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An investigation of the predictive effects of bullying behaviors and the psychosocial environment of schools on behaviors of middle school students

Nancy Meyer-Adams
University of Tennessee

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To the Graduate Council:

I am submitting herewith a dissertation written by Nancy Meyer-Adams entitled "An investigation of the predictive effects of bullying behaviors and the psychosocial environment of schools on behaviors of middle school students." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Social Work.

<div align="right">Karen M. Sowers, Major Professor</div>

We have read this dissertation and recommend its acceptance:

William R. Nugent, David R. Dupper, Robert T. Ladd

<div align="right">Accepted for the Council:

<u>Carolyn R. Hodges</u>

Vice Provost and Dean of the Graduate School</div>

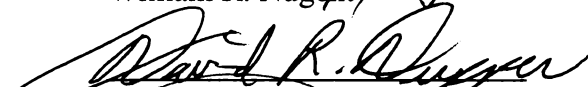(Original signatures are on file with official student records.)

To the Graduate Council:

I am submitting herewith a dissertation written by Nancy Meyer-Adams entitled "An Investigation of the Predictive Effects of Bullying Behaviors and the Psychosocial Environment of Schools on Behaviors of Middle School Students." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Social Work.

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An Investigation of the Predictive Effects of Bullying Behaviors and the Psychosocial
Environment of Schools on Behaviors of Middle School Students

A Dissertation Presented for the
Doctor of Philosophy Degree
The University of Tennessee, Knoxville

Nancy Meyer-Adams
December 2002

Dedication

This dissertation is dedicated to all those who believed in the dream of a high school dropout, that one could go from a "G.E.D. to a Ph.D. in ten years." My son, Bradley Conner, my daughter, Melissa Conner, my husband, Marcus P. Adams, and my daughter-in-law, Elsa Wong. Also, to three believers who served as the best role models a social worker and teacher could hope to have, my father, William H. Meyer and the two women who made a profound difference in my life in the all too short time that we shared, my mother Mary Ann Meyer and my "mama," Sarah P. Adams. The strength and perseverance you all have shown me throughout my life gave me the courage and inspiration to go after this dream. With your support and encouragement my dream has become a reality.

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I wish to thank the members of my committee, my major professor, Dr. Karen M. Sowers, Dr. David R. Dupper, Dr. William R. Nugent and Dr. Robert T. Ladd, for their time, patience, support and encouragement in this process.

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Abstract

The purpose of this study was to examine the relationships among a school's psychosocial environment and the prevalence and types of bullying behaviors that either lead to or resulted from that environment. More specifically, this study examined how the frequency of aggressive behaviors (e.g., bullying) experienced by students (as perpetrators and victims) contributed to their interpretation of their schools' psychosocial environment and how those environments effected the existence of ongoing aggressive and avoidance behaviors.

The data for this study was archival, having originally been collected for a study of school culture, climate and violence from the Philadelphia School District during the school year of 1993-1994. The current study used structural equation modeling (SEM) analysis to develop a theoretical model of predictive relationships among (a) students' perceptions of bullying behaviors and safety at school, (b) the schools' psychosocial environment as measured by the students and (c) the students' reactionary behavior to both (a) and (b) in order to understand the consequences of bullying in schools. The sample of 5,153 student surveys was randomly split into two groups in order to examine and test a model for Group 1 and then to be able to test a cross-validation analysis with the data from Group 2. This cross-validation helped to determine if the proposed model accurately predicted the proposed relationships across different samples.

After some model modification from the originally hypothesized model the SEM analysis found that the predicated relationships between the latent constructs of interest Victimization by Bullying Behaviors, Psychosocial Environment of the School, Contributing to Bullying Behaviors, Carry a Weapon for Protection and Avoidance Behaviors to Bullying were all significant at the p<.001 level. This model also achieved adequate to excellent fit statistics. The model from Group

2 also achieved adequate to excellent fit statistics and supported that the final model, after modification, was able to be replicated in a separate sample as an a priori specified model with no need for further modification. Limitations of the study and implications for future social work research, and social work practice and policy are discussed.

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CHAPTER I: Introduction

Statement of the Problems

School Violence

Traditionally school violence research has focused on acts of vandalism and theft of school property and assault. Of increasing attention in both research and popular culture are horrifying incidents of school shootings, occupations and hostage situations, and mass murders. As a result of searching for causes for these devastating incidents, researchers have broadened their focus to include the more prevalent issue of bullying behaviors and chronic victimization of students by other students (Batsche & Knoff, 1994; Dupper & Meyer-Adams, 2002; Haynie et al., 2001; Hoover, Oliver & Hazler, 1992; Ma, 2001). While bullying behaviors are not as overt as weapons offenses and fatal shootings, acts of bullying occur with greater frequency and may have a more profound and lasting effect on students' mental health and school performance (Astor, Vargas, Pitner, & Meyer, 1999; Elliott, Hamburg & Williams, 1998; Espelage, Bosworth & Simon, 2000; Hazler, Miller, Carney & Green, 2001; Kaufman et al., 1999; Nansel, Overspeck, Pilla, Ruan, Simons-Morton & Scheidt, 2001; O'Reilly & Verdugo, 1999). In fact, bullying may be the primary antecedent that leads to these more devastating incidents (Astor et al., 1999; Lockwood, 1997; Olweus, 1991, 1993; Vossekuil, Reddy, Fein, Borum, & Modzeleski, 2000).

"High-level school violence" (e.g., possession and use of weapons, severe physical attacks) grabs the headlines, the public's attention, and has resulted in the implementation of zero tolerance policies and procedures, such as metal detectors, locker searches,

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security personnel and expulsion (National School Boards Association, 1993; Welsh, 2000; Welsh, Jenkins, & Greene 1996; Welsh, Stokes, & Greene, 2000). However, while these incidents are devastating to all of those involved, including the nation as a whole, high-level violence in schools is relatively rare (Astor et al., 1999; Centers for Disease Control and Prevention, CDC, 1998; Kachur et al., 1996; Kaufman et al., 1999; Kaufman et al., 2000; Welsh, 2000). Brooks, Schiraldi and Ziedenberg (2000) found that "there was a 40% decline in school-associated violent deaths between school years 1997-98 and 1998-99" (p. 3). However, a recent report that examined profiles of school shooters concluded that in 66% of the cases, "the attackers felt persecuted, bullied, threatened, attacked or injured by others prior to the incident" (Vossekuil et al., 2000, p. 7). These researchers found that a number of the attackers had experienced longstanding and severe bullying. They concluded that this chronic victimization may have been a powerful motivating force behind the shootings.

"Low-level violence" (e.g., student to student bullying, verbal and/or physical threats and petty theft) is a more prevalent form of school violence that is largely overlooked by school personnel and the public. Chronic victimization results from the repeated and often ignored occurrence of this type of violence. With the absence of the recognition of the severity of this problem, perpetrators are allowed to continue to victimize fellow students (Batsche & Knoff, 1994; Dupper & Meyer-Adams, 2002; Furlong, Chung, Bates, & Morrison, 1995; Gable & Van Acker, 2000; Hyman & Snook, 1999; Olweus, 1977, 1991, 1993).

The most recognized and extensive form of low-level violence is "bullying,"

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defined as threats or intimidation of fellow students, verbal cursing and/or teasing, stealing either passively or by force, and/or physical attacks (Batsche & Knoff, 1994; Furlong et al., 1995; Hyman & Snook, 1999; Nansel, et al., 2001; Olweus, 1977, 1991, 1993). This form of low-level violence angers and alienates many students, threatens students' mental health, contributes to a hostile school environment, and may result in victims taking serious retaliatory actions (Astor et al., 1999; Lockwood, 1997; Olweus, 1991, 1993). Additionally, acts of bullying involve even those students who are not direct victims but who must think about avoiding conflict at school thus diverting energy that should be expended on learning (Chandler, Nolin & Davies, 1995; Harris, 2000; Howard, Flora & Griffin, 1999; Futrell, 1996; Olweus, 1991, 1993).

Bullies and Their Victims

Research dating back to the early 1970s in Europe on bullying behaviors suggested that one in ten students were the victims of bullies while as many as one in eight students were bullies themselves (for review see Glover, Gough, Johnson, & Cartwright, 2000). Almost all early research on bullying and low-level violence was conducted in Europe, primarily the Scandinavian countries, indicating that American researchers did not view low-level violence as a significant problem. However, only recently, as advances in technology have aided in spotlighting media focus across the country on these infrequent occurrences, have incidents of high-level violence become more overt and had a greater impact. As school violence has become a national issue, researchers in America have begun to conduct studies on the prevalence and impact of low-level violence as well (Astor et al., 1999; Lockwood, 1997; Olweus, 1991, 1993; Vossekuil et al., 2000). As

both American and European researchers have delved deeper into this issue and the definition of this victimization has broadened to include both physical and verbal assaults it is believed that these figures may be twice as high as the earlier findings (Glover et al., 2000). Bullying begins in elementary school, peaks in middle school and decreases, yet, does not disappear in high school (Batsche & Knoff, 1994; Olweus, 1993, 1994; Nansel et al., 2001; Silvernail, 2000). Previous research (Furlong et al., 1995; Nansel et al., 2001; Shakeshift, Barber, Hergenrother, Johnson, Mandel & Sawyer, 1995) suggests that students are bullied at school for a variety of reasons. Some of the explanations given by girls included being viewed as physically unattractive and/or not as physically well developed as their peers. For boys one explanation was not fitting a stereotypic macho male image. Explanations for both genders included: having a different religion; wearing unique/unusual clothes; having physical weaknesses, and/or being different in appearance from the dominant peer group.

The act of bullying has long-term implications for both victims and perpetrators. Furthermore, since acts of bullying are not classified as illegal, this form of low-level violence can occur on a daily basis, yet can be perceived as relatively minor occurrences by authority figures in the school (Hoover, Oliver, & Thomson 1993; Shidler, 2001). Additionally, current zero tolerance policies and procedures do not typically include sanctions for low-level violence (Twemlow, Fonagy, Frank, Gies, Evans, & Ewbank, 2001). School personnel usually overlook or diminish the importance of the acts of bullying by stating that "boys will be boys" or "all kids do that at this age" (Twemlow et al., 2001). Negative impacts of chronic victimization include increased rates of truancy

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and dropping out of school as well as difficult psychosocial and psychosexual relationships

(Hazler, Hoover & Oliver, 1991; Hoover & Oliver, 1996; Nansel et al., 2001; Olweus,

1977, 1991, 1993; Silvernail, 2000; Slee, 1994).

Hazler (1994) found that the impact of bullying on its victims included:

> a loss of self-esteem and feelings of isolation which, according to new research,
>
> can last into adulthood. Their grades may suffer because their attention is being
>
> drawn away from learning. Being repeatedly victimized may push even 'good
>
> kids' to extremes, such as starting fights or bringing weapons to school to exact
>
> vengeance on their tormentors...even students and adults who are witnesses are
>
> affected [in that] they must deal with the lowered self-esteem and loss of control
>
> that accompanies feeling unsafe and unable to take action. The result is children
>
> and adults who do all they can to avoid recognizing when someone else is being
>
> hurt. (p. 39).

It is also harmful to those who witness these low-level acts of bullying if this harassment is

tacitly approved of within the school environment and not acted upon by school personnel

(Espelage et al., 2000; Shidler, 2001). For example, youth who are not direct victims of

bullies at school "may be victimized by the chronic presence of violence..." (American

Psychological Association, 1993, p. 42).

Bullies who are allowed to continue these acts of low-level violence are five times

more likely than their classmates to end up in juvenile court, to be convicted of crimes,

and, when they become parents, to have highly aggressive children (Garbarino, 1999;

Hazler, 1994, 1996; Olweus, 1994). Olweus (1993) found that 60% of students

characterized as bullies in grades six through nine had at least one criminal conviction by age 24. Moreover, Hess and Atkins (1998) reported that children in elementary and secondary schools who were repeatedly the targets of aggression were at a greater risk for both physical and psychosocial problems such as "anxiety, physical weakness, social withdrawal, and loneliness, rejection from peers, school avoidance and academic underachievement" (p. 75).

Psychosocial Environment of Schools

In the past decade researchers have begun to recognize the importance of studying the psychosocial environment of the school in conjunction with their research of individual bullying behaviors (Haynie et al., 2001; Ma, 2001; Olweus, 1993, 1994). Psychosocial environment of schools for this study, is defined as the schools' climate and culture as perceived by the students. In this study, climate specifically refers to the students perception of safety and well-being within the system. While, culture refers to the norms, values and beliefs that drive the social system. Olweus (1993, 1994) identified some important factors of the psychosocial environment of the school that are thought to help reduce incidents of bullying including: firm and clear limits to undesirable conduct, positive interest and involvement from adults, monitoring of students and non-hostile, non-physical sanctions for bullying behaviors. Additionally, Barone (1997) supported Olweus' findings and added counseling for students and training for teachers to these characteristics. Positive psychosocial school environments prevent harassment by bullies from thriving (Hazler, 1994). Moreover, Olweus' (1991, 1993, 1994) research on bullying found that psychosocial school environments can make a difference in decreasing

or eradicating bullying behaviors as these behaviors occur more frequently inside a school than on the way to and from school.

Purpose of the Study

This study examined the relationships among schools' psychosocial environment and the prevalence and types of bullying behaviors that either lead to or resulted from that environment. More specifically, this study examined how the frequency of aggressive behaviors (e.g., bullying) experienced by students (as perpetrators and victims) contributed to their interpretation of their schools' psychosocial environment and how those environments effected the existence of ongoing aggressive and avoidance behaviors. Using structural equation modeling analysis, this study developed a theoretical model of predictive relationships among (a) students' perceptions of bullying behaviors and safety at school, (b) the schools' psychosocial environment as measured by the students and (c) the students' reactionary behavior to both (a) and (b) in order to understand the consequences of bullying in schools. Furthermore, cross-validation was used to determine if the proposed model accurately predicted the proposed relationships across different samples. This provided both exploratory and confirmatory validation of the proposed and final models.

Research Questions

The following research questions were explored in this study:

Research Question 1. Does, on average, a student's exposure to bullying behaviors (i.e. being a victim) predict the psychosocial environment of the school as measured by the students?

Research Question 2. Does, on average, a student's perception of safety at school predict the psychosocial environment of the school as measured by the students?

Research Question 3. Does, on average, a student's contribution to bullying (i.e. if they themselves have exhibited bullying behaviors) predict the psychosocial environment of the school as measured by the students?

Research Question 4. Does the psychosocial environment of the school, as measured by the students, predict students' avoidance responses to bullying behaviors?

Research Question 5. Does the psychosocial environment of the school, as measured by the students, predict students carrying a weapon for the purposes of protection?

Research Question 6. Does the psychosocial environment of the school, as measured by the students, predict gang involvement?

<center>Justification for Study</center>

While researchers in the area of school violence in the United Sates are just beginning to focus on the effects of bullying behaviors on both bullies and victims it is important that further research is conducted that examines the predictive relationship among the acts of bullying, the victimization of bullying and how safe students feel in their school to the overall psychosocial school environment and what types of behaviors stem from the interactions of these behaviors and the psychosocial school environment. By determining these relationships, prevention and early intervention programs can be developed. These prevention and intervention strategies can assist school social workers and other school personnel in creating safe learning environments for children. Furthermore, identifying factors that may predict whether students will act aggressively or

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try to avoid the environment where they are being victimized may also assist in keeping weapons out of school while keeping students in school. For example, prevention and early intervention strategies could reduce incidents of low-level violence, which would lead to students' having a more positive perception of the psychosocial environment of their school and should lead to a reduction in aggressive and avoidance behaviors, such as carrying weapons to school or not attending school.

Limitations

The study was limited in the following ways:

1. This study used a convenience sample from a pre-existing data set. The sample population for this study was drawn from the School Culture, Climate and Violence: Safety in Middle Schools of the Philadelphia Public School System, 1990-1994, study (for complete overview of the data set see Welsh et al., 1996). While it was a sample of convenience, given its overall size (N = 5,153), there were no concerns about generalizability, especially to middle school populations, where previous research (Batsche & Knoff, 1994; Olweus, 1993, 1994; Nansel et al., 2001; Silvernail, 2000) indicates low-level violence to be most disruptive and costly to the school environment.

2. The data were self-reported with little effort to ascertain the reliability or validity of the respondents' reports. This, however, is a common problem of all studies that use self-reported data.

3. The data were collected without random assignment to conditions and there are no manipulations of any of the independent variables, because of this, the data and the results are of a non-experimental nature. As the data are non-experimental, it is not possible to

establish causality and directionality unequivocally. Again, this problem is typical in all studies using non-experimental data. However, given the statistical procedures that were used, predictive relationships among the variables can be asserted. For clarification, predictive relationships are conclusions that result from confirmation of model fit and significant path predictors that were suggested from the a priori hypothesized model, whereas causal relationships result from direct manipulation of independent variables that cause changes in dependent or measured variables.

4. The selection of variables for the study was limited because the data were originally collected for use in a different series of studies to test a different set of theories. However, the development of proxy measures of the theoretical constructs of concern in this study was possible from the available set of variables, so any resulting measurement limitations should be minimal.

<div align="center">Definitions of Terms</div>

Specific terms operationally defined for the purpose of this study are as follows:

Bullying Behaviors - unprovoked physical or psychological abuse of an individual student by one or a group of students over time creating an ongoing pattern of harassment and abuse.

Psychosocial Environment of the School - the environment of the school (in the case of this study, as perceived by the students) that includes the school's climate (e.g., the individuals' perception of safety and well-being within the system) and culture (e.g., the norms, values and beliefs that drive the social system).

Aggressive Behaviors - reactionary behaviors of the students who are victims of bullying behaviors. These behaviors are typically outcomes and can be seen as measures of defense or protection (e.g., carrying weapons to school, joining a gang).

Avoidance Behaviors - reactionary behaviors of the students who are victims of bullying behaviors. These behaviors are typically outcomes and can be seen as measures of escaping or evasion (e.g., missing school, missing one or more classes, avoiding certain areas like locker rooms and the gymnasium).

CHAPTER II: Review of Literature

Overview and History

Overview

Selected literature in the areas of the history of school violence, bullying behaviors and school psychosocial environments is presented in this review to provide a context and rationale for this study. First, a summary of the history of school violence theories and research is provided as a background for this study. Second is a summary of existing studies on bullying research. Finally, an examination of research pertaining to the psychosocial environments within schools. Each section concludes with a discussion of gaps in the knowledge base. This review and discussion is presented to provide support for the arguments that underlie the research presented in this study. More specifically, previous research on violence in schools has a) been conducted outside of the United States, b) focused largely on the individual rather than the system, and c) focused almost solely on high-level violence, which, while devastating, occurs with less frequency and is likely caused by prolonged exposure to low-level violence (as either a perpetrator or victim), students' perceptions that their schools are unsafe, and students' perceptions of negative psychosocial school environments.

History of School Violence Research

In the early 1970s school crime and violence were brought to the forefront of the public's attention with the hearings of the Senate Subcommittee to Investigate Juvenile Delinquency and the House Subcommittee on Elementary, Secondary, and Vocational Education (U.S. Department of Health, Education & Welfare, USDHEW, 1978). In the

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preliminary report of the Senate subcommittee's findings, Senator Bayh, stated that a

"survey of public elementary and secondary schools had produced a ledger of violence

confronting our schools that reads like a casualty list from a war zone or a vice squad

annual report" (USDHEW, 1978, p. 1). This relatively abrupt emergence of the problem

of violence in, what the American public had previously believed to be a safe haven for

their children, the school environment, caught most of the country off-guard (USDHEW,

1978). Furthermore, school administrators and staff did not have the knowledge,

resources, or guidelines in place to begin to address the findings in this report (USDHEW,

1978). Vossekuil and colleagues (2000) reported that the earliest case of a school

shooting by a student took place in 1974 when a male student brought guns and

homemade bombs to his school.

Prior to the school violence research that was conducted in the 1970s, the issue of

school violence was thought to be a result of juvenile delinquency. It was, therefore

studied as a problem of certain individuals who were thought to be more disposed to

violence than others (Fagan & Wilkinson, 1998; Futrell, 1996; McPartland & McDill,

1977). Consequently, early research studies from the 1950s and 1960s focused on

predicting why certain individuals may be more disposed to violence than others. This

resulted in a proliferation of theories and policies that examined school violence as a

homogenous behavior, therefore overlooking the significant variations that occured in the

attributes, behaviors, and motivations of adolescents involved in the violent acts (Fagan &

Wilkinson, 1998; Futrell, 1996). McPartland and McDill (1977) reported that by focusing

the school violence issue on the individual students and the reasons behind their juvenile

delinquency, researchers neglected to examine schools as having a distinctive role in the causes of school violence. During this time, it was believed that the schools that were reporting violent acts were the schools that were enrolling individual students with serious personal problems and predispositions to violent behavior (McPartland & McDill, 1977).

Many believe that the National Institute of Education's (NIE) *Violent Schools - Safe Schools: The Safe School Study Report to Congress* of 1978 was the first research study to redirect focus from studying the cause of school violence as the fault of delinquent individuals to linking school disorder and violence to a school's environment, culture, and climate (Anderson, 1998; Gottfredson & Gottfredson, 1985; Welsh et al., 1996; Welsh et al., 1999; Welsh, 2000; Welsh et al., 2000). This survey consisted of victimization questionnaires that were administered to 31,373 students and 23,895 teachers from over 600 schools chosen from a statistically representative probability sample of 5,578 junior and senior high schools across the United States (Anderson, 1998; Elliott et al., 1998; NIE, 1978). This benchmark study revealed that 12.8% of the students and 13% of the teachers reported being victimized in a given month, with theft being the major form of victimization (11% of students and 12% of teachers) and only 1.3% of students and .5% of teachers reported being assaulted (Anderson, 1998; Elliott et al.,1998). Over 80 percent of these thefts for both students and teachers had a reported loss of $10 or less. The results indicated that most robberies were "instances of petty extortion-shakedowns which for some student victims become an almost routine part of the school day" (NIE, 1978, p.60). More recent studies report similar daily bullying victimization. A further discussion of the NIE study findings on school culture and

climate appears in the psychosocial school environment section of this chapter.

Since the NIE study of 1978 several national assessments of school safety have been conducted (Anderson, 1998). These include: *School Crime: A National Victimization Survey Report* (Bastian & Taylor, 1991) which is a supplement to the *National Crime Survey* and has had ongoing yearly data collection through 2001; *Student Victimization at School* as part of the National Household Education Survey sponsored by U.S. Department of Education's National Center for Education Statistics (NCES) (Chandler, Nolin, & Davies, 1995); *Violence in America's Public Schools* (Metropolitan Life Insurance Company & Harris Polls, 1993-1994) and *Monitoring the Future (1983-95)* (Maguire & Pastore,1996).

While the subject of all of the above surveys was victimization, the types of victimization varied (e.g., bullying, theft, property crime, physical assault), as well as the subjects, with some surveys having questioned a representative national sample of students only, and others having questioned representative national samples of students, teachers, parents and police (Anderson, 1998). To summarize the results across all of these studies, percentages of low-level violence such as bullying and petty theft consistently averaged between eight and twenty-four percent, while the percentages of high-level violence such as physical and/or violent attacks consistently averaged between two and sixteen percent (Anderson,1998). Thus, findings from these national, ongoing school victimization surveys support the aforementioned statements of researchers that despite media hyperbole, there has not been an increase of violent crimes in this country's schools over the past three decades. Additionally, these results indicate that low-level violence is more

prevalent than high-level violence.

Since that first NIE report, numerous studies have been conducted by both government and private agencies which addressed the prevalence of violence in schools, the types of violent occurrences, and locations where the violent incidents are most likely to occur within the school and its surroundings. Additionally, more recent, albeit, fewer studies have been conducted on violence prevention programs which have been implemented since the issue of school violence was brought to the public's attention in the 1970s (Anderson, 1998; Futrell, 1996, Astor et al., 1999; Elliot et al., 1998; Posner, 1994; Garbarino, 1999).

However, the research that grew from those early studies along with the studies of the violence prevention programs have examined the larger scope of violence in society as a whole as the starting point for their investigations into issues encompassing school violence (Anderson, 1998; Astor et al., 1999; Laub & Lauristen, 1998). During this period of research, incidents of violence in this country's schools were frequently linked to the levels of violence occurring in the society as a whole. Furthermore, these more recent studies argued that individual schools, often seen as communities themselves, could not ignore the effects of the neighborhood and societal factors of violence that the members of the "school community" (e.g., students, teachers, and staff) were bringing to the inside "community" of the school (Lorion, 1998).

During the 1990s there was a dramatic increase in school violence research and intervention literature, (Astor et al., 1999). There was also a shift to the theory that violent events are caused by "complex interactions among people, personal motivations, weapons,

the social control attributes of the immediate environment and the ascribed meaning and status attached to the violent act" (Fagan & Wilkinson, 1998, p. 56). With this increase in school violence research and extensive media coverage of fatal events on school campuses, it may seem that there has been an increase in school violence since that landmark 1978 Safe School Study. However, subsequent large-scale national studies have found that in fact high-level school violence has remained relatively stable during the 1980s and 1990s (Anderson, 1998; Astor et al., 1999). It is clear that even one incident of high-level violence is one too many and has a large immediate impact on the students, teachers, and administrators within the school, the community surrounding the school, and the nation as a whole. Although, it is likely that multiple incidents of low-level violence, occurring on a daily basis, have a more severe lasting effect that may lead to incidents of high-level violence.

Remaining concerns center around the seemingly easy access of guns and other lethal weapons by angry, confused students who see no other way out than violent retaliation (Anderson, 1998; Astor et al., 1999, CDC, 1998; Kachur et al., 1996). These concerns lead to the belief that high-level school violence is more serious today, despite the research that shows its stability. Determining causes of alienation and sources of anger in students, and implementing prevention programs is the most efficient method to reduce the risk of violent outbursts and thus keep high-level violence at a minimum.

When reviewing the history of school violence research it is imperative to consider the issues involved in studying such a multifaceted topic. First, school violence research has been historically fraught with lack of: uniformity of measurement procedures, accurate

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definitions of levels of units of analysis and the operationalizing of terms when defining what constitutes a violent act, how violent must an act be to be considered serious, (e.g., does one only count acts as violent if law enforcement is called) and how many violent acts must occur in a certain time frame before teachers, principals, and students feel that their school is unsafe (Astor et al., 1999; Rosenblatt & Furlong, 1997). In addition, educational researchers frequently ignore the fact that data collected from students are nested within the classrooms and classrooms are nested within the school environments which are nested within communities (Gottfredson & Gottfredson, 1985; Mayer & Leone, 1999; Welsh et al., 1996; Welsh, 2000).

Second, most empirical studies of all levels of school violence and victimization use self-report surveys to collect data. Mayor and Leone (1999) stated that most studies on school violence use a "[confirmatory] hypothesis verification approach" (p. 333). In other words, researchers assume that school violence is present and with the use of self-report surveys they elicit answers which validate its existence. Many researchers in this field contend that for practical and ethical reasons these cost and time effective self-report surveys are the only choice for data collection (Astor et al., 1999; Rosenblatt & Furlong, 1997). Several problems exist when relying solely on self-reported data, including but not limited to: memory recall, placing an event into a more recent time frame than it actually occurred, the desire to downplay violent events so that one's own school does not appear to be experiencing as high levels of student victimization as it may actually be, and differences in the level of comprehension of survey questions for different age groups of students (Astor et al., 1999; Rosenblatt & Furlong, 1997).

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Finally, an additional concern with self-reported data is the variation of reports among the various groups of a school's hierarchy. Astor and colleagues (1999) described the phenomena of varying levels of school violence being documented within one school when reported by more than one group of participants (e.g., students, teachers, administrators) as being a result of "who is asked what" (p. 140). These researchers hypothesized that students usually report higher incidents than teachers and administrators because of the number of violent acts which take place in areas and during times when adult supervision is not present. Additionally, when answering questions in national surveys, it is a common occurrence for principals and teachers to under-report violent acts in order to make their school appear safe (Anderson, 1998; Rosenblatt & Furlong, 1997). These limitations and disparities between student, teacher and administrator reports must be considered when examining any study on school violence, especially those that depend solely on self-reported data (Astor et al., 1999). Many of these limitations are examined in the studies on bullying behaviors which are reviewed in the following section.

Bullying Behaviors

   Definition and prevalence.

   To date, the majority of studies on bullying behaviors have been conducted in Europe and only recently has bullying research begun to emerge in America (for review see Glover et al., 2000). For example, the dominant body of empirical studies on bullying problems originated from Scandinavian schools in the 1970s (Borg, 1999, Olweus, 1977, 1991, 1994). Hence, little is known about the extent and prevalence of this issue in America and how it may differ from school violence and bullying in other countries.

As previously stated, the term used most often when describing low-level school violence is "bullying." Bullying has been defined as unprovoked physical or psychological abuse of an individual by one or a group of students over time to create an on-going pattern of harassment and abuse (Olweus, 1977, 1980,1991; see also Batsche & Knoff, 1994; Hoover et al., 1993; Nansel et al., 2001; Pellegrini, 1998). It is comprised of direct behaviors (e.g., teasing, taunting, threatening, hitting, and stealing) and indirect behaviors (e.g., causing a student to be socially isolated by spreading rumors) (Hoover et al., 1993; Nansel et al., 2001; Olweus, 1991, 1993; Smith & Sharp, 1994). Moreover, bullying is an act of harassment which has no geographic borders and affects students from all racial and socioeconomic groups in our society (Silvernail, 2000). According to Olweus, (1994) bullying can be distinguished by three criteria: "(a) aggressive behavior or intentional 'harmdoing' (b) which is carried out 'repeatedly and over time' (c) in an interpersonal relationship characterized by an imbalance of power" (p. 1173).

Bullying victimization is estimated to affect 15% to 20% of the U.S. student population, with verbal teasing and intimidation being its most common form affecting boys at a higher rate than girls (Furlong et al., 1995; Nansel et al., 2001; Silvernail, 2000). A study of secondary school students found that 88% of students reported having observed bullying and 90% of fourth through eighth graders reported being victims of bullying at school (Hoover et al., 1992; Silvernail, 2000). In addition, Hoover and colleagues (1992) reported that when bullying was defined as chronic harassment, 14% of 207 mid-western middle and high school students responded that they had been severely victimized. These findings indicate that bullying, likely the most common form of low-

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level violence, is a rather large and consistent problem in American schools, one that needs to be addressed.

Existing research on bullying.

According to the results of a 1983 study conducted by Olweus (1994), where a total of 130,000 Norwegian students were surveyed anonymously using the "Olweus Bully/Victim Questionnaire," an estimated 15% (84,000 students) of elementary and secondary school students (ages 7-16) were involved in bully/victim problems on a regular basis, either as bullies or as victims. Approximately 9% of this sample reported being victims with the remaining 6% reported as the bullies. This survey was administered to students from a representative sample of 830 primary and secondary schools from across Norway with a total of 715 of these schools providing valid data. All of the results were gathered from the self-report surveys (Olweus, 1993, 1994). Perry, Kusel and Perry (1988) reported validity of self-reported data in bully/victim research from earlier Swedish studies to be correlated (Pearson correlations - .40-.60) with reliable peer and teachers' ratings on equivalent measures. The size of the schools and the size of the classes varied throughout the sample with the smallest school having 43 students and the largest having 930 (Olweus, 1993).

Olweus' (1993) findings did not support two of the more common myths of bullying. He found no positive associations between the level of bullying and the size of the class or the size of the school. Secondly, his findings did support that "external deviations" (e.g., obesity, speaking with an unusual dialect, wearing glasses) do not have the effect that popular opinion believes them to have, specifically when looking at victims

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of long term bullying. Although, Olweus (1993) reported that bullies may make use of and "pick on" their victims' external deviations, his data do not support the theory that these external deviations are the cause or origin of the bullying. Additionally, Olweus (1993, 1994) reported that his findings did support that the degree to which students will manifest bully/victim behaviors was related to the strength of attitudes, values and beliefs (i.e., school culture) held by the students, teachers, and parents of non-tolerance of bullying behaviors in the school.

Olweus' (1993, 1994) best known study is the Bergen study which had a sample size of 2,500 male and female students divided into four cohorts from 42 primary and secondary schools who started the study in fourth through seventh grades, in Bergen, Norway. Each cohort had 600-700 subjects who spanned the grade levels. This study measured these students at three different intervals. The first measurement took place four months prior to intervention, while the second and third measurements were taken at eight and twenty months after the inception of the intervention respectively. The intervention included the implementation of Olweus' "Bullying Prevention Program" which strives to heighten the awareness of bullying among all the members of a schools' community, with the thought that the more teachers, parents, students and administrators know about bullying the less it will be ignored or allowed to take place. This program includes the "Bully/Victim Questionnaire," a teacher booklet about bullying, a parent information packet about bullying, a video that is to be shown in all classrooms on bullying and regular meetings with school staff to collect their feedback on the program (Olweus, 1993, 1994). Findings from this study included: marked reductions (approximately 50%) in bully/victim

problems during the two years following the introduction of the intervention program, a reduction in general antisocial behavior (e.g., vandalism, fighting, truancy) both at school and traveling to and from school, and an improvement of the "social climate" of the classes involved in the study. This improvement was observed in items such as "improved order and discipline, more positive attitudes towards the school and more positive social relationships" (Olweus, 1993, p. 113).

As previously mentioned, Olweus has done extensive research in the area of bullying, however, it has all been conducted in Scandinavia. The Maine Project Against Bullying, one of the few studies conducted in the United States, reported results from their "Survey of Bullying Behavior Among Maine Third Graders" in January, 1999 (Silvernail, 2000). The final sample consisted of 4,496 third graders (28% of all third graders in the state of Maine) from all Maine public schools that had a third grade. This survey revealed that approximately 75% of the sample reported "feeling very happy" or "sometimes happy" at school, while 6.3% said they felt "very sad" or "sometimes sad" at school. Fourteen percent reported that they had hit, kicked, or pushed others on a frequent basis while 83% said they "never" or "almost never" behaved in this manner. When responding to the question, "What do children do when they are bullied and what are the results?" 91% of the sample reported they "did something" and 48% reported that "when they told someone about the bullying it got better," however, 37% of this sample of Maine third graders reported that "nothing changed when they told someone or that the bullying got worse" (Silvernail, 2000, p. 11). The survey used for this study was designed based on a literature review of the existing research on bullying to discover the frequency of bullying

activities among third graders in Maine (Silvernail, 2000). This report does not give any details about missing data or the administration of the instrument nor does it describe any limitations to these research findings. The Maine study only reports the frequencies of each response to each survey question.

As Pellegrini (1998) reported, one limitation to the majority of the existing research on bullying is that it has been conducted using questionnaires which limits findings to what the respondents want to tell us. This limitation can be specifically distressing when considering the nature of the information being gathered in the interest of bully and victim research. This limitation not only applies to students who may not be forthcoming with some of the necessary information asked on the questionnaires, but also to teachers and school administrators who may be reluctant to report high incidents of low-level violence such as bullying behaviors in their classroom or school (Pellegrini, 1998; see also Astor et al., 1999). One suggestion to overcome this limitation is to add direct observation as a method of collecting bully/victim data. Direct observation would also allow the researchers to observe behaviors in areas outside of the classrooms, such as the cafeteria, playground, restrooms, and hallways. It is thought that more acts of bullying take place in these areas due to reduced adult supervision (Pellegrini, 1998; see also Astor et al., 1999; Siann, Callaghan, Glissov, Lockhart, & Rawson, 1994).

According to the findings from Hoover and colleagues (1993) study, bullying behavior was measured by the following five constructs: teasing, practical jokes, damage of property, hurt (physical attack) and social ostracism. These researchers noted that social ostracism was added to the list of bullying behaviors from earlier studies because of

numerous comments written on the surveys from female respondents. This study's sample consisted of 178 fourth though eighth graders of which 100 of the respondents were female from a random selection of four schools in the Midwestern United States.

Furthermore, the Hoover and colleagues (1993) study asked the respondents about five domains: physical, social, emotional, learning, and familial, to investigate what problem areas bullying had the greatest effect on these students. Emotional problems rated highest for both male and female students with 82% of the male sample citing emotional problems resulting from bullying and 95.5% of the female sample. Social problems had the second largest percentages with 50.7% of the males and 56.8% of the females. Learning and familial problems were close, with learning problems reported as 23.9% males and 27.3% females and problems with family because of being bullied reported as 21.4% (males) and 27.3% (females). Interestingly, physical problems from being bullied had the lowest percentages of all five domains with 11.3% of the males and 15.9% of the females reporting physical problems. Overall, nearly 90% of this sample of fourth to eighth graders reported being victimized by bullies during their school years (Hoover et al., 1993). However, these researchers also found a trend in the data suggesting that students reported their current school year as being their worst for bully victimization, thus leaving that data hard to interpret and limiting the validity of the self-report.

Although, Hoover and colleagues (1993) study had similar self-report limitations as the previously mentioned studies, the surveys used for this study contained questions which had been simplified to require a dichotomous yes or no answer which helped to reduce the complexity and vocabulary of the Likert-type surveys used in all previously

mentioned studies. While this dichotomizing of the answers caused a loss of level of severity for the items being measured, it may have made it easier for the younger subjects to answer the questions.

Espelage and colleagues (2000) conducted a study in the United States of sixth, seventh and eighth graders from a large middle school which was located within 10 miles of a major metropolitan Midwestern neighborhood. The sample included 558 students (300 females, 258 males) who were given a survey constructed from a review of the existing literature which asked for certain demographic information (e.g., race, sex, grade, free/reduced lunch), the number and frequency of bullying behaviors in the past 30 days, familial and adult influences, negative peer influences, neighborhood safety, access to guns and feeling unsafe at school. Only 19.5 % (15.5% of males and 23.0% of females) of this sample reported exhibiting no bullying behavior on their peers in the 30 days prior to completing the survey (Espelage et al., 2000). It is important to note that the data for this study were also self-reported data from the students, thus the survey measured the students' perceptions of family and peer behaviors, not the actual behaviors and that this sample consisted of primarily Caucasian students (84%, n = 468) making generalizability to more diverse middle school populations limited. Furthermore, the data were cross-sectional, preventing the researcher from reporting any findings about the stability of bullying behaviors over time or whether the association of the variables was negative or positive (Espelage et al., 2000).

George and Thomas (2000) examined victimization of middle and high school students in the United States by analyzing data from the National Educational

Longitudinal Study (NELS) which is an ongoing study that provides trend data about students' transitions as they depart elementary schools and progress through high school into college and beyond. NELS collected base rate information in 1988 from eighth grade students and the George and Thomas (2000) study used the baseline and the first 2-year follow-up data. The original sample for the NELS was 25,000 students from approximately 1,000 participating schools (24 students per school on the average) drawn from a multistage cluster sampling design. This sample was representative of eighth graders in the nation as a whole in the spring of 1988. As these students dispersed to approximately 3,000 high schools the National Center for Education Statistics decided to use a subsample of 1,500 of these high schools in order to reduce data collection costs for the 2-year follow-up. The George and Thomas (2000) analysis consisted of a sample size of 23,257 eighth graders and 15,052 tenth graders.

The importance of the George and Thomas (2000) study was the use of multilevel modeling analysis (e.g., student or teacher level is represented by its own sub-model which then represents a structural relationship occurring at that level to others being analyzed) to examine this data instead of the heretofore more commonly used single-level analysis. For example, many studies aggregated student and teacher data to the entire school level, making the school the unit of analysis based on individual data, or just the opposite by breaking down the school level data to analyze and report results on an individual student or teacher level. Data collected from students are nested within the classrooms and classrooms are nested within psychosocial school environments which are nested within communities and even though this hierarchical nature of educational data is recognized,

frequently researchers in this field ignore these nested relationships in their analyses

(George & Thomas, 2000; see also Gottfredson & Gottfredson, 1985; Mayer & Leone,

1999; Welsh et al., 1996; Welsh, 2000). George and Thomas (2000) explained that using

single-level analysis when analyzing multi-level models such as schools causes "problems

of aggregation bias and misestimations of the standard errors" (p. 52) as well as problems

with unit of analysis.

By using Hierarchical Linear Modeling (HLM) statistical analysis to estimate the

models, the George and Thomas (2000) study was able to investigate the data at more

than one level simultaneously. Thus, analyzing student victimization in both a within-

school model and the between-school model, where the within-school model examined the

relationship between individual effects within a particular school and the between-school

model examined the differences between schools (George & Thomas, 2000; see also

Welsh et al., 1996).

George and Thomas (2000) found that school level factors such as size and

location (urban, rural, and suburban) were significant predictors of student victimization

for eighth graders but not for tenth graders. These researchers also found that school

climate was a significant predictor of student victimization for both grades where more

positive school climates were associated with less victimization.

A more recent study conducted by Nansel and associates (2001) analyzed data

from a representative sample of 15,686 sixth to tenth grade students from all public,

Catholic and other private schools with minimum enrollment of 14 students throughout

the United States in 1998. The students were asked to complete a 102 item self-report

questionnaire during one class period after both parental and student consent had been granted. The content of the questions focused on how often each child had been bullied and had been the bully during the current school term. The response rate for this study was 83%. The sample was stratified by racial and ethnic status of the students in order to provide an "oversample of black and Hispanic students" as well as by "geographic region and counties' metropolitan statistical area status (largest urban areas/not largest urban areas)" (Nansel et al., 2001, p. 2095). Due to this over-sampling of certain groups, statistical sample weights were developed to adjust the effected categories prior to any statistical analyses of the data. In order for these researchers to analyze the relationship between psychosocial adjustment and bullying (either being the bully or the victim) the participants of this study were categorized as the following: "non-involved bullies, bullies only, those bullied only or both bully and bullied" (Nansel et al., 2001, p. 2096).

Results from this study revealed that the prevalence of bullying among sixth through tenth grade students is substantial in this country (Nansel et al., 2001). Moreover, the results indicated that 29.9% of these students reported involvement (frequent or moderate) in bullying, with 13% reporting this involvement as a bully, 10.6% as being the victim of bullies and 6.3% as both the bully and the victim (Nansel et al., 2001). As was the case with aforementioned studies, the frequency of bullying was higher among middle school grades (6-8) than among the high school students, and males reported being the bully and being bullied significantly more frequently than females (Nansel et al., 2001). In addition, youth who reported moderate to frequent involvement in bullying, either as the bully or as the victim, were found to have poorer psychosocial

adjustment than non-involved youth with notable differences among those who bullied, those who were bullied and those reporting involvement in both.

For instance, those who bullied reported to be more likely to participate in other problem behaviors (e.g., drinking alcohol, smoking) and poorer school adjustment in both academic achievement and perceived school climate, while victims of the bullies reported greater difficulty in making friends and greater loneliness. Additionally, those who were involved with both reported poorer social and emotional adjustment, as well as, an increase in problem behaviors (Nansel et al.,2001). These authors stated that the youth who both bully and are bullied may be in a particularly high risk group due to the combination of involvement with behaviors, such as drinking alcohol and smoking, coupled with social isolation and lack of academic success.

Limitations of this study (Nansel, et al., 2001) included use of self-report questionnaires, which, as discussed, may limit the researchers to knowing only what the respondents wanted to tell them and that these data were collected during only one class period at each school, thus the researchers were unable to compare respondent and non-respondent characteristics. However, this study did include variables enabling the researchers to examine the relationship between bullying behaviors and psychosocial adjustment, which is rarely done. These items included questions about problem behaviors, academic achievement, parental involvement and seven items related to school climate including the respondents' perception of their teachers and schools.

Limitations to existing research on bullying.

In summary, researchers who study bullying behaviors have only recently begun to

look at the school's psychosocial environment as a contributing factor to the prevalence of bullying in schools and to recognize that a positive school environment may be necessary to reduce the occurrences of bullying. Further research is needed in order to explore the interactions between the school environment and the prevalence of bullying. Gaining a better understanding of how these variables are interconnected could help researchers and school personnel with early identification and possible prevention of problems involving the following: incidents of bullying, behaviors of the bullies' victims that result from ongoing student victimization, and issues concerning a school's environment where ongoing bullying is allowed to take place. Additionally, further research is needed to probe deeper into what types of avoidance (e.g., staying home from school, fear or reporting incidents of bullying) and aggressive (e.g., carrying a weapon to school, joining a gang for protection) behaviors the bullies' victims exhibit when student victimization is tolerated in the school environment.

In addition, research using statistical techniques such as Hierarchal Linear Modeling (HLM) and Structural Equation Modeling (SEM), which provide the researcher with methods to address the issues of composition, multilevel modeling and nested data, is needed so that the data can be analyzed to reveal more accurate explanations to assist in the understanding of these phenomena. To date, as seen in the previous literature review on bullying, few studies have attempted to address these composition and unit of analysis issues.

Psychosocial Environment of Schools and Student Victimization

Definitions and theories.

Broadening the study of school violence to include the schools' psychosocial environment (i.e., its culture and climate) is an imperative step as these two attributes can significantly influence students' behavior and learning (Anderson, 1982; Hoy & Sabo, 1998; Hoy, Tarter & Kottkamp, 1991; Gottfredson, 1986, 2001; Gottfredson & Gottfredson, 1985; Wang, Haertel & Walberg, 1997). Moreover, the psychosocial environment contributes to students' feelings of safety and well-being while in the school building and while traveling through the surrounding school grounds and neighborhoods (Welsh, 2000; Welsh et al., 1996; Welsh et al., 1999; Welsh et al., 2000).

Frequently the definitions of culture and climate as these terms apply to psychosocial school environments are interchanged in the literature. James, James and Ashe (1990) distinguished climate from culture by emphasizing that culture is a property of the social system (the norms and values that drive the social system) as compared to climate which he described as a property of the individuals (their perceptions) within the system. This definition concurs with the generally accepted definitions from the organizational literature that states organizational climate is an aggregate of employees' shared psychological climate. Individual psychological climate is the employees' perception of the psychological impact of the work environment on his or her own personal well being (Glisson, 2000). Brown and Leigh (1996) emphasized "that positive climates are those in which workers perceive that their work environment poses no threat to their personal self-image or career and provides a return on their investment of personal

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energy" (p. 10).

In a comprehensive review of school climate research, Anderson (1982) explained how the unit of analysis in studies of school climate is an ongoing debate and may be problematic when interpreting results. One caution Anderson (1982) offered was that studies in the area of culture and climate rarely provide a theoretical rationale for their choice of unit of analysis. In many of the studies she reviewed researchers were often guilty of "generalizing from one level of analysis to another... which leads to serious distortions of the data" (p. 386).

Welsh (2000) defined the climate of a school as "the unwritten beliefs, values, and attitudes that become the style of interaction between students, teachers and administrators" (p. 89). In addition, he stated that "school climate sets the parameters of acceptable behavior... and it assigns individual and institutional responsibility for school safety" (p. 89). Welsh's (2000) definition of school climate was somewhat convoluted because he combined traits (e.g., beliefs, values and norms), which have historically been reserved for the definition of organizational/school culture (Cooke & Rousseau, 1988; Denison, 1996; Glisson, 2000), within his definition of organizational/school climate, for example, "the general 'we' feeling of the school...the feel of the school by those who work there or attend class there" (p. 92). Moreover, Welsh and colleagues (1999) defined school climate as something that could be influenced by a variety of community-level elements such as crime and poverty. Subsequently, Welsh and colleagues (2000) described the "perceptions of school disorder are important to the degree that students behave in ways consistent with their perceptions. As student fear increases, confidence in

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school administrators and/or informal social controls against violence weaken" (p. 244).

In a review of the literature concerning these concepts much has been written on the implication of schools' psychosocial environment on student behavior and student learning. Often this discussion centers upon relationship-building and building "community" in schools. An entire issue of *Educational Leadership* (Vol. 56, 1, September 1998) was devoted to the topic of realizing a positive school climate. Peterson and Skiba (2000) stated that schools need to develop caring relationships not only between educator-student but also between student-student, educator-educator, and educator-parent. Stolp (1995) contended that "students work harder, attend school more often, and have stronger academic skills in schools with strong communities. And student violence decreases in communal organizations" (p. 14). Furthermore, Stolp (1995) added that "teachers work harder and enjoy their work more in an environment that puts social bonds above individual success...school community positively affects school culture" (p. 14).

As the issue of school violence becomes one of paramount importance in the everyday lives of teachers, students and parents, so does the issue of building positive psychosocial school environments. Many researchers have supported the philosophy that a school's environment or more specifically, the psychosocial school environment has a direct effect on students' achievement (Gottfredson, 1986, 2001; Gottfredson & Gottfredson, 1985; Hoy & Sabo, 1998; Hoy et al., 1991). Additionally, researchers have connected a school's overall effectiveness with its climate and culture (Deal & Peterson, 1998; Hoy, 1990; Hoy & Sabo, 1998; Hoy et al., 1991). Erickson (1987) suggested that

exploring the concept of school culture can be "helpful as one tries to gain new understanding about the nature of daily life and instructions in schools" (p. 13). Chance, Cummins and Wood (1996) recommended that as schools work toward building a positive environment for their faculty, students and staff, they must address a change in the norms and values of the school in order to promote a positive, cooperative culture. Additionally, they reported that it is important for schools to view school climate as a component of school culture.

Reichers and Schneider (1990) found that the elements of both climate and culture attempt to distinguish the environment that affects the behavior of people within the organization and that climate is actually a manifestation of culture. In each individual school there is a culture that is owned by that school that embodies its values, norms and beliefs. Furthermore, in each individual school there are distinct, yet overlapping, climates that exist for the students, the faculty and the staff that play a critical role in the everyday performance and attitudes of these individuals. With that comes the issue of how these climates fit collectively so that these individuals can work together as a team to build a strong positive culture in their school environment (Reichers & Schneider, 1990; see also Davila & Willower, 1996; Glisson, 2000).

Existing research on school violence and psychosocial environment of schools.

Until recently, little methical attention has been concentrated on how safety and disorder within a school's setting is affected by its psychosocial environment (Welsh et al., 1996; Welsh et al, 1999; Welsh, 2000; Welsh et al., 2000). Previously, the only extensive study was the aforementioned, National Institute of Education's (NIE) *Violent Schools -*

Safe Schools: The Safe School Study Report to Congress of 1978, the benchmark research

study linking school disorder and violence to school culture and climate (Gottfredson &

Gottfredson, 1985; Welsh et al., 1996; Welsh et al, 1999; Welsh, 2000; Welsh et al.,

2000). This study used questionnaires to collect data from students, teachers and

principals from 642 secondary public schools across the United States. In addition,

community data for each school in the study was supplied from the 1970 Census (NIE,

1978). As previously reported, at the time of its release this study was thought to be the

optimum source available for researchers and policymakers in the area of school disorder

and violence (Gottfredson & Gottfredson, 1985; Welsh et al., 1999). This NIE (1978)

report found that decreasing the size of schools and making them more personal,

decreasing students' sense of powerlessness and alienation, making school discipline more

systematic while decreasing arbitrariness of rule enforcing, improving school reward

structures and increasing the relevance of schooling for career options, as well as

increasing the involvement of students, teachers, parents and community members in

school improvement programs were all policies that reduced school disorder and student

misbehavior.

Notwithstanding, many researchers were concerned over several limitations in this

early study (Gottfredson & Gottfredson, 1985; Welsh et al., 1999; Welsh et al., 2000)

which included: omission of tests of statistical significance, little information pertaining to

the reliability and validity of the measures used and the measures of misconduct were

gathered from self-reported incident rates of the school principals which varied widely

across schools and with many schools not reporting any incidents at all (Welsh et al.,

1999). For the schools with omitted data for this variable the researchers relied on self-reported teacher and student victimization incidents for measures of disorder, thus causing inconsistencies in the data collection (Welsh, et al., 1999).

As previously mentioned in the discussion of school violence research, lack of documenting incidents of misconduct and low-level violence is common in schools as principals and administrators have a tendency to under-report in order to make their school "look safe" to parents, officials and school board members (Astor et al., 1999; Welsh, 2000). Moreover, problems with the self-reporting of these incidents in each school is the variation in definitions of what constitutes an act of misconduct from one school to the next and what level of severity of the act is considered serious enough to report it to the principal (Astor et al., 1999; Welsh, 2000).

Gottfredson and Gottfredson (1985) re-analyzed the data from the NIE study because of these concerns over the limitations of the findings of the original report. These researchers also found that "most of the analysis were cross-tabulations of personal or school characteristics with victimization status" and "such analyses do not fully explain the multivariate nature of school violence problems" (p. 9). Other limitations to the original NIE study were that it did not address the multiple levels of analysis (e.g., individual, school) necessary to comprehend the dynamics of school disruption and violence. Additionally, by using individual levels of analyses only it did not fully address differences across the schools in the sample (Gottfredson & Gottfredson, 1985).

Using the teacher and student victimization data from this Safe School Study, Gottfredson and Gottfredson (1985) examined the following variables as they were related

to school disorder and violence: adult attitudes, styles and strategies for coping with delinquency, school governance policies such as rules, sanctioning practices, clarity and enforcement of rules, control over decision making, parental involvement in the school and student involvement. Additionally, they investigated the variable of social climate as defined by academic competition, academic orientation, sub-culture of delinquent opportunity, attachment, commitment, internal control and racial attitudes.

After re-analyzing the NIE data, Gottfredson and Gottfredson (1985) found that schools with the highest levels of disorder and violence were the schools whose participants reported the following shared characteristics: teachers and administrators did not know the rules or disagreed on responses to student misconduct (possibly because the rules were unclear, unfair or inconsistently enforced), used ambiguous responses to student misconduct (e.g., teacher lowered grade for misbehavior), and ignored misconduct. Additionally, students did not believe in the legitimacy of the rules. Gottfredson and Gottfredson (1985) also reported large school size, inadequate resources for teaching, poor teacher-administration collaboration, and punitive attitudes towards students on the part of teachers to also be high in the schools reporting the worst discipline problems.

In their analyses, Gottfredson and Gottfredson (1985) explored school disorder and disruption in the context of the school's psychosocial environment, its culture and climate (e.g., principal and teacher attitudes for coping with delinquency, clarity and enforcement of rules, students' beliefs in the rules). Gottfredson (1984) developed the Effective School Battery (ESB), a 118-item instrument to measure the psychosocial

school climate (e.g., staff morale, fairness and clarity of rules, student's attachment to the school) and its outcomes (Welsh et al., 1999). The ESB has both a student and a teacher version and both versions have two sets of scales. One set of scales encompasses the psychosocial climate measures while the second set of scales encompasses student and/or teacher characteristics (e.g., descriptors of how socially integrated the average student is; how much job satisfaction the average teacher reports) (Welsh et al., 1996; Welsh et al., 1999). Welsh and associates (1999) reported that "reliabilities and validities of ESB scales have been well established across diverse subgroups (e.g, age, race) and settings (e.g., urban, rural)" (p. 85).

Welsh and colleagues (1996) utilized both the teacher and student versions of the ESB in their study of the 42 middle schools in the Philadelphia School District during the 1993-1994 school year. The purpose of this study was to examine school psychosocial environment or climate and its effects on school violence and victimization while exploring the input of community factors from both the community in which the school resides (local community) and also the community where the students reside (imported community). These researchers combined data from the 1990 Census, student records, the results of the student and teacher ESB and a student victimization survey from 11 of the 42 middle schools in order to examine the effects of school environment on student victimization (Welsh et al., 1996). Welsh and colleagues (1996) examined these data using HLM in order to address the issues of nested data of the students and teachers nested inside the schools and the schools nested inside the communities. A summary of findings from the original report and subsequent research reveals that, despite assumptions based on the

theories that high levels of local and imported community crime contribute significantly to school violence, neither made a significant contribution in the final analysis of these data. Instead, individual student characteristics and measures of school psychosocial climate (e.g. students' academic efforts, belief in rules, positive peer relationships) did have significant relationships with victimization of students and school disorder (Welsh et al., 1996, Welsh et al., 1999, Welsh, 2000). In other words, these findings suggest that schools may not be pre-disposed to high or low rates of violent activities based solely on community factors and student demographics but that more attention should be paid to developing violence prevention programs which include strategies that address the school's psychosocial environment (Welsh et al., 1996, Welsh et al., 1999, Welsh, 2000).

Summary

To date, research studies which examine the existing knowledge base of the interactions between the effects of the psychosocial environment of schools with the incidents and frequency of bullying behaviors in school in the United States are rare (Dupper & Meyer-Adams, 2002; Ma, 2001). Furthermore, the few studies that have examined school environment issues in conjunction with bullying have similar limitations in that the accepted mode of analysis in many of these studies has been a general linear analysis (e.g., regression, ANOVA, ANCOVA).

In order to better understand the effects that bullying behaviors have on a school's psychosocial environment and resulting behaviors, there is a need to identify the factors which may assist school administrators to improve the school environment and thus prevent some of the resulting aggressive and avoidance behaviors. From the literature

review, victimization by bullies, contributing to bullying behaviors and student's perception of safety in the school were identified as important constructs which should be investigated in order to better understand the consequences of these variables on the psychosocial environment of a school. Additionally, using more sophisticated statistical methods, such as covariant structure analysis, testing constructs rather than just measured variables, may shed more light on the multifarious relationships among the students' behaviors and the environment of the school.

CHAPTER III: Methodology

Sample Description

Location of Data Collection

For this study, the participant population was drawn from the School Culture, Climate and Violence: Safety in Middle Schools of the Philadelphia Public School System, 1990-1994, study (for complete overview see Welsh et al., 1996). The Welsh and colleagues' study used census data from the 1990 census as well as surveys from students and school personnel in the Philadelphia School District during the academic year of 1993-94. At that time, this school district was the fifth largest public school system in the United States (Welsh et al., 1996). The make-up of the entire district included 255 schools (31 high schools, 42 middle schools, 171 elementary schools, and 15 special facilities) spread throughout the city of Philadelphia. During this academic year, the district served 192,000 students and employed a staff of nearly 30,000 (Welsh et al., 1996). Of the 30,000 employees, 13,217 were classroom teachers. The school district operated on an annual budget of more than $1.3 billion. The ethnic composite of the student body for the entire school district for the 1993-94 academic year was 63% African American, 4% Asian, 10% Latino and 23% Caucasian (Welsh et al., 1996).

Welsh and colleagues (1996) chose to focus on middle schools within the Philadelphia school district. Middle schools in this district typically enroll grades 6-8 usually encompassing ages 11-14. The authors (Welsh et al., 1999) cite Bastian and Taylor (1991) stating that children ages 12-15, the youngest age group Bastian and Taylor

surveyed, were at the highest risk for being victims of crime, as a justification for limiting

their study to students enrolled in middle schools. Welsh and colleagues selected 11 of the

possible 42 middle schools to collect more in-depth data. These 11 facilities were chosen

based on a macro-level analysis of all data collected in their initial analyses. Four primary

criteria for selection were used to select these 11 schools. The selection criteria were

"level of disruption" the schools reported, "level of poverty" the schools exhibited,

"regional representation" and the principals' willingness to participate in the study.

Description of Selection Criteria

The first criterion, level of disruption, was put in place to ensure a survey of

schools that included the broadest range of "level of disruption" scores. Level of

disruption was measured by school-reported incidents of disruption. Scores were then

summed and divided into 3 equal categories, low, medium, and high (Welsh et al., 1996).

For the second criterion, a similar effort was made to select schools that

represented a broad range of income levels among the families of students. Income data

were based on median family income, aggregated to the schools. Total income data were

then summed and divided into three categories, low, medium, high (Welsh et al., 1996).

In order to satisfy the third criterion, regional or geographical representation,

Welsh and colleagues (1996) attempted to select schools from each of the seven regions

that the Philadelphia school district was divided into. These 11 schools were selected

because they were spread across six of the possible seven regions in the district and they

did not violate any of the other criteria.

The fourth criterion, principals willingness to participate, was met by having the

principal in each of the 11 middle schools agree to participate in the study after a personal interview with one of the three principal investigators (Welsh et al., 1996).

Human Subject Review

This sample includes a total of 7,583 usable student surveys (65.44% response rate). Demographic information for the total sample used in this study (n = 5,351 after removing those cases with missing data; see Missing Data section below) is presented in Table 3.1. The data set selected for this study has been cleared of all personal identifiers such as names or social security numbers, a Form A, requesting exemption from review by the Institutional Review Board (IRB), at The University of Tennessee has been approved and is on file with the IRB (see Appendix).

Design and Analysis

Design of Study

The design of this study is retrospective in that data were not collected to answer the specific questions posed here. However, given the wealth of information contained in this data set, it is ideal for answering the proposed hypotheses. Additionally, as the data are non-experimental in nature, specific causality among variables cannot be established. Statistical methods were used, however, that provided the ability to show support for certain associations among the variables (see analyses section below). Finally, third variable problems could limit the ability to find support for these associations. This is, however, a limitation of any study using non-experimental data.

In order to address the specific hypotheses of this study, that contributing acts of bullying and victimization of bullying behaviors should negatively predict psychosocial

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Table 3.1 Demographic Characteristics for the Entire Sample.

		N (%)
Gender		
Male		2,629 (49.1)
Female		2,722 (50.9)
	Total	5,351 (100)
Age		
11 years or younger		1,746 (32.6)
12 years		1,760 (32.9)
13 years		1,416 (26.5)
14 years		381 (7.1)
15 years		42 (.8)
16 years		3 (.1)
17 years or older		3 (.1)
	Total	5,351 (100)
Ethnicity		
Am. Indian/Native Alaskan		98 (1.8)
Asian-Am./Pacific Islander		295 (5.5)
Spanish-American		860 (16.1)
Black		2,432 (45.4)
White		1,290 (24.1)
Other		376 (7.0)
	Total	5,351 (100)
Grade in School		
6th		1,661 (31.0)
7th		1,865 (34.9)
8th		1,825 (34.1)
	Total	5,351 (100)

environment of the school and that perception of safety should positively predict

psychosocial environment of the school and that in turn, the psychosocial environment of

the school should negatively predict carrying a weapon for protection, avoiding classes,

being absent from school and gang involvement in the school, measured variables were

used as indicators of certain latent constructs. Additionally, certain measured variables

were entered as specific outcome variables. The majority of the measured variables used

in this study were taken from the Student Victimization Survey (SVS). This questionnaire

was designed by Welsh and colleagues (1996) as part of their original study (see

participant section for description). The SVS questionnaire was a combination of items

taken from the Student Supplement to the National Crime Victimization Survey (U.S.

Department of Justice, 1990) and the National Institute of Education's Safe School Study

(1978) Supplement to the National Crime Victimization Survey (U.S. Department of

Justice, 1990) and the National Institute of Education's Safe School Study (1978).

Types of Analyses

Structural equation modeling.

In the present study all data were analyzed using structural equation modeling

(SEM) and the EQS 6.0 statistical software package (Bentler, 2002). The method of

analysis, SEM, is a statistical method that allows for the testing of predictive relationships

among hypothetical constructs and measured variables (for full description of SEM

underlying theory and procedures see Byrne, 2001). SEM analyzes a series of multiple

regression equations simultaneously within one theoretical model. Additionally, SEM

typically uses the Maximum Likelihood (ML) Theory. The ML theory operates under the

assumptions that (a) a very large sample size is present, (b) the distribution of the observed variables is multivariate normal, and (c) the observed variables are continuous (Byrne, 2001). It is important to test that these assumptions are not being violated prior to model estimation.

Several unique terms are used with SEM analysis and are described here briefly. **Latent variables** are theoretical constructs or factors that cannot be observed or measured directly (e.g., psychosocial environment of the school). In addition, latent variables are either **Exogenous** or **Endogenous.** Exogenous variables are synonymous with independent variables as they do not receive causal inputs from any other variable in the model. Any changes in these exogenous variables would not be explained by the model. Whereas, endogenous variables are considered "downstream" or dependent variables and, thus, are influenced either directly or indirectly by the exogenous variables in the model. **Manifest variables or observed variables** can be assessed directly and are used to operationalize the latent constructs (e.g., "Were you hit or pushed by another student?") (Byrne, 2001; Ullman, 1996).

SEM is a two-step process. The first step is analyzing the measurement model. The measurement model tests how accurately the manifest or measured variables estimate the underlying theoretical constructs under investigation. Assuming that the fit of the measurement model meets cut-off criteria for a good fitting model the next step would be to test the complete structural model. The goodness-of-fit of the hypothesized model to the model represented in the data is typically indicated by a non-significant χ^2 test statistic. In SEM, the hypothesis being tested is the null hypothesis, or more specifically that the

theoretical model does not significantly differ from the data-driven model. The χ^2 test statistic is sample size dependent, meaning as sample population increases the amount of difference needed between the theoretical model and the data-driven model to show that they are significantly different decreases (see Hu & Bentler, 1999 for review). Because of this bias, it is important to look at other indicators of goodness-of-fit such as the Comparative Fit Index (CFI) and the Root Mean-Square Error of Approximation (RMSEA; For detailed review of goodness-of-fit indices see Hu & Bentler, 1999). The RMSEA is an index that measures the amount of residual between the observed and predicted covariance structure (Hu & Bentler, 1999). Hu and Bentler (1999) stated that a RMSEA of less than .06 is indicative of excellent fit. Additionally, a CFI greater than .90 is considered indicative of adequate fit (Hu & Bentler, 1999).

For the current study the EQS 6.0 (Bentler, 2002) program was used to analyze the data. EQS offers options that other SEM software programs typically do not, including the Robust Maximum Likelihood Solution, which corrects fit indices for data that violate the assumptions of multivariate normality (Ullman, 1996). These modifications include the Robust Comparative Fit Index (RCFI), which has similar cut-off values as the CFI, and the Satorra-Bentler scaled χ^2 statistic (Bentler & Dudgeon, 1996), which, while still sample size dependent, is a better estimation for nonnormal data.

Finally, the EQS 6.0 (Bentler, 2002) software package allows the estimation of the Lagrange Multiplier (LM) test which suggests model modification and displays improvements in fit based on suggested modifications (Chou & Bentler, 1990). However it is important to note that these suggested modifications are not theoretically based, so any modifications made

from the results of the LM tests should be inspected to ensure that they are theoretically plausible.

The second step, after ensuring at least adequate fit for the measurement model, is to examine the structural model. In order to test the structural model, predictive paths are analyzed among the endogenous (dependent variables) and exogenous (independent variables) variables and the overall fit of the model is evaluated. Model modifications can be performed by adding a minimal number of supplementary correlated error residuals or other corrections to the measurement model or a minimal number of paths within the structural model that were not hypothesized in the original specified model if theoretically plausible and statistically probable to improve overall model fit (Bryne 2001; Ullman, 1996). If adequate fit can not be established then the model should be abandoned, however, if at least adequate model fit is achieved then interpretations of the predictive paths among the latent constructs can be made and support can be provided for the a priori specified model.

Categorical Data in SEM

As described above, one of the assumptions of the ML solution is that the variables are continuous and normally distributed. More specifically, when using SEM the assumption is that the relationships among the latent constructs are linear and that the underlying measurement and latent variables are continuous (Poon & Lee, 1987; Ullman, 1996). If this assumption is violated, then the validity of the ML solution can be questioned. The primary distinction being made here is between variables that are continuous and variables that are forced to be discrete but have an underlying continuous distribution (Ullman, 1996). When forcing variables to have discrete observations, limits are placed on the possible correlation

values that may be obtained when that variable is correlated with any other variable. This may result in an underestimation of the degree of association between the two variables. There are a few popular methods for addressing such violations.

One method for addressing or correcting violations of this assumption is to calculate the appropriate correlation value given the nature of the variable. The five primary correlations of interest when using mixed data, that is data that contain both continuous and discrete, either dichtomous or polytomous, variables are: tetrachoric, point biserial, polychoric, polyserial, and product moment correlations (Shi & Lee, 2000). The tetrachoric correlation is calculated between two dichotomous variables with assumed underlying normal distributions. The point biserial correlation is calculated between one dichotomous and one continuous variable. The polychoric correlation is calculated between two polytomous variables and assumes an underlying normal distribution for each variable. The polyserial correlation is calculated between one polytomous variable and one continuous variable. The product moment correlation is calculated between two continuous variables and is also used as a rough estimation for discrete variables when an underlying normal distribution can not be assumed. All of the correlation values described above are interpreted in the same way as a product moment correlation: as the value approaches 1.0 or -1.0 (unity) the association between the two values increases, either positively or negatively, values near zero indicate little to no association between the two variables (Shin & Lee, 2000).

When using mixed data in SEM, it is not possible to rely on the results of the ML solution (Poon, Lee, & Bentler, 1990). As noted above, one of the advantages of using EQS 6.0 is the robust solution. The robust solution does not have the same assumptions of

multivariate normality as the ML solution, and corrects for non-normally distributed data.

When using any of the correlations described in the previous paragraph, it is necessary to

interpret the robust solution (Poon, Lee & Bentler, 1990).

<div align="center">Hypotheses and Model Specification</div>

Hypotheses

   Hypothesis one.

   The first hypothesis that was tested was that higher prevalence of victimization by

bullying behaviors should negatively predict the psychosocial environment of the school. The

five measured variables taken from the SVS scale as indicators of the latent variable,

Victimization by Bullying Behaviors were: 1) "Did anyone curse at you at school?", 2)"Were

you hit or pushed by another student?", 3) "Did anyone take anything directly from you by

force, weapons, or threats at school?", 4) "Did anyone take something from your locker or

desk?", and 5) "Did anyone in school threaten you?". All of these measured variables were

answered with a three point Likert-type scale (1 = "often", 2 = "sometimes", and 3 = "never").

Additionally, these five measured variables were introduced in the scale by the following

statement: "The following questions are about crimes that may have happened to you at school

during the current (1993-94) school year. By 'at school' we mean in the school building, on

the school grounds, or on a school bus. Please circle the response that best represents how

often this has happened to you."

   Hypothesis two.

   In order to address the second hypothesis, the individual student's perception of safety

at school should positively predict the psychosocial environment of the school, students'

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perception of safety was measured. The measured variables loading onto the latent construct Students' Perception of Safety were also taken from the SVS. The four measured variables taken from this scale as indicators of this latent variable were: 1) "Are there street gangs at your school?" (measured by "yes," "no" and "don't know", 2) "In which of the following ways does your school try to prevent students from having weapons in school?" (measured by a 1 for each endorsed item: "locker searches," "security guards," "metal detectors," "school bag searches," and "school takes no preventive action" and collapsed into a single categorical manifest variable, 0 indicated that no preventative measures were reported). 3) "Is it safe to store money or valuables in your locker at school?" 4) "Do you feel safe carrying money at school?" Measured as a dichotomous (yes or no) variable.

Hypothesis three.

In order to address the third hypothesis that contributing to bullying behaviors should negatively predict the psychosocial environment of the school, Contributing to Bullying Behaviors, as a latent construct, was measured. The measured variables loading onto the latent construct Contributing to Bullying Behaviors were taken from the SVS. The five measured variables taken from this scale as indicators of this latent construct were: 1) "During the current (1993-94) school year did you ever hit another student," 2)"During the current (1993-94) school year did you ever hit a teacher," 3) "During the current (1993-94) school year did you ever threaten a student," 4)"During the current (1993-94) school year did you ever threaten a teacher," and 5) "During the current (1993-94) school year did you ever steal something from someone?" All of these manifest variables were measured with yes and no forced choice responses.

Hypothesis four.

In order to address the fourth hypothesis that the psychosocial environment of the school should negatively predict students' aggressive responses to bullying behaviors the latent construct Psychosocial Environment of the School was measured with manifest variables taken from The Effective School Battery Student Survey (ESBSS) (Gottfredson, 1984). Three of the 11 measured variables were: "Teachers here care about the students.", "I feel like I belong in this school." and "This school makes me like to learn." These variables were measured on a forced choice format with "agree" and "disagree" as the choices. Measured variable number four, "How do you feel about this school?" was measured on a forced choice format with "don't like" and "like" as the choices.

The fifth measured variable of this latent construct, "I do not have much to lose by causing trouble in school." was measured on a forced choice format with "true" and "false" as the choices. The remaining manifest variables defining the construct, Psychosocial Environment of the School , "Students are treated like children here.", "Teachers treat students with respect.", "Teachers do things that make students feel 'put down'." "The school rules are fair.", "The punishment for breaking school rules is the same no matter who you are.", were all measured on a three-point Likert-type scale (1 = "almost always," 2 = "sometimes" and 3 = "almost never").

Additionally, in order to measure students' aggressive behavior the latent construct Carrying a Weapon for Protection was measured with manifest variables as indicators taken from the SVS. The manifest variables taken from this scale as indicators of this latent construct were: "During the current (1993-94) school year, did you ever carry any of the following

weapons to school because you thought someone might attack or harm you?" The specific

weapons asked about were: "gun, knife, brass knuckles, razor blade, spiked jewelry, and

mace." Participants were asked to indicate a yes or no response for each weapon. This is

defined as Hypothesis Four A. One measured variable taken from the SVS was entered into the

model to investigate gang involvement of the students. This variable was "During the current

(1993-94) school year did you ever belong to a gang." It was measured with a forced choice

response format with the choices being yes and no. This is defined as Hypothesis Four B.

Hypothesis five.

In order to address the fifth hypothesis that the psychosocial environment of the school

should negatively predict students' avoidance responses to bullying behaviors the latent

construct Avoidance Responses to Bullying Behaviors was measured with manifest variables

taken from the SVS. The measured variables taken from this scale as indicators of this latent

variable were: 1) "Did you ever stay home because you thought someone might attack or harm

you at school?" 2) "Did you ever cut class because you thought someone might attack or harm

you at school?" 3) "Would you be afraid to report a student to the principal for attacking you?"

4) "During the current (1993-94) school year, did you ever avoid the locker room because you

thought someone might attack or harm you there?" 5) "During the current (1993-94) school

year, did you ever avoid the gymnasium because you thought someone might attack or harm

you there?" and 6) "During the current (1993-94) school year, did you ever avoid the parking

lot at school because you thought someone might attack or harm you there?" All of the above

manifest variables were measured with the dichotomous forced choice responses of yes and no

with the exception of the variable, "Would you be afraid to report a student to the principal for attacking you?" which was measured with yes, no and don't know as the possible responses.

Model Specification

The theoretical, or a priori specified, model for this study is presented in Figure 3.1. The specific predictive paths that were examined were those from the exogenous variables, exposure to Victimization by Bullying Behaviors, Students' Perceptions of Safety at School, and Contributing to Bullying Behaviors, to the endogenous variable, Psychosocial Environment of the School (hypotheses 1-3 respectively). Both Victimization by Bullying Behaviors and Contributing to Bullying Behaviors are theorized as negative predictors, whereas Students' Perceptions of Safety at School is theorized as a positive predictor of Psychosocial Environment of the School. Furthermore, predictive paths from Psychosocial Environment of the School to the endogenous variables, Carrying a Weapon for Protection, Belonging to a Gang, and Avoidance Behaviors to Bullying were examined (hypotheses 4a, 4b, and 5 respectively). Psychosocial Environment of the School should negatively predict all three of these endogenous variables. Finally, unanalyzed relationships allowing the exogenous variables to correlate were estimated.

Model Modification

Correlated error residuals or other modifications to the measurement model and additional paths in the structural model were to be added based on suggestions from the LM test in order to improve overall model fit. This step would only be necessary if the specified model significantly differed from the data driven model. Additionally, correlated error residuals
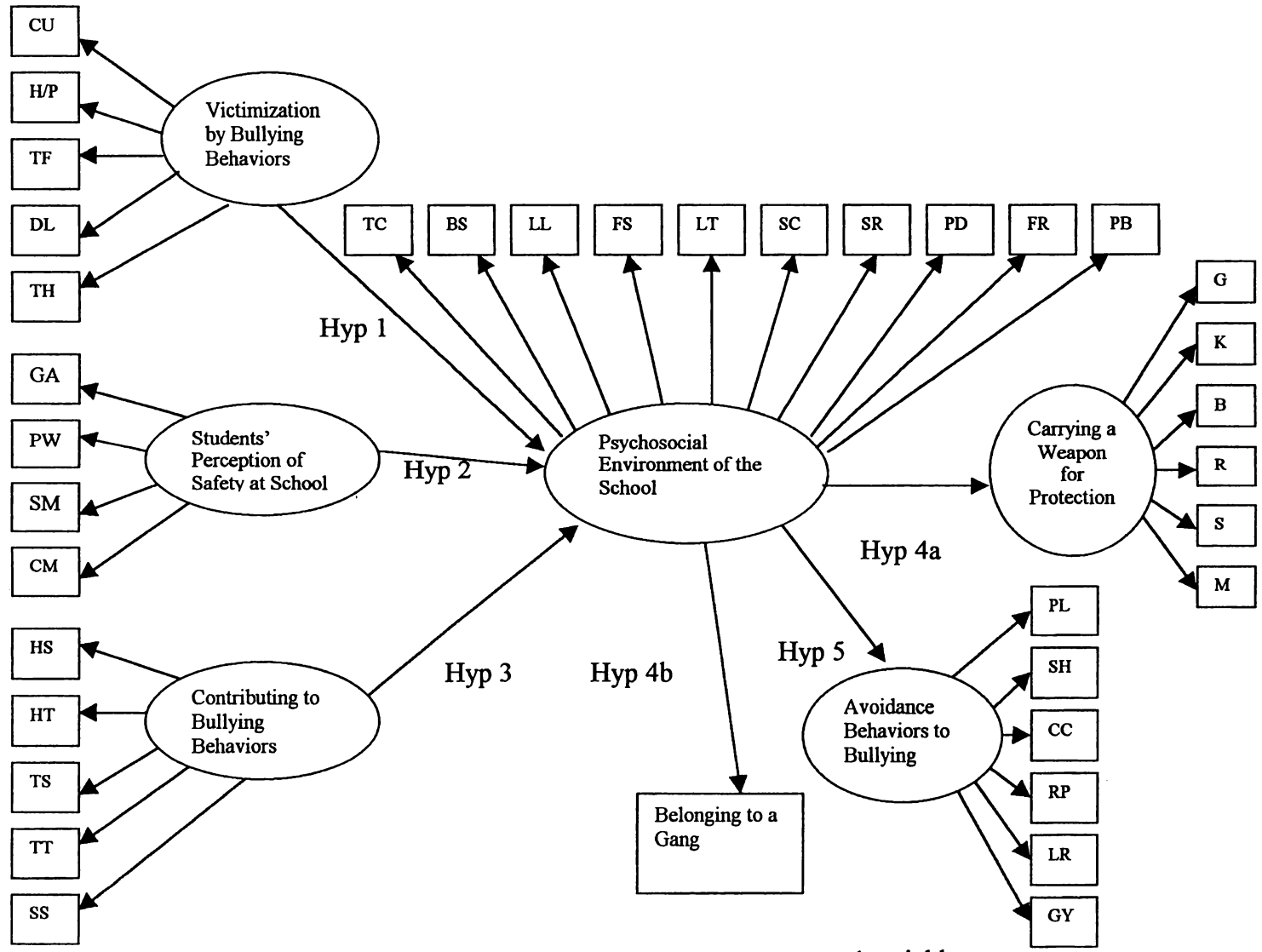
Figure 3.1. Hypothesized Model. Squares represent measured variables. Circles represent latent constructs.

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Legend of Variable Abbreviations

Victimization by Bullying Behaviors

        CU =" Did anyone curse at you at school?"

        H/P = "Were you hit or pushed by another student?"

        TF = "Did anyone take anything from you by force, weapons, or threats at school?

        DL = "Did anyone take something from your locker or desk?"

        TH = "Did anyone in school threaten you?"

Students' Perception of Safety at School

        GA = "Are there street gangs at your school?"

        PW = "In which of the following ways does your school try to prevent students from having weapons in school?"

        SM = "Is it safe to store money or valuables in your locker at school?"

        CM = "Do you feel safe carrying money at school?"

Contributing to Bullying Behaviors

        HS = "During the current (1993-94) school year did you ever hit another student?"

        HT = "During the current (1993-94) school year did you ever hit a teacher?"

        TS = "During the current (1993-94) school year did you ever threaten a student?"

        TT = "During the current (1993-94) school year did you ever threaten a teacher?"

        SS = "During the current (1993-94) school year did you ever steal something from someone?"

Psychosocial Environment of the School

        TC = "Teachers here care about students"

        BS = "I feel like I belong in this school"

        LL = "This school makes me like to learn"

        FS = "How do you feel about this school?"

        LT = "I do not have much to lose by causing trouble in school"

        SC = "Students are treated like children here"

        SR = "Teachers treat children with respect"

        PD = "Teachers do things that make students feel 'put down'"

        FR = "The school rules are fair"

        PB = "The punishment for breaking school rules is the same no matter who you are"

Carrying a weapon for Protection

        G = Gun

        K = Knife

        B = Brass Knuckles

        R = Razor

        S = Spiked Jewelry

        M = Mace

Avoidance Behaviors to Bullying

        SH = "Did you ever stay home because you thought someone might attack or harm you at school?"

        CC = "Did you ever cut class because you thought someone might attack or harm you at school?"

        RP = "Would you be afraid to report a student to the principal for attacking you?"

        LR = "During the current school year (1993-94) school year, did you ever avoid the locker room because you thought someone might attack or harm you there?"

        GY = "During the current school year (1993-94) school year, did you ever avoid the gymnasium because you thought someone might attack or harm you there?"

        PL = "During the current school year (1993-94) school year, did you ever avoid the parking lot because you thought someone might attack or harm you there?"

Figure 3.1 Continued.

and paths were only added to the model as long as they were considered logical and theoretically plausible. Plausibility was determined on face by examining the content of specific items that were correlated or the relationships that were created by the added paths. Only a minimal number of modifications were to be made. If adequate model fit was not achieved after modification then the original hypothesized model was to be abandoned.

Cross-validation of the Model

Following model specification, the sample data was randomly divided into two equal halves using the random cases selection function in SPSS 10.0 (SPPS, 1999). One of the two random halves was used to analyze both the measurement model and the a priori hypothesized structural model. After model modifications were made to improve overall model fit and better determine the relationships among the constructs and measured variables, the second data set was used to analyze the final structural model from Group 1. This final structural model from Group 1 was treated as the a priori specified model to be tested using the Group 2 data. This procedure, cross-validation, as described by Cudek and Browne (1983), allows for confirmation of the final structural model thus allowing for more stringent and accurate interpretation of the relationships among the latent constructs and measured variables of interest in this study.

Missing Data

While there are many popular strategies for handling missing data, for this project missing data was handled by using listwise deletion. Previous research indicates that in most cases there are little to no significant differences in variable means, standard deviations, or correlations between listwise deletion and many of the popular data replacement strategies

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(Conger, Wallace, Sun, Simons, McLoyd, & Brody, 2002). In other words, for any given participant, if a significant data point (i.e., relevant demographic variable, measured variable used in the model) was missing all of the data from that participant were deleted from the sample. A number of factors lead to this decision, but the primary deciding factor was the overall size of the data set. Having an initial sample of 7,583 eliminates worries that listwise deletion would inhibit power to determine significant differences between the variables used in this study. However, missing data were analyzed using SPSS 10.0 to ensure that there were not any significant or systematic patterns within the missing data that would affect the validity of this study.

CHAPTER IV: Results

Preliminary Analyses

Missing Data

Prior to any analyses, all cases that had any missing values for the relevant variables were removed. This resulted in a final sample size of 5,153 participants from the original 7,583 viable cases. As previously mentioned a complete statistical analysis of missing data patterns using SPSS 10.0 was conducted. This analyses did not reveal any significant patterns in missing data. For review of the overall sample descriptive statistics see Table 3.1.

Splitting of the Sample for Cross-Validation

Following removal of cases with missing data, the next step was to split the entire data set into two separate and distinct data sets. Using the random case selection feature in SPSS 10.0 two data sets were created (Group 1, n = 2,675, Group 2, n = 2,676). Then, the descriptive statistics were calculated for each sample and compared to determine if the samples were equal on gender distribution, ethnicity, age, and grade in school (see Table 4.1). Frequencies were computed for each sample and compared using the χ^2 distribution. None of the analyses revealed any significant differences between the two samples. This leads to the assumption that the data sets are equivalent or identical on all demographic and descriptive variables. From here on Group 1 denotes the sample that was used to test the hypothesized model and Group 2 denotes the sample used for cross-validation of the final structural model resulting from modifications to the hypothesized model tested with the data from Group 1.

Table 4.1. Demographic Characteristics Divided by Groups.

		Group 1	Group 2
		n(%)	n(%)
Gender			
Male		1,291 (48.3)	1,338 (50.0)
Female		<u>1,384 (51.7)</u>	<u>1,338(50.0)</u>
	Total	2,675 (100)	2,676 (100)
Age			
11 years or younger		869 (32.5)	877 (32.8)
12 years		887 (33.2)	873 (32.6)
13 years		706 (26.4)	710 (26.5)
14 years		188 (7.0)	193 (7.2)
15 years		23 (.9)	19 (.7)
16 years		1 (.0)	1 (.0)
17 years or older		<u>1 (.0)</u>	<u>1 (.0)</u>
	Total	2,675 (100)	2,676 (100)
Ethnicity			
Am. Indian/Native Alaskan		47 (1.8)	51 (1.9)
Asian-Am./Pacific Islander		144 (5.4)	151 (5.6)
Spanish-American		440 (16.4)	420 (15.7)
Black		1,228 (45.9)	1,204 (45.0)
White		636 (23.8)	654 (24.4)
Other		<u>180 (6.7)</u>	<u>196 (7.3)</u>
	Total	2,675 (100)	2,676 (100)
Grade in School			
6th		835 (31.2)	826 (30.9)
7th		936 (35.0)	929 (34.7)
8th		<u>904 (33.8)</u>	<u>921 (34.4)</u>
	Total	2,675 (100)	2,676 (100)

*Demographic statistics are not significantly different between groups.

Group 1

Group 1 Measurement Analysis

Table 4.2 shows the correlations among the measured variables that were

analyzed. The measured variables that loaded onto the Victimization by Bullying

Behaviors and the measured variables that loaded onto the Psychosocial Environment of

the School latent constructs were treated as categorical variables with assumed underlying

normal distributions. This means that tetrachoric, point biserial, polychoric, and polyserial

correlations were calculated as necessary. These variables are noted with a subscript in

the table. All other estimated correlations were product moment correlations. Since

treatment of certain variables as categorical results in special correlation values, the

correlation matrix was entered to be analyzed rather than the covariance matrix (as is

typically done in SEM), and thus the correlation matrix is presented here.

Table 4.3 presents the factor loadings of the measured variables onto the

hypothesized latent factors and the means and standard deviations of the measured

variables for Group 1. All measured variables that were retained in the final measurement

model loaded significantly ($p < 0.001$) on their hypothesized latent factors. After minimal

model modifications (described below), fit indices were adequate to excellent: Satorra-

Bentler χ^2 (387, n= 2,675) = 1,834.67, RCFI = .91 (adequate), RMSEA = .04 (excellent).

All factor loadings and correlations that were not significant were dropped from the

model. This resulted in significant modifications to the hypothesized model. The entire

Students' Perception of Safety latent variable was dropped from the model as the factor

appeared to be multidimensional and a single factor structure was not able to be

Table 4.2. Correlation Matrix for Group 1.

		I.	II.	III.	IV.	V,	VI.	VII.	VIII.	IX.	X.	XI.
I.	Fair rules[A]	1.00										
II.	Equity[A]	.338	1.00									
III.	Treated with respect[A]	.454	.318	1.00								
IV.	Putdown by teachers[A]	.284	.218	.479	1.00							
V.	Feel about school[A]	.339	.250	.417	.313	1.00						
VI.	Teachers care about students[A]	.431	.327	.599	.437	.467	1.00					
VII.	Belong in this school[A]	.359	.203	.398	.286	.703	.414	1.00				
VIII.	School makes me like to learn[A]	.434	.248	.474	.324	.620	.533	.618	1.00			
IX.	Hit or push[A]	-.067	-.066	-.083	-.133	-.194	-.083	-.125	-.078	1.00		
X.	Things taken from locker[A]	-.112	-.135	-.119	-.149	-.160	-.148	-.168	-.093	.347	1.00	
XI.	Things taken by force[A]	-.098	-.141	-.127	-.179	-.219	-.225	-.134	-.142	.468	.437	1.00
XII.	Threatened in school[A]	-.057	-.135	-.082	-.157	-.177	-.070	-.160	-.073	.505	.357	.542
XIII.	Stay home	-.064	-.104	-.106	-.065	-.154	-.111	-.150	-.094	.208	.135	.281
XIV.	Cut class	-.050	-.096	-.114	-.096	-.122	-.106	-.074	-.055	.121	.113	.200
XV.	Carry a gun	-.086	-.087	-.113	-.101	-.138	-.114	-.099	-.084	.031	.087	.150
XVI.	Carry a knife	-.113	-.122	-.163	-.116	-.145	-.132	-.120	-.119	.096	.120	.159
XVII.	Carry brass knuckles	-.104	-.136	-.121	-.112	-.144	-.108	-.072	-.070	.103	.076	.163
XVIII.	Carry razor blades	-.097	-.109	-.117	-.116	-.122	-.087	-.080	-.080	.050	.070	.129
XIX.	Carry spiked jewelry	-.066	-.095	-.092	-.076	-.068	-.074	-.048	-.069	.041	.087	.119
XX.	Carry mace	-.095	-.085	-.111	-.133	-.117	-.135	-.092	-.082	.059	.079	.124
XXI.	Avoid locker room	-.044	-.027	-.078	-.060	-.090	-.048	-.078	-.029	.185	.142	.200
XXII.	Avoid gymnasium	-.005	-.050	-.051	-.040	-.070	-.057	-.045	-.003	.108	.130	.198
XXIII.	Avoid parking lot	-.019	-.031	-.066	-.043	-.046	-.038	-.079	-.029	.219	.157	.191
XXIV.	Hit student	-.150	-.102	-.175	-.150	-.153	-.139	-.160	-.152	..223	.148	.109
XXV.	Hit teacher	-.109	-.117	-.109	-.113	-.083	-.116	-.093	-.105	.061	.115	.123
XXVI.	Threaten student	-.162	-.113	-.203	-.174	-.116	-.154	-.106	-.187	.095	.101	.137
XXVII.	Threaten teacher	-.128	-.131	-.168	-.121	-.122	-.148	-.114	-.108	.012	.085	.079
XXVIII.	Steal something	-.147	-.121	-.186	-.138	-.114	-.164	-.069	-.156	.100	.074	.155
XXIX.	Cursed at in school[A]	-.167	-.090	-.181	-.122	-.186	-.147	-.167	-.163	.443	.328	.342

[A] denotes measured variables that were treated as categorical variables with underlying distributions.

Table 4.2. Correlation Matrix for Group 1 continued.

XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.	XXIII.	XXIV.	XXV.	XXVI.	XXVII.	XXVIII.	XXIX.
1.00																	
.226	1.00																
.186	.312	1.00															
.180	.120	.194	1.00														
.136	.136	.166	.389	1.00													
.121	.180	.200	.408	.394	1.00												
.102	.124	.182	.407	.506	.370	1.00											
.113	.129	.141	.266	.327	.347	.302	1.00										
.092	.148	.176	.292	.376	.349	.355	.302	1.00									
.208	.227	.189	.170	.089	.154	.138	.108	.106	1.00								
.165	.230	.230	.189	.094	.104	.132	.120	.045	.467	1.00							
.204	.266	.156	.109	.092	.141	.125	.130	.102	.385	.306	1.00						
.121.	.028	.062	.095	.164	.117	.131	.104	.126	.008	.005	.012	1.00					
.113	.064	.154	.273	.191	.248	.179	.160	.158	.145	.185	.108	.090	1.00				
.227	.055	.085	.156	.220	.171	.175	.124	.147	.031	.024	.036	.394	.172	1.00			
.145	.088	.154	.307	.257	.259	.247	.153	.197	.121	.147	.069	.135	.483	.273	1.00		
.086	.068	.123	.222	.195	.227	.148	.153	.124	.089	.100	.073	.193	.222	.273	.205	1.00	
.413	.114	.071	.031	.122	.090	.070	.081	.068	.111	.042	.129	.259	.029	.198	.056	.141	1.00

[A] denotes measured variables that were treated as categorical variables with underlying distributions.

Table 4.3. Means, SDs and Factor Loadings for the Measured Variables in Group 1.

	Mean (S.D.)	Factor Loadings
Victimization by Bullying Behaviors[A]		
Hit or push	2.39 (.64)	.68
Things taken from locker	2.63 (.59)	.54
Things taken by force	2.85 (.43)	.71
Threatened in school	2.62 (.60)	.73
Cursed at in school	1.90 (.75)	.58
Contributing to Bullying Behaviors		
Hit student	1.41 (.49)	.51
Hit teacher	2.0 (.19)	.30
Threaten student	1.71 (.45)	.67
Threaten teacher	1.94 (.23)	.39
Steal something	1.89 (.31)	.44
Psychosocial Environment of School[A]		
Fair rules	1.87 (.73)	.59
Equity	1.62 (.76)	.42
Treated with respect	1.74 (.67)	.73
Putdown by teachers	1.82 (.67)	.55
Feel about school	1.34 (.47)	.66
Teachers care about students	1.28 (.45)	.76
Belong in this school	1.40 (.49)	.60
School makes me like to learn	1.45 (.50)	.71
Much to lose by causing trouble		<.30, p > .05
Treated like children here		<.30, p > .05
Carrying a Weapon for Protection		
Carry a gun	1.96 (.19)	.59
Carry a knife	1.90 (.31)	.69
Carry brass knuckles	1.94 (.23)	.61
Carry razor blades	1.93 (.24)	.67
Carry spiked jewelry	1.92 (.28)	.49
Carry mace	1.92 (.28)	.55
Avoidance Behaviors to Bullying		
Stay home	1.89 (.32)	.42
Cut class	1.93 (.25)	.36
Avoid locker room	1.93(.26)	.68
Avoid gymnasium	1.95 (.22)	.63
Avoid parking lot	1.69 (.32)	.53
Afraid to report to principal		<.30, p >.05

[A] denotes latent variables that were treated as categorical variables with underlying distributions.

*All factor loadings were significant ($p < .001$).

determined. Additionally, two of the measured variables from the Psychosocial Environment of the School latent variable and one of the measured variables from the Avoidance Behaviors to Bullying latent variable were dropped from the model because they did not load significantly onto their respective constructs. These measured variables were "I do not have much to lose by causing trouble in school" and "Students are treated like children here" from the Psychosocial Environment of the School latent variable and "Would you be afraid to report a student to the principal for attacking you?" from the Avoidance Behaviors to Bullying latent variable. The factor loadings were less than .30 and the p values were greater than .05 for these variables on their respective latent constructs.

Based on results of the LM test, three correlated error residuals were added to the model. The three correlated error residuals that were added to the final measurement model were between "I feel like I belong in this school" and "This school makes me like to learn" ($r = .29$. $p < .001$), "I feel like I belong in this school" and "How do feel about this school" ($r = .47, p < .001$), and "During the current school year have you ever threatened a teacher" and "During the current school year have you ever hit a teacher" ($r = .42, p < .001$). Theoretical plausibility was examined prior to adding these correlations and it was determined that the relationships between the unexplained residuals of these pairs was likely due to similarity in the wording of the items or overlap in the constructs tapped by the questions, thus indicating theoretical plausibility for the relationships. These paths are

not indicated in the final structural model as they are not hypothesized and do not add to the overall interpretation of the final model.

Table 4.4 shows the correlations among the latent constructs. The Victimization by Bullying Behaviors and Psychosocial Environment of the School latent constructs are treated as categorical latent variables. This means that tetrachoric, point biserial, polychoric, and polyserial correlations were calculated as necessary. These variables are noted with a subscript in the table. All other estimated correlations were product moment correlations.

Group 1 Structural Analysis

The final model depicting significant predictive paths is shown in Figure 4.1. The model had adequate to excellent fit statistics. The Satorra-Bentler χ^2 (369) = 876.63, RCFI = .93 (adequate), and the RMSEA = 0.02 (excellent). The correlated error residuals added in the measurement model were included in the final structural model as well. These paths are also not included in the final structural model as they are not theoretically important to model interpretation. Only one other modification was needed to achieve these fit statistics. The single measured variable, "During the current school year have you ever belonged to a gang", was dropped because the predictive path failed to achieve significance.

The predictive paths between Victimization by Bullying Behaviors and Psychosocial Environment of the School and Contributing to Bullying Behaviors and Psychosocial Environment of the School were both significant ($p < .001$) and negative. The predictive paths between Psychosocial Environment of the School and

Table 4.4. Correlations among the Latent Constructs for Group 1.

	I	II	III	IV	V
I. Victimization by Bullying Behaviors[A]	1.00	.38	-.30	.09	.06
II. Contributing to Bullying Behaviors		1.00	-.44	.13	.08
III. Psychosocial Environment of School[A]			1.00	-.30	-.19
IV. Carrying a Weapon for Protection				1.00	.06
V. Avoidance Behaviors to Bullying					1.00

[A] denotes latent variables that were treated as categorical variables with underlying distributions.
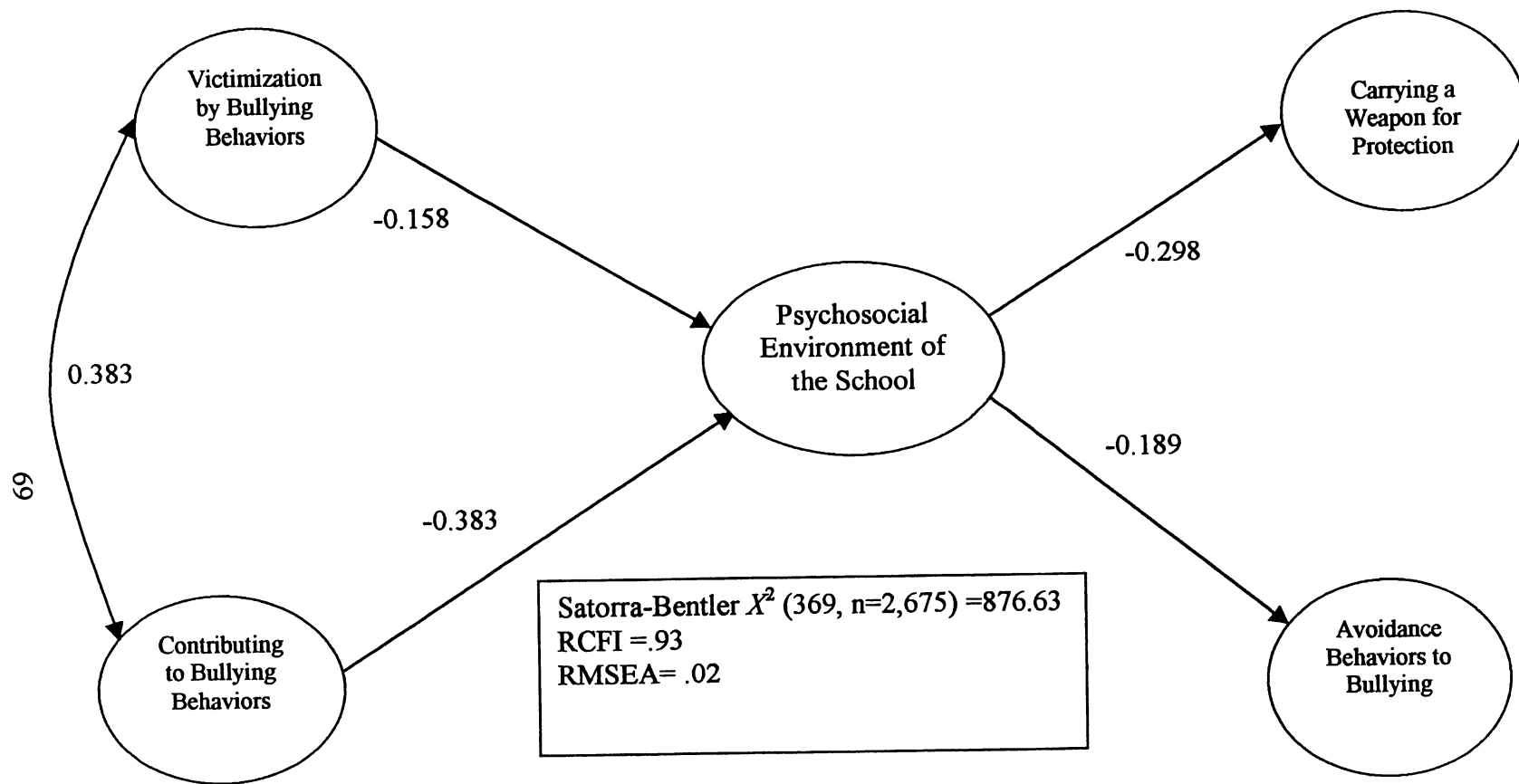
Figure 4.1. Final Structural Model for Group 1. Large circles represent Latent Variables. All paths are significant ($p < .001$).

Carrying a Weapon for Protection and Psychosocial Environment of the School and

Avoidance Behaviors to Bullying were both significant ($p < .001$) and negative.

These findings supported the hypothesized paths in the a priori specified model.

Group 2

Group 2 Measurement Analysis

Table 4.5 shows the correlations among the measured variables to be

analyzed. The measured variables that loaded on to the Victimization by Bullying

Behaviors and the Psychosocial Environment of the School latent constructs were

treated as categorical variables with assumed underlying normal distributions. The

procedures used for calculating the correlations in Group 1 were replicated in Group

2.

Table 4.6 presents the factor loadings of the measured variables onto the

hypothesized latent factors and the means and standard deviations of the measured

variables for Group 2. All measured variables loaded significantly ($p < 0.001$) on their

hypothesized latent factors. Model fit indices were adequate to excellent: Satorra-

Bentler χ^2 (387, n = 2,676) = 1,916.29, RCFI = .92 (adequate), RMSEA = .02

(excellent). All factor loadings and correlations were significant. The three correlated

error residuals that were added to the final measurement model in Group 1 were

retained in Group 2 analyses. These correlations were between "I feel like I belong in

this school" and "This school makes me like to learn" (r = .19. $p < .01$), "I feel like I

belong in this school" and "How do feel about this school" (r = .55, $p < .001$), and

Table 4.5. Correlation Matrix for Group 2.

		I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.
I.	Fair rules[A]	1.00										
II.	Equity[A]	.305	1.00									
III.	Treated with respect[A]	.460	.322	1.00								
IV.	Putdown by teachers[A]	.317	.233	.479	1.00							
V.	Feel about school[A]	.339	.250	.431	.318	1.00						
VI.	Teachers care about students[A]	.440	.324	.604	.423	.459	1.00					
VII.	Belong in this school[A]	.310	.204	.419	.284	.758	.460	1.00				
VIII.	School makes me like to learn[A]	.396	.217	.522	.335	.659	.578	.647	1.00			
IX.	Hit or push[A]	-.027	-.059	-.100	-.130	-.118	-.071	-.097	-.091	1.00		
X.	Things taken from locker[A]	-.074	-.040	-.125	-.106	-.122	-.095	-.125	-.102	.329	1.00	
XI.	Things taken by force[A]	-.072	-.119	-.137	-.194	-.180	-.150	-.155	-.074	.489	.384	1.00
XII.	Threatened in school[A]	-.052	-.110	-.114	-.169	-.147	-.110	-.120	-.095	.524	.394	.591
XIII.	Stay home	-.049	-.057	-.048	-.096	-.108	-.106	-.100	-.040	.183	.145	.269
XIV.	Cut class	-.045	-.111	-.057	-.106	-.097	-.075	-.093	-.040	.115	.090	.237
XV.	Carry a gun	-.086	-.079	-.078	-.114	-.092	-.072	-.065	-.035	.037	.073	.143
XVI.	Carry a knife	-.082	-.114	-.100	-.109	-.116	-.049	-.108	-.086	.073	.075	.165
XVII.	Carry brass knuckles	-.106	-.095	-.073	-.099	-.091	-.086	-.091	-.054	.019	.028	.131
XVIII.	Carry razor blades	-.082	-.114	-.097	-.104	-.129	-.059	-.101	-.057	.037	.061	.129
XIX.	Carry spiked jewelry	-.096	-.077	-.094	-.090	-.122	-.050	-.077	-.080	.065	.103	.151
XX.	Carry mace	-.040	-.072	-.087	-.068	-.081	-.056	-.095	-.075	.012	.023	.105
XXI.	Avoid locker room	-.007	-.051	-.038	-.075	-.055	-.043	-.022	.024	.158	.149	.244
XXII.	Avoid gymnasium	-.037	-.073	-.031	-.071	-.034	-.039	-.012	.002	.131	.126	.208
XXIII.	Avoid parking lot	-.026	-.058	-.033	-.072	-.061	-.030	-.010	.022	.175	.111	.221
XXIV.	Hit student	-.195	-.150	-.228	-.157	-.176	-.206	-.177	-.206	.221	.101	.170
XXV.	Hit teacher	-.085	-.100	-.082	-.087	-.096	-.110	-.077	-.033	.044	.057	.181
XXVI.	Threaten student	-.187	-.110	-.214	-.169	-.220	-.160	-.168	-.194	.100	.083	.167
XXVII.	Threaten teacher	-.137	-.136	-.135	-.128	-.126	-.130	-.119	-.084	.010	.061	.141
XXVIII.	Steal something	-.158	-.084	-.191	-.171	-.184	-.169	-.142	-.175	.080	.092	.136
XXIX.	Cursed at in school[A]	-.157	-.103	-.173	-.162	-.171	-.173	-.162	-.202	.455	.349	.317

[A] denotes measured variables that were treated as categorical variables with underlying distributions.

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Table 4.5. Correlation Matrix for Group 2 continued.

XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.	XXIII.	XXIV.	XXV.	XXVI.	XXVII.	XXVIII.	XXIX.
1.00																	
.239	1.00																
.183	.300	1.00															
.118	.139	.169	1.00														
.140	.117	.179	.391	1.00													
.100	.120	.168	.499	.415	1.00												
.095	.112	.151	.455	.525	.378	1.00											
.123	.096	.175	.333	.299	.403	.306	1.00										
.050	.121	.139	.287	.341	.375	.354	.330	1.00									
.209	.219	.248	.173	.104	.131	.105	.121	.143	1.00								
.190	.228	.206	.109	.076	.120	.097	.092	.103	.481	1.00							
.196	.225	.146	.120	.072	.065	.084	.099	.097	.389	.319	1.00						
.152	.045	.059	.110	.179	.124	.132	.130	.093	-.008	.024	.014	1.00					
.107	.071	.135	.263	.187	.230	.190	.151	.140	.121	.130	.098	.108	1.00				
.216	.049	.119	.159	.259	.196	.173	.185	.116	.021	.044	.031	.365	.171	1.00			
.142	.059	.110	.298	.236	.284	.231	.210	.156	.095	.090	.072	.157	.443	.298	1.00		
.083	.073	.099	.216	.205	.176	.172	.133	.114	.064	.084	-033	.216	.218	.318	.233	1.00	
.440	.120	.106	.062	.096	.070	.060	.113	.027	.061	.043	.083	.279	.047	.193	.100	.146	1.00

A denotes measured variables that were treated as categorical variables with underlying distributions.

Table 4.6. Means, SDs, and Factor Loadings for the Measured Variables in Group 2.

	Mean (S.D.)	Factor Loadings
Victimization by Bullying Behaviors[A]		
Hit or push	2.40 (.64)	.68
Things taken from locker	2.63 (.60)	.52
Things taken by force	2.90 (.43)	.72
Threatened in school	2.62 (.60)	.79
Cursed at in school	1.92 (.72)	.57
Contributing to Bullying Behaviors		
Hit student	1.41 (.49)	.53
Hit teacher	1.96 (.19)	.29
Threaten student	1.71 (.45)	.66
Threaten teacher	1.94 (.25)	.41
Steal something	1.92 (.72)	.48
Psychosocial Environment of School[A]		
Fair rules	1.89 (.73)	.57
Equity	1.63 (.76)	.40
Treated with respect	1.73 (.70)	.75
Putdown by teachers	1.82 (.68)	.55
Feel about school	1.32 (.46)	.67
Teachers care about students	1.28 (.45)	.62
Belong in this school	1.39 (.49)	.63
School makes me like to learn	1.44 (.50)	.74
Carrying a Weapon for Protection		
Carry a gun	1.96 (.20)	.65
Carry a knife	1.89 (.31)	.66
Carry brass knuckles	1.94 (.23)	.67
Carry razor blades	1.93 (.26)	.67
Carry spiked jewelry	1.92 (.27)	.52
Carry mace	1.91 (.28)	.52
Avoidance Behaviors to Bullying		
Stay home	1.90 (.29)	.38
Cut class	1.94 (.24)	.36
Avoid locker room	1.94 (.24)	.72
Avoid gymnasium	1.96 (.20)	.64
Avoid parking lot	1.91 (.28)	.52

[A] denotes latent variables that were treated as categorical variables with underlying distributions.

*All factor loadings for were significant ($p < .001$).

"During the current school year have you ever threatened a teacher" and "During the current school year have you ever hit a teacher" ($r = .37, p < .001$).

Table 4.7 shows the correlations among the latent constructs. The Victimization by Bullying Behaviors and Psychosocial Environment of the School latent constructs are treated as categorical latent variables. The procedures used for calculating the correlations in Group 1 were replicated in Group 2.

Group 2 Structural Analysis

The final model depicting significant predictive paths is shown in Figure 4.2. The hypothesized model that the data driven model was tested against was the final structural model, after modifications, from the Group 1 analysis. The model had adequate to excellent fit statistics. The Satorra-Bentler χ^2 (369) = 835.69, RCFI = .94 (adequate), and the RMSEA = 0.02 (excellent). The correlated error residuals added in the measurement model in Group 1 were included in the final structural model as well. The three correlated error residuals that were included in the final measurement model were between "I feel like I belong in this school" and "This school makes me like to learn" ($r = .19. p < .01$), "I feel like I belong in this school" and "How do feel about this school" ($r = .55, p < .001$), and "During the current school year have you ever threatened a teacher" and "During the current school year have you ever hit a teacher" ($r = .37, p < .001$). These paths are also not included in the final structural model as they are not theoretically important to model interpretation.

Table 4.7. Correlations among Latent Constructs for Group 2.

	I	II	III	IV	V
I. Victimization by Bullying Behaviors[A]	1.00	.39	-.26	.06	.03
II. Contributing to Bullying Behaviors		1.00	-.48	.11	.06
III. Psychosocial Environment of School[A]			1.00	-.22	-.12
IV. Carrying a Weapon for Protection				1.00	.03
V. Avoidance Behaviors to Bullying					1.00

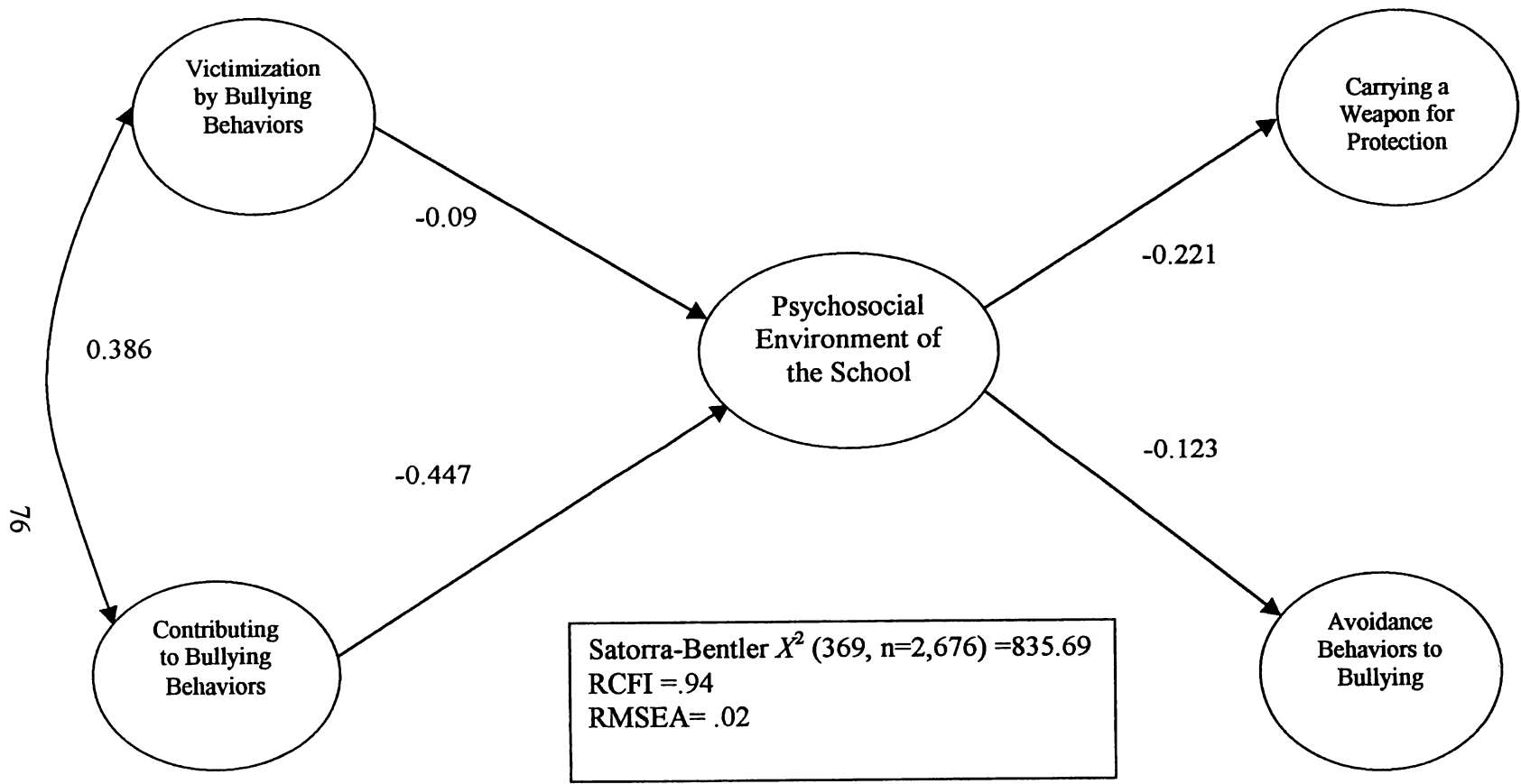[A] denotes latent variables that were treated as categorical variables with underlying distributions.

Figure 4.2. Final Structural Model for Group 2. Large circles represent Latent Variables. All paths are significant ($p < .001$), except the path from Victimization to Psychosocial Environment, which is significant ($p < .01$).

The predictive path between Victimization by Bullying Behaviors and Psychosocial Environment of the School was significant (p< .01) and negative. The predictive path between Contributing to Bullying Behaviors and Psychosocial Environment of the School was significant ($p < .001$) and negative. The predictive paths between Psychosocial Environment of the School and Carrying a Weapon for Protection and Psychosocial Environment of the School and Avoidance Behaviors to Bullying were both significant ($p < .001$) and negative. These findings supported the hypothesized paths in the a priori specified model.

Finally, the overall results from both the measurement model and the structural model that were analyzed with the Group 2 data replicated the findings suggested from the final measurement and structural models using the Group 1 data. Not only did the final model using the Group 2 data achieve adequate to excellent fit statistics, there was not a significant decrement in fit from the final models using the Group 1 data to the final models using the Group 2 data. This indicates that the final model, after modification, was able to be replicated in a separate sample as an a priori specified model with no need for further modification.

CHAPTER V: Discussion

Summary of the Study

The purpose of this study was to examine the empirical validity of the hypothesized relationships among schools' psychosocial environment and the prevalence and types of bullying behaviors that either lead to or resulted from that environment. More specifically, the investigation focused on constructs that examined how aggressive behaviors (e.g., bullying) experienced by students (as perpetrators and victims) contributed to their interpretation of their schools' psychosocial environment and how that environment effects the existence of ongoing aggressive and avoidance behaviors. Using SEM, this study developed a theoretical model of predictive relationships among (a) students' perceptions of bullying behaviors and safety at school, (b) the psychosocial environment of schools as measured by the students and (c) the students' reactionary behavior to both (a) and (b) in order to understand the consequences of bullying in schools. Furthermore, a cross-validation analysis was used to determine if the proposed model accurately predicted the proposed relationships across different samples. This provided both exploratory and confirmatory validation of the proposed and final models.

Interpretations of Findings

Hypothesis One

The first hypothesis tested whether higher prevalence of victimization by bullying behaviors negatively predicted the psychosocial environment of the school. Results of the SEM analyses of Group 1 provided support for this hypothesis in that the path from Victimization by Bullying Behaviors to the

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latent construct Psychosocial Environment of the School was significant

and negative. This hypothesis was also supported in the cross-validation model analysis of

Group 2 in that the same path was also significant and negative. This finding suggests that

the higher the number of incidents of victimization by bullies, the more negative a school's

psychosocial environment is likely to be. This finding also supports previous research

studies which stated that recognizing and curbing victimization by bullies will create a

safer leaning environment for all students in a school (Olweus, 1991, 1993; Espelage et

al., 2000; Shidler, 2001). Additionally, this finding along with previous research supports

the idea that school administrators might be able to improve the environment of the school

by addressing the problems of student victimization (Gottfredson, 1986, 2001;

Gottfredson & Gottfredson, 1985; Hoy et al., 1991). This could be accomplished through

the development of prevention and early intervention programs that reduce student

victimization by their peers.

Hypothesis Two

The second hypothesis tested was whether students' perception of safety at school

positively predicted the psychosocial environment of the school. The results of the

analysis failed to provide support for this hypothesis. The entire Students' Perception of

Safety latent variable was dropped from the model as the factor appeared to be

multidimensional and a single factor structure could not be determined.

Hypothesis Three

The third hypothesis tested whether a higher level of contributing to bullying

behaviors negatively predicted the psychosocial environment of the school. The outcome

of the SEM analysis for Group 1 provided support for this hypothesis in that the path from Contributing to Bully Behaviors to the latent construct Psychosocial Environment of the School was significant and negative. This hypothesis was also supported in the cross-validation model analysis of Group 2 in that the same path was also significant and negative. This finding suggests that the higher number of incidents of students contributing to bullying behaviors, a more negative a school psychosocial environment is likely to be. As in Hypothesis One, this finding also supports previous research that recognizing and restricting incidents of bullying behaviors will create a safer leaning environment for all students in a school (Espelage et al., 2000; Olweus, 1991, 1993; Shidler, 2001). This finding adds supports to the theory that school social workers and school personnel might be able to improve the environment of the school by addressing the problems of student victimization (Gottfredson, 1986, 2001; Gottfredson & Gottfredson, 1985; Hoy et al., 1991). Again, this could be accomplished through the development of prevention and early intervention programs that reduce student victimization by their peers.

Hypothesis Four

The fourth hypothesis examined whether the psychosocial environment of the school negatively predicted students' aggressive responses to bullying behaviors. This hypothesis was broken into two separate hypotheses: (a) for the latent construct of Carrying a Weapon for Protection and (b) for the measured variable of Belonging to a Gang. Results of the SEM analysis for Group 1 provided support for Hypothesis Four A in that the predictive path from the latent construct Psychosocial Environment of the

School to the latent construct Carrying a Weapon for Protection was significant and

negative. This hypothesis was also supported in the cross-validation model analysis of

Group 2 in that the same path was also significant and negative. This finding suggests that

the more negative the psychosocial environment of the school is the more students will

feel the need to carry a weapon for protection. However, the results failed to support

Hypothesis Four B, that there would be a significant negative predictive path from

Psychosocial Environment of the School to Belonging to a Gang. The single measured

variable, "During the current school year have you ever belonged to a gang", was dropped

from the model because the predictive path failed to achieve significance. The finding that

a negative psychosocial school environment predicts an increase in students carrying

weapons for protection supports previous research (Anderson, 1982; Hoy et al., 1991;

Wang et al., 1997; Welsh et al., 1996; Welsh et al., 2000) which states that implementing

programs and interventions designed to improve the psychosocial environment of the

school can possibly help to reduce the number weapons in schools that are being brought

by students who feel they need to carry a weapon for protection.

Hypothesis Five

The fifth hypothesis tested whether the psychosocial environment of the school

negatively predicted students' avoidance responses to bullying behaviors. The results of

the SEM analysis of Group 1 provided support for this hypothesis in that the path from

the psychosocial environment of the school to the latent construct of Avoidance Behaviors

to Bullying was significant and negative. This hypothesis was also supported in the cross-

validation model analysis of Group 2 in that the same path was also significant and

negative. This finding suggests that the more negative the psychosocial environment of the school the more students will try to avoid victimization by bullies. As with the previous hypotheses, these findings support previous research (Nansel et al., 2001; Olweus, 1991, 1993, 1994; Peterson & Skiba, 2000; Stolp, 1995; Welsh et al., 1996; Welsh, 2000; Welsh et al., 2000) that states that there is a need to address negative psychosocial school environments and to implement programs designed to prevent, intervene and educate on the dangers of allowing bullying behaviors and student victimization to occur in schools. School social workers and other school personnel should work in unison to reduce and eventually prevent the occurrences of bullying behaviors and thus improve the overall perception of the school's psychosocial environment so that students will be less likely to be truant, cut classes, and avoid certain areas of the school grounds.

<div align="center">Interpretations of the Cross-Validation Model</div>

The original sample was split into two separate samples in order to cross-validate the final measurement and structural models, following modification to the a priori hypothesized structural model. The primary advantage of this process is to treat the finalized model from the first sample, which can be construed as an exploratory model after modifications have been made to achieve at least adequate fit, as a specified model in the second sample. This provides the ability to replicate the model and allows for stronger statements about predictive relationships and implications of the overall model.

In this study, the models from the two groups did not significantly differ in either goodness-of-fit or significant directional predictive paths across the measurement and structural models. Additionally, the model used for the second group needed no further

modifications to achieve at least adequate and equal fit. This supports the theory that the hypothesized model is a good representation of what is occurring in the data and allows for generalization of the findings.

Implications for Practice

The results from this study support previous research in the theory that if the students' perception of the psychosocial environment of the school is low (e.g. negative) there is a higher likelihood that students will react either aggressively by carrying a weapon or by avoiding school, classes or certain areas of the school where student victimization by bullies is more likely to occur (e.g. locker room, gym, parking lot).

Results of the present study support the theories that when students are victimized by bullying behaviors and/or contribute to bullying behaviors the students' perception of the psychosocial environment of the school can be a negative one. In order to address this, school social workers need to develop new and implement existing interventions to reduce the occurrences of student victimization. These findings also support previous research (Astor et al., 1999; Gottfredson, 1986, 2001; Olweus, 1991, 1993; Welsh et al., 1996; Welsh, 2000; Welsh et al., 2000) that it would be important for school social workers to work with other school personnel to improve the psychosocial environment of the school for the students, teachers, staff and administrators.

Implications for Policy

The findings of this study also support previous research that found that school social workers and other school personnel should collaborate to develop and implement school policies which would impose sanctions on those students who victimize their peers

(Nansel et al., 2001; Olweus, 1991, 1993). Researchers have found that when the students and teachers know and understand the rules and sanctions for delinquent behaviors such as bullying and when these rules and sanctions are carried out consistently throughout the school year and imposed on every student the general psychosocial environment of the school is a more positive one (Chance et al., 1996; Gottfredson, 1986, 2001; Gottfredson & Gottfredson, 1985; Hoy et al., 1991; Olweus, 1991, 1993). Moreover, policies which are geared to help create a positive psychosocial school environment for all should be implemented and maintained. These policies could include, but not be limited to: creating fair rules which are the same for all students, allowing students to have input in establishing the above mentioned sanctions and policies to prevent bullying, and implementing a system where everyone would feel safe when reporting incidences of bullying. As previous research (Gottfredson, 1986, 2001; Gottfredson & Gottfredson, 1985; Olweus, 1991, 1993; Welsh et al., 1996; Welsh, 2000; Welsh et al., 2000) and the findings of this study suggest, schools where student victimization is monitored and prohibited allows a positive school environment to flourish and create an overall safer learning environment for all.

Limitations and Future Directions

The research design for this study was limited by many factors. However given the overall size and complexity of the data set and the large number of items that the were asked, many of the limitations should have only minimal impact on the research findings.

One limitation of the current study was the archival nature of the data. As the data were primarily collected to address other research questions, this investigation was limited

to items that may not have been designed to tap the constructs of interest. The results of the measurement model indicate, however, that reasonable, unidimensional factors were developed that tapped meaningful constructs, and likely the constructs of interest to this study. If this study were to be replicated, however, items could be designed to specifically address the constructs of interest. This would likely strengthen the ability to tap the proper constructs and improve the overall findings of any future studies. By designing specific questions to tap into the constructs of interest, the Students' Perception of Safety variable from Hypothesis Two could be tapped into as a single latent construct and added to any new studies in order to investigate how the individual student's perception of safety predicts the psychosocial environment of the school.

Another limitation may be that because data were not collected to answer these questions specifically this may have lead to measurement error in the measured variables that loaded onto the Students' Perception of Safety latent construct and the Belonging to a Gang variable, which may have been the reason that they failed to achieve significance, thus necessitating them being dropped from the model. This may also be true for the measured variables that were dropped from the Psychosocial Environment of the School and Avoidance Behaviors to Bullying latent variables.

An additional limitation may have been that since all the data were collected at the same time point, it is impossible to be sure that the directionality of the relationship from Psychosocial Environment of the School to occurrences of the Aggressive and Avoidance Behaviors to Bullying is correct. However, given the overall fit of the two models and that the signs (either negative or positive) occurred in the hypothesized direction, certain

assumptions about the hypothesized model can be made with some confidence. One is that the predicted directionality of the paths replicates what is occurring in the data. For future research, if possible, students should be surveyed at different time points during the school year for victimization from and contributing to bullying behaviors. And finally, data on their perceptions of the psychosocial environment of the school should be collected independently to gain a better understanding of whether the behaviors are causing the environment or the environment is causing the behaviors.

A possible alternative to a cross-sectional study of the influence and impact of the psychosocial environment of the school would be to use a longitudinal design. Using this type of design would allow for multiple measurements of the occurrences of bullying behaviors and the students perception of the psychosocial environment of the school. Additionally, longitudinal designs allow for the implementation of prevention and/or intervention programs. These programs could address student victimization and contributions to bullying behavior. If effective, one would expect the overall impression of the psychosocial environment of the school to improve, and given the findings of the current study, a reduction in avoidance and aggressive behaviors. Collecting data at two or more times during the same school year and then across consecutive school years would assist school social workers and other school personnel in better understanding what can be done to address the issues under consideration in this study (e.g., improving the psychosocial environment, reducing student victimization by bullies).

One final limitation to be discussed is the number and source of reporters used in this study. The only data analyzed in this study were self-reported data from the students.

This may limit the ability to generalize the findings to the overall school environment. Teacher reported data were not used because the original, archival study, did not collect data on teacher victimization. Future studies could correct for this by adding teacher and administrator measures of the psychosocial environment of their schools as well as victimization surveys for both populations. Surveys of the teachers' and school personnel's perception of the psychosocial environment of the school, as well as their perceptions of victimization would be helpful in developing prevention and intervention programs designed to reduce victimization on all levels and thus improving the school's psychosocial environment for all.

Summary Implications

In recent years, specific incidents of high-level school violence have been brought to the public's attention due the horrific magnitude of these events (e.g., the massacre at Columbine High School) and to the extensive media coverage paid to these incidents. However, these events occur infrequently and it is almost solely the magnitude and the repercussions (e.g., loss of life and psychological impact) of them that bring them to national attention. Yet, a much more prevalent and often understudied form of school violence is the phenomena of low-level violence (e.g., bullying behaviors). The distinction being made is that high-level violence occurs in terms of specific incidents, whereas low-level violence can be viewed as a phenomena that occurs daily. It has been postulated here that, based on previous research and the findings of this study, school administrators and school social workers should consider investing as many resources as are allocated to address incidents of high-level violence on low-level violence. If this occurred, not only

would the daily occurrences of student victimization by bullies possibly be reduced but so might the number of the incidents of high-level violence be lowered or even eliminated.

The results of this study combined with the results of previous research give credence to this hypothesis. More explicitly, the implications from these findings offer support for school social workers and school administrators to concentrate on intervening at the early stages of low-level violence in order to build a more positive psychosocial school environment. By improving the psychosocial environment of the school, these interventions should reduce the incidents of students cutting class, skipping school and carrying weapons to school. Previous research has shown that these aggressive and avoidant behaviors are often the direct antecedents of incidents of high-level violence (Astor et al., 1999; Lockwood, 1997; Vossekuil et al., 2000). Early intervention strategies implemented within the school would not only improve students' interpersonal experiences and overall academic achievement, but would also possibly save the lives of students, teachers, and other school personnel.

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APPENDIX

Form A

IRB:_____

Certification for Exemption from IRB Review for Research Involving Human Subjects

A. Principal Investigator: Nancy Meyer-Adams(Student) and

                                        Karen M. Sowers, Ph.D. (Dissertation Chair)

B. Department: College of Social Work

C. Complete mailing address and phone number: 5 Henson Hall

                                                                Knoxville, TN 37996-3333

                                                                 (865) 974-6498

D. Title of Project:

An Investigation of the Predictive Effects of Bullying Behaviors and the Psychosocial School Environment

on Behaviors of Middle School Students

E. External funding agency: Original funding source of archival data file #NIJ 93-IJ-CX-0038 was the

National Institute of Justice.

F. Grant submission deadline: N/A

G. Starting date: June, 2001 for analyzing archival data for dissertation (Note: original data collected

during the 1993-1994 school year)

H. Estimated completion date: Dissertation completion date Fall 2001

I. Research Project:

1. Objective of Project: To analyze portions of archival data located within the Inter-University

Consortium for Political and Social Research publication #2026 entitled *School Culture, Climate and*

Violence: Safety in Middle Schools of th Philadelphia Public School System, 1990-1994. These data are

being analyzed for a dissertation which will investigate the causal influences of students' perception of

bullying and being a victim of bullying and of the school setting and the way these bullying behaviors and

this perceived setting affects their behavior.

2. Subjects: In order to preserve complete respondent anonymity, all personal identifiers were

removed prior to this data set being posted on the ICPSR website. I will not have access in any

format to any identifying information of any of the respondents. Data used in this study were

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collected from 7,583 interviews completed by students (65% response rate) enrolled in grades 6-8 in eleven middle schools located throughout the Philadelphia School District during the 1993-94 school year.

3. Methods/Procedures: The students in these 11 middle schools were administered the Effective School Battery (EBS) survey (Gottfredson, 1984) which addressed the issue of school psychosocial climate and the Student Victimization Survey (a modified version of the Student Supplement to the National Crime Victims Survey) which measured self-reported data by students of bullying behaviors, victimization and school disorder (Welsh, Jenkins & Greene, 1998). These eleven school were chosen from the entire sample of 42 schools based on 3 criteria: (1) level of disruption, (2) level of poverty, and (3) regional representation. Efforts were made to include schools that covered the broadest range of each criteria.

4. Category for Exempt Research Per CFR 46: 4

J. Certification: The research described herein is in compliance with 45 CRF 46.101 (b) and presents subjects with no more than minimal risk as defined by applicable regulations.

Principal

Investigator _____   _____   _____

                              Name   **Signature**   **Date**

Student

Advisor   _____   _____ _____

                              Name   **Signature**   **Date**

Dept. Review

Comm.Chair_____   _____ _____

                              Name   **Signature**   **Date**

APPROVED: Dept. Head_____   _____ _____

                              Name   **Signature**   **Date**

VITA

Nancy Meyer-Adams was born in Indianapolis, Indiana in November of 1954. She spent her first 21 years in Indianapolis before moving around the country and finally settling in Fort Lauderdale Florida. Nancy married at a young age and raised two children before returning to school at the age of 37 to earn her G.E.D. in 1992. She received a scholarship to Broward Community College in Fort Lauderdale that spring and earned her Associate of Arts degree with honors in 1994. She went on to earn her Bachelor's of Social Work and Master's of Social Work at Florida International University in Miami, Florida.

In August of 1998 Nancy and her husband moved to Knoxville, Tennessee so that she could begin the doctoral program at the University of Tennessee College of Social Work While completing her doctoral studies, Nancy worked with community organizations in Knoxville including Gates to Hope which provides grief counseling and retreats for children and their families. Nancy and her family currently reside in Southern California where she plans to continue to teach and do research in the area of school social work and school violence.