for Tests of Model Fit

Further investigation of the power of the tests for model fit (MacCullum, Brown & Sugawara, 1996) revealed additional information regarding the SEM analyses presented in the above. The approach permits for direct estimation of power where effect size is defined in terms of a null and alternative value of the Root Mean Square Error of Approximation (RMSEA) fit index proposed by Steiger and Lind (1980). In case of close fit power analysis addresses the question that if the fit of the model in actuality is mediocre and the hypothesis that the fit is close is tested, what is the likelihood of rejecting the null hypothesis? Similarly, power analysis for test of not-close fit examines the question that if model fit is actually extremely good, and the hypothesis that fit is not close is tested, what is the probability of rejecting the null hypothesis? Finally, in the case of exact fit power analysis investigate the test of exact fit when true fit is close. Although, all three alternative tests are reported in Table 4.32, the power analysis addressing test of exact fit is preferred for the purpose of this study.

Using the sample size and degrees of freedom from final SEM analysis for each subgroup (by gender, race and school) the power of tests for fit of the models were examined. These results are reported in Table 4.32. When sample sizes were in-between two values identified by MacCullum et al., (1996), a range of values for power were considered instead of only one value. For example, for sub-group of males the sample size was 383 (Table 4.32), but the power for model fit was calculated and reported for sample sizes of 300 and 400 (McCullum, et al., 1996, p. 142). Since sample size of 383 falls in between these two values, a range was identified indicating that the power for

tests of fit of the model for males was in between the values calculated for sample sizes of 300 and 400.

Table 4.32

Power Analysis of Tests of Model Fit

				Range of Power By Degree of Fit of the Model		
Sub-Group	N	df	Fit N	Close Fit	Not Close fit	Exact Fit
Total Sample	706	11	700	0.612	0.555	0.661
Males	383	10	300-400	0.413-0.520	0.304-0.429	0.406-0.541
Females	323	14	300-400	0.413-0.520	0.304-0.429	0.406-0.541
African Americans	267	14	200-300	0.294-0.413	0.191-0.304	0.266-0.406
Hispanics	102	17	100	0.206	0.127	0.167
Caucasians	212	14	200-300	0.294-0.413	0.191-0.304	0.266-0.406
School A	406	13	400	0.520	0.429	0.541
School B	300	13	300	0.413	0.304	0.406

As indicated, the power of the fit of tests for "Exact Fit" were reasonable and was medium for most all sub-groups except for those by race. The sample sizes for these sub-group were lower than the other sub-groups, contributing to a lower power for testing the fit of the model. For total sample the power was the highest due to the size of the sample. In sum, examination of the power of tests indicated that the SEM results for fit of the models can be trusted as the power of the tests were reasonable. The only exception was the results for the sub-groups by race, especially the Hispanic sample. It is plausible to

think that a low power of the tests of fit contributed to the findings for Hispanic students showing a smaller number of significant pathways than the other two sub-groups by race.

CHAPTER 5

DISCUSSION

Group Differences on Measures of School Bonding

School Bonding by Gender

The first hypothesis in this study stated that "there are significant differences between male students and female students on their perceptions of school bonding". This hypothesis was partially supported.

Results indicated that after adjusting for students' grade level, self-reported grade obtained in school and educational aspirations, males and females were significantly different on only one of the four indicators of school bonding. Females reported a significantly higher level of perceived fairness in how school rules and punishments were determined and enforced. The two groups did not significantly vary on any other measures of school bonding. Males and females were similar in how much pride they had in themselves and their school, and how much they enjoyed school, including the people and the setting. Overall, gender did not have a large influence on school bonding. These results somewhat mirror previous research in which gender has not been systematically related to school bonding in a consistent manner. Previous research on gender differences for school bonding has been inconclusive. One study reported a higher level of school bonding for males than for females (McDonald, & Wright, 2002) while other studies (Simons-Morton, et al., 1999; Anson, 1995) found just the opposite. One explanation could be that school bonding is not affected by gender since findings have fluctuated. Another explanation could be that the findings are dependent on the

indicators used to measure school bonding. The present study result applied to fairness of school rules/punishment as one of the measures of school bonding.

Findings of this study showed that female students had more positive feelings towards school than male students, believed more than males that adults' behaviors in school were fair and school policies and rules were just. These results follow previous findings (Nichols, and Good, 1998) that females perceived school rules and punishment as more fair than did the male students. These authors conducted two surveys which included seventh and eighth grade students in one middle school and ninth through twelve graders in a high school. Results from both studies showed that female students consistently rated their schools and classes as more fair than males did. Furthermore, they reported that in both schools females especially were different than males in matters of personal concerns.

School Bonding by Race/Ethnicity

Hypothesis 2 in this study indicated that "there are significant differences between Caucasian students, African American students and Hispanic/Latino students on their perceptions of school bonding". Findings partially supported this hypothesis.

After controlling for students' background characteristics of grade level, self-reported grade obtained in school and educational aspirations, significant differences between sub-groups by race were detected on two of the four measures of school bonding. These were personal attachment to school and personal dislike of school where personal dislike of school assessed students' feelings about going to school. A high value indicated less negative feelings towards school, while a high value revealed students' feelings of aversion towards school. Compared to Caucasian and Hispanic/Latino

students, African American students reported higher levels of enjoyment and seeking contact with school, its inhabitants and its environment. Questions had asked students how much they would miss the school, their peers and teachers if they were to stop going to school. African American students seemed to have more affective attachment to school than their Caucasians or Hispanic/Latino counterparts. But, Hispanic/Latino students and Caucasians were similar in how much they felt bonded to school.

Both African American students and Hispanic/Latino students had less feelings of aversion towards school than their Caucasian peers. When comparing African Americans to Hispanic/Latino students, African Americans reported having less negative feelings towards school and more bonded to school. To explain these differences, one may consider the sample sizes for each group of student (Tables 1 and 2). It is possible that the African Americans and Hispanic students felt more bonded to school and less aversion towards school, simply because the majority of students in the sample were from diverse backgrounds (38% African Americans compared to 30% Caucasians, and 15% Hispanics) and this being part of the majority group in school, in turn, had contributed to their positive feelings towards school. In light of the findings of a previous research (Anson, 1995) which associated a higher percentage of African Americans in school to a higher level of school bonding for African American students, this explanation could particularly apply to school B where most of its student population were African Americans.

Furthermore, the fact that most of the population in school B had racial background other than Caucasians (i.e., African American, Hispanic/Latino and other minority groups) could have created a climate in school where minority students felt

more comfortable thus more positive towards school. This might explain the findings of higher bonding and less aversion towards school for both African Americans and Hispanic/Latino students in comparison to their Caucasian counterparts.

Results of the present study, however, seem contradictory to other studies (Anson, 1995; Chase, 2002) that showed a lower bonding to school for African American and Hispanic students compared to Caucasians. Anson's study was done on a middle school sample using the same measures of school bonding as those in the present study and one would expect similarity in the findings. The reasons for these different results are not clear. One possible explanation could be that unlike the present study, previous studies did not control for background characteristics as covariates in conducting their analyses.

School Bonding by Grade Level

Hypothesis 3 stated "there are significant differences between students in grades 6^{th}, 7^{th} and 8^{th} on their perceptions of school bonding". This hypothesis was fully supported.

A comparison of students' bonding to school by grade level showed that after controlling for students' background characteristics of gender, educational aspirations and self-reported grade obtained in school, students' grade level were significant for all four measures of school bonding. Sixth grade students were significantly different than their counterparts in seventh and eighth grade on all measures of school bonding. A trend was found for bonding to school that indicated steady decrease from sixth to seventh and to eighth grades, with the most significant declines occurring early in 6^{th} and 7^{th} grades. That is, 6^{th} grade students a) enjoyed the people in school and the environment of school more than those in 7^{th} and 8^{th} grades, b) felt proud of their school and perceived

others in school to be proud of the school more than their peers in upper grades, c) felt that adults and school rules were fair and policies were conducted in just ways more than 7th and 8th graders, and d) felt more positive about going to school than students in higher grades in middle school. One reason for these findings could be that as students move up in grades from 6th to 8th, they experience more pressure from school both academically and socially which makes them less bonded to school. In addition, students in 7th and 8th grades may be closer in age to adolescence and perhaps dealing with stresses of puberty makes them less bonded and less positive towards school.

Results of this study confirmed the findings of a previous research (Simons-Morton, et al., 1999) where bonding of 6th graders to school was found to be significantly higher than the 7th and 8th graders. Similarly, 7th graders had higher bonding than their peers in 8th grade. In addition, students in higher grades liked school less, and felt less closely affiliated with school. Similar findings were also reported by another study (Boggiano & Katz, 1991) that showed a decrease in student satisfaction with school climate during middle school years. Authors attributed this finding to a lack of person-environment fit

These findings however, are somewhat counter intuitive since one might assume that because 6th grade students are new to the middle school environment, their lack of familiarity with school would result in a weaker bond to school. In comparison, 7th and 8th graders would have a better command of the rules in middle school, and would have established social groups, which would consequently create a stronger school bonding for these students. Results of the present study as well as those of previous research

however suggested that bonding to school decreased steadily during the middle school years.

School Bonding by School Effect

Hypothesis 4 stated "there are significant differences between students in one of the middle schools in the sample (school A) and students in the other middle school in the sample (school B) on their perceptions of school bonding". This hypothesis was partially supported.

Results indicated that after controlling for students' background characteristics of grade level, gender, self-reported grade obtained in school, and educational aspirations as covariates, significant differences existed between students in school A and those in school B on two measures of school bonding: pride in school and personal dislike of school.

Students in school A reported having higher feelings of pride for themselves, their school, and others at school than students in school B. The findings that students in school A had significantly higher pride in their school than their counterparts in school B may be a reflection of characteristics of the school, style of leadership and organizational climate of school. Some observational data from the middle schools in the sample revealed that the leadership style of the principals in the two schools were different. In school A the principal was more democratic in leadership style, teachers seemed to be more involved in decision making, organizational climate of school seemed to be more intact and as a whole there seemed to be more sense of pride in school. However, a very different leadership style seemed to be operative in school B, where the principal seemed to be making most of the decisions regarding completion of the surveys, training time,

and teaching the curriculum without teachers' input. School B was characterized by higher levels of disorganization and had lower rates of compliance with the training, intervention and evaluation components of the study. It is possible that these variables (style of leadership, organizational climate of school) had influenced the sense of school spirit, thus affected students' feelings of pride in school and their perceptions of how proud other students and teachers were in school.

In school B students seemed to have less feelings of aversion towards school than those in school A. To explain this difference, the same reasoning as those explained for the discussion of findings in hypothesis 2 applies. It (See discussion of differences among students by race/ethnicity for hypothesis 2, above), Perhaps a higher percentage of students with racial backgrounds other than Caucasians in school B could have created a social climate that was more comfortable and stimulating for students of color which contributed to a lower aversion towards school for students in school B compared to those in school A. Furthermore, because a smaller number of Caucasian students attended school B, it is possible that their response to how they felt about school were overshadowed by the response of students with other racial background, hence the findings of significant differences between the two schools. In other words, the findings that students in school B felt less aversion towards school may be reflecting the feelings of students from racial backgrounds other than Caucasian.

Structural Equation Modeling (SEM) Analysis

Pathways of School Climate to School Bonding for the Entire Sample

Hypothesis 5 asserted, "There are significant pathways from perceived school climate to middle school students' bonding to school for the entire sample". This hypothesis was partially supported.

There were significant pathways from perceived school climate to school bonding when entire middle school sample was considered. This confirmed the findings of previous literature that students' perception of school climate is a significant predictor of their bonding to school (McBride, et. al., 1995; Anson, 1995; Kumpfer, & Turner, 1990-1991; Pyper, Freiberg, Ginsburg, & Spuck, 1987). Findings of this study revealed additional information on how school climate might predict bonding to school through identifying specific paths that linked the indicators of school climate to those of school bonding.

The final model identified two indicators of school climate that weighted heavily on students' bonding to school. These were students' perceptions of respect (measuring perceptions of respect for other students, staff and school property) and their perceptions of support and care for staff (measuring students' perception of caring and respect students, parents and other faculty and staff have toward faculty and staff). Perhaps these two attributes of school climate are indicative of a warm and friendly climate which consequently increases students' bonding to school. Furthermore, it appeared that except for friendship and belonging, all other indicators of school climate significantly contributed to students' perceptions of pride in school.

Students' involvement in the shaping of their environment (measuring students' attempts to influence the behavior and actions of others and the overall well-being of the school) was also a significant, although a medium contributor to school bonding. This finding confirmed the results of previous research that showed students' involvement in school was a significant variable that affected students' bonding to school (McBride et al., 1995). The present study added to pervious literature by revealing that involvement in school influenced school bonding by affecting students' attachment to school and their feelings of pride in school.

Finally, support and care that school provided for parents also influenced students' bonding to school. This finding was supported by previous research that identified parent-school connections (Pryor, 1994; Sunah, 2000) as a key variable that affected students' bonding to school.

Pathways for Sub-Groups by Gender

Hypothesis 6 postulated that "pathways of school climate to students' bonding to school are predicted to be different for male students than those for female students". This hypothesis was partially supported by the results indicating that the pathways in the final models were different for males than those for female students. Support and care that school provided for teachers and staff significantly contributed to both males' and females' school bonding.

In addition, student's involvement in shaping of their environment and their perceptions of friendship and belonging in school affected the bonding of males and females to school in similar ways. However, the impact of these two variables on students of both genders was mild. Degree to which students' perceived respect in school

heavily affected male students' bonding to school, but did not have a substantial influence on female students' bonding.

Moreover, the final model for males included a pathway from perceptions of support and care for parents to fairness of school rules/punishment. The final model for female students did not include this pathway at all. This finding suggest that male students' perceptions that school (including teachers, students, and other parents) provides support and care for parents somehow was related to their perceptions that adults in school were fair and that school policies were carried in just ways. A closer look at the survey items for measure of perceptions of support and care for parents may shed some light about these results.

Some of the items for this construct were: parents show that they care about their child's education and school behavior; teachers treat parents with respect; this school cares about the thoughts and feelings of parents; in their interactions with children, parents display the character qualities the school is trying to teach; and students try to get other students to follow school rules. It is possible that students' perceptions that school and teachers treated students' parents fairly and with respect had instilled a sense of belief particularly in male students, that adults in school were fair and that rules and punishments also were just. In addition, one of the items measured students' perceptions about parents' displaying the character traits that are taught in school. Perhaps male students were more affected by parents' authority than girls, especially during the adolescence, and if they perceived that the character of their parents was similar to the values of school, it would impact their opinions that school rules were fair.

Findings of this study also indicated that the final model for females had a better fit than the final model for males. The results in the present study seems to contradict the findings of previous research concerning gender differences (Kumpfer & Turner, 1990-1991) where a better fit of the model was reported for males than for females.

Pathways for Sub-Groups by Race

Hypothesis 7 suggested that "pathways of school climate to students' bonding to school are predicted to be different for each subgroup of students as identified by race/ethnicity: Black/African American students, Mexican/Latino/Hispanic students and Caucasian students". This hypothesis was partially supported.

Results indicated that the paths linking perceptions of support and care for faculty to school bonding influenced bonding to school for all three sub-groups, especially the African Americans and Caucasians. That is perceptions of respect for others and for the school property as well as caring and respect students, parents and other faculty, staff, showed toward faculty and staff were major contributors of students' bonding to school for African Americans and Caucasians. The effect of this indicator on Hispanic/Latino students was less pronounced.

Moreover, findings confirmed the hypothesis that the pathways of school climate to students' bonding to school were different for African Americans, Mexican/Latino/Hispanic students and Caucasians. Perceptions of student respect seemed to have heavily influenced Caucasian students' bonding to school compare to the other two groups.

Furthermore, friendship and belonging and support and care for parents did not have any affect on Caucasian students' bonding while these two indicators of school

climate somewhat influenced the bonding of African Americans and Hispanic/Latino students to school.

Pathways for Sub-Groups by School

Hypothesis 8 claimed that "pathways of school climate to students' bonding to school are significantly different for each subgroup of students as identified by school variable: School A, School B". This hypothesis was also partially supported.

Comparing the pathways of perceived school climate to school bonding for the two schools in the sample, the fit of the final models seemed to be better for school B than school A. For both schools, the indicators of perceptions of support and care for faculty were major contributors to school bonding. Although perceptions of students' involvement in shaping of their environment affected both bonding in both school, it seemed to have a greater influence on students' bonding to school in school B than in school A. Direct pathways from this indicator of school climate affected students' attachment to school, pride in school and fairness of school rules/punishment. Similarly, perceptions of student respect had a greater effect on school bonding in school A, than in school B.

While support and care for parents affected students' bonding to school by a direct path to feelings of pride in school, it had no effect in school A. Based on the observational data gathered during the course of this study, schools seemed to be quite different with regard to their social and organizational climate. Moreover, demographic data indicated that school A was mostly composed of Caucasian students while School B included mostly African Americans, Hispanic/Latino students and students with other minority backgrounds. The findings here could be partially due to the differences in the

culture and climate of the two schools. It is also possible that because the majority of students in school B were African Americans and students with race/ethnicity backgrounds other than Caucasian. Further qualitative data about school variables and climate of the schools are warranted to shed more light on these finding.

The findings that showed a link from perceptions of support and care for parents to feelings of pride in school for school B suggests that for students in school A the perceptions that school respected and cared about the parents had affected their feelings of belonging to school and being proud of their school. This could also be discussed in light of the observed differences in organizational and social climate of the two schools. In school A the principal demonstrated more democratic style of leadership and there seemed to be more harmony among the school faculty, staff and students. Furthermore, the school in general seemed to have friendlier climate than school B.

Among the items that measured support and care for parents were 'Parents show that they care about their child's education and school behavior'; 'teachers treat parents with respect'; and 'this school cares about the thoughts and feelings of parents'. It is possible that due to the differences in climate of the two schools, these variables were more pronounced in school A than in school B. Also, the parent-school connection could be stronger in school A than it was in school B, affecting students' perceptions and having a more positive attitude towards school rules and policies. Further qualitative data on various aspects of the climate of the two schools are needed to confirm these speculations.

Summary of Findings and Conclusions

Summary of Findings for the Entire Sample

Considering the entire sample, perceptions of students' respect and perceived support and care for faculty seemed to be major contributors to middle school students' bonding to school. . Perceptions of student respect assessed respect for other students, staff and school property while perceptions of support and care for faculty measured caring and respect students, parents and other faculty, staff, had toward faculty and staff.

These findings suggested that student respect and positive affect for teachers and staff are key components related to school bonding. Because the school climate and school bonding data were collected at the same point in time, it is difficult to know whether or not respect students perceive in school, and positive regard for faculty are precursors of school bonding or rather they are indicators of relationships characterized by the presence of bonding.

Summary of Findings by Grade Level

Findings indicated a linear but negative relationship in middle school students' bonding to school by grade level. That is, students in lower grades had stronger bonding to school than those in higher grades. These findings were in line with previous literature showing that as students moved up from sixth to eighth grades their bonding to school decreased (Simons-Morton, et al., 1999), and their satisfaction with school environment was reduced due to a lack of person-environment fit (Boggiano & Katz, 1991; Eccles, Midgley, Wigfield, Buchanan, Reuman, Flanagan, & MacIver 1993).

Summary of Findings by Gender

The present study findings by students' gender revealed significant differences between males and females on one of the four indicators of school bonding. That is, fairness of school rules and punishment. Examinations of the pathways of perceived school climate to school bonding indicated that perceptions of respect in school environment had a much stronger effect on school bonding for males than for females. Support and care for teachers and staff in school influenced both male and female students' bonding to school.

There seemed to be a lack of congruency in the findings of this study for gender differences (pervious study results were also inconsistent with regard to gender differences in school bonding). When gender differences for school bonding alone were examined, a stronger bonding to school for females was detected than for males. However, when the pathways from school climate to school bonding were investigated male students seemed to have a better fit of the model than females did. This suggests that additional variables may be important for fully understand and explain how males and females may bond differentially to school.

Summary of Findings by Race

Results indicated that students from different racial groups had different levels of bonding to school. African American students had a stronger bond to school than both Hispanic/Latino students and Caucasians on some measures. African American students reported being more personally attached to school and had less aversion towards school than Hispanic/Latino students or Caucasians. While Hispanic/Latino students and

Caucasians were not different on their attachment to school, they had lower aversion to school than Caucasian students did.

Examination of the pathways of perceived school climate to school bonding showed that perceptions of support and care for faculty were major contributors to school bonding for African Americans and Caucasians. This variable had a mild effect on Hispanic/Latino students' bonding to school. Furthermore, Caucasian students' bonding was heavily influenced by their perceptions of respect in the school environment.

Summary of Findings by School

The two schools in the sample were significantly different on two measures of school bonding. Students in school A had a higher level of pride in their school than their counterparts in school B. Students in school B, however, had less aversion towards school than their peers in school A. Examination of the pathways of perceived climate to school bonding showed that the indicators of perceptions support and care for staff had a significant impact on students' bonding in both schools. While, perceptions of student respect had a stronger effect on school bonding in school A, than in school B, indicators of school environment had a larger effect in students' bonding in school B than for those in school A.

Conclusions

In sum, the following conclusions can be made based on the results that were shown and discussed in this study:

- Perceived positive affect for teachers and staff seemed to be the most significant contributor of students' bonding to school.
- Perceived respect for others in school and for school property was the second significant contributor of school bonding. In particular,

indicators of student respect affected school bonding of males, Caucasian sub-sample, and students in school A.

- Degree of students' involvement in the overall well being of their school seemed to be the third significant contributor of students' bonding to school The impact of this variable was most evident in bonding of students in school B.

- As students moved up from grade 6 to grade 8 their bonding to school was shown to decrease steadily.

- Females were more likely to report that rules and punishments at school were fairly developed, and enforced than males.

- Male students' bonding to school was more likely affected by their perceptions that students in school were treated with respect by adults and by other students, than females' bonding.

- African American students had stronger bond to school than both Hispanic/Latino students and Caucasians. They were more attached to school and had less aversion towards school.

- Hispanic/Latino students had stronger bonding to school than Caucasians as indicated by their lower aversion towards school.

- Respect for others and for school property affected Caucasian students' positive bonding to school more than it did for African Americans and Hispanic/Latino students.

- Positive affect towards teachers and staff in school contributed to bonding to school for African Americans and Caucasians more than it did for Hispanic/Latino students.

- Schools were significantly different on two measures of school bonding. Students in school A had a higher sense of pride in themselves and in their school than those in school B. In school B students had less aversion towards school than their peers in school A.

- Support and positive affect towards teachers and staff influenced bonding of students in both schools.

Methodological Problems/Limitations

One limitation of this study is that the sample was selected non-randomly. That is schools were conveniently sampled. This may cause difficulty in the generalizing of the results to other middle schools. Also, the small number of schools in the sample could limit any school level inferences in the study. Furthermore, a relatively small sample size for sub-samples by race, particularly the Mexican/Hispanic/Latino group may have caused a smaller number of significant values for the estimates. In addition, there were limited amount of qualitative information in this study, hindering explanations of some of the findings, especially for discussing the results for sub-groups.

Implications and Future Directions

This study provided specific information about perceived school climate variables that contributed to middle school students' bonding to school. From the psycho-social perspective, this seems to be an interesting phenomenon in that it shows how students' perception of other students' behaviors and attitudes as well as their own behaviors and attitudes in school could affect individual's bonding to school.

One major finding showed that perceived positive affect for teachers and staff in school contributed to students' bonding to school. It is possible that, the perceptions that teachers were being respected and appreciated by adults in school; students were treated fairly by teachers; teachers were involved in school decision making; and adults cared for students' well being and their safety could be an indication of a supportive and warm school environment in which strong relationships between students and teachers and staff were developed. In turn, these strong relationships affected students' bonding to school

in positive ways. In addition, perhaps the style of leadership in such an environment was more democratic to allow for teacher involvement in school decisions.

Another finding of this study revealed that students' bonding to school were affected by their perceived respect for one another, for teachers and staff, and for school property. It is possible that these findings reflected school climate in which respect for individuals and for school property were encouraged and practiced, thus providing more opportunities for students to build trustworthy relationships and friendships These relationships, in turn, promoted and encouraged a stronger bond to school.

These findings seem to point and encourage school characteristics that provide a healthy context in which students can develop healthy attachment to adults, students and to school. These findings along with those pertaining to students' gender, race/ethnicity, grade level, and schools provided information that has implications for both research and practice.

Research in the area of adolescence development as well as those related to school climate and school bonding could benefit from the knowledge provided in this study. The literature search in this document revealed that the number of studies on school bonding and particularly those linking students' bonding and perceived school climate variables were sparse. Furthermore, it was indicated that to date few research had addressed differences among sub-groups on bonding to school as well as on pathways of perceived school climate to school bonding While findings of this study provided answers to some of the research questions that were posed here. They were constrained by the limitations of the study and need to be addressed by future investigations.

Furthermore, the perspective of schools' and practitioners' findings from this research may be very important, providing them with the knowledge base from which programs could be developed to improve students' bonding to school. If students' respect for others and the property of school significantly contributes to their bonding to school, as the findings of this study have indicated, then schools could place more emphasis in cultivation of an environment in which students are respected and valued. Similarly, as this study indicated if treating teachers and staff with respect and appreciation, and teachers' care for the safety and well being of students increases students' bonding to school, then the information from this study could be used to inform practices that allows for creation of such an environment that contributes and promotes positive bonding of students to school.

In addition, findings of this study informed and further confirmed what experts and developmental psychologists, such as Bronfenbrenner (1979) and Garbarino (1995), have been advocating for years. That is that creating a positive developmental context in schools promotes positive attachment and bonding to school, thus contributes to students' healthy development in all areas.

Future research should try to address the methodological limitations that were addressed by this study. Those included selecting random sample for the study as well as selecting a larger sample size for groups by race/ethnicity. Selection of a stratified random sample would seem to be a prudent way to resolve the small sample sizes for sub-group. Furthermore, future research should try to include a larger sample of schools that permits greater generalizability of results to other schools. In addition, such studies should try to include a richer qualitative data from schools and students in middle schools

in order to allow a greater explanation for some of the findings, especially those pertaining to sub-groups.

Finally, with regard to findings of the present study as well as those of previous research suggesting that school bonding decreased steadily during the middle school years, future research should conduct additional analysis to include grade by gender sub-sample. This is to investigate whether a different trend than those that were shown here would emerge.

APPENDICES

APPENDIX A

SURVEY ITEMS FOR STUDENTS' DEMOGRAPHIC CHARACTEIRSTICS
&
PERCEIVED SCHOOL CLIMATE

Source: 'School as a Caring Community Profile –II instrument (SCCP-II)' (Center for 4th and 5th R's, 2000),

Student School Climate Survey - Spring 2003
Middle Schools

What is this survey for? This voluntary survey is for all students and adults at this school so that we can determine how to make this school a better place for everyone.

We will ask you to fill this same survey out again later this year and again next year so we can see how much progress we are making. So we need your name to see how you think things have changed or stayed the same at your school.

All your answers will be kept completely confidential (a secret) and your name will never appear in any reports. If you have any questions, please ask your teacher or principal.

Remember, no one at school will see your answers.

1. **What is your school name?**

   _____

2. **Your teacher's name:** _____

3. **Class period:**_____

4. **Your name:**

   _____

5. **Are you a male or a female?**
   1 Male
   2 Female

6. **What grade are you in?** (circle one)

   6 7 8

7. **How old are you?** _____

8. **How many years have you been at this school?** _____

8. Which group describes you best? (you may circle more than one)

1 American Indian or Alaska Native
2 Asian
3 Black/African American
4 Mexican/Hispanic/Latino
5 Pacific Islander
6 White—Not Hispanic
7 Other (specify) _____

9. What grades do you usually get?

1 Mostly A's
2 Mostly A's and B's
3 Mostly B's
4 Mostly B's and C's
5 Mostly C's
6 Mostly C's and D's
7 Mostly D's
8 Mostly D's and F's

10. How far will you go in school?

1 Won't finish high school
2 Finish high school and stop

After high school ---

3 Go to trade or vocational school
4 Go to college for less than 4 years
5 Graduate from a 4-year college

11. What is the highest level your mother (or female guardian) completed in school?

1 8th grade or less
2 Some high school
3 Graduated from high school
4 Some college
5 Graduated from a four year college
6. I don't know

Please circle one number for each sentence that describes how often you think these things occur at your school:		Almost never	Some-times	As often as not	Frequently	Almost always
		●	●●	●●●	●●●●	●●●●●
1	Students treat classmates with respect.	1	2	3	4	5
2	Students exclude other students because they are different.	1	2	3	4	5
3	Students try to comfort peers who have experienced sadness.	1	2	3	4	5
4	Students respect the personal property of others.	1	2	3	4	5
5	Students help each other, even if they are not friends.	1	2	3	4	5
6	When students do something hurtful, they try to make up for it (for example, they apologize or they do something nice).	1	2	3	4	5
7	Students show respect for school property (such as, desks, walls, bathrooms, busses, buildings, and grounds).	1	2	3	4	5
8	Older students are unkind to younger students.	1	2	3	4	5
9	Students try to get other students to follow school rules.	1	2	3	4	5
10	Students behave respectfully toward all school staff (including secretaries, custodians, aides, and bus drivers).	1	2	3	4	5
11	Students work well together.	1	2	3	4	5
12	Students help to improve the school.	1	2	3	4	5
13	Students are disrespectful toward their teachers.	1	2	3	4	5
14	Students help new students feel accepted.	1	2	3	4	5
15	Students try to have a positive influence on the behavior of other students.	1	2	3	4	5
16	Students pick on other students.	1	2	3	4	5
17	Students are willing to forgive each other.	1	2	3	4	5

	Please circle one number for each sentence that describes how often you think these things occur at your school:	Almost never	Some-times	As often as not	Frequently	Almost always
18	Students show poor sportsmanship.	1	2	3	4	5
19	Students are patient with each other.	1	2	3	4	5
20	Students resolve conflicts without fighting, insults, or threats.	1	2	3	4	5
21	Students are disrespectful toward their schoolmates.	1	2	3	4	5
22	Students listen to each other in class discussions.	1	2	3	4	5
23	When students see another student being picked on, they try to stop it.	1	2	3	4	5
24	Students refrain from put-downs (negative, hurtful comments).	1	2	3	4	5
25	Students share what they have with others.	1	2	3	4	5
26	Students are involved in helping to solve school problems.	1	2	3	4	5
27	Students can talk to their teachers about problems that are bothering them.	1	2	3	4	5
28	Parents show that they care about their child's education and school behavior.	1	2	3	4	5
29	In their interactions with students, all school staff (the principal, other administrators, counselors, coaches, secretaries, aides, custodians, bus drivers, etc.) act in ways that demonstrate the character qualities the school is trying to teach.	1	2	3	4	5
30	Students are disrespectful toward their parents in the school environment.	1	2	3	4	5
31	Teachers go out of their way to help students who need extra help.	1	2	3	4	5
32	Teachers treat parents with respect.	1	2	3	4	5

	Please circle one number for each sentence that describes how often you think these things occur at your school:	Almost never	Some-times	As often as not	Frequently	Almost always
33	In this school you can count on adults to try to make sure that students are safe.	1	2	3	4	5
34	This school treats parents in a way that makes them feel respected (welcomed, valued, cared about).	1	2	3	4	5
35	Faculty and staff treat each other with respect (are caring, supportive, etc.).	1	2	3	4	5
36	In their interactions with students, teachers act in ways that demonstrate the character qualities the school is trying to teach.	1	2	3	4	5
37	Teachers are unfair in their treatment of students.	1	2	3	4	5
38	This school cares about the thoughts and feelings of parents.	1	2	3	4	5
39	Faculty and staff are involved in helping to make school decisions.	1	2	3	4	5
40	In this school, parents treat other parents with respect.	1	2	3	4	5
41	Parents show respect for teachers.	1	2	3	4	5
42	In their interactions with children, parents display the character qualities the school is trying to teach.	1	2	3	4	5
43	This school shows appreciation for the efforts of faculty and staff.	1	2	3	4	5

APPENDIX B

SURVEY ITEMS FOR SCHOOL BONDING

Source: 'Survey of School Climate' (Anson, 1995)

In this section we will ask you questions about how you feel about your school

Please tell us how much you agree with each comments by circling ONLY one answer for each sentences below:	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
1. School is boring	1	2	3	4	5
2. When I wake up in the morning, I often don't feel like going to school	1	2	3	4	5
3. Sometimes I pretend to be sick so I don't have to go to school	1	2	3	4	5
If you had to stop going to this school, how much would you miss: (Please circle ONLY one answer for each question)	Not at all	Not very much	Some	Pretty much	A lot
4. Your fellow students?	1	2	3	4	5
5. Your teachers?	1	2	3	4	5
6. The principal?	1	2	3	4	5
7. Adults in the school who are not teachers or the principal?	1	2	3	4	5
8. The sense of school spirit?	1	2	3	4	5
9.The way this school treats students?	1	2	3	4	5
Please circle only one number for the following question:	Not at all proud	Not very proud	Kind of proud	Proud	Extreme -ly proud
10. How proud do you feel of your school?	1	2	3	4	5

Please circle one number for each sentence that describes what you think about each question:	**None**	**A few**	**About half**	**Most**	**All**
11. How many students feel proud of this school?	1	2	3	4	5
12. How many students are willing to defend the school when bad things are said about it?	1	2	3	4	5
13. How many students care About keeping the school clean and in good condition?	1	2	3	4	5
14. How many parents of students feel proud of this school?	1	2	3	4	5
Please ccontinue to circle one number for this question:	**Not at all Clear**	**Not very clear**	**Kind of clear**	**Clear**	**Extreme ly Clear**
16. How clearly stated are the school rules?	1	2	3	4	5
17. How fair are the school rules?	1	2	3	4	5
18. When students are punished at school, how fair is the punishment?	1	2	3	4	5

APPENDIX C

Results of the Multivariate Analysis of Variance

Results of the Multivariate Analysis of Variance

Table 1

Differences Among Students by Gender on Measures of School Bonding

Test	Value	F	Hyp df	Error df	Sig of F
Wilks	0.98	2.74	4.00	676.00	**0.03**

Univerate [Note: Univariate? Do search and replace thru text] F-Tests with (1, 679) df

Variable	MS Hyp	MS Error	F	Sig of F
Personal Attachment to school	1.67	0.84	1.90	0.16
Pride in School	1.53	0.62	2.46	0.12
Fairness of Rules/Punishment	8.44	0.78	10.87	**0.00**
Personal Dislike of School	0.69	0.83	0.83	0.36

Table 2

Differences Among Students by Race/Ethnicity on Measures of School Bonding

Test	Value	F	Hyp df	Error df	Sig of F
Wilks	0.96	2.91	8.00	1108.00	**0.003**

(Univariate?) F-Tests with (2, 557) df

Variable	MS Hyp	MS Error	F	Sig of F
Personal Attachment to school	3.24	0.87	3.74	**0.024**
Pride in School	1.15	0.61	1.88	0.154
Fairness of Rules/Punishment	0.02	0.78	0.03	0.971
Personal Dislike of School	4.95	0.80	6.22	**0.002**

Table 3

Differences Among Students by Grade Level on Measures of School Bonding

Test	Value	F	Hyp df	Error df	Sig of F
Wilks	0.95	4.49	8.00	1350.00	**0.000**
		Univariate F-Tests with (2, 678) df			
Variable			MS Hyp	MS Error	F	Sig of F
Personal Attachment to school			6.46	0.84	7.67	**0.001**
Pride in School			10.55	0.62	17.08	**0.000**
Fairness of Rules/Punishment			4.50	0.77	5.81	**0.003**
Personal Dislike of School			3.91	0.83	4.73	**0.009**

Table 4

Differences Among Students by School on Measures of School Bonding

Test	Value	F	Hyp df	Error df	Sig of F
Wilks	0.94	11.15	4.00	675.00	**0.00**
		Univariate F-Tests with (1, 678) df			
Variable			MS Hyp	MS Error	F	Sig of F
Personal Attachment to school			1.22	0.84	1.45	0.23
Pride in School			6.12	0.61	10.00	**0.00**
Fairness of Rules/Punishment			1.84	0.77	2.38	0.12
Personal Dislike of School			4.85	0.82	5.91	**0.02**

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