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Violence Among Rural Youth

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Violence Among Rural Youth

Executive Summary

In the image of the public and policy makers, youth violence is largely an urban problem. To some extent, this perception is justified. Overall crime rates are, in fact, higher in more populous areas. However, complacency is not justified in regard to the need for research and planning related to youth violence. The purpose of this group of studies, funded by a grant from the Office of Juvenile Justice and Delinquency Prevention, was to help to fill a gap in the body of knowledge pertaining to the prevalence and nature of violence among youth in rural and nonmetropolitan communities, community-level predictors of youth violence, and the effectiveness of violence prevention strategies in these communities.

Bullying and Antisocial Behavior Among Middle School Students

Although bullying among school children is not a new phenomenon, there has been a recent surge of interest in the issue by researchers, educators, and the press. Results from several large-scale studies abroad (primarily in Scandinavia, England, and Canada) have provided insights into the prevalence and nature of bullying among school children in those countries. Although all findings reveal that bullying is a significant problem among school children, the research also reports marked differences in the prevalence of bullying between nations. To date, remarkably little is known about bullying among school children in the United States. Moreover, no published research has attempted to assess bullying among American school children using methods similar to those used in large-scales studies abroad (i.e., variations of

Olweus' self-report questionnaire). The purpose of this study was to begin to fill in these gaps in our knowledge.

Methods. A total of 6,385 students (4th, 5th, and 6th graders) in six nonmetropolitan school districts in the Southeast participated in this study. Students completed an English-language of Olweus' standard questionnaire to assess the nature and frequency of bullying and related antisocial behavior among youth.

Findings. One in five children admitted bullying schoolmates at least several times during the previous two months; nearly 10% of all children reported that they had engaged in frequent bullying of their peers (at least once per week). Moreover, one in four children reported being victimized at least several times during this period, with 9% reporting being frequent victims of bullying (at least once per week). These rates are substantially higher than those observed by Olweus in Scandinavian samples but are similar to rates reported by researchers in England and Canada.

Consistent with the findings of others, boys were significantly more likely than girls to report bullying their peers, and they were twice as likely as girls to engage in physical means to bully others. Girls were somewhat more likely than boys to be victims of bullying, although the difference between groups was small. Consistent with others' observations, boys in our sample typically were victims of same-sex bullying (typically by a single boy), while girls reported that they were bullied by both boys and girls.

Sixth graders were significantly more likely than fourth or fifth graders to admit that they had bullied other students, while fourth graders were more likely than older students to report that they had been bullied. These results are consistent with others'

findings from Canada, England, and Scandinavia which suggest that the likelihood of being a victim of bullying decreases with age. Despite the high prevalence of bullying among school children in our sample, substantial percentages of students who had been victimized by their peer admitted that they had not reported incidents to school personnel or their parents. Boys and older children were particularly reluctant to discuss their victimization with school personnel or their parents.

The high rates of victimization and the hesitation of many children to inform adults about these incidents are cause for much concern in light of the short- and long-term negative effects of bullying on child victims. Moreover, bullying may seriously erode the climate of the school as a whole. High rates of bullying among school children also heighten concerns about the children who bully their peers. Findings from our survey lend support to others' conclusions that bullying is not an isolated behavior but rather is related to a constellation of other antisocial behaviors. We observed that self-reported bullying (of both peers and teachers) was highly positively correlated with self-reported antisocial behaviors, including misbehavior at school, delinquent behaviors, and group delinquency, as well as receiving sanctions for misbehavior at school. More disturbingly, several studies point to a link between bullying behavior among children and antisocial behavior in adulthood.

The small but growing research literature paints a disturbing picture of the high prevalence and harmful consequences of bullying. Additional studies are needed, however, to increase understanding of the nature and prevalence of bullying among other age groups of children in the U.S., examine further the effects that such behavior has on victims and bystanders, and specify the linkages between bullying behavior and

other antisocial behaviors among different age groups of American children.

Patterns and Correlates of Gun Ownership Among Nonmetropolitan Middle School Students

Studies of youth in urban settings indicate that firearms are readily available to minors. Available evidence from urban samples suggests that the rationales that youth give for owning guns are related to their involvement in antisocial behavior. Youth who own guns for recreational purposes are less likely to engage in criminal behavior and less likely to carry guns regularly than are youth who own guns for protection or for engaging in dangerous or illegal activities. Unfortunately, little is known about patterns of gun use among youth in nonmetropolitan communities. It was the purpose of this study to help fill this void in knowledge.

Method. In 36 middle schools in nonmetropolitan counties in South Carolina, 6,263 students were surveyed with regard to their gun ownership, reasons for gun ownership, antisocial behavior, and bullying.

Findings. Results revealed a rate of gun ownership that was commensurate with rates observed in metropolitan samples of somewhat older children; 14% reported owning rifles or shotguns, 9% reported owning a pistol or handgun. Gun ownership and reasons for gun ownership were linked with rates of antisocial behavior and bullying. High-risk gun owners (i.e., those students who owned guns for gain respect or to frighten others) reported significantly higher rates of antisocial behavior and bullying than did low-risk gun owners (i.e., those students who owned guns to feel safe or for sporting purposes), and the latter group reported slightly higher rates of antisocial behavior and bullying than did students who did not own guns. In addition, multivariate

analyses showed that the most powerful correlates of high-risk gun ownership in youths were high-risk gun ownership by family members and peers. These findings suggest that effective violence prevention programs that target high-risk youths must at least have the capacity to address risk factors in the youths' social networks. Ideally, such efforts should be truly comprehensve, given the place of high-risk gun ownership in a constellation of antisocial behaviors.

Prevention of Bullying Among Middle School Students: Description and Evaluation of a Comprehensive School-Based Prevention Program

Despite the prevalence of school-based violence prevention initiatives, relatively few have focused on the prevention and reduction of bullying among school children. The first and best-known intervention to focus on bullying was developed by Olweus and launched in Norwegian schools in the early 1980s. This comprehensive model, which represents a whole-school approach to reducing bullying among school children, resulted in marked reductions in bullying, victimization, and related antisocial behaviors among Norwegian school children. Evaluations of similar programs in England and Canada also have shown promising results. This study represents the first large-scale implementation and evaluation of the model in the United States.

Method. Participants were three cohorts of school children (in fourth, fifth, and sixth grades at baseline, N=6,389) in six nonmetropolitan school districts in the Southeast. The districts were in matched pairs. Three districts (Group A) received the bullying program for two years of the project; the others (Group B) served as a comparison group for the first year of the project and received the intervention during the second year. Students completed an English version of Olweus' survey of bullying

and related antisocial behavior. To assess the effects of the intervention, the survey was conducted with the same cohort of students over the next two years.

Findings. Results suggested that the first year of the South Carolina bullying program positively affected students' self-reports of bullying and several antisocial behaviors. After experiencing one year of the program, students in Group A schools reported decreases in the frequency with which they bullied other children, while students in control schools reported slight increases in the frequency with which they bullied their peers. Although we observed an increase over time in the frequency of self-reported antisocial behavior among control schools during this first year (Group B), we observed either no increase or a slower rate of increase in Group A students' self-reports of delinquency, vandalism, school misbehavior, and punishment for school-related misbehavior. Thus, the program appeared to slow the natural rate of increase in students' engagement in these antisocial behaviors. During the first year of the program, we did not observe any program effects on students' reports of victimization, bullying of teachers, group delinquency, theft, substance abuse, or their attitudes about bullying.

None of the program effects that we observed after the first year of the program were sustained for Group A students during the second year of the program. Moreover, we were unable to discern any one-year program effects on the behavior of Group B students, who started the program in year two. The explanation for these findings may lie in the inherent difficulty of establishing and sustaining whole-school approaches to violence prevention. Unlike the adoption of purely curricular or other narrow approaches to violence prevention, the establishment of a comprehensive school

approach requires that school personnel expend significant amounts of time and energy to develop, implement, sustain, and build upon interventions that are designed to target students at multiple levels. During the first year of our intervention, weekly visits by consultants proved important means of sharing particular intervention strategies, problem-solving, and offering support and enthusiasm to school staff. During the second year of the project, the time that consultants could spend with any given school was essentially cut in half, as new schools began the project. It is possible that the new programs simply did not receive sufficient consultation to take hold and that continuing programs lost momentum without continuing consultation. The task of implementing a bullying prevention program may be particularly difficult given the structure of the middle school setting. Moreover, it is during the middle school years that bullying behavior appears to reach its peak, and other antisocial behaviors are on the rise. Although the Olweus model may provide to be an effective intervention among middle school students, it may be significantly more effective to introduce such programs during the elementary school years, before bullying and other antisocial behaviors have become so commonplace among children and pervasive within a school setting.

Social Disorganization and Youth Violence in Rural Settings: A Negative Binomial Analysis of Counties in Four States

In order to extend the study of community social disorganization and crime beyond its exclusive focus on large urban centers, this study presents an analysis of structural correlates of arrest rates for juvenile violence in 264 non-metropolitan counties of four states.

Method. The analysis included 264 counties from four states (Florida, Georgia,

98,000. The measure of delinquency was based on the number of arrests for juveniles (ages 11 through 17) in each county, pooled over a 5-year period from 1989 through 1993. The primary dependent variables in the analyses included arrests for homicide, forcible rape, aggravated assault, robbery, weapons offenses, and simple assault; arrests for the Uniform Crime Reports violence index; and arrests for burglary, larceny, and motor vehicle theft. Explanatory variables, which were based primarily on 1990 census data, included mobility, unemployment rates, family disruption, ethnic heterogeneity, poverty, proximity to metropolitan counties, and proximity to an interstate highway.

Findings. Findings support the generality of social disorganization theory: Juvenile violence was consistently associated with rates of family disruption, ethnic heterogeneity, and poverty. Rates of juvenile violence also were strongly related to population size through a curvilinear relationship in which counties with the smallest juvenile populations had exceptionally low arrest rates. A plausible interpretation of this relationship would be that a sparse population limits opportunities for offending and opportunities for detecting offenses. There was no significant relationship between rates of mobility and delinquency. This report also introduces the use of negative binomial regression (a variation of Poisson regression) for analyzing aggregate rates that are based on small numbers of events, and that would, therefore, be ill suited to least squares regression.

Homicides Committed by Juveniles

Although juvenile homicide represents a relatively small percentage (14%) of all homicides committed, and although recent statistics suggest a decline in rages of

homicides by juveniles, these acts are of tremendous concern because of both their seriousness and the youthfulness of the offenders. In order to understand better the phenomenon of juvenile homicide, researchers increasingly have recognized the importance of examining differences in patterns of offending between juvenile homicide perpetrators and adults who have committed similar crimes, between male and female juvenile homicide perpetrators, and between juvenile homicide offenders and juveniles who have committed other types of offenses. The purpose of this study was to expand our knowledge about several individual, familial, and case characteristics of youth who commit homicide versus youth who commit other serious offenses.

Methods. Computerized case record information was obtained for the years of 1992, 1993, and 1994, for three groups of youth: (a) all male youth who had been referred to the state solicitor for homicide (n = 86), (b) a random sample of 77 male youth who had been referred for assault and battery with intent to kill, and (c) a random sample of 87 male youth who had been referred for other serious offenses exclusive of homicide or assault and battery with intent to kill. All available newspaper accounts of the homicide cases were acquired (n = 34) in order to obtain additional information pertaining to the circumstances surrounding the homicide.

Findings. Regardless of offense group or the type of community in which the youth lived (rural, non-metropolitan, or metropolitan), the demographic characteristics of youth and their families were consistent with the findings of others. The majority of youth were from relatively poor families, were black, and only one-quarter resided with two parents. More than one-quarter of the boys had at least one parent with a known criminal record; a similar percentage of youth had at least one sibling with a history of

known delinquent or criminal offenses. Few group differences were observed relative to boys' offense histories. Regardless of group, boys received their first referral to the solicitor at 14 years of age. The average age at which boys were referred for homicide or assault and battery with intent to kill was approximately 15 ½ years. The age at which boys were referred for these two offenses was significantly older than the age at which youth in the other serious offense group were referred for their final target offense. For substantial numbers of youth (approximately one-third), the homicide or assault and battery with intent to kill was their first referral to the solicitor.

On average, youth had just over two referrals prior to their target offense. With one exception, we did not find differences among groups in the number of different types of offenses in their histories. Youth in all three groups had been referred for similar numbers of status offenses, other juvenile offenses, property offenses, and public order offenses. Youth in the homicide and assault and battery groups were referred for significantly more offenses against persons than youth who had been referred for other serious offenses.

Findings regarding the case characteristics of the homicides (obtained from the small number of available newspaper accounts) generally were consistent with the findings of others regarding the gender and age of the victim (most victims were males who were older than the perpetrator), the involvement of multiple perpetrators in approximately one-third of the cases, and the overwhelming use of handguns in the commission of the homicide. Among our sample, most victims were strangers to the perpetrator and half of the offenses took place in businesses, suggesting that substantial numbers of the homicides may have occurred during the commission of

other crimes, such as robbery.

Additional research is needed to illuminate the individual, familial, peer, situational, community, and societal factors that contribute to these violent acts. Nevertheless, it is clear that violence prevention and intervention efforts that are targeted at such youth are likely to fall short if they do not embrace a comprehensive strategy that focuses on risk factors within the many different contexts in which the youths interact (family, peer, school, neighborhood).

Introduction

In the image of the public and policy makers, youth violence is largely an urban problem. To some extent, this perception is justified. Overall crime rates are, in fact, higher in more populous areas. However, complacency is not justified in regard to the need for research and planning related to youth violence. Crime rates are less dependent on population size than is widely assumed, and there is considerable variation in crime rates among small towns and rural areas.

According to the most recent census figures, only 49% of the U.S. population lives in urban areas of 500,000 or more, while 25% lives in rural communities (with populations of no more than 2,500), and an additional 12% lives in towns and cities with populations under 50,000. Unfortunately, relatively little research has focused on assessment and prevention of youth violence in these rural and nonmetropolitan settings, however.

The purpose of this group of studies, funded by a grant the Office of Juvenile Justice and Delinquency Prevention, was to help to fill a gap in the body of knowledge pertaining to the prevalence and nature of violence among youth in rural and nonmetropolitan communities, community-level predictors of youth violence, and the effectiveness of violence prevention strategies in these communities. Specifically, there were five major foci of our work:

- An examination of the nature and prevalence of bullying and related antisocial behavior among a large sample of nonmetropolitan middle school children;
- A study of patterns and correlates of gun ownership among nonmetropolitan middle school youth;

- A large-scale evaluation of an internationally-recognized violence prevention strategy among middle school students in nonmetropolitan communities;
- An examination of community-level predictors of youth violence in rural settings; and
- A study of case histories and case characteristics of juveniles in nonmetropolitan communities who have committed homicides.

Each study is presented as a separate chapter within this report, including a description of relevant literature, the presentation of specific hypotheses, a description of the study's methodology, the presentation of the study's findings, and a discussion of the implication of the findings for researchers and policymakers.

Bullying and Antisocial Behavior Among Middle School Students

Although bullying among school children is not a new phenomenon, there has been a recent surge of interest in the issue by researchers, educators, and the press. Stimulated by the pioneering work of Olweus in Scandinavia (1978, 1991), researchers from several nations (e.g., Australia, Canada, England, Ireland, Japan, and the United States) have begun to explore the nature and prevalence of bullying among school children. An understanding of such issues is critical in order to implement effective interventions to reduce the prevalence of bullying and its harmful effects on victims.

Definition

The term *bullying* may hold somewhat different connotations for students, researchers, and educators. Most commonly, though, bullying is understood as repeated negative acts committed by one or more individuals against another individual (Olweus, 1993). These negative acts may be physical or verbal in nature (e.g., hitting or kicking; teasing or taunting), or they may involve indirect aggression such as social exclusion. Implicit in this definition is an imbalance in real or perceived strength between the bully and victim. Thus, fighting among peers of equal strength generally is not considered bullying.

Prevalence of Bullying

Initial studies of the prevalence of bullying among school children were conducted by Olweus (1978, 1991, 1993). Large-scale studies of school children in Norway and Sweden revealed that 9% of students in primary and junior high schools admitted that they had been bullied "now and then" or more frequently, while 3%

reported that they had been bullied at least once a week. Seven percent of students reported that they had bullied other students at least "now and then" and 2% had bullied other children at least once per week.

Studies conducted in other countries have revealed substantially higher rates of bullying. However, direct comparisons between studies often are difficult because of difference in researchers' definitions of bullying and the measures that they use (Boulton & Underwood, 1992). A number of researchers have adapted Olweus' self-report measure for use in their own countries (e.g., Boulton & Underwood, 1992; O'Moore & Hillery, 1989; Pepler, Craig & Ziegler, 1994; Rivers & Smith, 1994; Whitney & Smith, 1993; Yates & Smith, 1989) or created their own self-report measure (Rigby & Slee, 1991), while others have employed peer nomination approaches (e.g., Boulton & Smith, 1994; Perry, Kusel & Perry, 1988).

A series of studies in England by Smith and colleagues (Rivers & Smith; Whitney & Smith, 1993) and Boulton and Underwood (1992) revealed rates of bullying that were significantly higher than those reported in Scandinavia. Among middle school students, self-reports of bullying peers at least "sometimes" during the last school term ranged from 16% (Whitney & Smith, 1993) to 20% (Boulton & Underwood, 1992) and even higher (Rivers and Smith, 1994). Rivers and Smith (1994) did not report overall rates of bullying but noted that physical bullying was experienced by over 23% of children and verbal bullying was reported by over 39% of children. Victimization rates from studies in England ranged from 20% (Boulton & Underwood, 1992) to 27% (Whitney & Smith, 1993).

Similar rates of bullying have been observed in studies of Canadian school

children. Using an English version of the questionnaire developed by Olweus, Charach, Pepler, and Ziegler (1995) surveyed 211 students in grades 4 through 8. One in five students reported being bullied more than once or twice during the term; 8% reported being bullied at least once per week. Fifteen percent admitted that they had bullied other children with some regularity (more than twice during the term), and 2% reported bullying their peers once per week or more. Similarly, Hirano (1991, cited in Whitney & Smith, 1993) reported that 12% of Japanese school children acknowledged bullying other children at least "sometimes," while 15% noted that they had been bullied by other children. Rigby and Slee (1991) reported that 17% of Australian boys and 11% of Australian girls reported being bullied "pretty often" or very often." In the Netherlands, Junger (1990) interviewed a multiethnic sample of 200 boys between the ages 12 to 17. Twenty percent reported being physically bullied "sometimes" and 6% reported being physically bullied "often" or "very often." Slightly higher percentages of these children indicated that they had been verbally abused by peers. Twenty-six percent reported being verbally abused "sometimes," and 7% noted that they had been verbally abused "often" or "very often."

Although numerous studies have examined issues of youth violence within the United States, relatively few have focused on bullying. Evidence from several available studies indicates that bullying is quite common in American schools, however. For example, in a study of junior and senior high school students from small Midwestern towns, 88% of students reported that they had observed bullying, and 77% indicated that they had been victims of bullying at some point during their school careers (Hazler, Hoover, & Oliver, 1991; Hoover, Oliver, & Hazler, 1992). In a national telephone survey

of 2,000 children between the ages of 10 and 16, 16% reported that they had bullied by other children within the last year (Finkelhor & Dziuba-Leatheran, 1994). Finally, Perry and colleagues (1988) assessed bullying through peer nominations. These researchers found that 10% of children in their sample of 165 3rd-6th graders were "extreme victims" of bullying.

Gender and Age Differences

Researchers have observed both age and gender differences in children's reports of victimization and bullying others. Consistently, studies report that boys are more likely than girls to bully other children (Boulton & Smith, 1994; Boulton & Underwood, 1992; Charach et al., 1995; Hazler et al., 1991; Lowenstein, 1978; Olweus, 1991, 1993; Whitney & Smith, 1993). Gender patterns for victimization are less clear, however. Although some studies have observed that boys are somewhat more likely than girls to be victims of bullying (Boulton & Underwood, 1992; Olweus, 1991, 1993; Perry et al., 1988; Rigby & Slee, 1991; Whitney & Smith, 1993), others have found that boys and girls are equally likely to be bullied by their peers (Boulton & Smith, 1994; Charach et al., 1995; Hoover et al., 1992). Typically, boys are bullied by other boys, although girls are bullied by both boys and girls (Boulton & Underwood, 1992; Olweus, 1991, 1993; Whitney & Smith, 1993).

An examination of age trends suggests that the likelihood of being bullied decreases as children age, with primary school children being more likely than secondary school children to experience bullying (Boulton & Underwood, 1992; Charach et al., 1995; Olweus, 1991, 1993; Whitney & Smith, 1993). Olweus (1991, 1993) observed that decreases in victimization were particularly marked between the ages of

8 and 13. Age trends for bullying behavior are less consistent in the literature. Olweus' large-scale study revealed fairly steady rates of bullying behavior between grades two and nine (Olweus, 1991, 1993) (although the frequency of bullying among boys in secondary/junior high school was slightly higher than for boys in younger grades). Findings from other studies, however, suggest that bullying may peak as children approach adolescence (i.e., at approximately 11 years of age Boulton & Underwood, 1992; Charach et al., 1995; Hoover et al., 1992).

Forms of Bullying

As noted above, bullying may take many forms, including physical aggression (hitting, shoving, kicking), verbal assaults (taunting, teasing, verbal threats), and more indirect actions such as social isolation and friendship manipulation. A number of researchers have found that girls are more likely than boys to use verbal aggression in bullying another student, while boys were more likely than girls to use physical force to bully another child (Olweus, 1993; Whitney & Smith, 1993). However, Boulton and Underwood (1992) observed no gender differences in children's forms of bullying.

Characteristics of Bullies

Several studies which have examined characteristics of bullies have noted clear age and gender trends. Children are more likely to bully students their own age or younger (see e.g., Olweus, 1993). Moreover, although boys report being bullied primarily by other boys (either individual boys or groups of boys), girls report being bullied by both girls and boys (Boulton & Underwood, 1992; Olweus, 1993; Whitney & Smith, 1993).

Reporting of Bullying to Adults

Despite the high prevalence of bullying in schools and the harm that it may bring to victims, substantial numbers of children indicate that they do not report their victimization to adults at school or their parents. For example, studies of children in England revealed that fewer than one-quarter of children who were bullied at least "sometimes" had reported the incidents to teachers or other school staff (Boulton & Underwood, 1992; Whitney & Smith, 1993). Reporting of bullying incidents appears to be less likely among older than younger children (Whitney & Smith, 1993) and less likely among boys than girls (Rivers & Smith, 1994).

Children's reluctance to report being bullied at school may reflect a lack of confidence in teachers' handling of such incidents. In a survey of high school students in the Midwestern United States, 69% of all students and 66% of children who had been victims of bullying believed that school personnel responded poorly to bullying incidents at school; very few (2% of all students and 6% of victims) felt that school staff handled such problems very well.

Children are somewhat more likely to inform family members than school personnel about being bullied, but a substantial percentage never discuss such incidents with their parents. Boulton and Underwood (1992) found that 42% of children indicated that they had informed a parent about being bullied, and Olweus (1993) noted that 55% of primary school children had notified someone at home.

Location of Bullying

Findings from England and Scandinavia suggest that bullying occurs more frequently on school grounds than on the way to or from school (Olweus, 1993; Rivers &

Smith, 1994; Whitney & Smith, 1993). The most common location for bullying on school grounds tends to be the playground, although bullying also is quite prevalent in classrooms and in hallways (Rivers & Smith, 1994; Whitney & Smith, 1993).

Attitudes About Bullying

Children's propensities to engage in bullying other students likely are reflected in their attitudes toward bullying. Several researchers have examined students' attitudes towards bullies and bullying behavior by asking such questions as, "What do you usually do if you see someone being bullied?" and "Do you think you could join in bullying a student whom you don't like?" Only about half of the students surveyed by Boulton and Underwood (1992) and Whitney and Smith (1994) indicated that they typically tried to help a student who was being bullied. Approximately one-fifth of students responded that they typically do not help "because it's none of my business" (Boulton & Underwood, 1992; Whitney & Smith, 1994). Nearly two-thirds of the 8-11-year-olds surveyed by Whitney and Smith (1994) did not think that they could join in bullying another child, but 16% admitted ed that they might be able to engage in bullying.

Summary

Results from several large-scale studies abroad (primarily in Scandinavia, England, and Canada) have provided insights into the prevalence and nature of bullying among school children in those countries. Although all findings reveal that bullying is a significant problem among school children, the research also reports marked differences in the prevalence of bullying between nations. To date, remarkably little is known about bullying among school children in the United States (but see Hazler, Hoover, & Oliver, 1991; Hoover, Oliver, & Hazler, 1992; Perry et al., 1988). Moreover,

no published research has attempted to assess bullying among American school children using methods similar to those used in large-scales studies abroad (i.e., variations of Olweus' self-report questionnaire). The purpose of this study was to begin to fill in these gaps in our knowledge. An understanding of the prevalence and nature of bullying among school children is critical to the development of effective and appropriate school-based violence prevention interventions.

Method

Participants

Participants were 6,389 4th, 5th, and 6th grade students from six nonmetropolitan school districts in a southeastern state. The sample included 2,037 4th graders (average age 9.7 years), 2,259 5th graders (average age 11.3 years), and 2,069 6th graders (average age 11.8 years). Grade information was missing for 24 students. The gender of participants was evenly split between boys (n = 3,186) and girls (n = 3,187). The number of participants from each district varied from 306 to 2,022.

The school districts are in nonmetropolitan counties that represent primarily poor, under-served regions of the state. In five of the six school districts, the percentage of students receiving free or reduced lunches substantially exceeded the state average (ranging from 60% to 91% of the students compared to a state average of 47%). The percentage of students receiving free or reduced lunches in the sixth school district matched the state average. Additionally, all districts were in counties that ranked in the top 15% in the state for rates of juvenile arrest in 1994 (The base rates were computed using 1990 U.S. Census figures).

Ethnicity of the school districts was predominantly African-American, ranging from 46% to 95% African-American. White students represented from 4% to 53% of the districts' student populations.

Materials

Students completed an English-language version of the Olweus' Questionnaire for Students, which was revised for use with middle school children in the United States (see Olweus, 1995, Appendix). In addition to several demographic questions (including students' age, grade, and school), the questionnaire assessed the frequency and circumstances surrounding being bullied by other students, bullying other students, and bullying teachers. "Bullying" was defined in the survey in following manner:

> We say a student is being bullied when another student or a group of students call him or her bad names. It is also bullying when a student is hit, kicked, threatened, locked inside a room, sent mean notes, and things like that. These things may take place over and over, and it is difficult for the student being bullied to defend himself or herself. It is also bullying when a student is teased over and over in a mean way. But it is not bullying when two students of about the same strength argue or fight.

Questions that addressed the frequency of behaviors related to bullying (e.g., the frequency with which students are bullied, the frequency with which teachers are told about bullying) asked students to indicate how often the behaviors had occurred "since Christmas," approximately 3 months prior to the survey date.

The second half of the questionnaire consisted of 42 questions about antisocial

behaviors and 9 questions about students' ownership and use of weapons[2]. Children were asked to indicate the frequency with which they had engaged in behaviors, such as stealing money or other things from family members, being sent to the principal's office, skipping school, and starting a fight with another student. Students had the options of indicating that they had never engaged in that behavior, that they had engaged in the behavior in the past but not since Christmas, once or twice since Christmas, or three or more times since Christmas.

Procedure

All 4th, 5th, and 6th grade students (N = 6,385) in six school districts were invited to participate in the study. Letters were sent home to parents to inform them about the anonymous student survey and the consent procedures. Parents who did not want their child to participate in the study were asked to notify the school office. No parents asked to exclude their children from the study.

All surveys were conducted within a 10-day period in early March. Teachers administered the survey to their classes during one class period (approximately 40 minutes in length). After instructing students that the survey was both voluntary and anonymous, they read aloud the survey instructions, the definition of "bullying," and each question in turn. Students followed along in their questionnaire booklets and circled the answers that best described their feelings or behaviors.

Results

To aid in our analyses, we used logical clustering to form 12 scales, each

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[2]Data regarding weapon possession are reported separately.

containing two or more items from the Olweus questionnaire. Four scales related to bullying (bullying other children, being bullied by other children, bullying teachers, and having attitudes opposing bulling), and the remaining eight scales pertained to other self-reported antisocial behaviors (theft, vandalism, violence, delinquency, school misbehavior, school sanctions, group delinquency, and substance abuse) (See Table # 1). For all scales, children received scale scores only if they had valid data for at least two-thirds of the items. Reliability coefficients (Chronbach's *a*) were all acceptably high, ranging from .67 to .90.

Insert Table 1 About Here

Prevalence of Bullying Other Children

Nearly one in four children (23.6%) indicated that they had been bullied at least "several times" during the last three months. Of these children, 11% noted that they had been bullied at least once per week, with 7% indicating that they were bullied several times per week by other children.

To examine differences in victimization rates by grade and gender, a 2 x 3 factorial ANOVA was performed using gender and grade as grouping variables, and the score on the victimization scale as the dependent variable. The overall model was significant, F (5,6301) = 6.35, p<.0001. Main effects were observed for grade, F (2,6296) = 11.85, p<.0001, and a marginally significant difference was observed for gender, F (1,6296) = 5.28, p < .05, indicating that younger children reported being bullied more frequently than older children and that girls were slightly more likely than

boys to report being bullied. The interaction between grade and gender was not significant. Tukey's post hoc test indicated that fourth graders reported being bullied significantly more frequently than fifth or sixth graders but that there were no differences between fifth and sixth graders in rates of self-reported victimization.

Insert Figure 1 About Here

Overall, 20.1% of participants admitted to bullying other children "several times" or more frequently within a three month period (since Christmas). Of these students, 9.2% indicated that they had bullied other students at least once per week. To examine differences in self-reported bullying by gender and grade, a 2 x 3 factorial ANOVA was conducted using gender and grade as independent variables and the bullying scale score as the dependent variable. The overall model was significant, F (5,6278) = 19.68, p< .0001. Main effects were observed for grade, F (2,6273) = 6.24, p < .001, and for gender, F (1,6273) = 119.90, p< .0001, indicating that older children report bullying others more frequently than younger children, and boys indicate that they bully others more often than do girls. Tukey's post-hoc test revealed that fourth and fifth graders did not differ in the extent to which they reported bullying other children, but that sixth graders reported bullying other children significantly more frequently than did both fourth and fifth graders (p < .05).

Insert Figure 2 About Here

Bullying of Teachers

Overall, 24.6% of children reported ever having bullied a teacher, and 12.4% reported having bullied a teacher at least several times in the last three months. To examine grade and gender differences in the frequency with which students report bullying teachers, a 2 x 3 factorial ANOVA was performed, using gender and grade as grouping variables and the score on the bullying teacher scale as the dependent variable. The overall model was significant, F (5,6219) = 23.90, $p < .0001$. Main effects were observed for both grade, F (2,6214) = 23.44, $p < .0001$, and gender, F (1,6214) = 67.68, $p < .0001$, such that boys and older children reported bullying teachers more frequently than did girls and younger children. Tukey's post-hoc test revealed that sixth graders reported bullying teachers significantly more frequently than did fourth or fifth graders ($p < .05$). No significant differences were observed in reports of fourth and fifth graders.

Insert Figure 3 About Here

Relationship Between Bullying and Victimization

A correlation was performed to determine the extent to which students who admitted to being bullied by other children also admitted to bullying other children. A small but significant correlation was observed, $r = .10$, $p < .001$, indicating that there are a number of students who identify themselves as both a bully and a victim but a much larger number who identified themselves in one or the other role.

Consistency of Bullying

Two questions asked children to indicate the extent to which they had been bullied or had bullied other children during the previous school term. A strong correlation, $r = .47$, $p < .001$, exists between those students who identified themselves as victims during the fall semester and the spring semester (the 3 months since Christmas). Similarly, a strong relationship also was observed between those students who identified themselves as bullies during the fall and spring semesters, $r = .56$, $p < .001$.

Type of Bullying

Most victims reported being verbally assaulted by their perpetrators (76.9%), but almost one-fourth of all students who had been bullied indicated that they had experienced physical attacks (23.1%). Chi-square analyses revealed that there were significant differences by gender in the type of bullying that students reported, as boys were almost twice as likely as girls to report being physically bullied, $X^2(1) = 66.85$, $p < .0001$. There were no differences in the type of bullying by grade.

Insert Figure 4 About Here

Location of Bullying

Examining a list of possible sites, students were asked to identify all of the locations at school (or on the way to and from school) where they had been bullied. Those students who had been bullied during the last three months reported that bullying

occurred most frequently in class (29.2%), on the playground (25.7%), or on the school bus (21%). Other sites of bullying included hallways/stairwells (17.6%), bathrooms (12.5%), the lunchroom (11.4%), the bus stop (8.0%), in the gym locker room (4.6%), and at the lockers (3.1%). A number of children (12.1%) indicated that bullying occurred outside of school--in their neighborhood.

Insert Figure 5 About Here

Perpetrators of Bullying

Children who had ever been bullied were asked to describe various characteristics of the bullies, such as whether the bully acted alone or in groups, and the age of the bully. Of those who reported ever having been bullied almost one-third reported that their perpetrator was primarily one boy (32.7%); 21.2% noted that they had been bullied by several boys. No grade differences were observed in children's identification of bullies, but significant gender differences emerged, $X^2(4) = 818.38$, $p < .0001$. Boys indicated that they were most frequently bullied by one boy (46.1%) or several boys (32.2%), while girls were most likely to report being bullied by both girls and boys (35.9%), and less frequently by one girl (21.8%) or one boy (20.5%).

Children who reported having been bullied during the last three months were asked to indicate whether their perpetrators were in their own grade, in higher grades, lower grades, or in different grades. Most children reported being bullied by children who were in their own grade (58.5%) or in a higher grade (19.0%); 20% indicated that they had been bullied by children in different grades, and only 2.5% noted that they had

been bullied by children in lower grades. Although no clear age differences in reporting emerged, we observed gender differences in children's reports about their perpetrators, $X^2(3) = 49.0$, $p < .0001$. Significantly more girls than boys indicated that the perpetrator was in their same grade, while more boys than girls reported that the children who bullied them were in higher grades.

Reporting Victimization To Adults

Of those children who reported being bullied, about half (50.4%) indicated that a they had told a teacher or another adult at school about their victimization. In order to investigate gender and grade differences in the frequency with which victims informed a teacher or other adult at school, we performed a 2 X 3 factorial ANOVA, with gender and grade as the independent variables and frequency of reporting as the dependent variable. The overall model was significant, $F(5,3406) = 6.53$, $p < .001$. There were main effects for gender, $F(1,3401) = 8.77$, $p < .005$, and grade, $F(2,3401) = 11.67$, $p < .001$. Girls and younger children were most likely to report being bullied to teachers or other school staff. No gender x grade interactions were significant. Post-hoc analyses (Tukey's) indicated that fourth and fifth graders were significantly more likely than sixth graders to report being bullied ($p < .05$).

Insert Figure 6 About Here

A somewhat higher percentage of students who were bullied (63.7%) reported that they had told one or both parents. We examined gender and grade differences in students' propensities to disclose bullying to their parents. A 2 x 3 factorial ANOVA was

significant, F (5,3454) = 10.26, p < .001. We observed significant main effects for gender, F (1,3449) = 19.49, p < .001, with girls informing parents of their victimization more frequently than did boys. Significant main effects were also observed for grade, F (2,3449) = 15.50, p < .001, with older students showing more reluctance to inform their parents about being bullied. No grade x gender interactions were found. Tukey's post-hoc test indicated that fourth and fifth grade students were more likely than sixth graders to report their victimization to their parents (p < .05).

Insert Figure 7 About Here

Attitudes About Bullying

Several questions assessed students attitudes about bullying. When asked to indicate how they feel when they see a student being bullied, 38.1% noted that it bothered them "a lot," and 26.9% admitted that it bothered them "a little." One-fifth of students (20.9%) reported that it did not bother them. Chi-square analyses revealed significant gender and grade differences, $X^2(2) = 141.79$, $p < .00001$, $X^2(4) = 122.94$, $p < .00001$, respectively. Significantly more girls than boys reported being bothered "a lot" by seeing another student bullied, while more boys than girls indicated that they were not bothered by seeing another child bullied.

When asked what they do when they see another student being bullied, only 35.3% reported that they try to help the student, 26.9% admitted that they don't help but feel that they should, and 37.8% noted that they do nothing because it is none of their business. Chi-square analyses revealed significant gender, $X^2(2) = 63.52$, $p < .00001$,

and grade, $X^2(4) = 104.00$, $p < .00001$, differences. Equal numbers of boys and girls indicated that they would intervene to help the victimized student. Of those students who indicated that they would not intervene, boys were more likely than girls to state that it was none of their business. Girls noted that although they would not intervene, they felt that they should step in. Fewer sixth graders than fourth or fifth graders reported that they would intervene to help a student being bullied.

Nearly one-quarter of students (23.6%) admitted that they thought it was fun at least "once in a while" to make trouble for other students. Chi-square analyses were performed to examine gender and grade differences in students' responses, $X^2(3) = 101.90$, $p < .00001$, and $X^2(6) = 129.78$, $p < .00001$, respectively. More boys than girls felt that it was fun to make trouble for others; more sixth graders than fourth or fifth graders felt that it would be fun to make trouble for other children. Over one-third (33.5%) of children thought that they might be able to join in bullying a student whom they did not like.

A 2 x 3 factorial ANOVA was conducted to examine gender and grade differences in students' scores on the scale of attitudes opposing bullying. The overall model was significant, $F(5,6279) = 82.72$, $p<.0001$. Significant main effects were observed for grade, $F(2,6274) = 129.21$, $p< 0001$, and gender, $F(1,6274) = 143.34$, $p < .0001$. Younger children and girls expressed stronger beliefs opposing bullying than did older children and boys. Tukey's post-hoc test indicated that fourth graders held significantly stronger beliefs against bullying than did fifth or sixth graders, and fifth grade students expressed stronger attitudes against bullying than did sixth graders ($p< .05$). There were no significant interactions between grade and gender.

Prevalence of Antisocial Behaviors

In addition to questions related to bullying behavior, the study also assessed the prevalence of other antisocial behaviors among participants. The most commonly reported school-related antisocial behavior included being sent out of the classroom because of their behavior (31.6% within the past 3 months), saying something mean to another student to frighten him/her (28.1%), starting a fight with another student (26.5%), being sent to the principal's office (26.5%), refusing to follow a teacher's directions (25.1%).

Insert Figure 8 About Here

The most common antisocial behaviors that did not occur in school included fighting at a party (13.4%), torturing animals (12.8%), fighting in a public place (12.7%), getting drunk (11.6%), beating up someone badly (9.1%), and stealing from members of their family (8.7%).

Insert Figure 9 About Here

In order to examine grade and gender differences in self-reports of vandalism, theft, delinquency, delinquent peers, violence, substance abuse, school misbehavior, and school sanctions, we conducted a 2 (gender) x 3 (grade) factorial ANOVA for each scale. In each instance the full model was significant, and main effects for grade and gender were significant, with boys and older children reporting that they had engaged in

more antisocial behavior than younger children and girls (see Table 2). A significant interaction was observed between gender and grade on the substance abuse scale, revealing markedly higher scores for sixth grade boys than sixth grade girls on the scale.

Insert Table 2 and Figure 10 About Here

Tukey post-hoc tests were conducted to further examine the effects of grade on each scale score. For all scales, sixth grade students received significantly higher scale scores than did fourth or fifth grade students ($p < .05$). Additionally, on five of the nine scales (delinquency, school misbehavior, school sanctions, and group delinquency), fifth graders received significantly higher scores than did fourth graders ($p < .05$).

Relationship Between Bullying and Antisocial Behaviors

Controlling for gender and grade, correlation coefficients were calculated to determine the relationship between the various scale scores. As can be observed from table 3, the bully scale and the bullying teachers scale were significantly positively correlated with all antisocial behavior scales, indicating that self-reported bullying behavior is related to self-reports of other antisocial behaviors. The bullying scale was most highly correlated with the school misbehavior scale ($r = .51$), the delinquency scale ($r = .45$), and the group delinquency scale ($r = .40$). The bullying teachers scale was most highly correlated with the school misbehavior scale ($r = .54$), the delinquency scale ($r = .47$), and the group delinquency scale ($r = .40$).

Insert Table 3 About Here

Discussion

The picture that emerges from this large-scale survey of bullying among fourth through sixth graders in non-metropolitan communities in the Southeast is a disturbing one. One in five children admitted bullying schoolmates at least several times during the previous months; nearly 10% of all children reported that they had engaged in frequent bullying of their peers (at least once per week). Moreover, one in four children reported being victimized at least several times during this period, with 9% reporting being frequent victims of bullying (at least once per week). These rates are substantially higher than those observed by Olweus in Scandinavian samples (1991, 1993) but are similar to rates reported by researchers in England (Boulton & Underwood, 1992; Whitney & Smith, 1993) and Canada (Charach et al., 1995).

Consistent with the findings of others (Boulton & Smith, 1994; Boulton & Underwood, 1992; Hazler et al., 1991; Lowenstein, 1978; Olweus, 1991, 1993; Whitney & Smith), boys in our sample were significantly more likely than girls to report bullying their peers, and they were twice as likely as girls to engage in physical means to bully others. These gender differences in self-reported behavior also were reflected in children's attitudes toward bullying. Girls in our study expressed significantly more negative attitudes towards bullying (e.g., feeling distressed when they witnessed bullying, believing that they should try to stop bullying) than did boys.

Girls in our sample were somewhat more likely than boys to be victims of

bullying, although the difference between groups was small. This finding is supported by the results of studies in Scandinavia (Olweus, 1991, 1993) and England (Boulton & Underwood, 1993; Whitney & Smith, 1993) that observed gender differences in rates of victimization, but others (e.g., Charach et al., 1995; Hoover et al., 1992) have failed to find significant gender differences. Consistent with others' observations (Boulton & Underwood, 1992; Olweus, 1991, 1993; Whitney & Smith, 1993), boys in our sample typically were victims of same-sex bullying (either by a single boy or a group of boys), while girls reported that they were bullied both by boys and girls.

Age patterns that emerged from our study indicated that sixth graders were significantly more likely than fourth or fifth graders to admit that they had bullied other students, while fourth graders were more likely than older students to report that they had been bullied. These results are consistent with others' findings from Canada, England, and Scandinavia which suggest that the likelihood of being a victim of bullying decreases with age (Boulton & Underwood, 1992; Charach et al., 1995; Olweus, 1991, 1993; Whitney & Smith, 1993). Our findings lend support to the conclusions of some researchers that bullying tends to peak between the ages of 11 and 12, as children approach adolescence (Boulton & Underwood, 1992; Charach et al., 1995; Whitney & Smith, 1993). Others, however (most notably Olweus, 1991, 1993) have observed steady rates of bullying across age.

Despite the high prevalence of bullying among school children in our sample, substantial percentages of students who had been victimized by their peer admitted that they had not reported incidents to school personnel (approximately half) or their parents (more than one-third). Boys and older children were particularly reluctant to discuss

their victimization with school personnel or their parents.

The high rates of victimization that we observed, and the hesitation of many children to inform adults about these incidents are cause for much concern in light of findings that suggest that children may suffer both short- and long-term negative effects from being bullied by peers. In the short-term, victims of bullying may experience more emotional trauma, scholastic difficulties, and physical ailments than their non-bullied peers. For example, in a study of elementary school children, Williams and colleagues (Williams, Chambers, Logan, & Robinson, 1996) observed that victims of bullying reported signficantly more frequent headaches, stomachaches, and problems with bed-wetting then did other children. Boulton and Smith (1994) found that middle school students who had been bullied by their peers scored significantly lower than their non-bullied peers on several measures of self-esteem. In their sample of midwestern middle- and high-school students, Hoover and colleagues (1992) found that 19% of all boys and 14% of all girls surveyed believed that school bullying negatively affected academic performance. Finally, in a sample of English secondary students, Sharpe (1995) observed that 44% of the students who had been bullied reported irritability and other problems in coping, including anxiety and an inability to concentrate. Several studies also suggest that individuals who have been bullied by their peers as children are at heightened risk of emotional problems in adulthood (Olweus, 1993b; Parker & Asher, 1987). For example, Olweus (1993b) studied 71 males who had been bullied by their peers during secondary school and observed that several years after graduating from high school, these young adults exhibited significantly more symptoms of depression and poor self-esteem than did their non-victimized peers.

Bullying among school children not only affects the direct victims of bullying, but it also may seriously erode the climate of the school as a whole. As Rembolt (1994) and others have suggested, bully/victim violence tends to have a "spreading effect" throughout a school community. Tolerance of bullying by school staff and other students may be perceived by students as permission to act aggressively toward their peers and may contribute to a social climate in which students are fearful and have negative attitudes toward schoolwork and school. To date, little research has been conducted to document the specific effects that bullying has on bystanders and on the school climate as a whole. Olweus (1993a) observed, however, that a school-wide anti-bullying effort not only reduced bullying, but it also resulted in marked improvements in the social climate of classrooms, including improved order and discipline, more positive social relationships, and a more positive attitude toward school.

High rates of bullying among school children not only raise concerns about the harmful effects of bullying on victims and learning environments, but they also heighten concerns about the children themselves who bully their peers. Findings from our survey lend support to others' conclusions that bullying is not an isolated behavior but rather is related to a constellation of other antisocial behaviors. In our study, we observed that self-reported bullying (both of peers and teachers) was highly positively correlated with self-reported antisocial behaviors, including misbehavior at school, delinquent behaviors, and group delinquency, as well as receiving sanctions for misbehavior at school. Olweus (1993b) also found that children who bullied their peers were several times more likely than their peers to engage in antisocial acts (such as vandalism, fighting, theft, drunkenness, and truancy). Similarly, Byrne (1994) observed

that those students who perpetrated acts of bullying attended school less often and were more likely to drop out of school than were other students.

More disturbingly, several studies point to a link between bullying behavior among children and antisocial behavior in adulthood. A study of more than 500 children revealed that aggressive behavior at age eight was a powerful predictor of criminality and violent behavior by the age of 30 (Eron, Husemann, Dubow, Romanoff, & Yarmel, 1987). Similarly, Olweus (1993b) observed that individuals who bullied others as children were significantly more likely than their peers to have been arrested by early adulthood.

In sum, the small but growing research literature about bullying among school children paints a disturbing picture of the high prevalence and harmful consequences of bullying. Findings from this large-scale study of fourth through sixth grade students in nonmetropoligan and rural communities in the southeast add significantly to our understanding of the nature and prevalence of bullying among students in the United States. Additional studies are needed, however, to better understand the nature and prevalence of bullying among other age groups of children in the U.S., further examine the effects that such behavior has on victims and bystanders, and specify the linkages between bullying behavior and other antisocial behaviors among different age groups of American children.

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Table 1. Summary of scales from the Questionnaire for Students

Scales and Scale Descriptions	Number of Items	Chronbach's alpha
Bully Victimization: Being bullied by others at school or while going to school	4	.78
Bullying: Bullying others at school or while going to school	4	.85
Opposing Bullying: Attitudes opposing bullying	5	.68
Bullying Teachers: Student bullying of teachers	2	.83
Theft: Stealing of property or money	8	.81
Vandalism: Destruction of public or private property	3	.72
Violence: Fighting, hurting others, or using a weapon	4	.69
Delinquency: A total global delinquency scale including items from previous three scales and two additional items	22	.90
Substance Abuse: Substance use/abuse	5	.79
School Misbehavior: Student misbehavior at school	8	.81
School Sanctions: Sanctions for misbehavior at school	4	.74

Group Delinquency: Associating with gangs or groups who commit delinquent acts	4	.70

Table 2. Analyses of variance of antisocial behavior scales

Scale	Full Model	Grade	Gender	Grade x Gender
Theft	F(5,6298) = 38.88**	F(2,6293) = 11.14**	F(1,6293) = 165.65**	F(2,6293) = 1.92
Vandalism	F(5,6298) = 36.87**	F(2,6298) = 18.78**	F(1,6298) = 139.06**	F(2,6298) = 2.19
Violence	F(5,6258) = 33.97**	F(2,6258) = 4.16*	F(1,6258) = 154.27**	F(2,6258) = 1.84
Subst.Abuse	F(5,6269) = 68.73**	F(2,6269) = 78.60**	F(1,6269) = 166.44**	F(2,6269) = 8.67**
Delinquency	F(5,6291) = 74.98**	F(2,6291) = 52.06**	F(1,6291) = 259.39**	F(2,6291) = 2.68
SchMisbeh.	F(5,6294) = 46.69**	F(2,6294) = 54.41**	F(1,6294) = 114.82**	F(2,6294) = 2.58
SchSanctions	F(5,6295) = 98.32**	F(2,6295) = 68.24**	F(1,6295) = 345.34**	F(2,6295) = .66

* $p < .05$
** $p < .001$

Table 3. Correlations between bullying and antisocial behavior scales

	Theft	Vandalism	Violence	Delinq.	School Misbehav.	School Sanctions
Bullying Other Students	.331	.330	.347	.330	.447	.510
Bullying Teachers	.344	.386	.361	.365	.470	.538

All correlations significant at $p < .001$

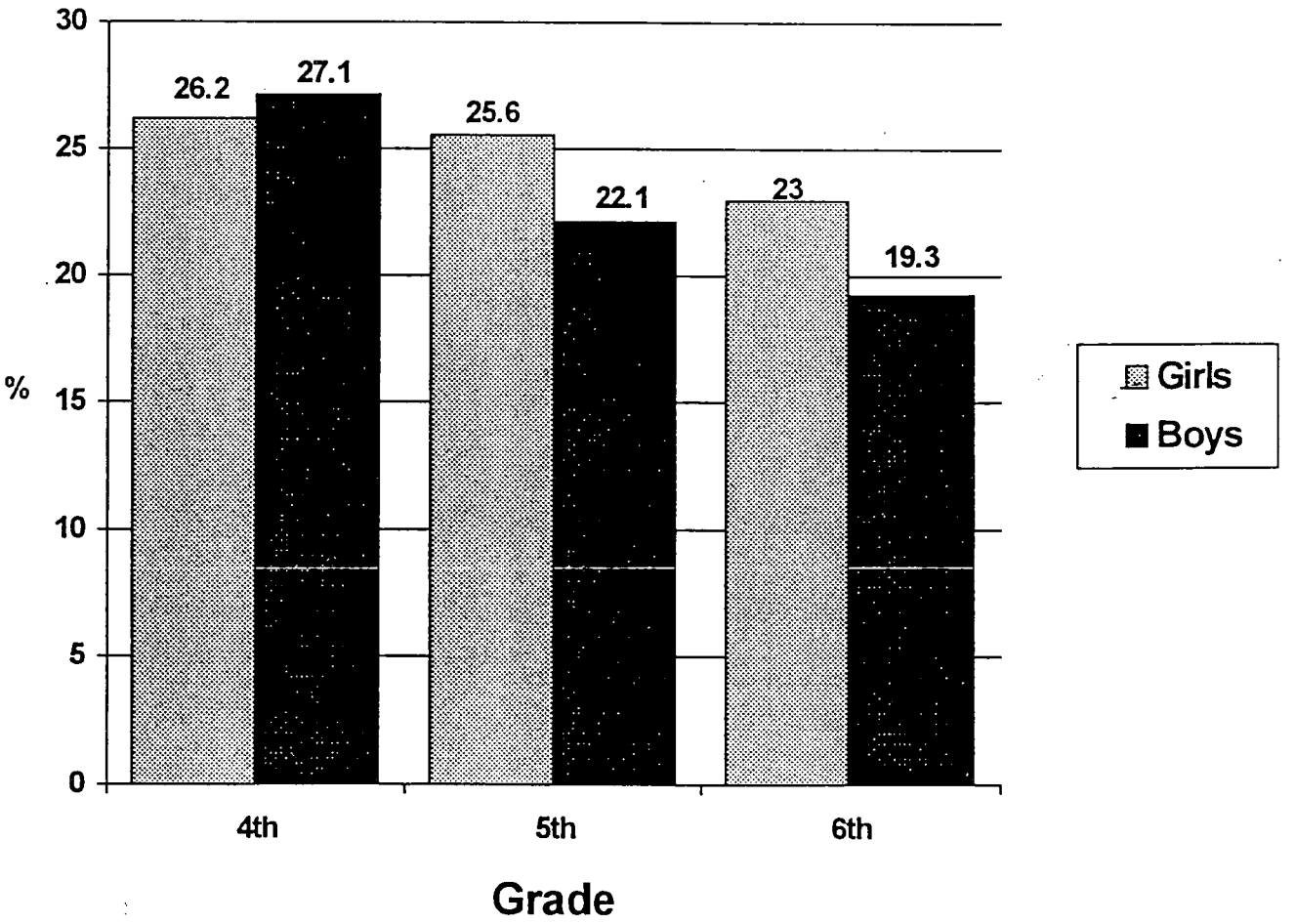

Figure 1. Percentage of students who were bullied since Christmas

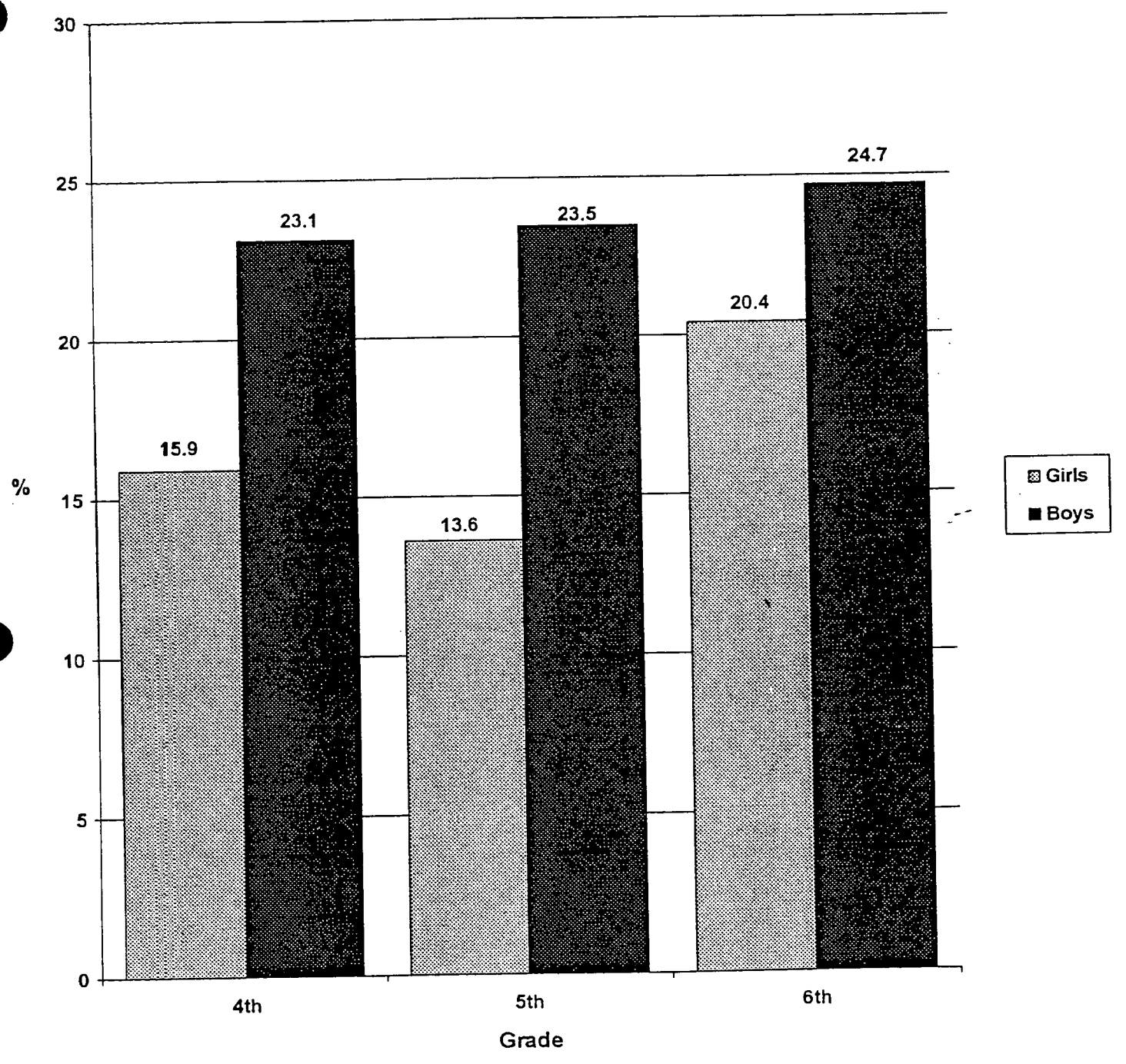

Figure 2. Percentage of students who bullied others since Christmas

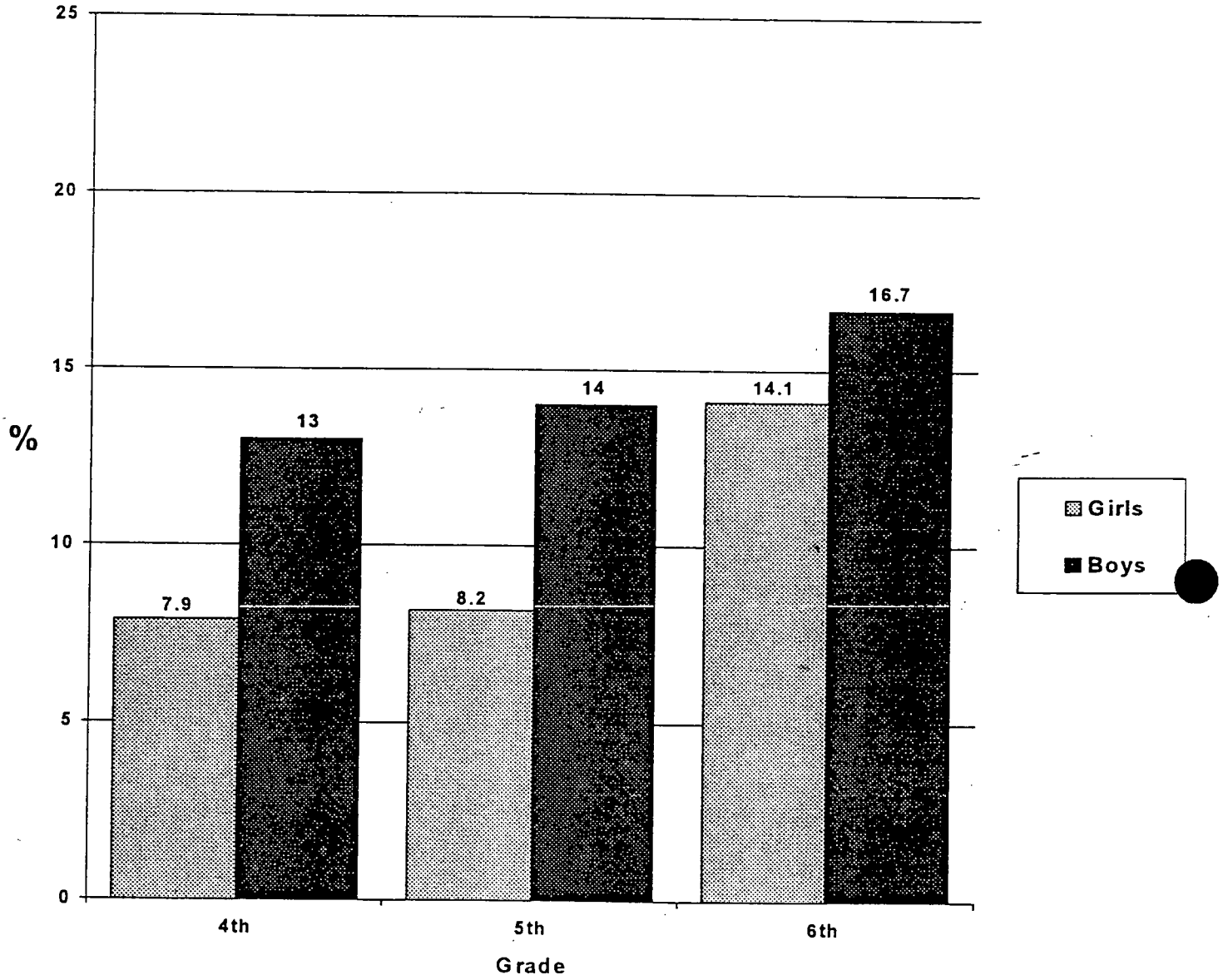

Figure 3. Percentage of student who bullied teachers since Christmas

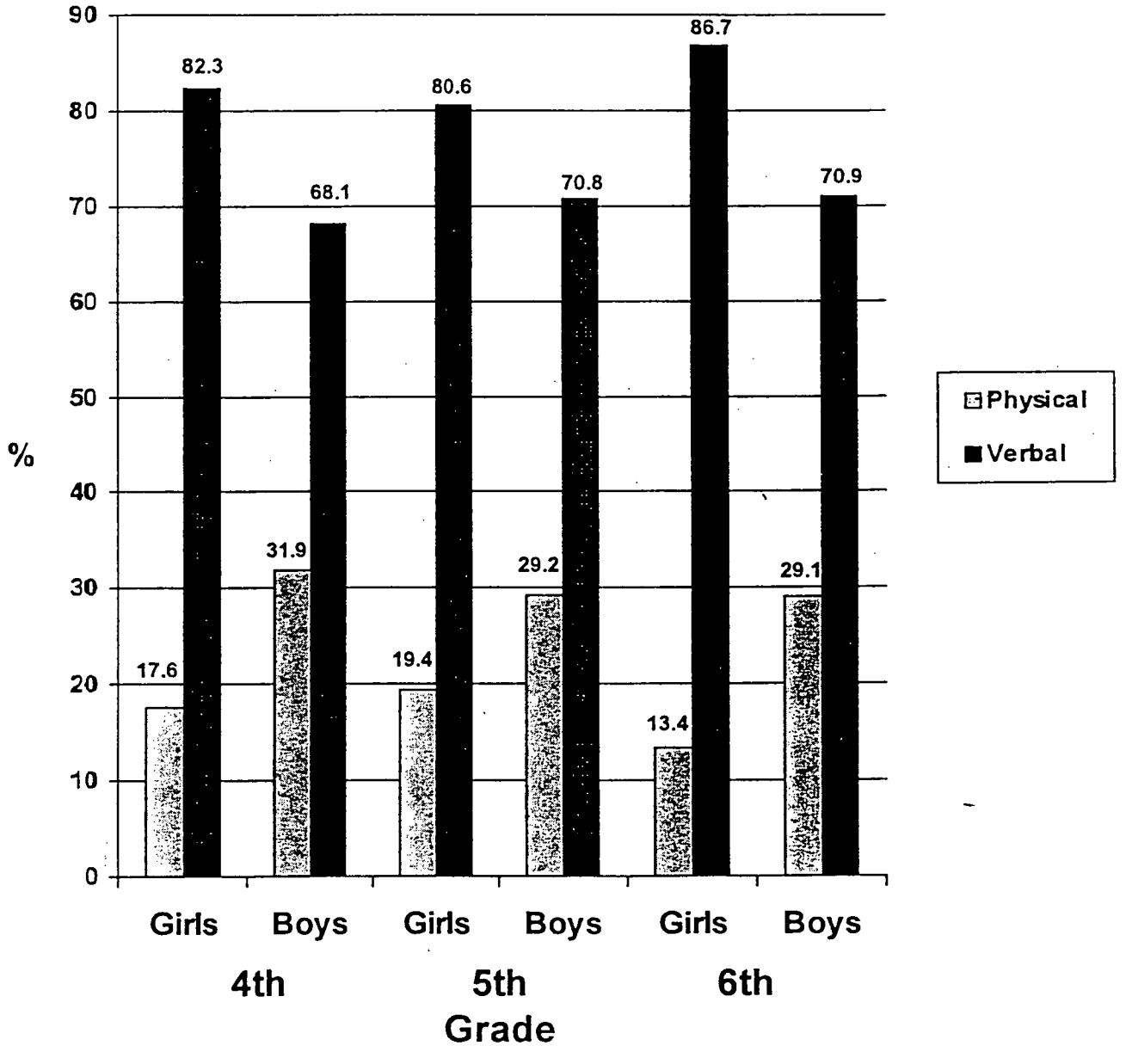

Figure 4. Type of bullying

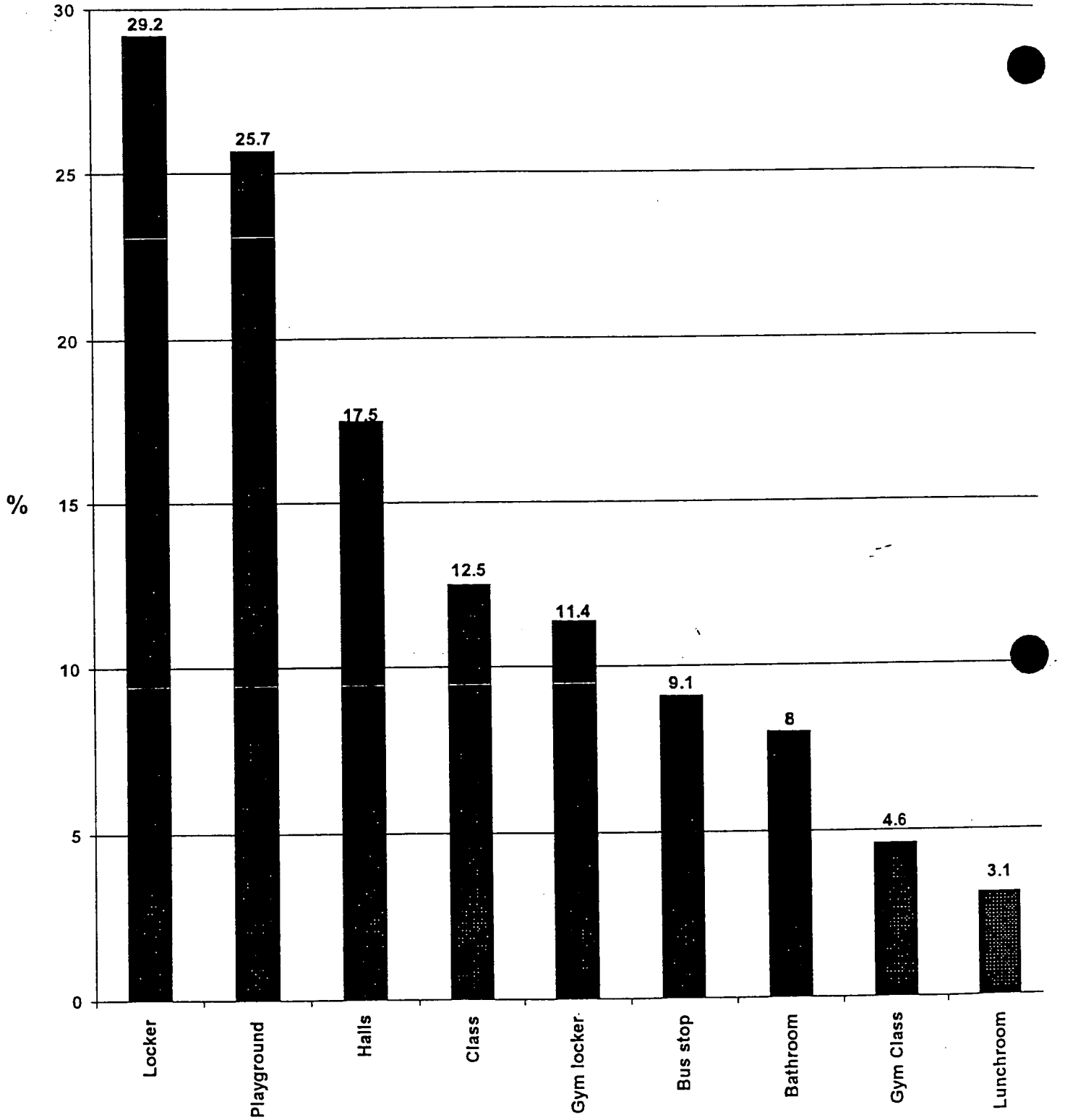

Figure 5. Location of bullying

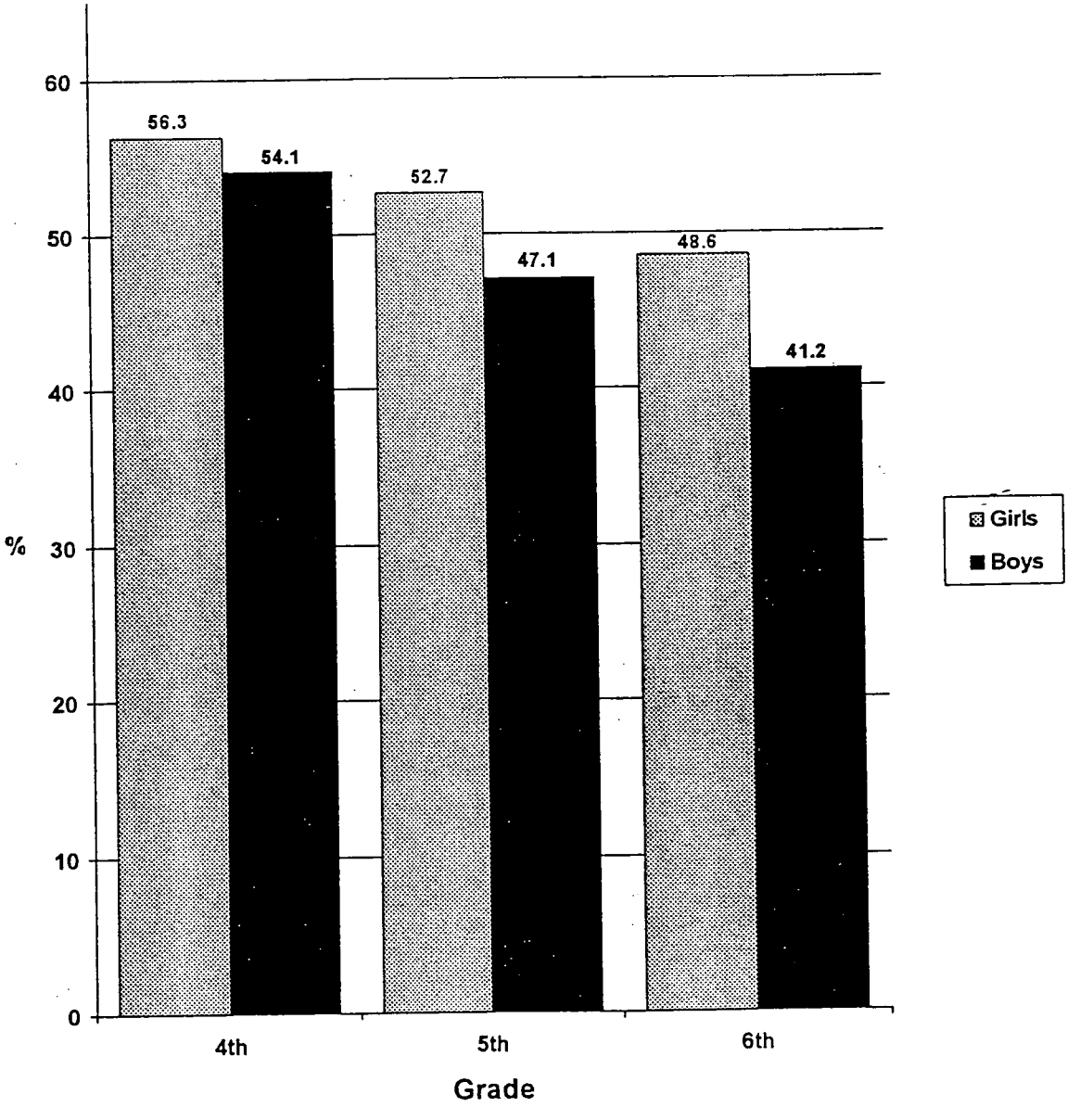

Figure 6. Percentage of students who reported being bullied to teachers or other school staff

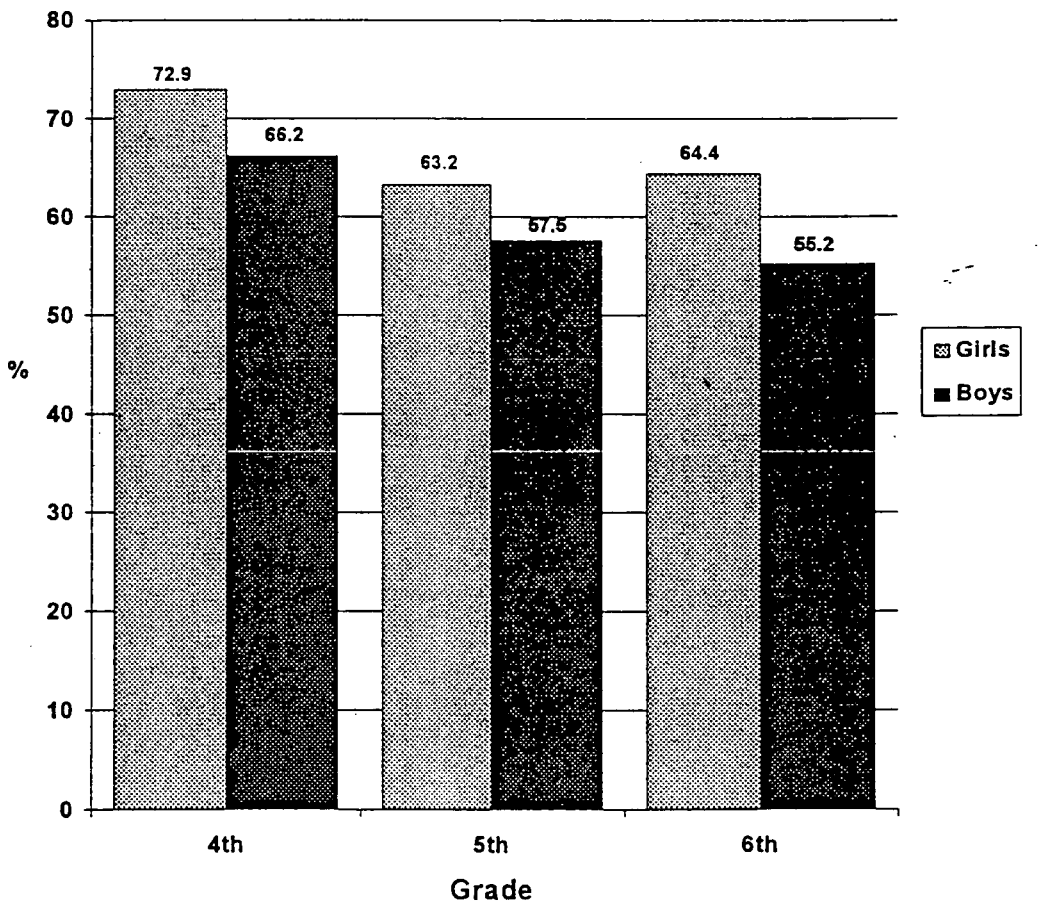

Figure 7. Percentage of students who reported being bullied to parents

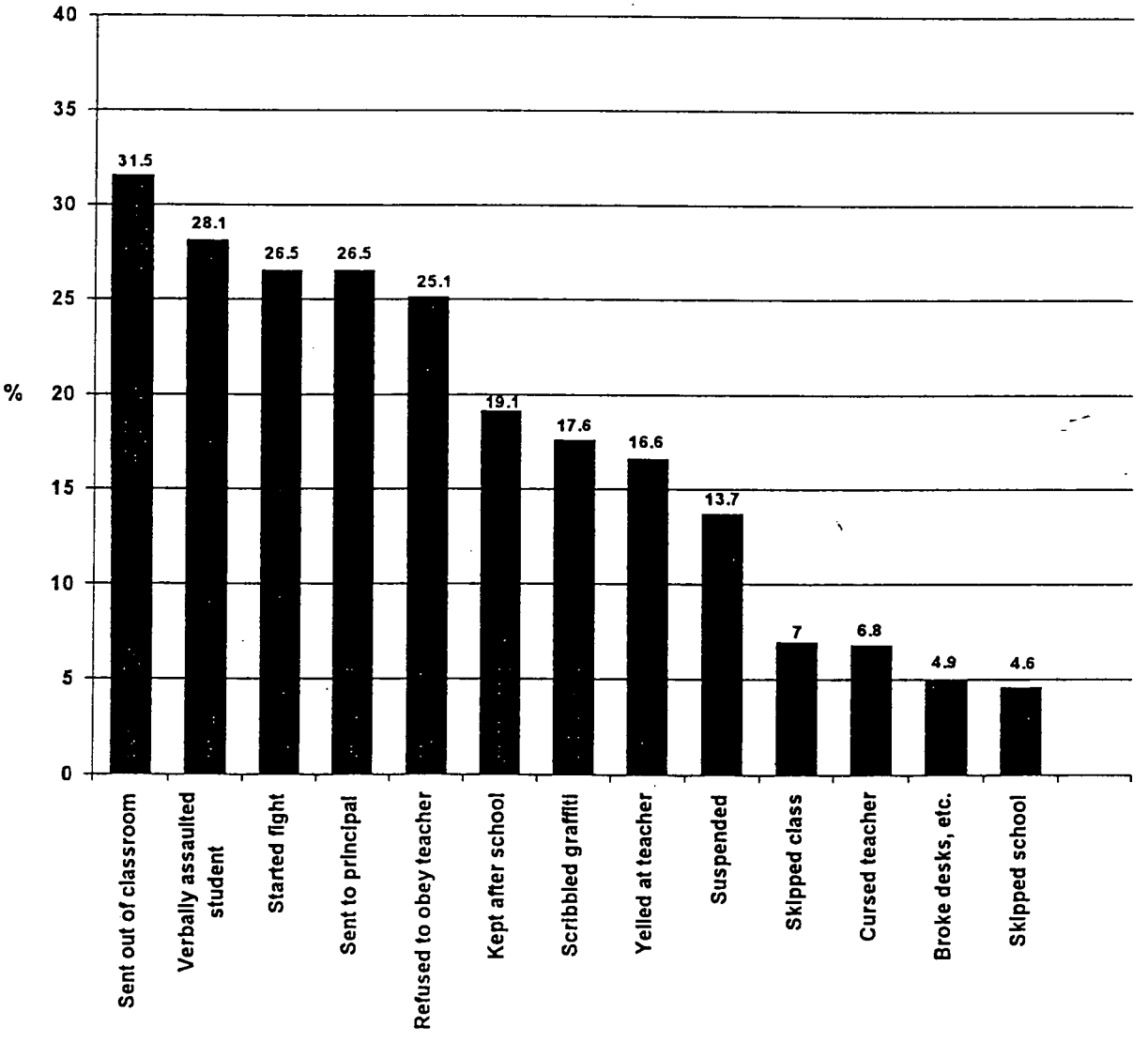

Figure 8. Prevalence of school-related antisocial behavior

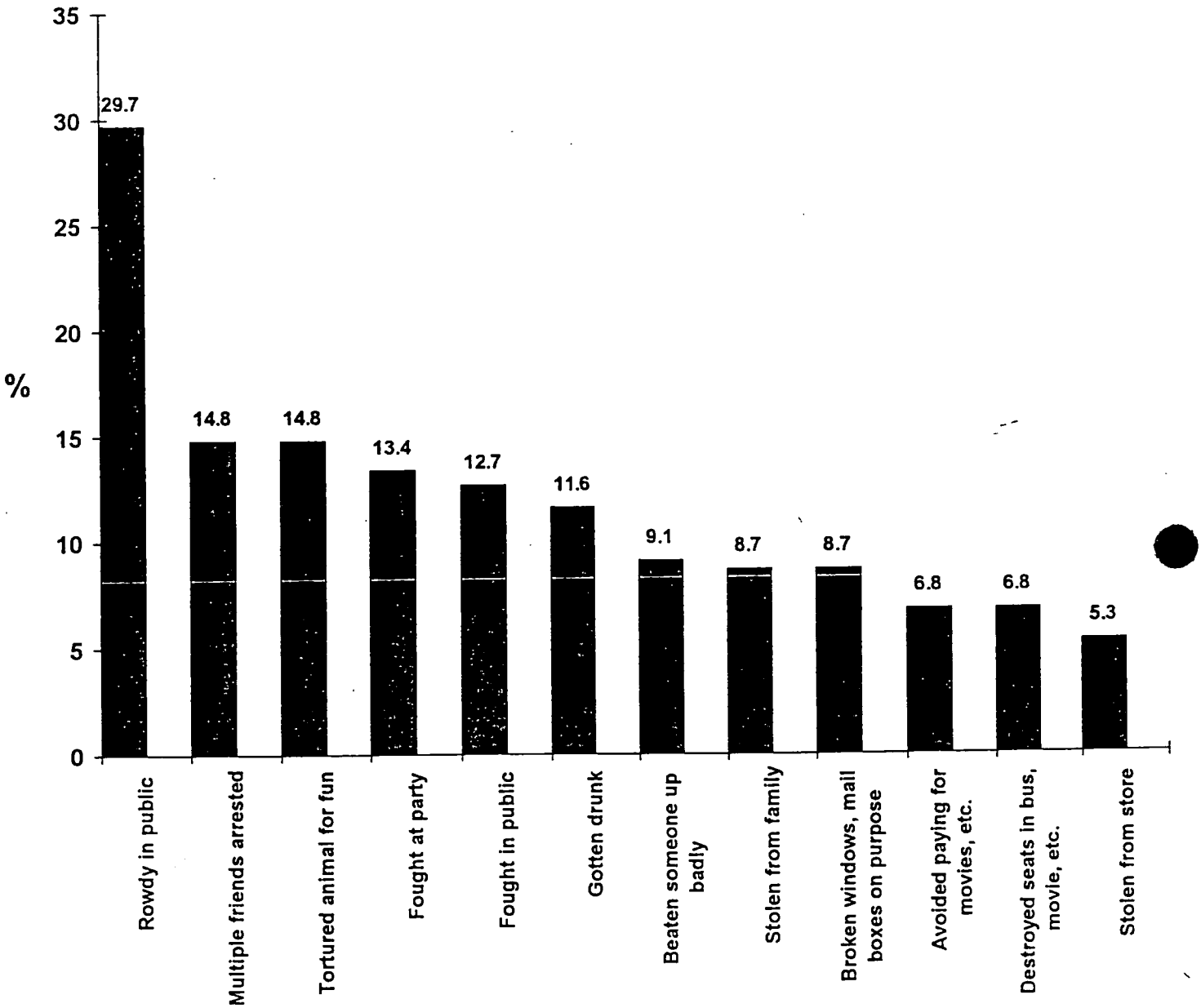

Figure 9. Prevalence of non-school related antisocial behavior

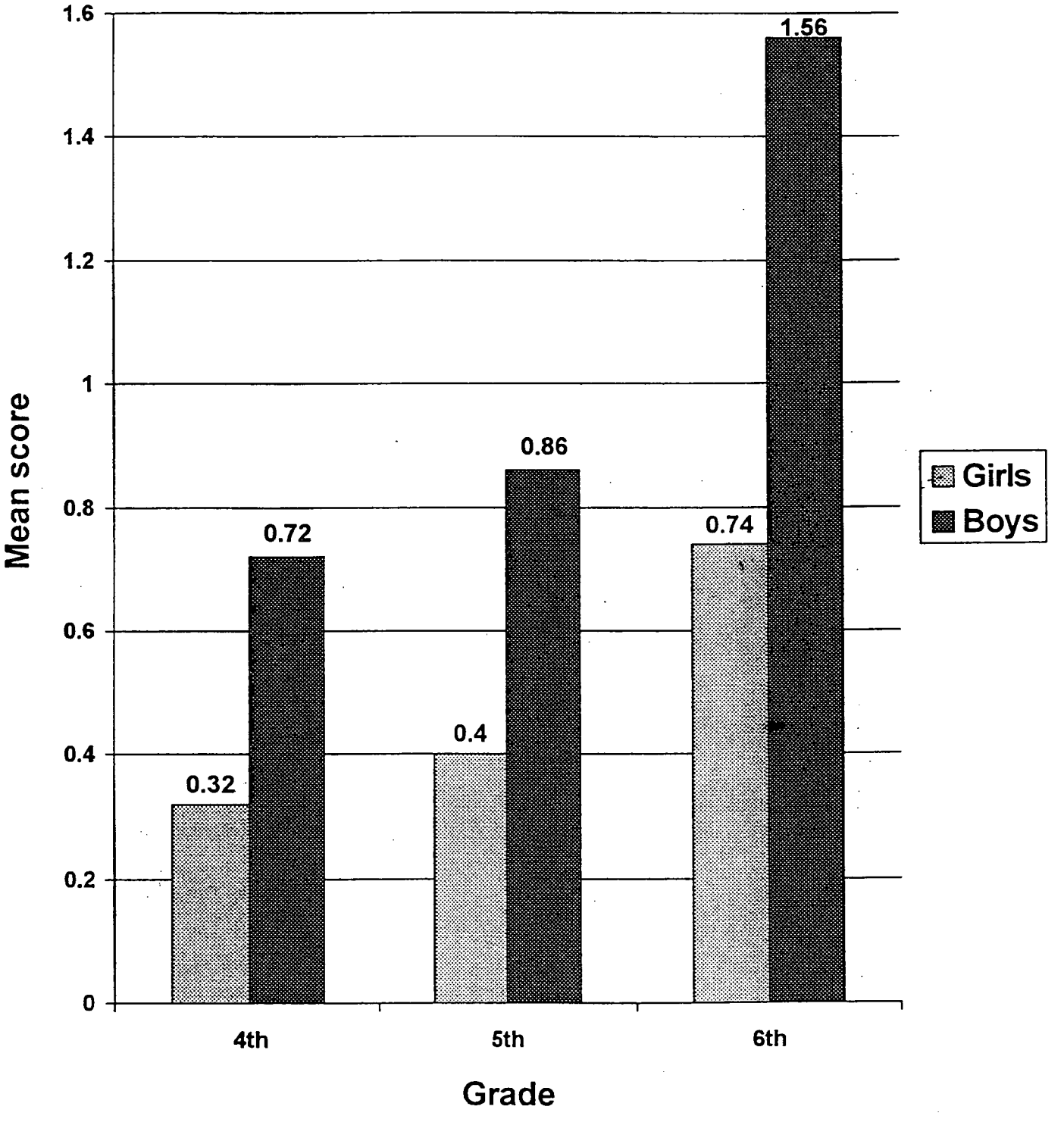

Figure 10. Mean scores on substance abuse scale

Patterns and Correlates of Gun Ownership Among Nonmetropolitan Middle School Students

Firearms, particularly handguns, have become major risk factors in the incidence of adolescent suicide and homicide (Mercy, Rosenberg, Powell, Broome, & Roper, 1993). For example, firearms are the most common method of adolescent suicide (Boyd & Moscicki, 1986; Brent, Perper, & Allman, 1987; Brent, Perper, Allman, Moritz, Wartella, & Zelenak, 1991; Brent et al., 1988; Koop & Lundberg, 1992), accounting for more than 50% of reported adolescent suicides across studies (Centers for Disease Control, 1995). Moreover, the rise of youth firearm-related violence has emerged as a major public health problem (Berkowitz, 1994; Koop & Lundberg, 1992). During the 1980s, for example, homicide became the second leading cause of death for all males aged 15-24 years and the leading cause of death for African-American males and females (Anderson, Kochanek, & Murphy, 1997), with firearms accounting for 44% of these deaths (Centers for Disease Control, 1995). Similarly, figures from 1990 indicated that 82% of murder victims aged 15 to 19 years were killed with guns (Roth, 1994).

As one might expect from the established linkages between firearms and adolescent suicide and homicide, guns are readily available to America's youth. For example, Callahan and Rivara (1992) found that among eleventh graders in Seattle, 6.4% reported owning a handgun and 34% reported having easy access to a handgun. Similarly, Shapiro and colleagues (Shapiro, Dorman, Welker, & Clough, 1998) found that 5% of a sample of third, fifth, sixth, seventh, ninth, eleventh, and twelfth graders in metropolitan Cleveland (6% of students in sixth through twelfth grades) currently own

their own gun.

Significantly higher rates of gun ownership and possession have been found in other studies. For example, in a study of inner-city male high school students in California, Illinois, Louisiana, and New Jersey, 22% of the respondents reported owning a gun, 35% carried guns at least occasionally (12% reported carrying a gun "all" or "most of the time"), 53% reported that they could borrow a gun from a family member if they wanted to, and 37% reported that they could easily get a gun on the street if they so desired (Sheley & Wright, 1993). A recent national survey conducted by the New York Times and CBS News (1998) revealed that 15% of 13- to 17-year-olds (and 19% of youth residing in the South) reported that they owned a gun (Goldstein & Cõnnelly, 1998).

Not only are firearms readily available to children and youth, but they are carried to school with disturbing frequency. For example, among the inner-city high school boys surveyed by Sheley and Wright (1993), 9% reported carrying a gun to school at least "now and then;" 3% of these youth admitted that they carried a gun to school "all" or "most of the time." Four percent of the 11th graders surveyed by Callahan and Rivara (1992) in urban Seattle reported that they had ever carried a gun to school. In a survey of 859 tenth, eleventh, and twelfth graders in a small, urban Midwestern city (with a population of less than 250,000), 2.6% of students reported carrying a handgun to school during the 1991-1992 school year (Asmussen, 1992). A summary report from the Office of Juvenile Justice and Delinquency Prevention indicates that in 1995, one in ten high school students in 1995 had carried a weapon (including guns) to school in the past 30 days (U.S. Department of Justice, 1997). Consistent with these findings,

Kachur et al. (Kachur, Stennies, Powell, Modzeleski, Stephens, Murphy, Kresnow, Sleet, & Lowry, 1996) reported that firearms were responsible for more than 77% of the 105 school-associated violent deaths that occurred between 1992 and 1994.

In light of the high prevalence of firearm ownership and use among youth, and high rates of firearm-related violence, it is important to understand youths' patterns of firearm ownership and use. Although data are limited, available evidence from urban samples suggests that both adults' and adolescents' reasons for owning guns are significantly related to their involvement in antisocial and/or criminal behaviors (Lizotte & Bordua, 1980; Lizotte, Tesoriero, Thornberry, & Krohn, 1994). Lizotte and Bordua (1980) identified two groups of adult firearm owners, low-risk and high-risk owners. The low-risk group owned guns legally for protection and sport (e.g., target shooting, hunting) and posed no serious criminal threat, whereas high-risk owners used guns for criminal activity and posed a substantial criminal threat. Using data from the Rochester Youth Development Study, Lizotte et al. (1994) found a similar pattern of low-risk vs. high-risk gun ownership among urban adolescents. Low-risk adolescent gun owners were often influenced by parents who owned guns for recreational purposes and, consequently, were more likely to own guns for sport. In addition, low-risk adolescent gun owners were more likely to own long guns (e.g., rifles), less likely to engage in criminal behavior, and less likely to carry guns regularly than high-risk counterparts. On the other hand, high-risk adolescent gun owners were more likely to own guns for protection, associate with peers who owned guns for protection, own handguns and sawed-off long guns, use guns in an assortment of dangerous illegal activities (e.g., using or selling drugs, gang involvement, minor and street crimes), and carry guns

regularly.

Such linkages between adolescent gun ownership and deviant behavior have been observed consistently. In a school-based sample, Callahan and Rivara (1992) found that adolescent gun owners reported higher rates than non-owners of several deviant behaviors, including gang membership, expulsions and suspensions from school, court involvement, selling drugs, and assault and battery. Similarly, Sheley and Wright (1993a) reported that youth attending inner-city high schools who owned guns reported higher rates of deviant behaviors, particularly selling drugs, than did non-owners. Among samples of adolescents who have been engaged in criminal activity, the rates of gun ownership are exceedingly high. Sheley and Wright (1993b) found that 55% of juveniles incarcerated in a maximum security institution reported that they had carried guns routinely and that their primary reason for gun ownership was the belief that the gun was needed for protection. In sum, although the number of studies are limited, evidence consistently suggests that inner-city adolescents who engage in high rates of antisocial behavior are the most likely to own and carry guns regularly.

The primary purpose of the present study was to expand the knowledge base regarding the patterns and correlates of gun ownership among a nonmetropolitan sample of youth. To date, the literature has focused almost exclusively on urban samples, and researchers have yet to establish if findings are generalizable to nonmetropolitan and rural settings. The high prevalence of hunting in rural communities may indicate that the previously observed relationship between gun ownership and antisocial behavior do not apply in such communities. Although a focus on youth violence in urban settings is understandable given the high rates of violent crime among

urban youth, violence has become increasingly common in rural communities. For example, Kingery, Mirzaee, Pruitt, and Hurley (1990) reported that many rural schools have violence problems greater than the national average.

A specific focus of the present study was to examine the linkages among gun ownership, *bullying behavior*, and other forms of antisocial behavior. Although we are aware of no studies that have examined the relationship between gun possession and bullying behavior, research has shown that bullying behavior is a component of antisocial, rule-breaking behavior pattern and is an early developmental marker for serious antisocial behavior (Olweus, 1993). Children who bully their peers engage in power displays, interpersonal dominance tactics, hostility toward their environment, and instrumental aggression (e.g., coercing victims to give them money and valuables). Moreover, this aggressive behavior is highly stable over time (Boulton & Smith, 1994; Olweus, 1994; Patterson, Littman, & Bricker, 1967). Olweus (1993) observed that youth who had engaged in bullying behavior in grades 6-9 were significantly more likely than their non-bullying peers to have at least one criminal conviction by age 24. In light of the high rates of antisocial behavior presented by youth who bully their peers, we hypothesized that such youth also are more likely than their peers to be "high-risk" gun owners (e.g., to own guns for reasons other than sport). Thus, the aims of the present study are to assesses rates and rationales for gun ownership; examine the relationship among bullying, other antisocial behaviors and gun ownership; and identify correlates of high-risk gun ownership among a sample of nonmetropolitan school children.

Method

Participants

The sample included 6,263 students from 36 elementary and middle schools serving six nonmetropolitan school districts in a southeastern state that were participating in a 3-year study examining the effectiveness of a school-based violence prevention program. All fifth, sixth, and seventh grade students attending school on the day of the survey were asked to participate in the study. For students attending school that day, the missing data rate was 1.9%, leaving ns of 2,071, 2,065, and 2,005 for the fifth, sixth, and seventh grades, respectively. Age and gender were the only demographic characteristics assessed on the survey. Students ranged in age from 9 to 16 years (M = 11.8 years, SD = 1.13 years) and were equally distributed across gender (3,123 females, 3,127 males, 13 missing).

Neither racial nor socioeconomic data were obtained directly from participants. However, examination of district-wide aggregate data indicate that the racial composition of the sample was predominantly African American. Percentages of African American students in school districts ranged from 46% to 95% African American; white students represented between 4% and 53% of the districts' student populations. The percentage of students receiving free or reduced lunches substantially exceeded the state average of 47% (ranging from 60% to 91% of all students).

Instruments

Students completed a version of Olweus' Questionnaire for Students (QFS) (1995; see Appendix), which was modified for use among American middle school

children. This self-report instrument is comprised of two parts. Part A includes 33 questions about being bullied, bullying others, bullying teachers, and students' attitudes toward bullying. Questions that addressed the frequency of behaviors related to bullying (e.g., the frequency with which students are bullied, the frequency with which teachers are told about bullying) asked students to indicate how often the behaviors had occurred "since Christmas," approximately 3 months prior to the survey date.

Part B of the survey included 54 questions that assessed self-reported participation in antisocial activities within and outside of the school, and the use and availability of weapons. For the purposes of the present analyses, questions were logically grouped into 12 different scales, including social isolation, bully victimization, bullying, student attitudes against bullying, bullying teachers, theft, vandalism, violence, substance abuse, school misbehavior, school sanctions, and group delinquency. (For a more detailed description of each scale, see the discussion in the previous section of this report.) A description of each scale, number of items comprising the scale, and its Cronbach's *a* are presented in Table 2. All scales exhibited acceptable internal consistency (i.e., $a > .60$).

Insert Table 1 About Here

Procedures

This study took place during the spring of 1996, and is based on survey data collected as part of an evaluation of a school-based violence prevention program. At the time of the survey, students in three of the six school districts had experienced six

months of the violence prevention project; students in the remaining three districts had not begun the project. Baseline data collected prior to the start of the program were not used in the present analysis because several subsequent modifications were made to the survey instrument (i.e., changes were made to several to questions that assessed patterns of firearm ownership). We do not anticipate that the existence of the anti-bullying program in three school districts had any affect on students' reports of patterns of firearm ownership.

Parents were informed prior to the administration of the survey via written and verbal descriptions of the project (e.g., letters sent home, announcements at PTA meetings, church announcements). Parents who did not want their child to participate in the study were asked to notify the school office. No parents asked to exclude their children from the study.

Surveys were completed in classroom settings within a 10-day period in early March 1996. After instructing students that the survey was both voluntary and anonymous, teachers read aloud the survey instructions, the definition of "bullying," and each question in turn. Students followed along in survey booklets and circled answers that best described their attitudes and behaviors.

Results

Prevalence of Gun Ownership

Data from these nonmetropolitan fifth-, sixth-, and seventh-grade students paint a disquieting picture of the availability of guns. Over 46% (n = 2,919) of the students reported owning a total of 3,594 guns (see Table 2). Of these gun owners, 80.9% (n = 2,361) owned one type of gun, 15.4% (n = 450) owned two types, 3.4% (n = 99) owned

three types, and 0.3% (n = 9) owned four types. Nearly 30% (29.6%) of students owned pellet or BB guns (accounting for 1,851 pellet or BB guns in all), 14.4% owned rifles (accounting for a total of 904 rifles), 9.0% owned pistols or handguns (565 guns in all), and 4.4% owned other types of guns (accounting for 274 guns).

Insert Table 2 About Here

Gun Ownership and Use Among Youth

Of those students owning guns, 21.2% (n = 619) reported that the primary reason they owned the gun was for target shooting, 44.1% (n = 1,287) for hunting, 12.4% (n = 362) for safety, 3.2% (n = 95) for respect, 3.5% (n = 103) for inducing fear in others, and 5.9% (n = 174) for other miscellaneous reasons (see Table 3). More than 80% (n = 2,418) of these nonmetropolitan middle school gun owners reported having carried guns outside of their home, with 17.1% (n = 498) having done so within the past three months. Over 39% of student gun owners (n = 1,157) reported that they obtained their first gun as a gift from their parents, 22% (n = 654) indicated that they obtained their first gun from a gun store, and 11% (n = 339) noted that their first gun was a gift from a friend or relative. Of considerable concern, 11.3% (n = 330) of the adolescent gun owners reported having used a gun to frighten others, and 5.5% (n = 160) reported ever having carried a gun to school.

Insert Table 3 About Here

Gun Ownership by Family and Friends

Data on family and peer gun ownership suggest that these nonmetropolitan middle school students reside in a culture where guns are prevalent. More than 70% (n = 4,231) of the students in the total sample reported that someone in their home owned a gun. According to students, the most frequent reasons for someone at home owning a gun (see Table 4) were for hunting (39%), for personal protection (36%), for target shooting (16%), for their jobs (5%), and for respect (3%). More than 50% of the youths (n = 3,177) also reported that at least one of their friends owned a gun. The most frequently endorsed reasons students gave for their friends owning guns paralleled those of family members, namely hunting (35%), personal protection (20%), and target shooting (19%). In addition, 14% of the students (n = 447) reported that at least one of their gun-owning friends owned a gun to get respect, and more than 10% of the students (n = 650) reported that at least one of their friends had carried a gun to school.

Insert Table 4 About Here

Reasons for Gun Ownership

Discriminant analysis was used to determine the factors associated with gun ownership. Student gun owners were categorized according to their reasons for gun ownership, with students who owned guns for hunting and target shooting grouped into a sport ownership category. Thus, four student gun ownership groups (the "other" category was not included in these analyses) were identified, ownership for sport use: for protection (i.e., "to feel safe"), for respect, and for instilling fear in others. Predictor

variables included the set of 12 scales: social isolation, bully victimization, bullying, opposing bullying, bullying teachers, theft, vandalism, violence, substance abuse, school misbehavior, school sanctions, and group delinquency (see Table 1 for a description of each scale).

Insert Table 5 About Here

Two significant discriminant functions were observed (see Table 5). The first function accounted for 24.2% of the variance and primarily contrasted students who own guns to gain respect or frighten others from students who own guns for protection, from students who own guns for sport. Nonmetropolitan students who owned guns to gain respect or to frighten others were more likely than sport or protection owners to engage in antisocial behaviors including bullying others, bullying teachers, theft, vandalism, violence, substance abuse, and school misbehavior. Students who owned guns to get respect or frighten others were also more likely to have received school sanctions for school misbehavior and to associate with deviant peers than were students who owned guns for sport or protection. Similarly, students who owned guns for sporting purposes exhibited even lower scores on measures of antisocial behavior and bullying than did students who owned guns for protection.

The second discriminant function contributed only 1.5% of additional variance. Although little variation was evident among student gun owner groups on the second function (see Table 6), the results suggest that students who own guns for protection are slightly more likely to be involved with group delinquency than are counterparts in

the other ownership groups. In addition, students who own guns for protection seem to endorse attitudes opposing bullying, scored low on social isolation, vandalism, and substance abuse.

Gun Ownership and Antisocial Behavior

To examine further the relationship between gun ownership and adolescent antisocial behavior, students were classified into three risk groups: "no-risk" (i.e., students who did not own guns), "low-risk" (i.e., gun ownership for sport or protection), and "high-risk" (i.e., gun ownership to gain respect or to frighten others). Sporting and protection rationales for gun ownership were combined because the variance explaining the difference between the two was less than 1%. One-way analyses of variance (ANCOVAs), controlling for gender, were conducted on the nine scales associated with antisocial behavior in the discriminate analysis (i.e., bullying, bullying teachers, theft, violence, substance use, school misbehavior, school sanctions, vandalism, group delinquency).

Analyses (see Table 6) revealed a consistent set of findings. For all comparisons, youths in the no-risk group reported significantly less antisocial behavior than counterparts in the low-risk and high-risk groups, and youths in the low-risk group reported less antisocial behavior than counterparts in the high-risk group. In addition, although low-risk adolescent gun owners reported more antisocial behavior than adolescents who did not own guns, mean scores for low-risk adolescent gun owners were much closer to those of the no-risk adolescents than to those of the high-risk gun owners. In other words, high-risk gun owners reported much higher rates of antisocial behavior than did youths in either of the other groups.

Insert Table 6 about here

Predictors of High-Risk vs. Low-Risk Gun Ownership

Logistic regression analyses were used to identify key factors associated with the "high-risk" group of gun owners vs. the "low-risk" gun owners. Logistic regression allows for analysis of dichotomous variables while accommodating multiple covariates (Walker, 1997). Given the role of high-risk family gun ownership (i.e., to get respect) and high-risk peer gun ownership (i.e., to get respect) identified in other studies, students' ratings of reasons for family and peer gun ownership were also dichotomized into high-risk or low-risk gun ownership groups. Thus, the dependent variable in the regression analysis was high-risk vs. low-risk adolescent gun ownership and the independent variables were high-risk family gun ownership, high-risk peer gun ownership, respondent grade and gender, and the 12 subscales.

As presented in Table 7, the logistic regression indicated that five variables were key and unique predictors of high-risk gun ownership among youths who owned guns. These variables included family high-risk gun ownership, peer high-risk gun ownership, gender (male), bullying teachers, and substance abuse. Examination of the odds ratios showed that peer high-risk gun ownership increased the probability of high-risk gun ownership almost six-fold, and that family high-risk gun ownership increased the probability of high-risk gun ownership among these nonmetropolitan middle school students almost five-fold. In addition, male gender increased the probability of high-risk gun ownership by 81%, and problems with substance use and bullying teachers

provided small but statistically significant increases in the probability of high-risk adolescent gun ownership.

Insert Table 7 about here

Bullying and Gun Ownership

As noted previously, bullies are likely to be high risk gun owners because of their high levels of antisocial behavior and the established linkage between antisocial behavior and gun ownership. To examine this hypothesis, students were divided into three bullying categories based on their scores on the 4-item Bullying scale. Forty-six percent of the students reported no bullying behavior in the recent past and were classified as non-bullies. Of the remaining students, 33% reported moderate amounts of bullying (i.e., received scores of 2-4 on the bullying scale), and 21% reported high amounts of recent bullying (i.e., received scores greater than 4 on the bullying scale) and these youths were placed in respective categories. Chi square analysis were conducted to determine the association between bullying and high-risk gun ownership. As shown in Table 9, the findings were statistically significant, $X^2(4) = 306.79$, $p<.001$, with almost 60% of high-risk gun owners classified as frequent bullies. From another perspective, almost 10% of frequent bullies were high risk gun owners, which contrasts with only 2% of the children who engaged in moderate amounts of bullying, and 0.1% of non-bullies classified as high-risk gun owners. Hence, high-risk gun owners were likely to be frequent bullies, and bullies are much more likely to be high-risk gun owners than non-bullies.

Insert Table 8 About Here

Discussion

The results of this study reveal that nonmetropolitan middle school students in our southeastern sample had rates of gun and handgun ownership comparable to those that have observed for older youth attending urban and suburban schools. For example, 9.0% of the fifth, sixth, and seventh grade students in our sample reported owning a handgun, which is higher than rates of 6.4% among an urban Seattle sample of 11th graders (Callahan & Rivara, 1992), and 5.5% among a sample of seventh and eighth graders in Rochester, NY (Lizotte et al., 1994). In contrast, rates from our survey were lower than those observed by Sheley and Wright (1993) in their survey of inner-city, male, high-school students (in which 15% reported that they owned a revolver and 18% owned a semiautomatic or automatic handgun). Moreover, self-reported rifle and shotgun ownership was higher in the present sample (14.4%) than in the aforementioned urban samples. The higher rates of rifle and shotgun ownership is not surprising in light of the high rates of sport hunting in many nonmetropolitan areas. Indeed, about two-thirds of the youths in the present sample reported recreational (i.e., hunting or target shooting) use as their primary reasons for owning guns. On the other hand, the high percentage of youths who report owning guns to get respect and to frighten others is disturbing, especially in light of the high percentage that report having brought a weapon to school or having a friend who had done so.

A second important set of findings pertains to the reasons for adolescent gun ownership and the clear linkages between these reasons and various types of deviant adolescent, family, and peer behavior. Across the entire sample, high percentages of adolescents (30%), families (55%), and peers (54%) reportedly own guns for sporting purposes. Our findings support those of Lizotte et al. (1994), who observed that youth who own guns for sport have relatively low rates of virtually all measured antisocial behaviors. Nevertheless, youth who did not own a gun were somewhat less likely than youth classified as "low-risk" gun owners (i.e., those who owned guns for sport or protection) to engage in bullying and other antisocial behaviors.

On the other hand, high-risk adolescent gun ownership (i.e., owning a gun to gain respect or to frighten others) was linked with all measures of antisocial behavior, including bullying students, bullying teachers, delinquent behavior, substance abuse, and school behavior problems. Analyses designed to delineate the key predictors of high-risk adolescent gun ownership showed that youths who own guns to gain respect or to frighten others were embedded in highly antisocial contexts and, at a relatively young age, exhibited serious behavior problems. The strongest predictors of high-risk adolescent gun ownership were high-risk gun ownership in families and by peers. Other predictors of gun ownership included high rates of substance abuse and bullying of teachers. These findings are consistent with extensive causal modeling literatures in the areas of delinquency (Loeber & Hay, 1997) and adolescent drug use (Henggeler, 1997) which show that family and peer factors are key predicts of antisocial behavior in adolescents. Indeed, the family and peer variables in the present study may be proxies for family and peer factors that have well-established associations with youth antisocial

behavior.

A third important set of findings from the current study pertained to the association between high-risk gun ownership and bullying. Not only did most high-risk gun owners engage in high rates of criminal and antisocial behaviors, but the vast majority (83%) also engaged in either moderate or high rates of bullying. Likewise, bullies were more likely to own guns and engage in high-risk gun ownership than were non-bullies. Those youth who exhibited both high rates of bullying and high-risk gun ownership (approximately 2% of the sample), constitute a particularly worrisome subgroup of the middle school population.

The findings have at least two general implications for the design of prevention and intervention programs. First, although youths who own guns for sporting purposes have slightly higher rates of antisocial behavior than their counterparts who do not own guns, gun ownership per se does not seem to be a key factor associated with antisocial behavior. Rather, owning guns to gain respect or to frighten others (i.e., high-risk ownership) is highly associated with antisocial behavior. Thus, one might argue that school-based violence prevention programs should focus on those youths in high-risk groups. Such a focus does not deny that the availability of weapons, per se, is a major risk factor in adolescent suicide and violence. Indeed, restrictions on gun ownership such as those in Canada and Great Britain likely would have dramatic effects on these problems.

The second implication pertains to the foci of violence prevention efforts that target high-risk youths. The findings showed that high-risk gun ownership by family members and peers were powerful predictors of high-risk ownership by these middle

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Table 1
Descriptions, Number of Items, and Reliability Coefficients for Questionnaire for Students Scales

QUESTIONNAIRE FOR STUDENTS		
Scales and Scale Descriptions	Number of Items	Cronbach's *a*
Social Isolation: Having friends versus feeling left out and lonely	Four items	.62
Bully Victimization: Being bullied at school, or going to or coming from school	Four items	.78
Bullying: Bullying others at school, or going to or coming from school	Four items	.85
Stop Bullying: Attempts by students or teachers to stop bullying if they see it	Two items	.41
Prevalence of Bullying: Prevalence of classroom bullying	Two items	.50
Opposing Bullying: Student attitudes against bullying	Five items	.68
Bullying Teachers: Student bullying of teachers	Two items	.82
Theft: Self-reported stealing of property or money	Eight items	.81
Vandalism: Destruction of public or private property	Three items	.72
Violence: Fighting, hurting others, or using weapons	Four items	.69
Substance Abuse: Self-reported drug use	Five items	.79

QUESTIONNAIRE FOR STUDENTS		
School Misbehavior: Wide range of school misbehavior	Eight items	.81
School Sanctions: Reflects school sanctions for misbehavior	Four items	.74
Group Delinquency: Association with deviant peers (groups or gangs)	Four items	.70

Table 2
Prevalence of Gun Ownership Among Nonmetropolitan Youth

Gun Type	n	Percentage
Pellet or BB Gun	1851	29.6%
Rifle or Shotgun	904	14.4%
Pistol or Handgun	565	9.0%
Other	274	4.4%

Table 3
Reasons for Gun Ownership Among Nonmetropolitan Middle School Students

Reason for Owning	n	Percentage of Gun Owners	Percentage of Total Sample
For Target Shooting	619	21.2%	9.8%
For Hunting	1287	44.1%	20.5%
For Safety	362	12.4%	5.8%
For Respect	95	3.2%	1.5%
For Instilling Fear in Others	103	3.5%	1.6%
Other	174	5.9%	2.8%
MISSING	279	9.5%	4.5%

Table 4
Reasons for Gun Ownership Among Family and Friends of Nonmetropolitan Middle School Students

Reason for Owning Guns	n	Percentage of Owners	Percentage of Sample
Family			
No One in My Family Owns a Gun	1723	-------	27.5%
For Their Job	308	7.3%	4.9%
For Hunting	2446	57.8%	39.1%
For Personal Protection from Crime	2273	53.7%	36.3%
For Target Shooting	1013	23.9%	16.2%
For Respect	164	3.9%	2.6%
Other	333	7.9%	5.3%
Friends			
I don't Have a Friend Who Owns a Gun	2770	-------	44.2%
For Their Job	258	8.1%	4.1%
For Hunting	2162	68.1%	34.5%
For Personal Protection	1253	39.4%	20.0%
For Target Shooting	1214	38.2%	19.4%
For Respect	447	14.1%	7.1%
Other	215	6.8%	3.4%

Note. Respondents could endorse multiple choices (i.e., endorse all that apply) and hence sums exceed sample size.

Table 5
Discriminant Function Analysis and Class Means for Reasons for Gun Ownership Among Middle School Students

QFS Scales	Discriminant Function 1	Discriminant Function 2
Social Isolation	-.01	**-.23***
Bully Victimization	.07	-.15
Bullying	**.58***	-.07
Opposing Bullying	-.29	**.19***
Bullying Teachers	**.62***	-.17
Theft	**.69***	-.10
Vandalism	**.72***	**-.30***
Violence	**.84***	-.04
Substance Abuse	**.85***	**-.20***
School Misbehavior	**.75***	.13
School Sanctions	**.58***	.13
Group Delinquency	**.86***	**.35***

*$p<.001$

Reasons for Gun Ownership	Class Means Discriminant Function 1	Discriminant Function 2
Sport	-.27	-.02
Protection	.57	.25
Respect	1.71	-.07
Frighten	1.58	-.34

Table 6
Adjusted Means and Standard Deviations of Adolescent Gun Risk Categories for Each of the QFS Scales, Controlling for Gender

	GUN RISK CATEGORIES					
	NO RISK		LOW RISK		HIGH RISK	
QFS SCALES	M	SE	M	SE	M	SE
Bully	5.93	0.06	6.76	0.08	10.53	0.25
Bullying Teachers	2.65	0.03	2.99	0.04	5.06	0.12
Theft	8.45	0.04	9.16	0.05	13.00	0.17
Violence	4.39	0.02	5.02	0.03	7.88	0.10
Substance Abuse	5.86	0.04	7.27	0.06	12.38	0.19
School Misbehavior	11.84	0.08	13.67	0.10	19.76	0.33
School Sanctions	6.79	0.05	7.49	0.06	10.41	0.21
Vandalism	3.41	0.02	3.99	0.03	6.53	0.10
Group Delinquency	4.87	0.03	5.70	0.04	8.62	0.13

Note. All F's > 94.10, p <.0001; Group means are significantly different for each post-hoc comparison at p<.05.

Table 7
Logistic Regression Analyses Predicting High-Risk Adolescent Gun Ownership

Variable	Probability Level	Standard Error	Odds Ratio
Intercept	.001	1.42	-------
High Risk Family	.001	.28	4.94
High Risk Peer	.001	.22	5.74
Grade	.922	.13	1.01
Gender	.010	.23	1.81
Social Isolation	.277	.05	1.06
Bully Victimization	.611	.03	1.01
Bullying	.384	.03	1.02
Bullying Teachers	.023	.04	1.10
Opposing Bullying	.112	.05	.93
Violence	.574	.06	1.04
Substance Abuse	.002	.04	1.13
Delinquency	.124	.02	1.03
School Misbehavior	.452	.03	.98
School Sanctions	.734	.04	1.01
Delinquency Group	.501	.05	1.06

Table 8
Number and Percentage of Participants Across Each of the Gun-Risk and Bullying Categories

		BULLYING CATEGORIES			
GUN RISK CATEGORIES		NO BULLYING	MODERATE BULLYING	FREQUENT BULLYING	TOTALS
No-risk	n	1804	1125	542	3471
	%	51.9	32.4	15.6	
Low Risk	n	887	803	575	2265
	%	39.2	35.5	25.4	
High Risk	n	34	46	118	198
	%	17.2	23.2	59.6	
Total		2725	1974	1235	5934

Note. Totals may not sum to expected values due to missing data across categories.
$X^2 = 306.79$, df $= 4$, $p < .001$.

Prevention of Bullying Among Middle School Students: Description and Evaluation of a Comprehensive School-Based Prevention Program

In response to growing concerns about violence among school children, numerous violence prevention programs have been launched in U.S. schools in recent years. For example, a recent survey of 729 school districts revealed that the districts had implemented over 750 different violence prevention initiatives (National School Board Association, 1993). Such initiatives vary widely in their goals and strategies, and range from the use of police and metal detectors in schools to the implementation of conflict resolution training or peer mediation initiatives (see Gottfredson, 1997 for a comprehensive review of program types). Despite the prevalence of school-based violence prevention initiatives, few have focused specifically on the prevention and reduction of bullying among school children.

As the preceding review of bullying literature suggests, there are several compelling reasons why the phenomenon of bullying deserves particular attention by educators, parents, and others concerned with violence prevention. First, statistics from our study and those conducted elsewhere indicate that numerous children are victims of bullying. Our own statistics suggest that one in four children in grades four through six are victimized somewhat regularly by bullying; more than one in ten are bullied at least once per week, and 7% are bullied several times a week. Researchers have documented both short- and long-term effects of such bullying on children. In the short-term, victims of bullying may experience more emotional trauma (e.g., low self-esteem, anxiety, an inability to concentrate, [Boulton & Smith, 1994; Sharpe, 1995]), complain of more physical ailments such as headaches and stomach aches (Williams, Chambers,

Logan, & Robinson, 1996), and experience more difficulties with school work (Hoover, Oliver, & Hazler, 1992) compared with their non-bullied peers. Moreover, several studies indicate that individuals who were bullied as children tend to experience more emotional problems (e.g., depression and poor self-esteem) in adulthood (Olweus, 1993b; Parker & Asher, 1987) than individuals who were not bullied in their youth.

Second, bullying likely affects not only the children who are direct victims of bullying, but it also may contribute to a negative atmosphere at a school, in which students are fearful of standing out among their peers, and in which they believe that adults within the school do not have control over students' behavior (Remboldt, 1994). Such a climate is not conducive for the development of positive social relationships or high academic achievement.

Third, bullying behavior among children is often linked with other types of antisocial behavior. Our own findings indicated that bullying was strongly related to misbehavior at school, delinquent behaviors (e.g., theft, vandalism, violence), and group delinquency. Others have observed a relationship between bullying and vandalism, fighting, theft, drunkenness (Olweus, 1993b), truancy (Byrne, 1994; Olweus, 1993a), and school drop-out (Byrne, 1993). Thus, bullying may be an early indication of numerous other antisocial behaviors. Several studies indicate that bullying also may be a powerful predictor of future criminal activity in early adulthood. For example, Olweus (1993b) observed that individuals who bullied others as children were significantly more likely than their peers to have been arrested by their early twenties.

Fourth, the nature of bullying does not necessarily lend itself to the same interventions that may be effective in reducing other types of conflict between children.

Because bullying involves harassment by powerful children against children with less power (rather than a conflict between peers of relatively equal status) common conflict resolution strategies such as mediation may not be effective or may actually put the victim at greater risk.

Bullying behavior, like other forms of antisocial behavior among youth, is a result of a complex set of factors related to the individual, the family, the school system, and other aspects of the youth's sociocultural environment (see e.g., Bronfenbrenner, 1974; Henggeler, 1991; Olweus, 1994). Any prevention or treatment program that addresses problems at only one of these levels would have, at best, limited success. In order to maximize the potential for success, prevention programs, like treatment programs, must include interventions at multiple levels and must target multiple determinants of behavior.

Although most violence prevention programs have not received rigorous evaluation, there is evidence that comprehensive school-based initiatives show the most promise in preventing violence at school (Office of Juvenile Justice and Delinquency Prevention, 1996). Successful prevention programs appear to have a number of characteristics in common, including the development of school-wide approaches to violence prevention, a focus on primary prevention, involvement of parents, staff development, cultural and developmental sensitivity, and links between the school program and the community (U.S. General Accounting Office, 1995).

The Norwegian Model

The first and best-known intervention to reduce bullying among school children was developed by Olweus (1993a) and launched in Norway in the early 1980s. Inspired

by the suicides of several severely victimized children, Norway supported the development and implementation of a comprehensive program "to reduce as much as possible--ideally to eliminate completely--existing bully/victim problems in and out of the school setting and to prevent the development of new problems" (Olweus, 1993a, p. 65). The program involved interventions at multiple levels (i.e., school-wide interventions, classroom interventions, and individual interventions). Interventions were designed to establish social norms within the school environment that support prosocial, inclusive behavior among children and that discourage bullying and other antisocial behavior. Although the specific program elements varied among participating schools, Olweus (1993a) identified a number of core program elements, which are discussed below.

School-wide interventions. Schools were encouraged to form coordinating committees to plan and guide the school's efforts throughout the various phases of the project. Committees commonly consisted of school psychologists or counselors and representative teachers, students, and parents. Critical to the success of a program was the awareness of committee members and all school staff about bully/victim problems in their school. In order to assess the nature and extent of bullying problems, each school administered Olweus' Questionnaire for Students. Typically, findings from the survey were presented at a conference day for teachers and other school staff, as well as at PTA meetings. School conference days also provided an opportunity for the school to develop a long-term plan to address bullying at their school. In addition to forming a coordinating committee, administering the Bully/Victim Questionnaire, and holding a day-long teacher conference day on bullying, another critical school-wide

intervention included increased adult supervision of students at school, particularly in areas of the school where children reported being frequently bullied (e.g, the playground).

Classroom-level interventions. Several critical interventions were designed to be implemented within the classroom setting.[3] Such interventions included the development of rules prohibiting bullying, the development and use of consistent sanctions for violating rules, the use of consistent praise by teachers for prosocial behavior, and the scheduling of regular classroom meetings, during which students and teachers discussed issues related to bullying in their school.

Individual interventions. Key activities at the individual level included interventions with bullies, victims, and their parents. Olweus recommended that teachers and other school staff intervene on every occasion that they observed bullying, even in its mildest forms (e.g., social exclusion of children). Interventions included discussions with bullies and their parents, and the development of safety plans for chronic victims of bullying.

Effectiveness of the Scandinavian model. Olweus' violence prevention program was found to be highly effective in reducing bullying and other antisocial behavior among Norwegian students in primary and junior high schools. Evaluation results are based upon data collected from four cohorts of approximately 2,500 students in Bergen schools. Students, who originally were assessed in fourth, fifth, sixth, and seventh grades were followed for two years (Olweus, 1991, 1993a). Because a national

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[3]In Norway, students are grouped in one class for the majority of the school day, throughout their twelve years of education.

campaign against bullying was launched throughout Norway, it was not possible to set up an experimental study with random assignment of classes or schools to treatment or control conditions. Rather, the evaluation utilized a quasi-experimental design and employed time-lagged contrasts between age-equivalent groups. Results indicated that in the two years following the introduction of the intervention, self-reported bullying and victimization decreased markedly for both boys and girls and for children of all ages. The changes in children's self-reported behavior were more pronounced the longer the program was in effect. After two years, self-reported bullying and victimization had decreased by approximately 50%. Moreover, students reported significant decreases in rates of general antisocial behavior such as vandalism, theft, and truancy (although for grade 6 comparisons, the effects were marginal). Olweus reported an increase in student satisfaction with school life as reflected in their "liking recess time." Changes in students' attitudes toward bullying were weak and inconsistent, however. Those schools that had implemented more of the program's core components experienced the most marked changes in behavior (Olweus, 1991, 1993a).

Other Efforts to Reduce Bullying

The core components of Olweus' anti-bullying program have been adapted for use in several other cultures, including England (Whitney, Rivers, Smith, & Sharp, 1994) and Canada (Pepler, Craig, Ziegler, & Charach, 1994). Evaluation of a large-scale program in Toronto schools suggested that the program positively affected students' attitudes and behaviors, although the effects were more modest than those observed in Scandinavian schools (Pepler et al., 1994). After 18 months of the comprehensive anti-bullying program, Canadian students (aged 8-14 years) from four schools in urban

Toronto reported more frequent interventions by teachers to stop bullying, and more bullies indicated that teachers had talked with them about their behavior. There was an 18% decrease in the number of children who reported being bullied in the last 5 days, although there was an increase in the number of students who reported bullying their peers (perhaps as a result of increased awareness of the many forms bullying may take). After the program, fewer students indicated that they could join in a bullying incident, but students were no more likely to indicate that they felt uncomfortable watching bullying. No program effects were observed with regard to the frequency with which bullies or victims discussed their problems with their parents.

An evaluation of the comprehensive anti-bullying program in 23 primary and secondary schools in Sheffield, England revealed significant decreases in bullying behavior after two years and positive changes in students' attitudes (Whitney et al., 1994). Specifically, project schools exhibited a significant increase in the percentages of students who had not been bullied and a significant decrease in the frequency with which students were bullied. This finding was marked in the 16 primary schools but negligible for secondary schools. Both primary and secondary schools showed decreases in the frequency with which students reported bullying others. Project schools showed a significant increase in students' reporting that they would not join in bullying others, a result that also was more marked in secondary schools. There were no significant changes in students' perceptions of teachers intervening in bullying situations. However, project schools showed significant increases in the frequency with which students told someone (particularly a teacher) about being bullied and in the frequency with which students reported that teachers had talked with them about

bullying other students. In sum, the program appeared particularly effective in reducing bullying in primary schools, although there was substantial variation between individual schools. Those schools that were more active in implementing the program observed the most marked changes in reported behaviors.

The encouraging results from Olweus' initial evaluation and from the subsequent Canadian and English evaluations have led to recent recognition of the Olweus model as a promising model of violence prevention (Office of Juvenile Justice and Delinquency Prevention, 1995; Elliott & Mihalic, 1997). Until recently, there has been little attempt to establish anti-bullying initiatives in U.S. schools. Within the past several years, a number of school-based programs have been developed to combat bullying (e.g., Garrity, Jens, Porter, Sager, & Short-Camilli, 1994; 1996; Johnson Institute, 1996; Smith, 1995; Webster-Doyle, 1991; Wilczenski, Steegmann, Braun, Feeley, Griffin, Horowithz, & Olson, no date), although the degree to which they embrace a whole-school approach to bullying varies. Moreover, to our knowledge, none have been systematically evaluated.

Description of the South Carolina Program

Like the original Norwegian model upon which it is based, the South Carolina program embraced an ecological model of violence prevention. It's goal was to reduce bullying and antisocial behavior among middle school children by intervening at multiple levels of a child's environment: with individual children (i.e., with children who bully others and with victims of bullying), with families, with teachers and students within the classroom, and with all individuals within the school as a whole. In our view, the missing element in Olweus' program (at least in the American context) was the

involvement of the community. Accordingly, we made an effort to involve community members in anti-bullying efforts in schools and in the community at large.

In addition to incorporating a focus on community involvement in the project, we made several other modifications to the Olweus model in order to meet the perceived needs of our American, nonmetropolitan, middle school population. These modifications included:

- The development of an English version of Olweus' Questionnaire for Students (Olweus, 1995; see Appendix) that was appropriate for use with American middle school children;
- The involvement of school-based mental health professionals to assist with the implementation of the prevention program and the development of individual interventions with children who bullied other children or with students who were victimized by their peers;
- Ongoing (i.e., weekly or bi-weekly) consultation between project staff and school programs;
- The development of American versions of several materials used in the Norwegian program (e.g., an American adaptation of Olweus' video on "Bullying"; informational pamphlets for parents).
- The development of additional materials for teachers and other school staff to provide ideas for classroom activities (e.g., teacher guide books and reference materials on bullying) and to share creative school-wide activities across sites (e.g., a newsletter for teachers)

Each will be described in more detail below.

School-Wide Interventions

School-wide survey. A central component of the program involved the development and distribution of an English version of Olweus' Questionnaire for Students (which includes questions about the nature and prevalence of bullying and other antisocial behaviors). The questionnaire was administered the March prior to the implementation of the program.

School-wide staff inservices. School-level data from the survey were compiled and presented to school administrators, teachers, and other school staff as part of a school-wide inservice. The purpose of the inservice was to raise awareness of the problem of bullying at school, discuss the core elements of the program, and begin to discuss means of tailoring the program to the strengths and needs of each particular school.

Violence prevention coordinating committees. In order to facilitate the development of each program, violence prevention coordinating committees were formed at each school. Typically, the group was comprised of 6-8 members, who included a school administrator (e.g., principal or assistant principal), a teacher representative from each grade, a guidance counselor, a school-based mental health professional (if present within the school), and other staff representatives (e.g., physical education teachers, school attendance officers). This group was encouraged to meet regularly throughout the year to plan specific components of the program and to act as program liaisons with the university consultants and with the entire school staff. A program consultant from the university typically helped to facilitate the first several

meetings of this committee and met periodically with the group throughout the school year.

School-wide events to launch the program. After the initial planning of the program implementation was complete, schools typically scheduled a formal announcement and explanation of the new program for all faculty, staff, and students. In many schools, principals and/or members of the violence prevention coordinating committee introduced the program during a school assembly. Several other schools developed unique events to launch the program, including a student-produced news program that broadcast information about the anti-bullying program throughout the school on closed circuit television.

Observation and monitoring of students. Increased supervision of students was a key element of schools' school-wide efforts. Coordinating committees examined data from the school survey regarding the most prevalent locations for bullying within their school. Committees then developed plans to increase monitoring in these particular "hot spots." Frequently, committees addressed the need for increased supervision during recess, in hallways and bathrooms during the changing of classes, and during the loading and unloading of school busses.

Development of school rules and sanctions against bullying. A core component of the Norwegian prevention program was the establishment of a common set of rules against bullying. This was also true for the South Carolina project. School-wide rules were developed by each school's coordinating committee, posted throughout the school (e.g., in classrooms, in the cafeteria), and discussed with students in

classroom settings during the first several weeks of the program. Although the wording of the rules was unique to each school, they typically captured the following messages:

1. We will not bully other students.
2. We will try to help students who are bullied.
3. We will make a point to include students who are easily left out.

All adults in the school were enlisted to help enforce the school rules. Each coordinating committee also developed a plan for sanctioning students who violated the school's rules (particularly by engaging in bullying behavior). Typically, the plans consisted of a graduated system of intervening with children who bullied their peers. Initial bullying incidents frequently were addressed by having individual discussions with students. Subsequent violations commonly were met with the loss of privileges and/or meetings with school personnel, the student, and his/her parents. In some circumstances, children were referred to the school-based mental health counselor for more intensive intervention.

Reinforcement of prosocial behavior. One of the most crucial components of the program was the development of a system of reinforcement for prosocial behavior, such as including new students in social activities, standing up for students who were bullied, and being a "buddy" to a younger student. Coordinating committees were encouraged to devise creative strategies (or expand existing programs already in place) for rewarding children who exhibited such behavior. Several schools distributed coupons that could be redeemed at the school store. Others compiled names of students who had been observed engaging in prosocial behavior and held a monthly drawing for prizes or privileges.

Parent involvement. Parents were notified of the bullying program through several means. Within the first month of the program, schools distributed informational pamphlets to parents that described problems associated with bullying and warning signs of bullying and victimization among children. The pamphlets provided a brief introduction to the school's bullying program and encouraged parents to become involved in upcoming efforts. Most schools also highlighted the program during regular parent-teacher events, including PTA meetings, school open-houses, and special violence prevention programs. For example, one school convened a special discussion session that included school staff, project personnel, and parents of children who had been bullied.

Classroom Interventions

An important component of the Norwegian program involved holding regular classroom discussions on the topic of bullying. Schools in our program also were strongly encouraged to schedule classroom meetings (typically once per week or once every two weeks for 20-30 minutes per session) during which students and teachers could focus on issues of bullying and violence in their school. The coordinating committee worked with school administrators to ensure that this meeting was scheduled regularly. Early in the program's implementation, class meetings provided a forum for the discussion of the nature and prevalence of bullying at their school, the harm caused from bullying, the school's rules against bullying, and sanctions for bullying behavior.

Several supplementary materials were developed by project staff to help facilitate these early discussions as well as subsequent classroom meetings. For example, a 10-minute videotape entitled, Bullying (South Carolina Educational Television, 1995) and

an accompanying teacher guide were made available to teachers in all schools (see Appendix).[4] The video, which was patterned after the video originally used in the Norwegian program, depicted several vignettes of middle school children involved in various bullying situations. Using the video as a stimulus, teachers were encouraged to engage children in discussions, role-playing, and other activities (e.g., creative writing, artistic expression) that were designed to help children understand the seriousness of bullying and strategies to stop bullying incidents and support victims of bullying.

An additional unit of lesson plans was developed for use by teachers later in the school year. These lessons centered around engaging students in the development of aspects of the school's violence prevention program, including the involvement of parents and members of their community. It should be emphasized that although the classroom lesson plans provided guides for structuring classroom activities around the topic of bullying, teachers were encouraged to use their own creativity to structure their meetings. As an additional resource to assist teachers in developing their own lesson plans, we provide a resource list of books, videos, and other materials on the topic of bullying.

Individual interventions

Each school was encouraged to develop strategies for intervening with children who bullied other children and for supporting children who were victims of bullying. The goal of interventions with bullies was to end their bullying behavior by registering immediate awareness of and disapproval for their actions and administering sanctions

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[4]The video and teacher's guide were not developed using funds from this grant.

as necessary. The goals of interventions with victims of bullying were to guarantee their protection from harassment by their peers and to enhance their social skills and friendships with peers. Teachers and other school staff were encouraged to assume responsibility for intervening in every bullying situation of which they were aware and to involve school administrators, clinicians, counselors, and parents as needed to resolve the situations and provide ongoing monitoring.

Those children who exhibited frequent bullying behavior or extreme vulnerability to being bullied by their peers were frequently referred to local or school-based mental health professionals for more intensive interventions. As a result of a collaborative effort by local mental health centers, the local school districts, the state Department of Mental Health, and the University of South Carolina, approximately half of the participating schools had the benefit of an on-site mental health professional (and, in some cases, one or more graduate assistants). The mental health professionals, who were employees of local mental health centers, provided support during the development and implementation of the bullying program (e.g., several were members of violence prevention coordinating committees), and they provided individual and group interventions with bullies and victims of bullying as needed. The program support that they were able to provide was somewhat limited, however, by the demands of their full caseloads.

Community interventions.

Olweus' original model focused exclusively on interventions targeted at the level of the individual, the classroom, and the school as a whole (1993a). In recognition of the affect that the broader community environment has on children and their families,

we sought to broaden the focus of our intervention to include efforts targeted at community members. The form of these interventions varied from community to community but typically included efforts to: (a) make the program known among a wide range of residents in the local community (e.g., convening meetings with leaders of the community to discuss the school's program and problems associated with bullying, encouraging local media coverage of the school's efforts, engaging students in efforts to discuss their school's program with informal leaders of the community); (b) engage community members in the school's anti-bullying activities (e.g., soliciting material assistance from local businesses to support aspects of the program, involving community members in school district-wide "Bully-Free Day" events); and (c) engage community members, students, and school personnel in anti-bullying efforts within the community (e.g., introducing core program elements into summer church school classes).

Consultation

As noted above, project staff provided ongoing consultation to schools throughout the project. During the first year of the project, one project consultant was assigned to each of the three school districts in Group A (those receiving the program in year one). After providing intensive consultation during the first two months of the project (i.e., holding introductory meetings with school administrators, assisting with initial staff inservices, and facilitating early meetings with members of coordinating committees) consultants typically spent several hours per week at each school throughout the remainder of the school year (meeting with teachers, school-based mental health professionals, and administrators; and assisting with the development of

community activities).

During the second year of the project, the three project consultants were responsible for assisting with the development of programs in Group B schools (those beginning the program in year two), as well as providing ongoing consultation to all Group A schools. Necessarily, the time that consultants spent in each school and community during year two was significantly less than during year one of the program.

Supportive Materials

In addition to support provided through ongoing consultation, project staff provided various material supports for each participating school. Most of the materials, (with the notable exceptions of the survey [Olweus, 1995] and book, Bullying at School: What We Know and What We Can Do [Olweus, 1993a]), were developed specifically for the purposes of this project. All supportive materials are listed below:

- Yearly surveys of bullying and antisocial behaviors (Olweus, 1995). Data were compiled each spring and discussed with school officials and teachers prior to the start of the school year.
- Copies of the book, Bullying at School: What We Know and What We Can Do, by Dan Olweus (1993a). This book, which describes in detail the elements of Olweus' bullying program and problems associated with bullying, was provided to all staff at participating schools.
- Educational videotape entitled, Bullying, and the accompanying teacher's guide. The videotape was produced by South Carolina Educational Television (1995), in collaboration with Dan Olweus and other project staff.

- Two supplementary teacher's guides. These guides, which were developed by project staff, provided suggestions for numerous classroom and community-based activities to engage children in efforts to reduce bullying and related antisocial behaviors. Copies were provided to all teachers in participating schools (see Appendix).
- Resource Guide of books, videos, and other resources on bullying. This guide, which included an annotated bibliography of several hundred resources, was provided to all teachers in participating schools (see Appendix).
- One-page pamphlets, which described the bullying program, problems associated with bullying, and warning signs of bullying behavior. Pamphlets, which were personalized by each participating school (or school district), were distributed to all parents and members of the community.
- Program newsletters (Bully-Free Times), which featured creative program activities in participating schools and communities and described upcoming project activities. Newsletters were distributed to all teachers and other school staff each semester.

Hypotheses

The evaluation of the South Carolina bullying program was designed to test the following hypotheses:

1. Implementation of the school-wide program will result in significant decreases in rates of bullying and victimization among middle school children. Consistent with the findings of Olweus (1991, 1993a), Pepler et al. (1994), and Whitney and colleagues (1994), we expected that as a result of the program, students would report significant

decreases in the frequency with which they were bullied. Moreover, we anticipated that after experiencing the program, students would report that they had bullied other students less frequently in the recent past (consistent with Olweus, 1991, 1993a; Whitney et al., 1994; but see Pepler et al., 1994). Middle school students were selected as the targets of the intervention for several reasons. First, this methodology would permit direct comparisons with evaluations of programs targeted at similarly-aged children from other countries. For example, Olweus (1991, 1993a) studied a cohort of 4th through 7th graders over two years, Pepler et al. (1994) studied the effects of the program on 8-14-year-old students, and Whitney et al. (1994) assessed the effects of the bullying program on both primary and secondary students. Second, as many investigators and commentators have observed (and as our own data on the prevalence of bullying and antisocial behaviors confirmed), the middle school years are times of transition for children, during which rates of bullying peak (Boulton & Underwood, 1992; Charach, Pepler, & Ziegler, 1995; Hoover, Oliver, & Hazler, 1992; Whitney & Smith, 1993) and during which students' participation in related antisocial behaviors increases.

2. Implementation of the school-wide program will result in significant decreases in rates of related antisocial behavior among middle school children. As a result of the school-wide bullying program, Olweus (1991, 1993a) observed decreases in several related antisocial behaviors such as theft, vandalism, truancy, and substance abuse. We anticipate that a comprehensive violence prevention initiative will have similar effects on these and other related antisocial and delinquent behaviors.

3. Program effects will be more marked after the program has been in effect for two school years (as compared with one school year). Although Olweus (1991)

observed significant reductions in self-reported bullying and victimization after 8 months of the Norwegian program, such reductions were more pronounced after children had experienced 20 months of the program. Similarly, we anticipate that program effects will build over time, resulting in stronger effects after year two of the program.

4. Program effects will vary according to the intensity of programs. Olweus (1993a) and Whitney et al.(1994) observed considerable variability in the intensity with which schools implemented the bullying programs. Not surprisingly, each found that those programs that had implemented more of the core components of the program had stronger program effects. We predict similar findings.

Method

Participants

Participants included fourth through eighth grade students in six nonmetropolitan school districts in the Southeast. The districts were organized into matched pairs based on geographic location and the demographics of the students. In each pair, one district was selected to receive the intervention for both years of the project (Group A). The other served as a comparison group for the first year of the project, and received the intervention during the second year (Group B). During the first year of the project, there were 11 Group A schools that implemented the program. During the second year of the project, seven Group B schools began the program, and the 11 Group A schools continued the intervention.

Within each school district, all fourth, fifth and sixth graders were given a baseline assessment of bullying and antisocial behaviors during the first 2 weeks of March, 1995. To assess the effects of the intervention, similar surveys were conducted

with the same cohort of students during the first 2 weeks of March for the next two years. At baseline, 6389 students (grades 4, 5, and 6) completed the survey, and at time 1, 6263 students (grades 5, 6, and 7) completed the survey. For the final survey, three schools in one of the Group B districts elected not to participate, resulting in a sample of 4928 students (grades 6, 7, and 8) for the third year. Overall, a total of 17,579 questionnaires were completed across the three years of data collection.

The school districts were located in nonmetropolitan counties that represented primarily poor, under-served regions of the state. In five of the six school districts, the percentage of students receiving free or reduced lunches substantially exceeded the state average (ranging from 60% to 91% of the students compared to a state average of 47%). The percentage of students receiving free or reduced lunches in the sixth school district matched the state average. Additionally, all districts were in counties that ranked in the top 15% in the state for rates of juvenile arrest in 1994 (The baserates were computed using 1990 U.S. Census figures). Ethnicity of the school districts was predominantly African-American, ranging from 46% to 95% African-American. White students represented from 4% to 53% of the districts' student populations.

Materials

Olweus' self-report measures. Students completed an English-language version of the Olweus' Questionnaire for Students, which was modified for use with middle school children in the United States (Olweus, 1995, Appendix). In addition to several demographic questions (including students' age, grade, and school), the questionnaire assessed the frequency and circumstances surrounding being bullied by other students, bullying other students, and bullying teachers. "Bullying" was defined in the survey in

following manner:

> We say a student is being bullied when another student or a group of students call him or her bad names. It is also bullying when a student is hit, kicked, threatened, locked inside a room, sent mean notes, and things like that. These things may take place over and over, and it is difficult for the student being bullied to defend himself or herself. It is also bullying when a student is teased over and over in a mean way. But it is not bullying when two students of about the same strength argue or fight.

Questions that addressed the frequency of behaviors related to bullying (e.g., the frequency with which students are bullied, the frequency with which teachers are told about bullying) asked students to indicate how often the behaviors had occurred "since Christmas," approximately 2 ½ months prior to the survey date.

The second half of the questionnaire consisted of 42 questions about antisocial behaviors. Children were asked to indicate the frequency with which they had engaged in behaviors, such as stealing money or other things from family members, being sent to the principal's office, skipping school, and starting a fight with another student. Students had the option of indicating that they had never engaged in that behavior, that they had engaged in the behavior in the past but not since Christmas, that they had engaged in the behavior once or twice since Christmas, or three or more times since Christmas.

Dosage measure. A dosage measure, similar to that used by Olweus, was developed to determine the extent to which schools implemented core components of the bullying program. The measure assessed both the number of program components

implemented at different levels (school-wide components, classroom interventions, individual interventions, and community activities) and the intensity with which each were implemented. Schools could receive a total of 51 possible points.

Procedure

All students within the target cohorts (fourth, fifth, and sixth grade students at baseline), in six school districts were invited to participate in the study. Letters were sent home to parents to inform them about the anonymous student survey and the consent procedures. Parents who did not want their child to participate in the study were asked to notify the school office. No parents asked to exclude their children from the study.

All surveys were conducted within a two week period in early March for each of the three years of the study. Teachers administered the survey to their classes during one class period (approximately 40 minutes in length). After instructing students that the survey was both voluntary and anonymous, they read aloud the survey instructions, the definition of "bullying," and each question in turn. Students followed along in their questionnaire booklets and marked the answers that best described their feelings or behaviors.

In order to measure the extent to which schools implemented key components of the program, program consultants conducted debriefing interviews with members of each school's coordinating committee. The interview was conducted in March of each year, at the time that the student surveys were being conducted. Program consultants also relied on weekly notes of program activities, where necessary, to complete a detailed description of each intervention. Program staff used these descriptions to

compute a dosage rating for each school.

Analysis Strategy

In general, school-based studies have a hierarchical structure because of the interest in the relationship of school and classroom characteristics with student outcomes (Bryk & Raudenbush, 1992). Since each student, classroom and school is different, there is unique variance for each level of the hierarchy. For some studies this creates a data analysis problem because the common data analysis strategies (e.g., basic ANOVA or OLS regression) can analyze differences at only one level. Frequently, the solution to this problem has been to analyze all the variables as if they were measured at the same level.

This solution causes a variety of problems related to accurately estimating the relationships between the predictor and criterion variable (Arnold, 1992; Garner & Raudenbush, 1991). First, a single level regression model at the school level assumes that the each of the variables has a fixed value for the entire school. Since school-level variables will represent a group of individual outcomes, this technique may underestimate the variance in school characteristics. Secondly, single-level models at the individual level assume that students' characteristics are unrelated to each other (i.e., independent). However, students within a class are likely to be more alike than other students in other classrooms or at other schools. The results of the misspecification of the variance is that analysis may fail to accurately reflect the relationship between levels (i.e., may yield inaccurate significance levels), and cannot assess interactions between the levels that may have implication for outcomes.

Hierarchical Linear Modeling has been developed to deal with multiple levels of

data (Bryk, Raudenbush, & Congdon, 1996). It defines regression models at the individual level and then uses these models as criteria for calculating regression coefficients for higher level variables. In the example of a school-based study of factors associated with violence, an individual model might be written as:

$$\text{Violence}_{ij} = \beta_{0j} + \beta_{1j}\,(\text{grade}) + \beta_{2j}\,(\text{gender}) + e_{ij}$$

Where β_{0j} is the intercept, β_{1j} and β_{2j} are the regression coefficients for the personal characteristics of grade and gender of students in school *j*, and e_{ij} represents the unique differences of individual students that are associated with violence but not associated with gender and grade.

The school-level model might be written in part as:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\,(\text{school size}) + \gamma_{02}\,(\text{percent of minority students}) + U_{0j}$$

Where γ_{00} is the intercept for the school level equation, γ_{01} and γ_{02} represent the regression coefficients for the school level variables (in this case size and percent of minority students), and U_{0j} represents the unique contribution of each school that is not explained by the other variables in the equation. This equation is written to predict the intercept of the individual-level model, so that γ coefficients characterize differences in mean levels of violence. Similar equations could be written for any or all of the beta coefficients in the level 1 equation. The partitioning of variance at each level increases the ability to determine the relationship between variable at any level and the outcome variable (Bryk & Raudenbush, 1992). Furthermore, it provides a powerful tool for determining the cross-level interactions between individual and school-level variables.

Program evaluation is a relatively new application of HLM. In fact, we are aware of no other evaluation of a school-based program using this approach. Osgood and

Smith (1995) describe multiple methods of using HLM for program evaluation. They note that successful program evaluation using HLM, hinges on defining models at the two levels that capture program impact on the individual over time. Although this may require complex recoding of time variables, such models provide the most accurate estimation of program effects when there is a large number of schools.

Results

Variables

To determine the effectiveness of the program, several hierarchical models were calculated using gender and grade as level one variables. Another level one variable was included to determine the overall program impact (program). This variable compares scores from baseline to scores after each group has experienced one year of the intervention. Finally, also at level 1, the time variable was coded to distinguish the effect of the second year of the program (time3). A level 2 variable was included to provide a test of group differences at each point of measurement (group).

The primary dependent variables employed in these analyses included students' scores on 12 scales related to bullying and antisocial behavior. Scales were formed using logical clustering techniques and each included two or more items from the Olweus (1995) questionnaire. Four scales pertained to bullying (including the frequency with which children bullied other children, the frequency with which students were bullied by their peers, the frequency with which they bullied teachers, and children's attitudes opposing bullying). In addition, 8 scales pertained to self-reported antisocial behaviors involving theft, vandalism, violence, delinquency, school misbehavior, school sanctions, group delinquency, and substance abuse (see Table 1). For all scales,

children received scale scores only if they had valid data for at least two-thirds of the items. Chronbach's alpha reliability coefficients were all acceptably high, ranging from .68 to .90.

Insert Table 1 About Here

Student Characteristics Associated With Bullying, Victimization and Antisocial Behavior

Level 1 of the hierarchical model indicated boys bullied their peers more frequently than girls (B = .249, t = 17.65, p<.001) and older students bullied other children less than younger students (B = .038, t = 3.77, p<.01). For victimization, the differences between the rates for boys and girls were not statistically significant. However, grade-level of students was a significant predictor of victimization. Rates of victimization declined as students grade-level increased (B = -.105, t = -11.92, p<.001).

Student characteristics were associated with a variety of antisocial behaviors. According to Table 2, gender was a significant predictor of delinquency, group delinquency, school sanctions, school misbehavior, substance abuse, vandalism and theft. For all antisocial behaviors, boys reported higher levels of participation than girls. Table 2 indicates that grade was significant predictor for all the antisocial behaviors. In contrast to bullying, students in higher grade-levels reported participating in more antisocial behaviors than younger students.

Insert Table 2 About Here

Program Effects on Bullying and Victimization

Figures 1 to 3 provide a visual summary of the percentage of students being victimized by bullies, bullying other students and bullying teachers. Tables 3 to 5 provide a numerical summary program effectiveness based on the scale scores.

Bullying. Figure 1 illustrates the percentage of students who reported participating in bullying (at least several times during the last several months). The initial differences between group A and group B was significant with group A reporting higher levels of bullying other students than Group B (γ= 0.159, t = 3.38, p<.01). An overall assessment of the program effect (combining the effects for both years for group A and the second year group B) revealed that the program did not significantly decrease the rate of bullying. A test of the additional impact of the second year of the program indicated a non-significant trend toward increased bullying for both Groups A and B.

Insert Figure 1 and Table 3 About Here

Victimization. Figure 2 illustrates the percentage of students who reported being bullied (at least several times within the last several months). The initial differences between Groups A and B were small and insignificant, suggesting that the groups experienced similar levels of victimization prior to program implementation. Tests of the overall effect of the program on victimization and the additional second year of the

program on victimization were non-significant.

Insert Figure 2 and Table 4 About Here

Bullying teachers. Figure 3 provides a visual summary of the percentage of students who bullied teachers at least several times during the last several months. Group A and B's rates of bullying teachers differed significantly prior to beginning the intervention, with Group A bullying teachers more frequently than roup B (γ = .179, t = 3.95, p<.001). Overall program effects were not significant; nor were effects of year two of the program.

Insert Figure 3 and Table 5 About Here

Program Effects on Antisocial Behavior

An important part of the program evaluation was to determine whether the program had an effect on a wide variety of antisocial behaviors. These behaviors included: delinquency, group delinquency, school misbehavior, school sanctions, vandalism, theft, violence, and substance abuse. Figures 4-10 present visual summaries of Group A and Group B students' scores on these scales over time. Tables 6 to 12 provide the numerical summaries of the program's effect on antisocial behaviors. Analysis of each of the antisocial behaviors yielded a similar pattern. Neither the overall program effects nor the effects of year two of the program were significant.

Insert Figures 4-10 About Here

Insert Tables 6-12 About Here

Attitudes Toward Bullying

Hierarchical analysis was used to test the effect of the intervention on attitudes toward bullying. As Table 13 indicates, prior to the intervention, the differences between group A and B were small and insignificant. The introduction of the program did not produce significant changes in the attitudes of students, and the second year of the program did not provide any added benefit.

Insert Table 13 and Figure 11 About Here

Limitations of HLM

Although HLM provides the most accurate evaluation of the program, our project illustrates several reasons why the use of HLM to analyze such programs has some limitations. HLM has limited ability to analyze data with missing values or to conduct analyses on a subset of cases in a study (Arnold, 1992). These limitations affected our ability to answer several follow-up questions related to the impact of the first year of the intervention on bullying and antisocial behaviors, and the effect of variables such as the frequency of teacher interventions in bullying situations. Analyses of these questions

required that we designate some responses as missing data, making HLM unable to construct the models. Consequently, we employed factorial ANOVA designs for such analyses.

Effects of the Program on Group A Schools After Year One

Although overall program effects on self-reported bullying and antisocial behaviors were not significant, examination of Figures 1 through 10 suggests that significant program effects may have existed for Group A during the first year of the program. As noted above, such analyses cannot be conducted using HLM procedures. Hence, analyses of covariance were used to examine differences between Group A and Group B schools after one year of the program (during which time Group B schools served as controls). Covarying grade and gender, we conducted a 2 x 2 factorial ANCOVA, with time (baseline vs. time 1) and group (Group A or Group B schools) as the independent variables, and students' scores on the various bullying and antisocial behavior scales as the dependent variables.

Bullying. Analyses were conducted to examine group, time, and group x time interactions regarding the frequency with which students reported bullying other children. Significant group effects were observed, F (1,12460) = 32.41, $p < .001$, but no significant time differences were found. Analyses revealed significant time x group interactions, F (1,12460) = 22.92, $p < .001$. As Figure 1 suggests, students in Group A schools initially reported significantly higher rates of bullying than did students in Group B schools. Group A students reported reductions in bullying after one year of the program, while students in Group B schools reported increases in bullying behavior.

Victimization. No significant group or time effects were observed regarding the

frequency with which students reported being bullied by other students. Moreover, the group x time interaction was not significant, indicating that the program did not significantly affect the number of students in Group A schools who reported being bullied after experiencing one year of the program (see Figure 2).

Bullying teachers. Significant group effects were observed regarding the frequency with which students reported bullying teachers, F (1,1235)= 53.08, p< .001. As Figure 3 illustrates, students in Group A schools were more likely than students in Group B schools to report bullying teachers. No significant time effects were observed, nor did we find significant group x time interactions. Thus, there was no indication that Group A students' self-reports of bullying teachers were significantly altered after experiencing year one of the program (see Figure 3).

Antisocial behaviors. Analyses of covariance also were conducted to examine effects of year one of the program on Group A students' self-reports of antisocial behaviors relative to Group B (controls). Covarying grade and gender, 2 x 2 factorial ANCOVAs were performed, with time (baseline vs. time one) and group (Group A vs. Group B) as the independent variables, and students' scores on the various antisocial behavior scales as the dependent variables.

With regards to students' scores on the delinquency scale, we did not observe significant time differences, however we did find significant group differences, F (1,12391) = 16.22, p < .001, and a significant group x time interaction, F (1,12391) = 7.60, p = .006. As Figure 4 illustrates, although students' delinquency scores increased between baseline and Time 1, Group B students' scores increased at a faster pace than did those for Group A.

Regarding students' scores on the theft scale, we observed significant group effects, F (1,12507) = 23.65, p < .001, indicating that Group A students reported higher rates of theft than did Group B students. No significant effects for time were observed. A non-significant interaction was observed between time x group interaction. As Figure 6 suggests, Group B students' scores on the theft scale appeared to increase somewhat more dramatically than Group A students' scores during year one of the program (although this difference was not statistically significant).

Regarding students' scores on the vandalism scale, analyses revealed significant group differences, F (1,12503) = 7.94, p =.005, with students in Group A reporting higher rates of vandalism than students in Group B. No significant time effects were observed, but results revealed significant group x time interactions, F (1,12503) = 7.13, p < .005. Examination of Figure 7 suggests that self-reported vandalism increased among Group B students relative to Group A students during year one of the program.

Significant group differences were observed in students' self-reports of substance abuse, F (1,12467) = 15.71, p < .001, with Group A students receiving higher scores than Group B students. No significant effects were observed for time. The group x time interaction approached significance, F (1,12467) = 3.63, p = .057 (see Figure 8).

Similar patterns emerged in examining group, time, and group x time interactions for the school misbehavior scale and the school sanctions scales. In each instance, significant effects were observed for group, F (1,12512) = 24.32, p < .001, and F (1,12505) = 38.24 respectively, with Group A receiving significantly higher scores on these scales. Significant time effects were also observed for each scale, F (1,12512) =

14.15, $p < .001$, $F(1,12505) = 11.33$, $p = .001$, respectively. Moreover, significant group x time interactions emerged for the school misbehavior scale, $F(1,12512)=29.52$, $p <.001$, and the school sanctions scale, $F(1,12515)=57.66$, $p<.001$. As figures 9 and 10 illustrate, in each instance, students who did not experience the program (Group B students) reported significant increases in these antisocial behaviors relative to Group A students, who reported no such increases.

Program dosage

To explain the lack of program impact in year two, we conducted further tests of program characteristics. The first question was whether the level of program implementation explained variance in program outcomes. Using the debriefing interviews conducted at the end of each year of the intervention, we calculated a level of implementation based on the number of program components implemented and the frequency with which they were implemented. This method produced a numerical estimate of the level of implementation, which ranged from 0 (indicating a failure to implement any elements of the program) to 38 (based on a total possible score of 51 points). The mean dosage score for schools after year one was 24.8, the mean score for year two of the program (excluding three schools that received scores of zero) was 38.0.

Since the level of implementation varied at each school, additional level 2 variables were included in each model to determine whether school differences in the intensity of the intervention program (dosage) affected the outcomes, and whether changes in intensity could predict the outcome of the second year of the program (dosediff). The results indicated that dosage level was not a significant predictor of any

program outcomes.

Student and Teacher Interventions in Bullying Situations

A second series of analyses assessed students' perceptions of the extent to which other students and teachers intervened in bullying situations. Specifically, students were asked to indicate the extent with which adults at school and other students attempted to put a stop to bullying at school. Another question asked participants to indicate the frequency with which teachers had talked with students about being bullied or bullying other students. Since adult and student intervention in bullying situations is a key part of the program and an indicator of change in the norms of the school, implementation of the anti-bullying program should result in more intervening in bullying situations on the part of students and adults at school.

Prior to beginning the prevention program, there were significant differences between Group A and B in the extent to which participants reported that other students intervened in bullying situations, F (1, 6339) = 25.43, p<.0001), and the frequency with which teachers engaged in discussions with victims of bullying, F (1, 6243) = 35.48, p<.0001, and with bullies, F (1, 6254) = 29.79, p<.0001). In each case, students in Group A schools reported that peers and teachers intervened more frequently in bullying situations than did students in Group B schools. There were no initial group differences in the extent to which students reported that teachers intervened in bullying situations.

To test the impact of the intervention on these variables, we calculated a 2 X 3 factorial ANCOVA with group (Group A vs. Group B) and time (baseline, time 1, and time 2) as the independent variables and students' perceptions of student and teacher

interventions in bullying situations as the dependent variables. Grade and gender served as covariates for all analyses. Regarding the extent to which students reported that teachers intervened in bullying situations, there were no group differences, no differences across time, and no apparent interaction between group and time.

Insert Figure 12 About Here

There were significant group, $\underline{F}$ (1,17358) = 14.81, $\underline{p}$<.001, and time, $\underline{F}$ (2, 17358) = 7.13, $\underline{p}$<.001) differences in students' perceptions of student interventions in bullying situations. Furthermore, there was a significant group by time interaction, $\underline{F}$ (2, 17358) = 5.24, $\underline{p}$=.005). As Figure 13 suggests, the decrease in student interventions from baseline to time 1 was somewhat more pronounced for Group A than for Group B students.

Insert Figure 13 About Here

As illustrated in Figure 14, students reported a decrease over time in the extent to which victimized students reported that teachers had talked with them about being bullied, $\underline{F}$ (2, 17186) = 14.58, $\underline{p}$<.001). Moreover, there were significant group differences, indicating that such discussions were more common among teachers in Group A than Group B, $\underline{F}$ (1,17186) = 110.10, $\underline{p}$<.001). The pattern of scores across time differed by group, with Group A reporting declines in teacher discussion from time

1 to time 2 and Group B declining from baseline to time 1, F (2, 17186) = 19.49, p<.001).

Insert Figure 14 About Here

A similar pattern of group, F (1, 17148) = 40.29, p<.001) and time, F (2, 17148) = 7.09, p<.001, effects were reported for teacher discussions with bullies. There was an interaction between time and group, F(2,17148)= 7.37, p =.001. As Figure 15 illustrates, students in Group A reported declines across all time periods in the frequency with which teachers talked with bullies about their behavior, whereas students in Group B reported such declines only from baseline to time 1.

Insert Figure 15 About Here

Discussion

Results suggest that the first year of the South Carolina bullying program positively affected students' self-reports of bullying and several antisocial behaviors. After experiencing one year of the program, students in Group A schools reported decreases in the frequency with which they bullied other children, while students in control schools reported slight increases in the frequency with which they bullied their peers. Moreover, although we observed an increase over time in the frequency of self-reported antisocial behavior among control schools during this first year (Group B), we observed either no increase or a slower rate of increase in Group A students' self-

reports of delinquency, vandalism, school misbehavior, and punishment for school-related misbehavior. Thus, the program appeared to slow the natural rate of increase in students' engagement in these antisocial behaviors.

During the first year of the program, we did not observe any program effects on students' reports of victimization, bullying of teachers, group delinquency, theft, substance abuse, or their attitudes about bullying, however. It is somewhat puzzling that although students in our intervention schools reported engaging in less bullying after the first year of the program, we did not observe a corresponding decrease in the frequency with which students in these schools reported being bullied by students. These findings are inconsistent with findings of Olweus (1991, 1993a) and Whitney and colleagues (1994), who observed fairly decreases in both bullying and victimization as a result of the bullying intervention. Nor do our findings correspond to those of Pepler and colleagues (1994), who observed decreases in self-reported victimization but increases in self-reported bullying after 18 months of the intervention. Our failure to observe significant changes in students' attitudes about engaging in bullying situations are consistent with those of Olweus (1991) and Pepler and colleagues (1994), who also failed to find consistent program effects on students' attitudes regarding bullying.

Unfortunately, none of the program effects that we observed after the first year of the program were sustained for Group A students during the second year of the program. Moreover, we were unable to discern any one-year program effects on the behavior of Group B students, who started the program in year two. The reasons for these patterns of findings are not clear and were not explained by our assessment of program intensity.

Perhaps the most reasonable explanation for these findings lies in the inherent difficulty of establishing and sustaining whole-school approaches to violence prevention. Unlike the adoption of purely curricular or other narrow approaches to violence prevention, the establishment of a comprehensive school approach requires that school personnel expend significant amounts of time and energy to develop, implement, sustain, and build upon interventions that are designed to target students at multiple levels. Such efforts require that schools develop strategies to address bullying and other aggressive behavior of individual students as well as methods to meet the needs of individual students who are victimized by bullies. They demand that teachers continually incorporate violence prevention themes into classroom activities. They require vigilance on the part of all school personnel to closely monitor all students' behavior, as well as energy and motivation to develop creative means for engaging parents and community members in school-wide activities.

Given the numerous demands upon school personnel, at least within the American context, it is not surprising that comprehensive violence prevention programs are difficult to launch and sustain. In our own experience, project personnel spent considerable time consulting with schools during the first year of the project. Weekly visits by consultants proved important means of sharing particular intervention strategies, problem-solving, and offering support and enthusiasm to school staff. Moreover, consultants frequently provided the extra "legwork" needed to help to engage parents and community members in school efforts.

During the second year of the project, the time that consultants could spend with any given school was essentially cut in half, as new schools began the project. It is

possible that the new programs simply did not receive sufficient consultation to take hold and that continuing programs lost momentum without significant ongoing consultation. Although we attempted to measure the extent to which school programs had fully implemented the core components of the program, it is likely that our measure simply was not sensitive enough to capture subtle differences in the extent to which schools embraced a whole-school approach.

The task of implementing a bullying prevention program may be particularly difficult in the middle school setting. It is during the middle school years that bullying behavior appears to reach its peak, and other antisocial behaviors are on the rise. It may be significantly more effective to introduce such programs during the elementary school years, before bullying and other antisocial behaviors have become so commonplace among children and pervasive within a school setting.

Moreover, the structure of the middle school setting does not as easily lend itself to many of the core interventions suggested by Olweus. For example, as a result of the frequent changing of classes throughout the typical middle school day, teachers are not able to provide as close supervision of students' behavior as they would in an environment in which students remained in the same classroom for the majority of the day (which is the case with students in Norwegian schools and in most elementary schools in the United States). Moreover, most middle schools follow very busy, fairly rigid weekly schedules, which makes it challenging (although not impossible) for staff to insert creative classroom and school-wide violence prevention activities on a regular basis. An elementary school setting would more easily lend itself to such an approach. Moreover, as noted above, there is good reason to believe that the program would have

more impact on younger students' behaviors.

In sum, the results from our study in nonmetropolitan communities support the conclusion that the Olweus bullying prevention program is a promising approach to violence prevention among students in the United States. Future initiatives are needed to further test its efficacy among middle school students in different settings. Our own experiences suggest that such programs would benefit greatly from the services of a violence prevention consultant (perhaps a part-time school employee or a full-time district employee), whose job is to provide ongoing support to school staff in the development of a comprehensive approach to the prevention of bullying and other aggressive acts among students. With such support, the program may prove to be a highly effective prevention strategy in middle school settings[5]. It is our belief that the approach may prove even more appropriate for elementary school settings in the United States, however. Such conclusions are supported by the research of Whitney and colleagues (1994) who observed more marked effects of the bullying project on primary versus secondary school students in England (see also Arora, 1994). Future research is needed to test this assumption in the context of American elementary school settings.

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[5]Although this would add to the cost of school programs, it should be noted that the Olweus model is a very inexpensive program.

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Table 1. Summary of scales from Questionnaire for Students

Scales and Scale Descriptions	Number of Items	Chronbach's alpha
Bully Victimization: Being bullied by others at school or while going to school	4	.78
Bullying: Bullying others at school or while going to school	4	.85
Opposing Bullying: Attitudes opposing bullying	5	.68
Bullying Teachers: Student bullying of teachers	2	.83
Theft: Stealing of property or money	8	.81
Vandalism: Destruction of public or private property	3	.72
Violence: Fighting, hurting others, or using a weapon	4	.69
Delinquency: A total global delinquency scale including items from three previous scales and two additional items	22	.90
Substance Abuse: Substance use/abuse	5	.79
School Misbehavior: Student misbehavior at school	8	.81
School Sanctions: Sanctions for misbehavior at school	4	.74

Group Delinquency: Associating with gangs or groups who commit delinquent acts	4	.70

Table 2. The relationship between student characteristics and antisocial behavior

	Gender** (t-value)	Grade** (t-value)
Delinquency	24.78	13.71
Group Delinquency	22.14	16.42
School Sanctions	28.47	11.23
School Misbehavior	12.73	15.64
Substance Abuse	19.45	18.94
Vandalism	21.30	7.62
Theft	19.39	7.97

**All values are significant at $p<.001$.

Table 3. Program effects on bullying other students

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.159	0.047	3.38	.002
Impact of year 2 (Group A)	-0.049	0.153	-0.32	.748
Overall Program Effect (for Groups A & B)	-0.116	0.112	-1.03	.31

Table 4. Program effects on Victimization

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.026	0.038	0.67	.508
Impact of year 2 (Group A)	0.026	0.087	0.29	.767
Overall Program Effect (for Groups A & B)	0.074	0.069	1.06	.293

Table 5. Program effects on bullying teachers

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.178	0.045	3.952	.000
Impact of year 2 (Group A)	-0.001	0.120	-0.01	.991
Overall Program Effect (for Groups A & B)	-0.067	0.041	-1.63	.110

Table 6. Program effects on delinquency

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.696	0.23	3.02	.005
Impact of year 2 (Group A)	0.947	1.03	.924	.362
Overall Program Effect (for Groups A & B)	0.648	0.758	.855	.398

Table 7. Program effects on group delinquency

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.055	0.099	0.55	.582
Impact of year 2 (Group A)	0.083	0.343	0.242	.810
Overall Program Effect (for Groups A & B)	0.096	0.253	0.381	.705

Table 8. Program effects on school sanctions

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.261	0.144	1.81	.078
Impact of year 2 (Group A)	0.211	0.404	0.52	.603
Overall Program Effect (for Groups A & B)	0.140	0.295	0.47	.638

Table 9. Program effects on school misbehavior

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.524	0.138	3.78	.001
Impact of year 2 (Group A)	0.003	0.544	0.01	.996
Overall Program Effect (for Groups A & B)	-0.046	0.399	-0.12	.908

Table 10. Program effects on substance abuse

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.207	0.077	2.69	.011
Impact of year 2 (Group A)	0.527	0.415	1.27	.212
Overall Program Effect (for Groups A & B)	-0.028	0.014	-1.94	.059

Table 11. Program effects on vandalism

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.098	0.034	2.86	.007
Impact of year 2 (Group A)	0.05	0.142	0.35	.729
Overall Program Effect (for Groups A & B)	0.029	0.102	0.28	.779

Table 12. Program effects on theft

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	0.195	0.067	2.89	.007
Impact of year 2 (Group A)	0.334	0.269	1.239	.223
Overall Program Effect (for Groups A & B)	0.298	0.202	1.47	.148

Table 13. Program effects on attitudes opposing bullying

	Coefficient	Standard Error	t - score	p - value
Initial Difference (between Groups A & B)	1.057	0.032	-1.769	.084
Impact of year 2 (Group A)	-.049	0.150	-0.324	.747
Overall Program Effect (for Groups A & B)	0.025	0.134	.185	.854

Figure 1. Percent of students bullying other students

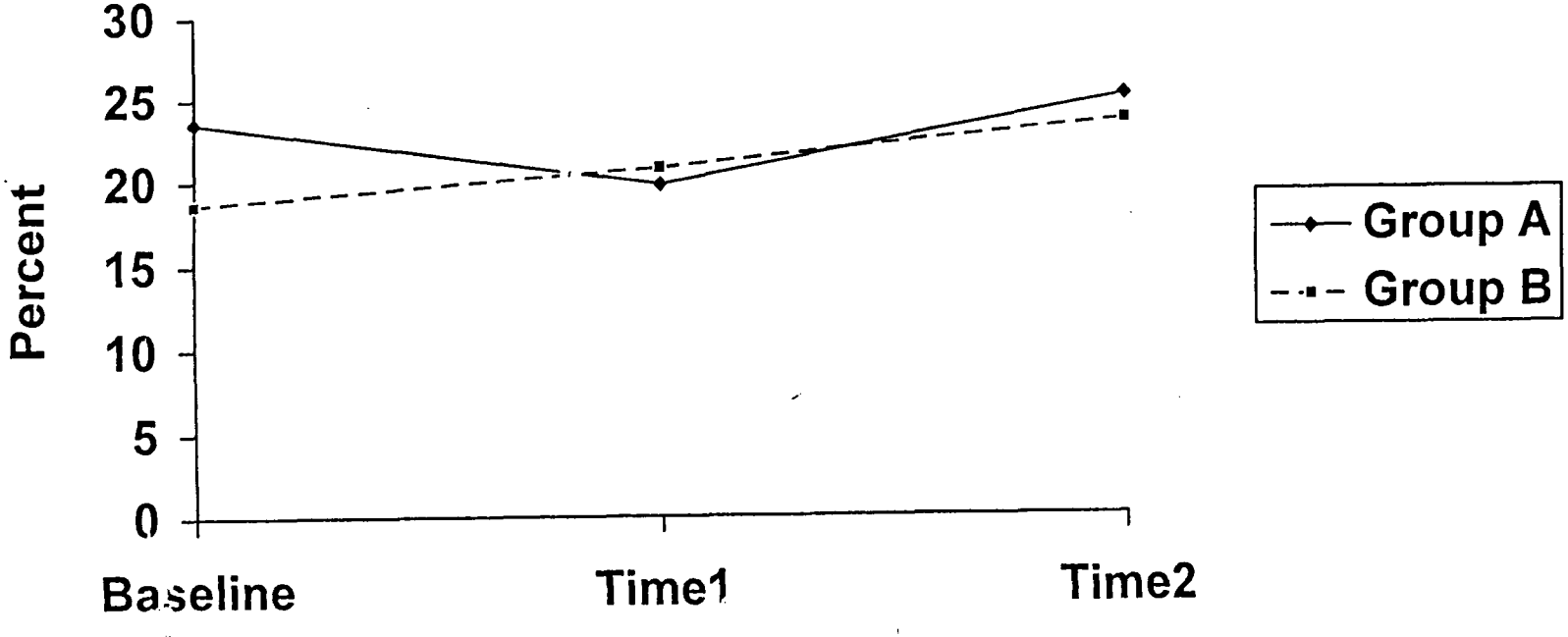


Figure 2. Percent of students being bullied

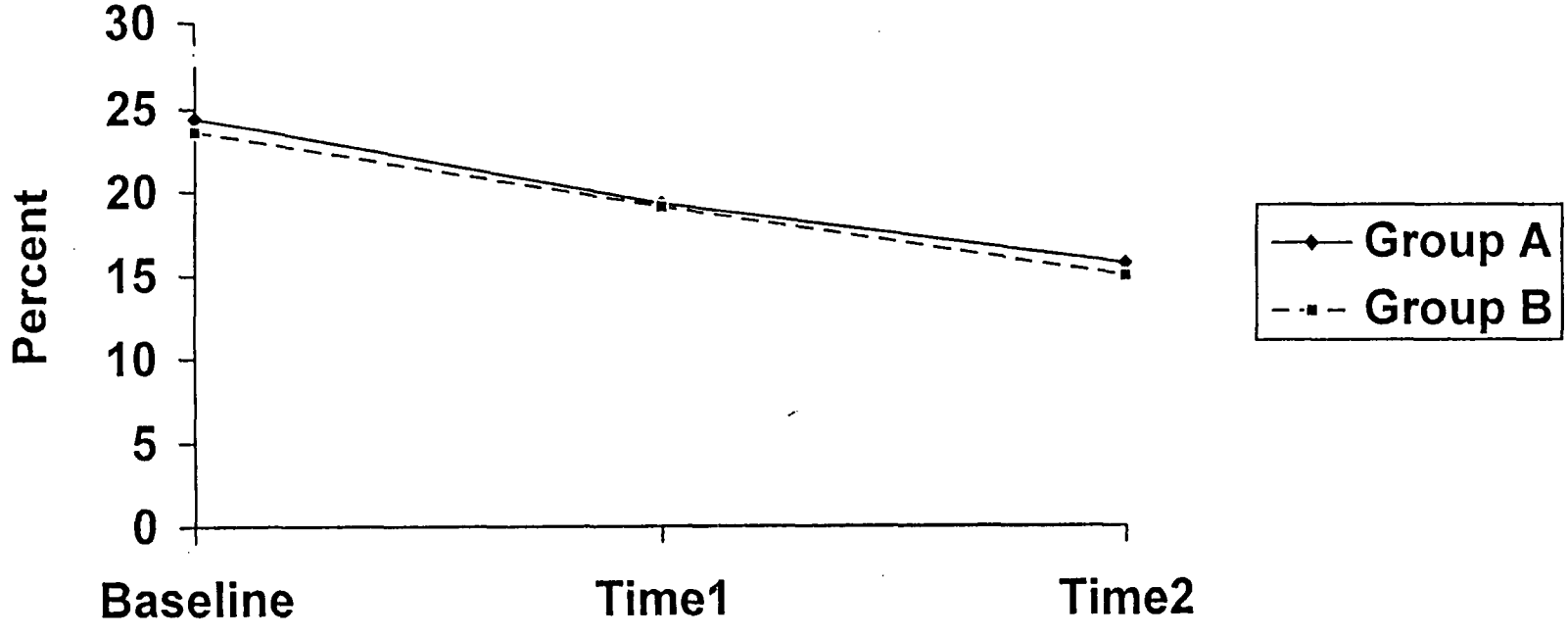


Figure 3. Percent of students bullying teachers

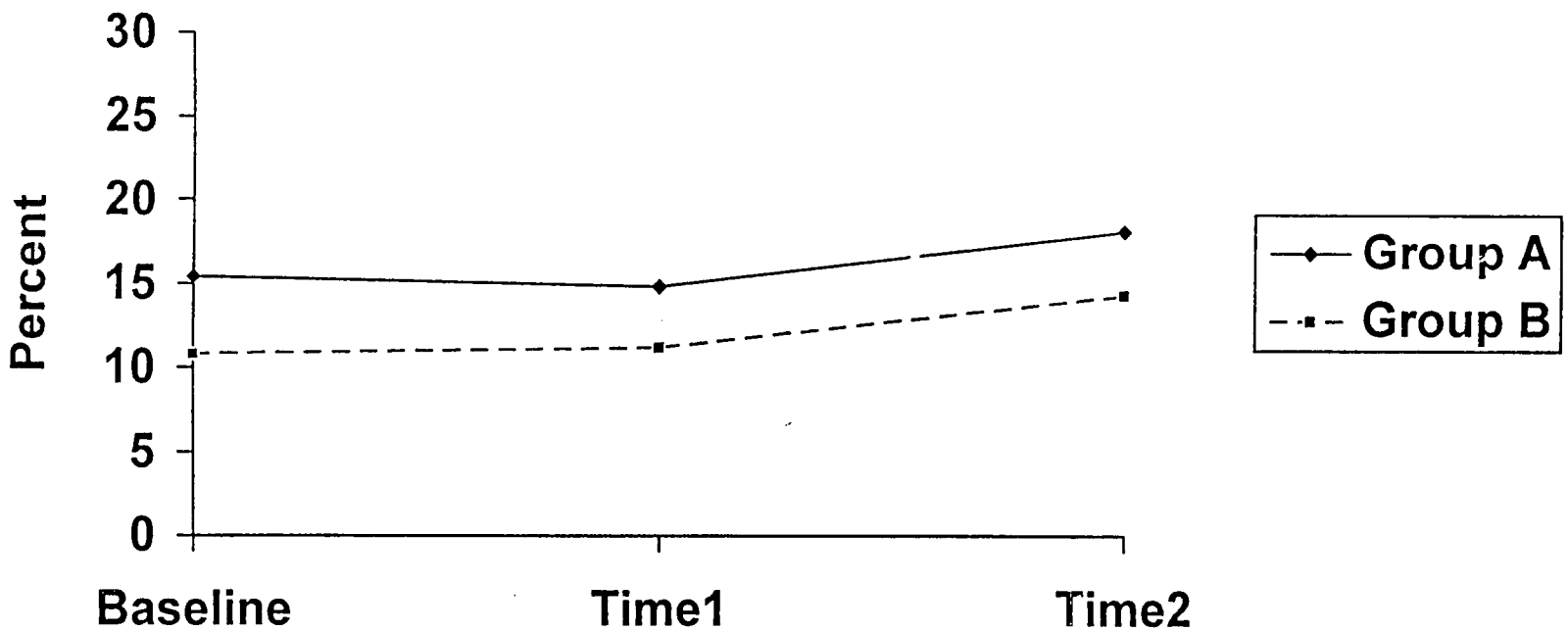


Figure 4. Delinquency

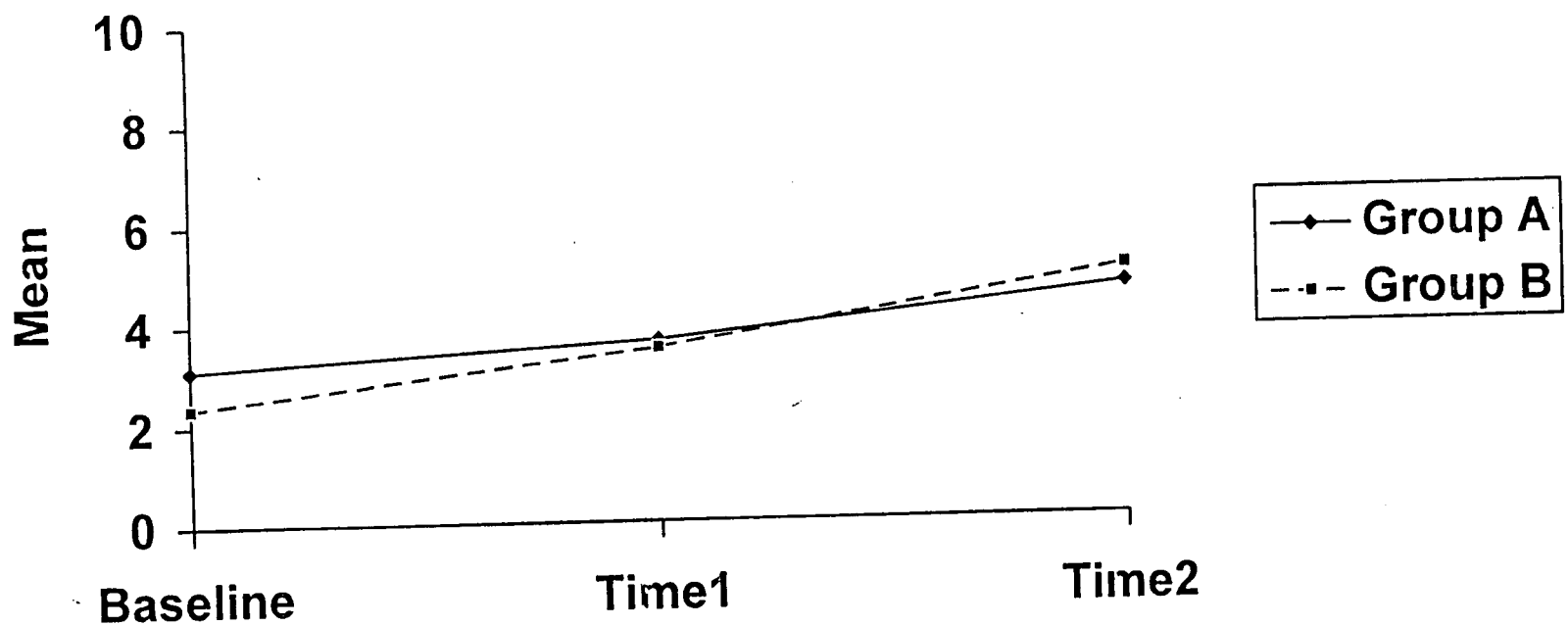


Figure 5. Group Delinquency

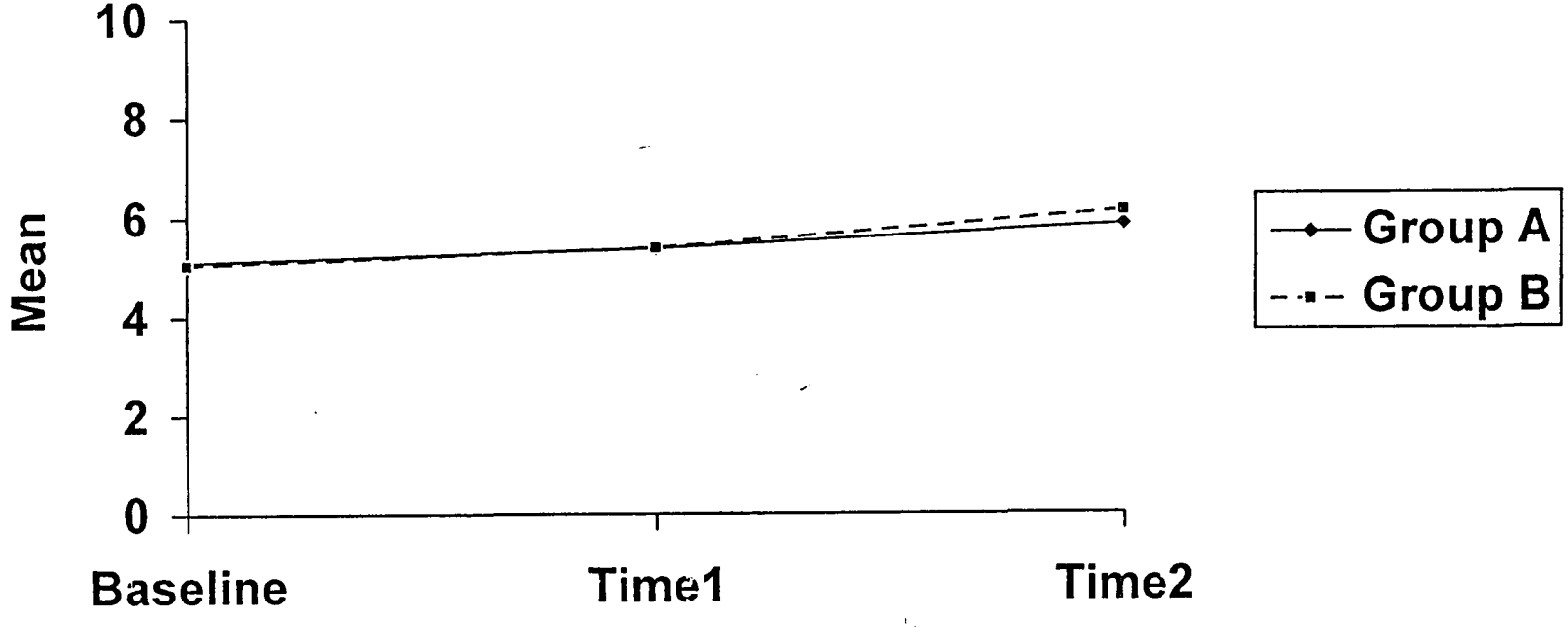


Figure 6. Theft

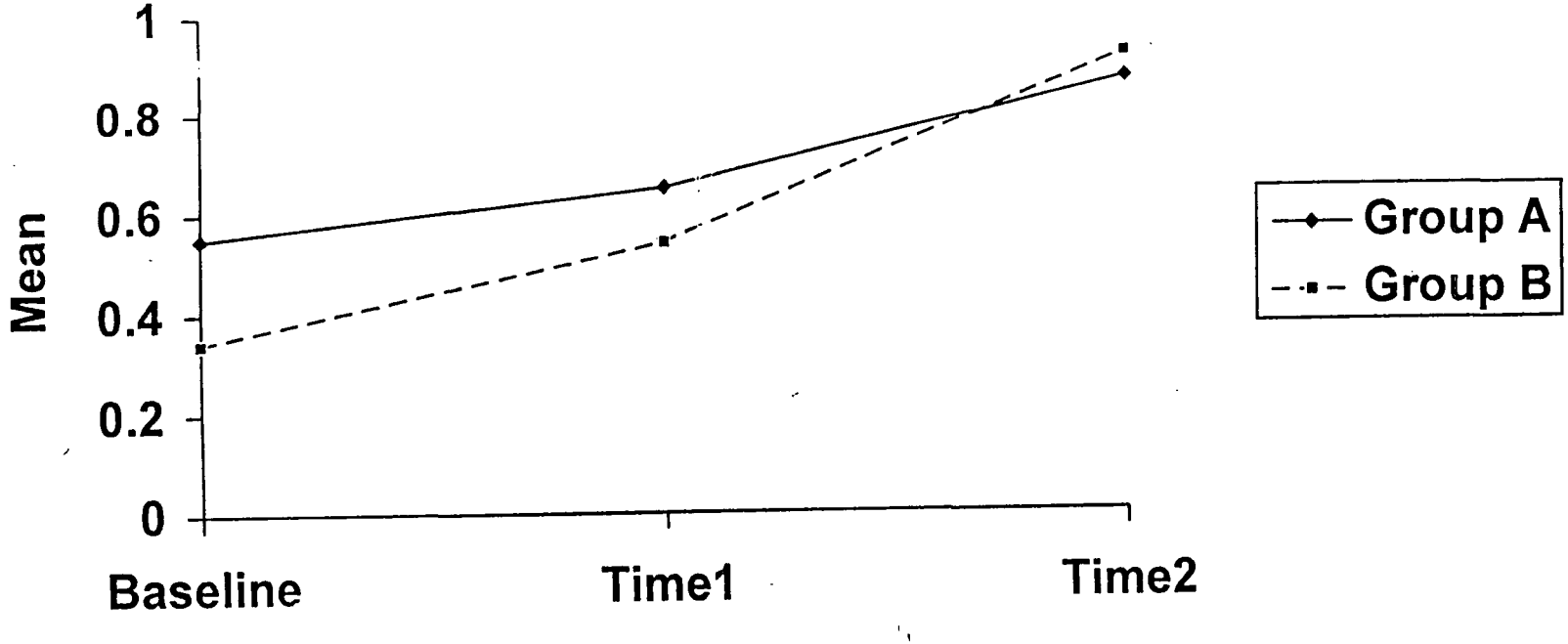


Figure 7. Vandalism

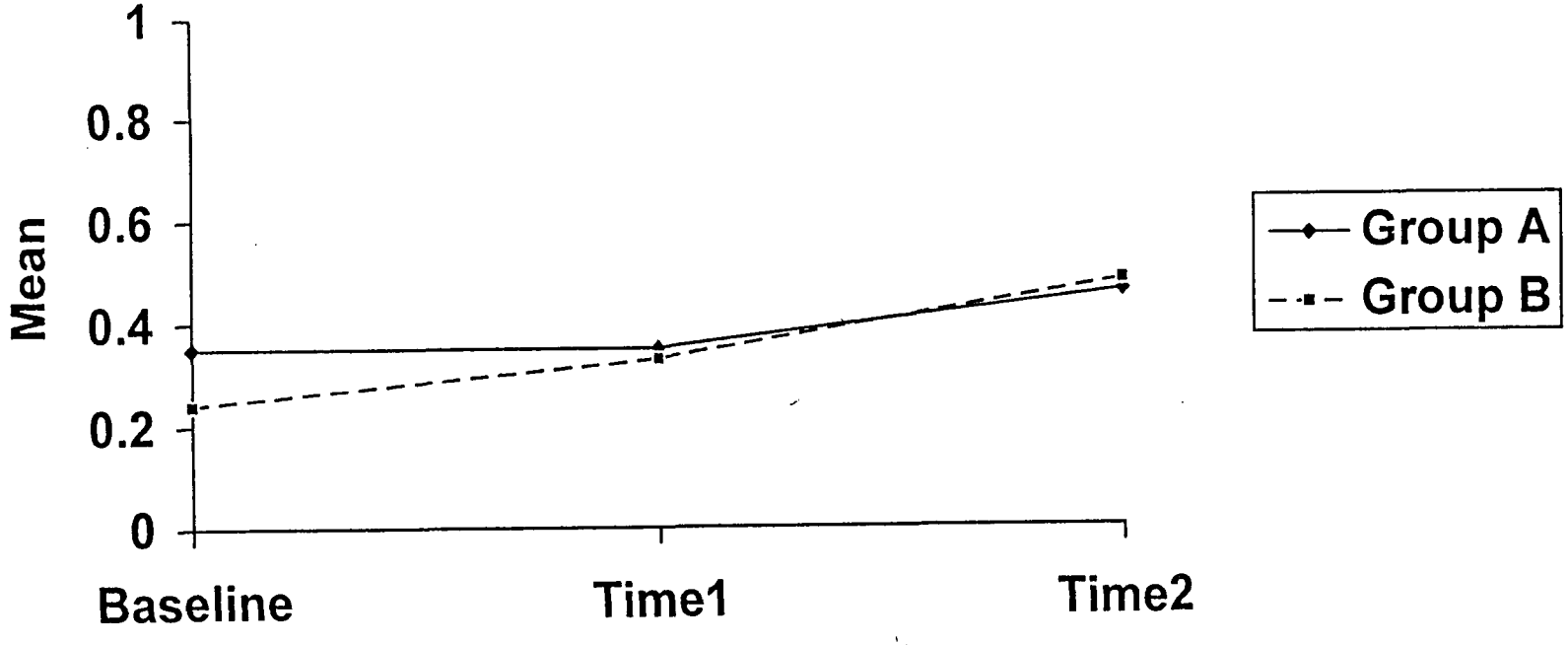


Figure 8. Substance Abuse

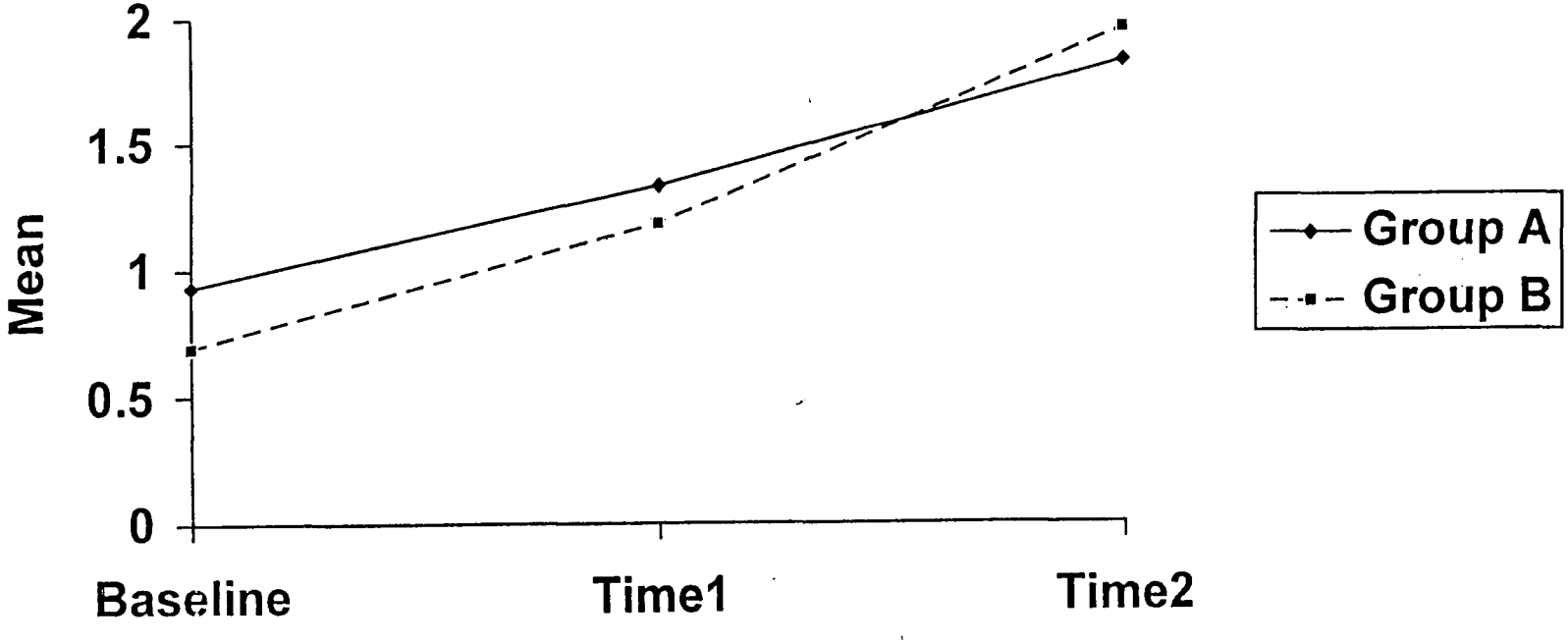


Figure 9. School Misbehavior

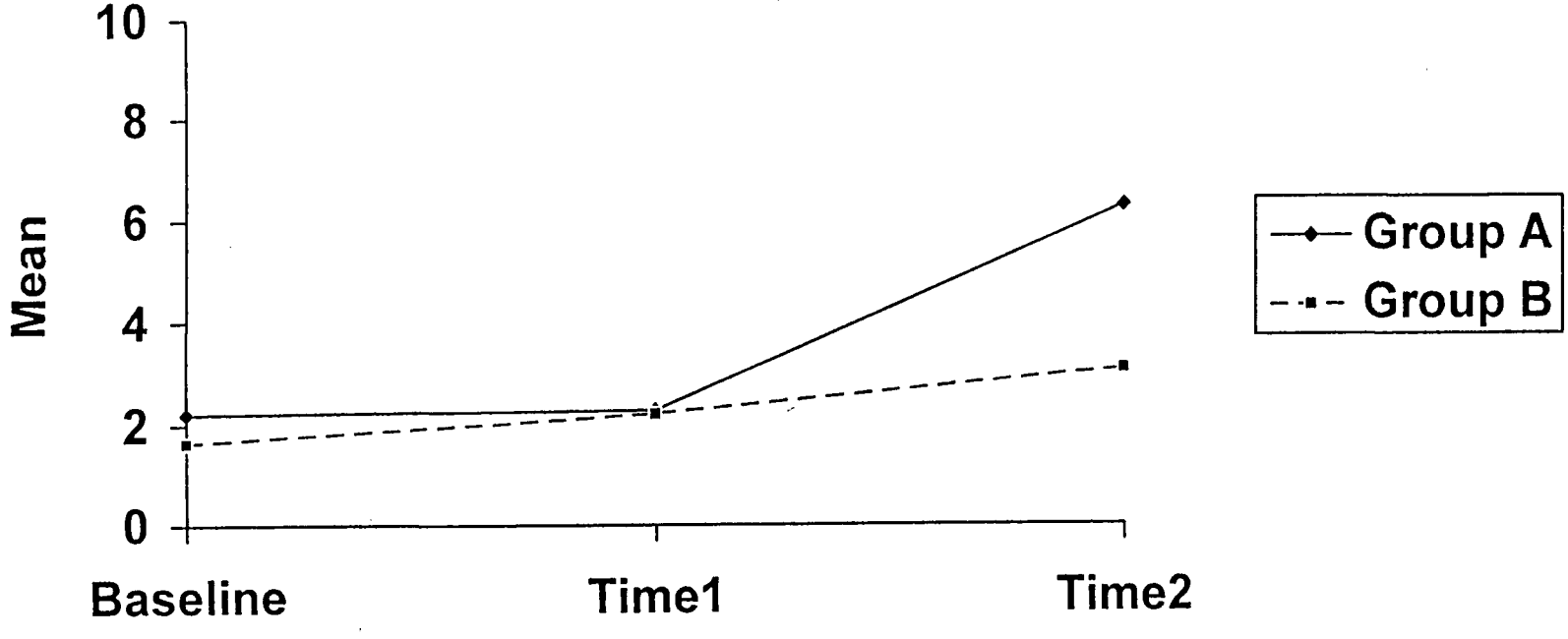


Figure 10. School Sanctions

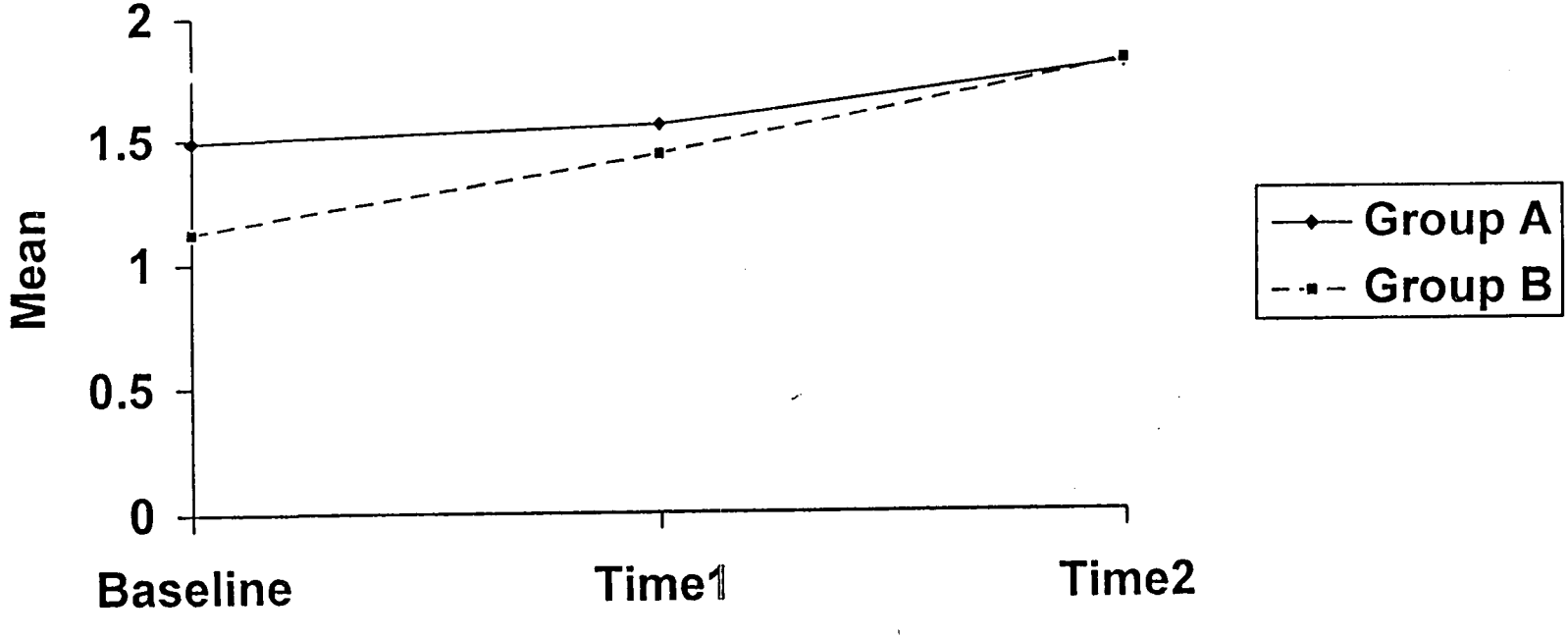


Figure 11. Attitudes toward bullying

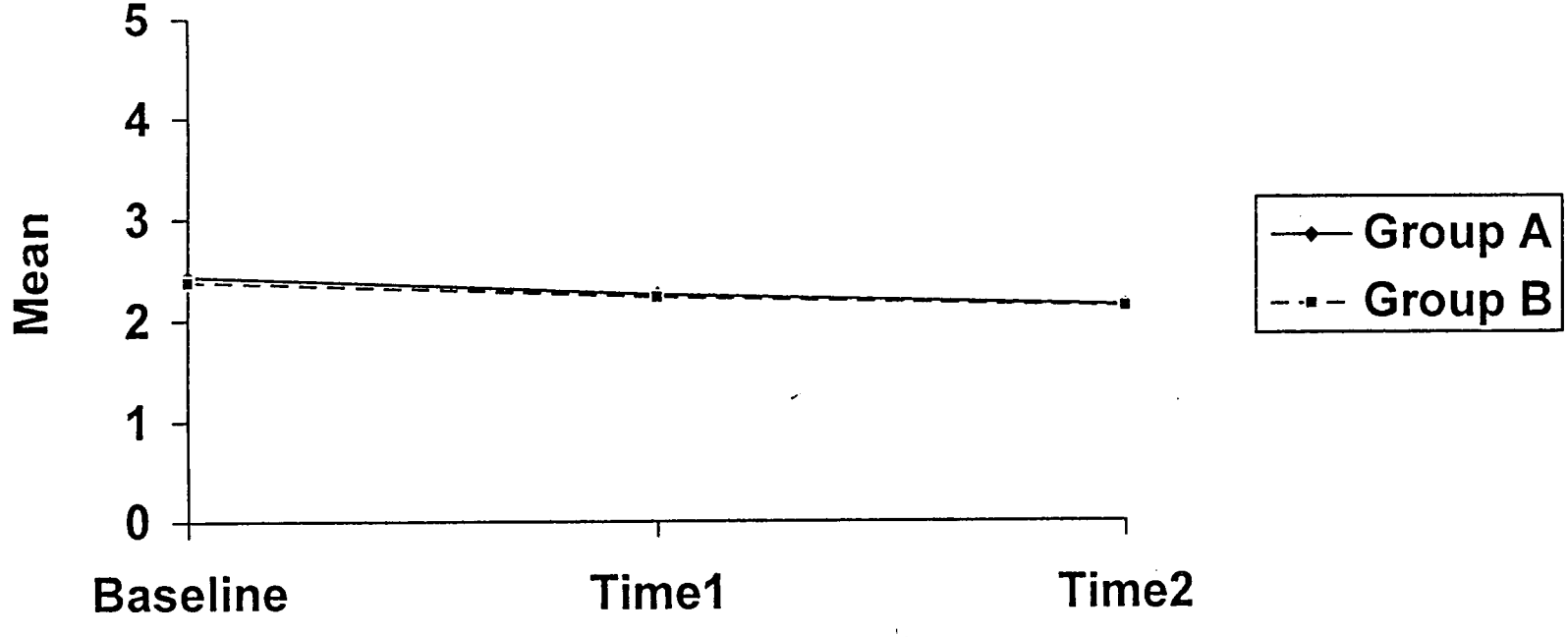


Figure 12. Percent of students reporting teacher intervention in bullying situations

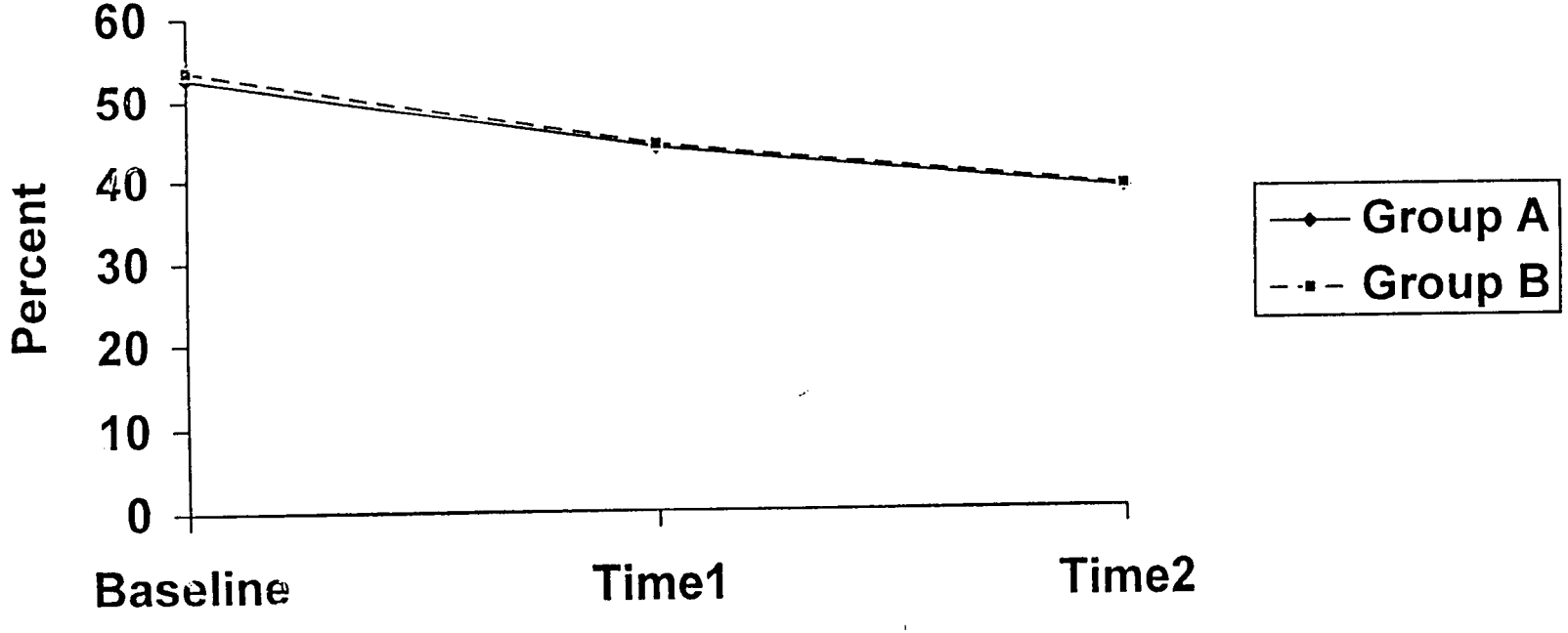


Figure 13. Percent of students reporting student intervention in bullying situations

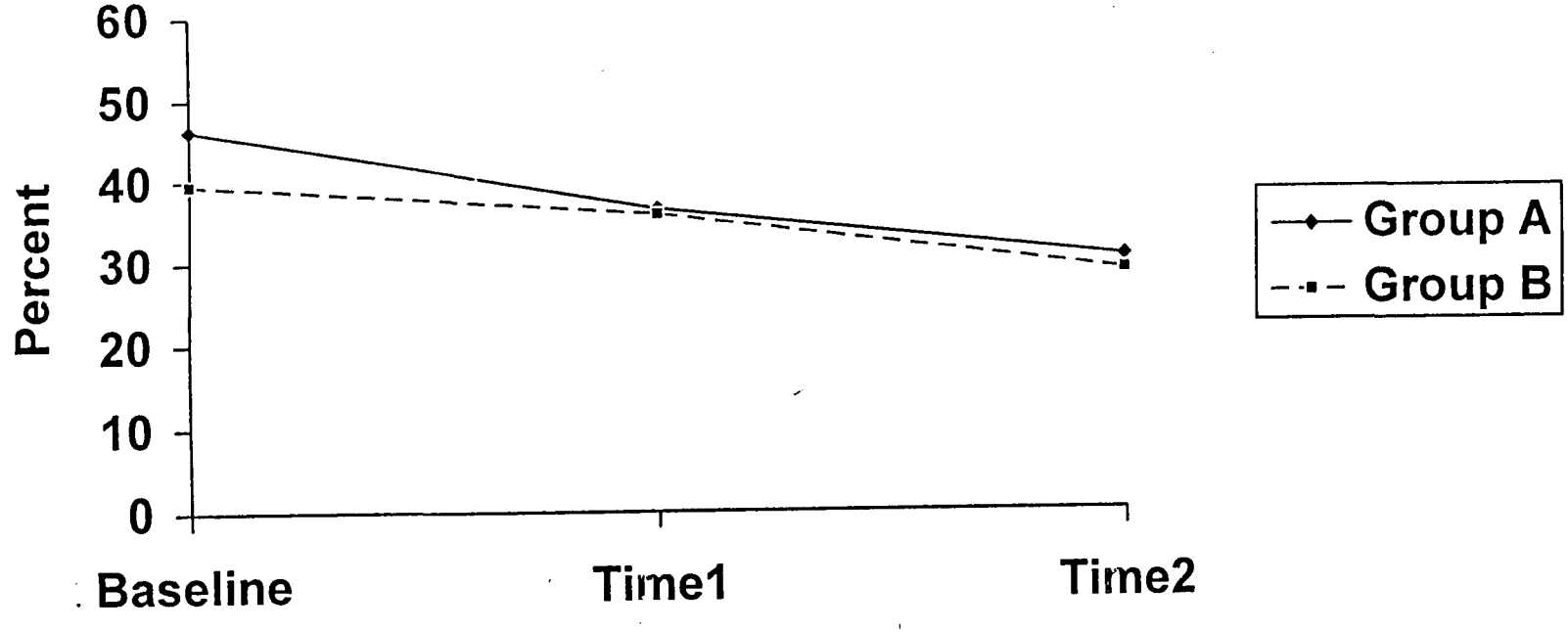


Figure 14. Percent of students reporting teacher discussions with victims of bullying

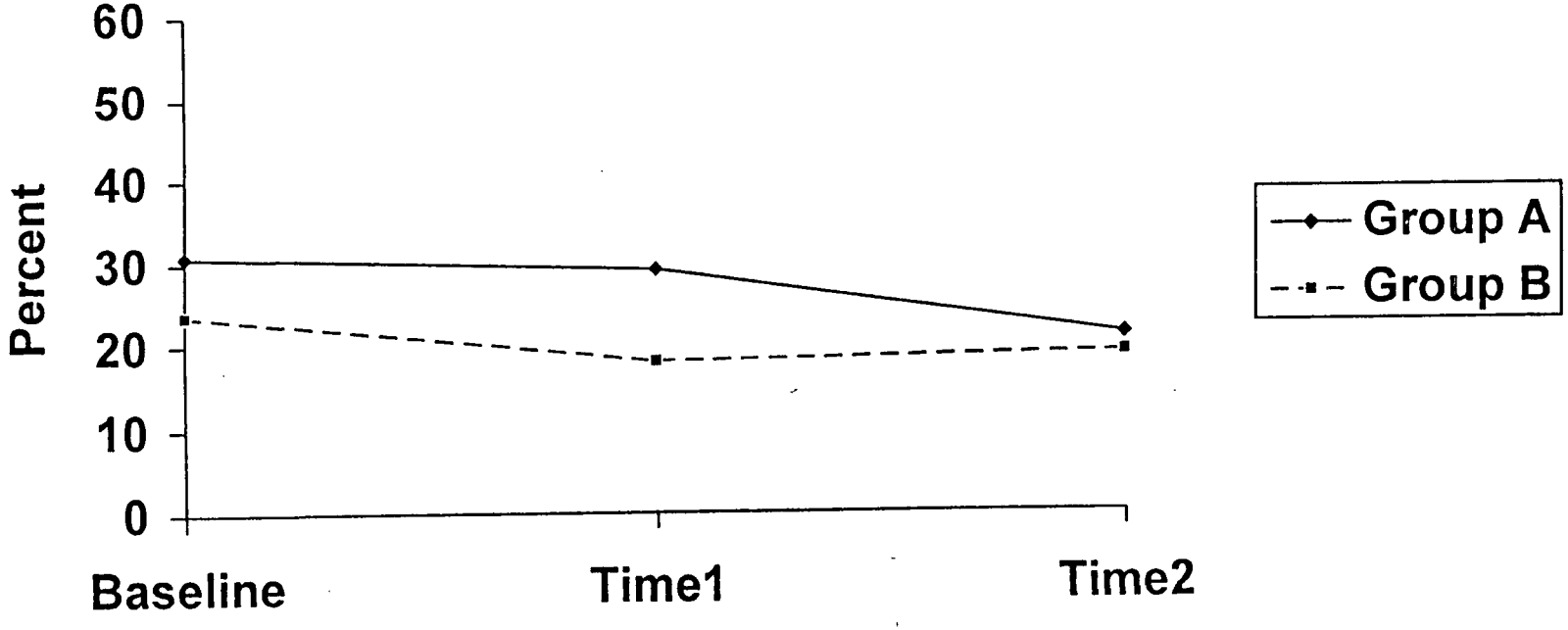
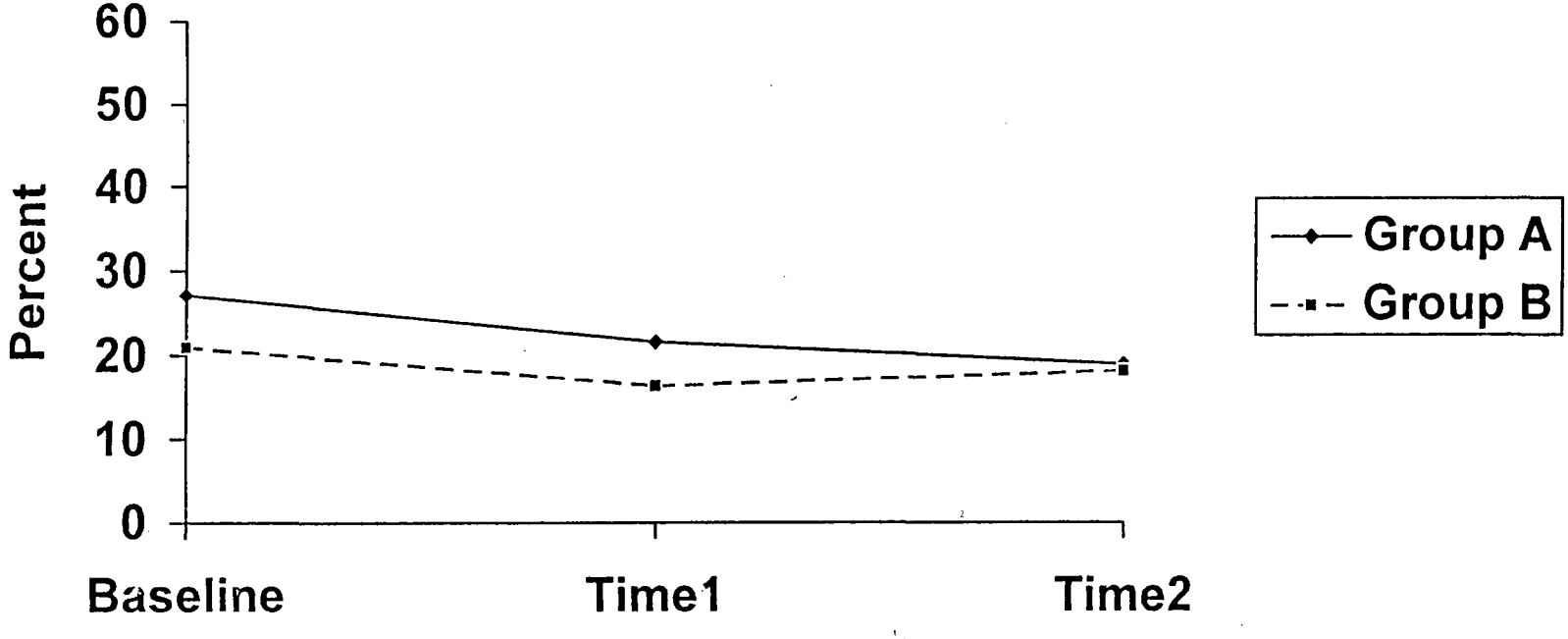


Figure 15. Percent of students reporting teacher disscussions with bullies



Social Disorganization and Rural Youth Violence:

A County Level Negative Binomial Analysis of Four States

This paper extends the study of community social disorganization and crime to include rural and non-metropolitan settings. Research on the contribution of community context to rates of crime and delinquency is not only a tradition of long standing in criminology, but it is also a very active area of research today. Growing out of the Chicago school of sociology's emphasis on urban ecology (Shaw and McKay, 1942; Burgess, 1925; Thrasher, 1927), theory and research on crime and communities has almost exclusively defined communities as neighborhoods within large urban centers.[1]

Yet according to the 1990 census (United States Department of Commerce, 1992), only 49% of the U.S. population lives in urbanized areas of 500,000 or more, while 25% lives in fully rural settings (i.e., places with population of no more than 2,500) and another 12% lives in towns or cities of under 50,000 population. Though overall crime rates are higher in more populous areas (e.g., Maguire and Pastore, 1995), crime rates are less dependent on population size than is widely assumed, and there is considerable variation in crime rates among small towns and rural areas. If the study of communities and crime is to mature, it must expand to encompass the full range of communities. Toward that end, we present a county level analysis of youth violence that tests the applicability to rural communities of the most prominent theory in this area, social disorganization theory.

A second emphasis of this paper is to introduce a statistical approach to analyzing aggregate rates when those rates are based on small numbers of events,

such as arrests in sparsely populated areas. Because our data are ill suited to standard least squares analysis, we turned to the alternative of negative binomial regression. This statistical approach has broad applicability to problems of aggregate data analysis, but it appears to have had little use for that purpose by social scientists. We will, therefore, describe it in some detail.

Social Disorganization Research and Rural Communities

As was typical of the progressive era philosophy from which it grew, members of the Chicago school started from the premise that major social problems such as crime stemmed from the disruption of the social fabric that occurred with massive population shifts from rural to urban areas (e.g., Bursik and Grasmick, 1993). Shaw and McKay's (1942) now classic theory portrays delinquency as arising from social disorganization, which is an inability of community members to achieve shared values or to solve jointly experienced problems (Bursik, 1988). One aspect of social disorganization, for instance, would be a lack of effective social networks to aid adult supervision of children's behavior.

Shaw and McKay traced social disorganization to conditions endemic in the urban areas where the newly arriving poor were forced to settle: high residential mobility, low economic status, and ethnic heterogeneity. Here Shaw and McKay were building on notions of community solidarity and disorganization that were first developed by fellow members of the Chicago School, Thomas and Znaniecki (1958 [1927]), in their classic study of Polish peasants. Shaw and McKay's analyses relating delinquency rates to these structural characteristics spawned an enduring line of research. In the past twenty years the themes of social disorganization theory have

been more clearly articulated and extended by several authors (e.g., Kornhauser, 1978; Bursik and Grasmick, 1993; Sampson and Groves, 1989) and integrated with additional theoretical perspectives by others (e.g., Sampson and Wilson, 1995; Stark, 1987; Taylor, 1997).

Urban settings have been the dominant focus of both theoretical development and empirical research, not only for social disorganization theory in particular, but for the study of community influence on crime in general. For instance, many of the largest cities in the country have been the subject of ecological studies of crime (e.g., Chicago, New York, Boston, Baltimore, San Diego). Shannon's (1988) research on Racine, Wisconsin (1990 population 84,000) is a lone example of research on a smaller city.

Considering the origins of the concept of social disorganization, the lack of attention to non-urban communities is a glaring omission. Thomas and Znaniecki (1958 [1927]) originally developed this concept to explain the disruptive impact of migration and industrialization on rural communities in Poland. Indeed, if the claims of social disorganization theory are valid, they should be applicable to communities of all sizes and settings. Like urban communities, non-urban communities must also vary in their ability to realize values and solve problems. Furthermore, the arguments that population turnover, population heterogeneity, and poverty would contribute to that inability appear equally applicable to all types of communities. Having no one but strangers for neighbors surely must be at least as problematic in a small town as in a big city. Indeed, one of the few studies that included rural settings found a stronger impact of community structure in rural than in urban areas (Sampson, 1983).

Though ecological and social disorganization theorists have not attended to rural

communities, rural areas have been included in some studies of communities and crime. Most of these studies were based on victimization surveys (Sampson, 1983; Sampson, 1985; Sampson and Groves, 1989) that used national samples rather than samples of limited geographic areas (e.g., neighborhoods within a city). The results of these studies are, indeed, supportive of social disorganization theory. Nevertheless, these studies either did not systematically examine the applicability of the theory within non-metropolitan areas (Sampson, 1985; Sampson and Groves, 1989) or limited their attention to a specific structural variable rather than the general model (Sampson, 1983). Sampson and Groves' (1989) influential study is set in Britain rather than the United States. Petee and Kowalski (1993) test social disorganization theory's structural model through an analysis of arrest rates in 630 "exclusively rural" counties, but it is difficult to evaluate the strengths and weaknesses of their work on the basis of this three page article.

As a first step in testing the applicability of social disorganization theory outside of large urban areas, we present a county level analysis relating rural youth violence to the structural characteristics of communities specified by social disorganization theory. These structural correlates have long been the primary basis of support for the theory in analyses of urban areas (e.g., Bursik, 1988). Results supportive of the theory's applicability to non-metropolitan areas would call for launching research integrating individual and community levels of analysis, which is necessary for directly examining the mediating processes specified by the theory (Bursik, 1988; Sampson, 1987). Studies of this type have been critical to the advance of research on crime in urban communities (Elliott, Wilson, Huizinga, Sampson, Elliott, and Rankin, 1996; Gottfredson,

McNeil, and Gottfredson, 1991; Sampson and Groves, 1989; Sampson, Raudenbush, and Earls, 1997; Simcha-Fagan and Schwartz, 1986). We focus on youth violence both because this aspect of the crime problem is such a critical area of concern today and because juvenile delinquency (rather than adult crime) has been a special emphasis of both early and recent work in the social disorganization tradition.

Hypotheses to Be Tested

Social disorganization theory specifies that a number of structural variables influence a community's capacity to develop and maintain a strong social organization. Lower levels of social organization limit a community's ability to control behavior both formally and informally and to organize effectively to address social problems. In more disorganized communities, parents and neighbors will be less able to guide and supervise youth. These organizational deficits are hypothesized to result in increased levels of crime and delinquent behavior.

Hypothesis 1: Rates of juvenile violence will be positively related to low economic status. A central theme of social disorganization theory is that the lack of economic resources is a detriment to social organization. Though some research suggests that the relationship of poverty to delinquency may be accounted for by other structural factors (e.g., Sampson, 1985), there is broad agreement that there is a reliable bivariate relationship between rates of poverty and delinquency (e.g., Warner and Pierce, 1993).

Hypothesis 2: Rates of juvenile violence will be positively related to ethnic heterogeneity. An important feature of Shaw and McKay's (1942) conception is that ethnic diversity presents problems of social disorganization by interfering with

communication among adults who would wish to control their children's behavior. Effective communication is less likely in the face of ethnic diversity because differences in customs and a lack of shared experience may breed fear and mistrust, even when groups share conventional values opposed to delinquency (e.g., Sampson and Groves, 1989). It is important to distinguish this theoretically driven notion from simple ethnic differences in offense rates, which have very different implications.

Hypothesis 3: Rates of juvenile violence will be positively related to residential mobility. Residential mobility is equivalent to low stability and high turnover of the population in an area. When the population of an area is constantly changing, there is less opportunity for residents to develop extensive and strong personal ties to one another and to community organizations (e.g., Bursik, 1988).

Hypothesis 4: Rates of juvenile violence will be positively related to family disruption. Sampson (1985, Sampson and Groves, 1989) has added family disruption (e.g., divorce or single parent households) to Shaw and McKay's list of structural indicators of social disorganization. He reasons that unshared parenting strains parents' resources of time, money, and so forth, interfering with parents' abilities to supervise their children and communicate with other adults in the neighborhood.

Hypothesis 5: Rates of juvenile violence will be positively related to population density. We expect the first four hypotheses from urban community research to hold for rural communities as well. We see no reason that these factors would not affect the organization of rural communities in a manner similar to urban communities. Population density is a rather different matter for two reasons. First, evidence on the relationship of population density to urban crime and delinquency is much less consistent, and there

does not appear to be a clear relationship (Figueroa-McDonough, 1991). Second, the significance of density becomes quite different for rural communities, where in the least dense areas one must travel several miles to have significant contact with non-family members. The original reasoning about the urban context was that high density created problems by producing anonymity that interferes with social controls. Instead, very low density rural areas may bring a problem of social isolation that can interfere with social support to monitor children and respond to problem behavior. On the other hand, Sampson (1983) suggested that density may be more important in terms of opportunities for offending than in terms of social disorganization. The relative isolation of living in a sparsely populated area may reduce opportunities for offending in the form of distance from targets and from potential companions in crime (Cohen and Felson, 1979; Osgood, Wilson, Bachman, O'Malley, and Johnston, 1996).

Hypothesis 6: Rates of juvenile violence will be higher in communities that are closer to urban areas. With this hypothesis we go beyond the themes of Shaw and McKay's work to an issue that is specific to rural settings and to the linkages among communities. Various rural and suburban communities have very different relationships with urban communities, and this is an important theme of research on rural communities. In their pioneering research, Thomas and Znaniecki (1958 [1927]) concluded that the primary source of social disorganization for peasant villages was the contact of young villagers with urban communities. By this logic we would expect that, in rural communities, proximity to large urban areas will engender social disorganization by interfering with the strength of internal relationships.

Methods

Sample

One of the principal weaknesses of community level research on delinquency is that most studies focus on variation among neighborhoods within a single metropolitan area. As Bursik has pointed out (1988), this yields a weak base for generalizing results, and there has been no way of resolving inconsistencies in findings that have arisen across studies of different cities. In the same vein, a county level analysis would be more meaningful if it were based on more than a single state. Thus, our analysis includes four states with substantial rural regions: Florida, Georgia, South Carolina, and Nebraska.[2]

The standard unit of analysis for research in the urban setting has been neighborhoods that are no more than a few miles across. This conception of community does not generalize very well to rural settings where population density is much lower. Because both arrest data (for the Uniform Crime Reports) and population characteristics (for Census Bureau population reports) are gathered at the county level, this is a convenient unit of analysis for the study of community influences on rural crime rates. Our analysis is limited to counties that are not included in metropolitan statistical areas (MSA) by the Census Bureau. These are counties that neither have a city of 50,000 or more, nor have 50% of their population residing in a metropolitan area of 100,000 or more. Thus, residents of these counties live in smaller cities, towns, and open country rather than in moderate to large cities or their suburbs. For simplicity's sake, we refer to our sample as rural counties, but it should be remembered that it includes many smaller cities and towns.

No doubt some rural counties encompass two or more distinct communities that differ in their level of social disorganization, just as city neighborhoods defined by census boundaries may combine diverse settings. It is safe to assume that the diversity of communities within rural counties will be considerably less than within the far larger populations of metropolitan counties. Even so, we must remember that, though our research design treats a single value as characteristic of an entire county, areas within the county may deviate from this average. Inaccuracy of this sort will decrease the variation in our explanatory variables, with the statistical consequence of reduced power to detect relationships. Nevertheless, if there is a meaningful level of variation across counties, then strong relationships should be apparent, and there is no reason that a lack of precision would introduce systematic biases.[3] Indeed, Land, McCall and Cohen (1990) demonstrated that structural correlates of crime rates are generally robust across city, county and state levels of aggregation. Thus, their results suggest that our county level analysis should provide a reasonable approximation to the relationships that would be found with more precisely defined communities.

It is worth noting, however, that Land et al. caution that bivariate relationships are far more consistent across levels of aggregation than are partial relationships (i.e., relationships to crime of one structural factor controlling for others). Accordingly, we will place more emphasis on bivariate relationships, though we will report partial relationships as well.

Our analysis included 264 counties with total populations ranging from 560 to 98,000. Though these rural counties are much larger geographic units than the areas analyzed in community level research on crime in urban settings, they are of equal or

smaller size in terms of population. The average total population of these rural counties is roughly 10,000, and that is considerably less than the widely studied 75 community areas of Chicago (e.g., Curry and Spergel, 1988), which have an average population of more than 37,000, and comparable to the fine-grained analysis of 343 neighborhoods in the ambitious Project on Child Development in Chicago Neighborhoods, which have an average population of a little over 8,000 (Sampson et al., 1997). Thus, our sample compares favorably with studies of urban areas in terms of the number of aggregate units, the level of aggregation, and the breadth of settings included.

Measures

Delinquency

County level arrest data are the obvious starting point for analyses of crime in rural areas because they are routinely gathered by state criminal justice agencies for inclusion in the Uniform Crime Reports (UCR, Federal Bureau of Investigation, 1997). Yet criminologists have long been concerned about potential biases in measuring crime through official records, especially arrests. A decade ago, over-reliance on arrest records was a critical issue facing research on social disorganization. Bursik (1988) reviewed a variety of potential shortcomings of arrest records that might render worthless the entire body of social disorganization research. Fortunately, more recent research allays this fear. Findings relating social disorganization to arrests consistently have been replicated by studies measuring offending through citizen calls for police assistance (Warner and Pierce, 1993), self-reports of victims (Sampson, 1985; Sampson and Groves, 1989), and self-reports of offenders (Elliott, et al., 1996; Gottfredson, et al., 1991; Simcha-Fagan and Schwartz, 1986). This degree of

convergence across methods is impressive and rarely seen in social science. Our measure of delinquency is based on the number of arrests of juveniles (ages 11 through 17) in each county, pooled over a 5 year period from 1989 through 1993. Arrests for homicide, forcible rape, aggravated assault, robbery, weapons offenses, and simple assault were used as the primary dependent variables in our analyses, as were arrests for the Uniform Crime Reports (UCR) violence index (the sum of the first four offenses). For comparison to property offenses, we also included arrests for burglary, larceny, and motor vehicle theft. In analyzing so many separate offenses we deviate from the common practice of limiting attention to a few offenses judged to be most reliably measured (for instance, following advice of Hindelang, 1981; or Gove, Hughes, and Geerken, 1985). Instead, we include those violent and property offenses for which recording is comparable across these four states, allowing us to ascertain from our data whether results are consistent across offenses.

Table 1 presents descriptive statistics for all of our measures, calculated separately for each state. Rates of arrest for serious violent offenses and for burglary are considerably higher in the rural counties of Florida and South Carolina than in those of Georgia or Nebraska. Differences are less consistent for simple assaults and the remaining property offenses. We suspect that some of these inconsistencies, such as the extremely low rate of simple assault in Florida, may reflect that police and citizens give less attention to minor offenses in areas with high rates of serious offenses (as noted by Smith, 1986; and Stark, 1987).

Explanatory Variables. Our measures of the explanatory variables associated with social disorganization theory were based primarily on 1990 census data (United

States Department of Commerce, 1992). As is standard in research on in this area, we defined mobility as the proportion of households occupied by persons who had moved from another dwelling in the previous five years (e.g., Sampson, 1985; Warner and Pierce, 1993). Unemployment rates (coded as proportions of the workforce) were collected from State Data Centers, and a mean rate was calculated for the period under analysis.

Family disruption was indexed by female headed households, expressed as a proportion of all households with children. Previous studies have more often calibrated female headed households with children as a proportion of all households (e.g., Sampson, 1985; Warner and Pierce, 1993). We reasoned, however, that the burden of monitoring the behavior of children and teenagers falls disproportionately on adults in households with children (especially mothers), so that the proportion of mothers without marital partners would be most relevant to delinquency. Indeed, preliminary analysis indicated that an index based on households with children was more strongly related to crime rates than was an index based on total households.

We measured ethnic heterogeneity in terms of the proportion of households occupied by white versus non-white persons. Following many researchers in this area (Sampson and Groves, 1989; Warner and Pierce, 1993), we calibrated ethnic heterogeneity with the index of diversity, calculated as $1 - (\Sigma p_i^2)$, where p_i is the proportion of households of a given ethnic group, which is squared and summed across the groups that are distinguished (here only white and non-white). This index reflects the probability that two randomly drawn individuals would differ in ethnicity (Blau, 1977).

A county entirely comprised of white households or of non-white households would receive the minimum score of 0, while a county with equal numbers of white and non-white households would receive the maximum score of .5.

We defined poverty as the proportion of persons living below the poverty level. Some research indicates that there may be a threshold effect of low economic status rather than a continuous one (Figueroa-McDonough, 1991), with rates of true poverty more important than average incomes. In preliminary analyses, we investigated two indices of poverty: simple poverty, defined as the proportion of persons living below the poverty level, and extreme poverty, defined as the proportion of persons living below half of the poverty level. The simple poverty index proved to be more consistently related to juvenile arrest rates, so it is used in the analyses reported here.

Proximity to metropolitan counties was indicated by a dummy coded variable based on Beale Code designations (United States Government Accounting Office, 1989), with 1 being adjacent to a metropolitan statistical area and 0 being non-adjacent. Also included in the analysis were the number of youth 10 to 17 years of age, which is the population at risk for juvenile arrests. Because the surface area of counties is relatively homogeneous within each state, the population size measure is highly collinear with population density ($r = .92$). Therefore, we use population size as a proxy measure for population density in our models. Because states may differ in their statutes and in the organization, funding, and policies of their justice systems, it was important that we eliminate from our analysis all variation between states and assess only within-state relationships pooled across the states. We accomplished this through dummy variables representing states (with Florida serving as the omitted reference

category).

Because we control for differences between states in our analysis, our power to detect relationships is dependent on within-state variation in our measures. As can be seen in Table 1, there is substantial variation within each state for rates of arrest for all but the most rare offenses (i.e., homicide and rape in all four states and robbery in Nebraska). Similarly, the means and standard deviations of the explanatory variables reflect that there are many-fold differences within each state for rates of all of these phenomena except unemployment. Because unemployment rates were relatively constant within each state, we have limited statistical power to detect any impact of unemployment on delinquency.

Statistical Model

The outcome of interest for our analysis is the arrest rate, defined as the number of arrests in a county divided by the size of the population at risk for arrest. The standard approach to analyzing per capita rates such as these is to compute the rate for each aggregate unit and to use the computed rates (or a transformed version of them) as the dependent variable in ordinary least squares regression. As we will describe below, however, this least squares approach is inappropriate for a study such as ours where the offense rate is low relative to the population size of many of the aggregate units. We resolve these problems through a Poisson based regression model that is well suited to the essential nature of our dependent variables, which take the form of counts of arrests for each county. The statistical basis of this analysis approach is well established (e.g., Gardner, Mulvey, & Shaw, 1995; King, 1989; Liao, 1994; McCullagh & Nelder, 1989), but it rarely has been applied to aggregate analysis of crime or other

social phenomena. (To our knowledge, the sole application is a study by Bailey, Sargent, Goodman, Freeman, & Brown, 1994).

The juvenile populations of the counties included in our analysis vary widely in size, from 50 to 11,000. In 31% of these counties the population of youths age 10 - 17 was less than 1000. The smaller the population at risk, the less precise our estimate of the arrest rate. As a result, we can expect much larger errors of prediction for per capita arrest rates of counties with small populations than for counties with large populations.

Furthermore, because arrests are discrete events, the only arrest rates possible for any given population size are those corresponding to integer counts of arrests. If the population size is large relative to the average arrest rate, then the calculated rates will be sufficiently fine-grained that there is no harm in treating them as though they were continuous and applying least squares statistics. When populations are small, however, the discrete nature of the arrest counts cannot be ignored. Indeed, in the counties with the smallest populations, even a single arrest would correspond to an extremely high arrest rate for a rare offense such as rape or homicide. Furthermore, because the possible rates are both discrete and have a limiting lower value of zero, a normal or even symmetrical error distribution cannot be assumed for counties with small juvenile populations.

Poisson based regression models provide an approach that is well suited to raw data which are recorded as the number of events for each aggregate unit, in this case the number of arrests for each county. The Poisson distribution characterizes the probability of observing any discrete number of events (i.e., 0, 1, 2, . . .) for any mean

count or rate of events, assuming that the timing of the events is random. Zero events is a relatively likely outcome if the underlying mean count is low enough and the period of observation is short enough. Figure 1 shows the Poisson distribution for four different mean counts. When the mean arrest count is low, as is likely for a county with a small population, the Poisson distribution is skewed, with only a small range of counts having a meaningful probability of occurrence. As the mean count grows, the Poisson distribution increasingly approximates the normal, and a broader range of arrest counts have meaningful (but smaller) probabilities. The Poisson distribution has a variance equal to the mean count. Therefore, as the mean count increases, the probability of observing any specific number of events declines and a broader range of values have a meaningful probability of being observed.

The basic Poisson regression model is:

$$\ln(\theta_i) = \sum_{k=0}^{K} \beta_k x_{ik}, \qquad [1]$$

$$P(Y_i = y_i) = \frac{e^{-\theta_i}\theta_i^{y_i}}{y_i!}. \qquad [2]$$

Equation 1 is a regression equation relating the natural logarithm of the mean or expected number of events for case i, $\ln(\theta_i)$, to the sum of the products of each explanatory variable, x_{ik}, multiplied by a regression coefficient, β_k (where β_0 is a constant

multiplied by 1 for each case). Equation 2 indicates that the probability of y_i, the observed outcome for this case, follows the Poisson distribution (the right hand side of the equation) for the mean count from Equation 1, θ_i. The natural logarithm in Equation 1 is comparable to the logarithmic transformation of the dependent variable that is common in analysis of aggregate crime rates. In both cases, the regression coefficients will correspond to proportional differences in rates.

Our interest is actually in arrest rates relative to population size rather than in simple numbers of offenses. If θ_i is the expected number of arrests in a given county, then θ_i/n_i would be the corresponding per capita arrest rate. Equation 1 can be transformed to a model of that per capita arrest rate with a bit of algebra:

$$\ln\left(\frac{\theta_i}{n_i}\right) = \sum_{k=1}^{K} \beta_k x_{ik},$$

$$\ln(\theta_i) - \ln(n_i) = \sum_{k=0}^{K} \beta_k x_{ik},$$

$$\ln(\theta_i) = \ln(n_i) + \sum_{k=0}^{K} \beta_k x_{ik}. \qquad [3]$$

Thus, by adding the natural logarithm of the size of the population at risk to the model, and by giving that variable a fixed coefficient of one, we obtain an analysis of rates of events per capita, rather than simply counts of events.

A Poisson based regression model that is standardized for the size of the population at risk acknowledges the greater precision of rates based on larger populations, which presented a serious problem for an ordinary least squares analysis. This is demonstrated in Figure 2, which shows how the magnitude of errors of prediction from the regression model are expected to depend on size of the population. This figure translates the Poisson distributions of arrest counts in Figure 1 to distributions of arrest rates, given a mean rate of 500 arrests per 100,000 population. A population size of 200 would produce a mean arrest count of one, in which case only a very limited set of arrest rates is possible (i.e., increments of 500 per 100,000) but the probable outcomes comprise an enormous range of arrest rates. As the population base increases, the range of likely arrest rates gradually decreases, with the standard deviation around the mean rate shrinking from 500 arrest per 100,000 for a population of 200 to 71 arrests per 100,000 for a population of 10,000.

The basic Poisson regression model is appropriate only if the probability model of Equation 2 matches the data, and this requires that the variance of the data be equal to the fitted values, θ_i. Generally speaking, this will be true only if the explanatory variables account for all of the meaningful variation across cases. If they do not, the variance will be greater than the mean. This overdispersion of residuals can produce a substantial underestimation of standard errors of the βs and highly misleading significance tests. This is a very serious issue, for there is no more reason to expect that a Poisson regression will explain all of the meaningful variance in an event count variable than to expect that an ordinary least squares regression would yield an R^2 value equal to the

reliability of the dependent variable.

We allow for the possibility that the explanatory variables in the model do not fully account for systematic differences among the counties' arrest rates by using the negative binomial variant of Poisson regression. Specifically, the negative binomial combines the assumption of a Poisson distribution of event counts with a gamma distribution of unexplained variation in the underlying mean event counts. Thus, the Poisson distribution of Equation 2 is replaced by the negative binomial distribution, which is expressed as follows:

$$P(Y_i = y_i) = \frac{\Gamma(y_i + \phi)}{y_i!\Gamma(\phi)} \frac{\phi^{\phi}\theta_i^{y_i}}{(\phi + \theta_i)^{\phi + y_i}}, \qquad [4]$$

where Γ is the gamma function (a continuous version of the factorial function), and ϕ is the reciprocal of the variance of the gamma distribution of unexplained variation in mean counts, α (Gardner et al., 1995). Figure 3 demonstrates the impact of residual variance on the resulting distribution, given a mean count of 3 arrests. With α equal to zero, we have the original Poisson distribution. For the Poisson, 5.0% of cases would have zero arrests and 1.2% would have 8 or more arrests. As α increases, the distribution becomes decidedly more skewed as well as more broadly dispersed. With even a moderate α of .75, the change from the Poisson is dramatic: 20.8% of cases would have zero arrests and 8.8% would have 8 or more arrests.

With negative binomial regression, the substantive portion of the regression

model remains either Equation 1 or Equation 3. Therefore, the interpretation of the regression coefficients is unchanged. The negative binomial regression model combining Equations 3 and 4 is the basis for our analysis, which we conducted using the LIMDEP statistical package (Greene, 1995).

Results

Model Comparisons

Before turning to the specific explanatory variables associated with social disorganization theory, we first examine the necessity of including certain types of factors in our models. We do this by comparing models with differing levels of complexity. In the framework of the negative binomial regression approach described above, we defined a baseline model corresponding to the assumption that the per capita arrest rate does not differ among counties within a state. For all of the models, the dependent variable is the number of arrests for a county, and the baseline model includes as independent variables the dummy variables representing the states and the natural logarithm of the juvenile population at risk, with a fixed coefficient of one.

We tested whether the size or density of the juvenile population had a substantive effect on juvenile violence rates by removing the constraint that the coefficient for log population at risk equal one. A significant increase in the explanatory power of the model would indicate that per capita arrest rates vary with population size. The portion of Table 2 labeled "Linear Effect of Log Population" reports these significance tests. The models which were compared also controlled for the other six explanatory variables (mobility, female headed households, unemployment, ethnic heterogeneity, poverty rate, and adjacency to metropolitan area), to insure that effects

of population size would not be better explained by those variables. The significance test is a likelihood ratio test, which is computed by taking twice the difference of the log likelihoods of the models being compared. The significance level is obtained by comparing this value to the χ^2 distribution, with degrees of freedom equal to the number of parameters added to the model. These tests reveal that per capita arrest rates do, indeed, depend on population size for all offenses except homicide.

The strong dependence of per capita arrest rates on population size or density prompted us to explore this relationship in more detail. To this point the analysis constrains the log arrest rate to be a linear function of the log population size. We have no a priori reason to assume that variation in arrest rates would take this precise form. Therefore, we added to our model squared and cubed terms for log population at risk, which allows considerable flexibility in the form of the relationship. In order to reduce collinearity and improve the efficiency of the estimation, we transformed population size to deviations from the mean before raising it to higher powers. Likelihood ratio tests of the cubic versus linear relationship of arrest rates to population size also controlled for the additional explanatory variables, and these tests are reported in the second portion of Table 2.

These results were more variable across the specific offenses. The relationship of per capita arrest rate to population size was significantly non-linear for the violence index, aggravated assault, simple assault, larceny, and vehicle theft, but not for homicide, weapons offenses, or burglary. For rape, the deviation from linearity was of borderline significance.

The third set of model comparisons addressed whether the other explanatory variables (mobility, female headed households, unemployment, ethnic heterogeneity, poverty rate, and adjacency to metropolitan area), considered in combination, account for significant variation across counties in per capita arrest rates. To insure that any differences detected were not attributable to population size, this model comparison controlled for a cubic relationship of population size to offense rate.

The final set of model comparisons in Table 2 report these results. These six explanatory variables account for significant variation in per capita arrest rates for the violent offense index and for all of the individual violent offenses except homicide. It is likely that our power to detect differences in homicide rates is limited by the low rate of homicides. Indeed, the homicide rate was low enough that in 69% of these counties no homicides occurred over this five year period. Nevertheless, even though arrests for rape were almost as rare as those for homicide, rape was significantly related to these variables. This set of explanatory variables was also significantly related to two of the three property offenses: larceny, and vehicle theft, but not burglary. The contribution of the explanatory variables to property offense rates appears to be somewhat weaker than to violent offenses.

Our model comparisons make clear that per capita juvenile arrest rates are significantly related to at least some of the factors we have identified from social disorganization theory, and for population size or density the relationship is often nonlinear. We now turn to a more specific examination of these relationships.

Arrests Rates and Specific Explanatory Variables

In considering the individual explanatory variables, it is helpful to examine

relationships to offense rates both with and without controlling for the other explanatory variables. Usually social scientists place greater emphasis on partial relationships, which reflect the unique contribution of an explanatory variable, above and beyond relationships attributable to other explanatory variables under study. There are reasons to be cautious in interpreting partial relationships, however, especially under the high levels of collinearity common for aggregate measures of social disadvantage such as these (e.g., Land et al., 1990). Partial relationships may mask the contribution of one variable that is indirectly mediated by another or that is attributable to a higher order concept inherently shared with another, and with high collinearity partial relationships are far less stable than bivariate relationships. To provide a more complete picture of the pattern of results, Table 3 shows the "bivariate" relationships of the social disorganization measures to crime rates (controlling only for population size and differences between states), and Table 4 presents the partial relationships for full models including all of the measures. The complexity of the controls for population size in Table 3 and 4 are based on the model comparisons reported above.

Mobility. Though most studies of both urban (e.g., Sampson, 1985) and rural settings (Petee and Kowalski, 1993) have found high mobility to be associated with high offense rates, in our data there is little relationship for either violent or property offenses. Only 1 of the 20 bivariate or partial coefficients reaches the nominal .05 level of statistical significance, and the direction of the relationship is not consistent across the offenses.

Female headed households. Higher levels of family disruption, as indexed by the proportion of female headed households, were strongly and consistently associated with

higher rates of arrest for both violent and property offenses in both the bivariate and multivariate models. Almost all of the bivariate and partial coefficients are large, positive, and reach statistical significance. To gauge the strength of these relationships, consider that the coefficients reflect differences in log rates of offense, and a doubling of offense rates corresponds to a log difference of .693. Thus, the partial coefficient of 5.152 for the violent crime index indicates that if one county had 13.5% more female headed households than another (e.g., 28.5% vs. 15.0%), it would have double the number of arrests for violent offenses.

Unemployment. Unemployment rates were not significantly related to arrest rates for any of the offenses. Most coefficients (both bivariate and partial) were positive, indicating an association of unemployment with higher arrest rates. Though the magnitude of some of these coefficients would reflect substantial relationships, their standard errors were extremely large, due to the limited variance in unemployment rates within each state. Thus, we had little power to detect any impact of unemployment, and these results are relatively uninformative.

Ethnic heterogeneity. At the bivariate level, ethnic heterogeneity is consistently associated with higher rates of arrest for violent offenses, though this is not true for property offenses. The association of ethnic heterogeneity with violent offenses is somewhat weaker in the multivariate models, and it less consistently reaches statistical significance. This difference is likely due to the combination of the strong contribution of the rate of female headed households to arrest rates and the correlation of .84 between the level of ethnic heterogeneity and the rate of female headed households. Considering Land et al.'s findings concerning the instability of partial coefficients in such

circumstances, we consider the bivariate coefficients more informative. The bivariate coefficients are quite consistent, ranging from 2.2 to 3.7 for violent offenses. The bivariate coefficient of 2.556 for the relationship of ethnic heterogeneity to the violence index implies that a 27.1% difference in the heterogeneity index (i.e., approximately half its range) would correspond to a doubling in the arrest rate.

The reader may wonder whether the results for ethnic heterogeneity truly reflect heterogeneity or if that variable is merely a proxy for the proportion of minority group members in the population. These variables are too highly correlated to address this directly by including both in the same model. To gain some perspective on the issue, we estimated models replacing ethnic heterogeneity with proportion non-white. Percent non-white was less strongly related to arrest rates, suggesting that heterogeneity is the more important variable.

Poverty rate. Our findings concerning the contribution of poverty rates to juvenile offending are similar to those for ethnic heterogeneity. For all violent offenses, a higher rate of poverty is associated with higher juvenile arrest rates at the bivariate level, significantly so for the violence index, robbery, and aggravated assault. The poverty rate has negligible or negative bivariate relationships with the property offenses. Surprisingly, the multivariate relationships of the poverty rate to most arrest rates reverse sign and become negative, and this negative partial relationship is statistically significantly for simple assaults and larceny. No doubt the reversal is a reflection of the substantial correlation of the poverty rate with the proportion of female headed households (r = .69) and with ethnic heterogeneity (r = .64). As noted by Land et al. (1990), reversals between bivariate and multivariate relationships are common for

regression coefficients of highly correlated variables in aggregate analysis, and it is unlikely that they are substantively meaningful. Therefore, we conclude from the bivariate coefficients that there is a meaningful association of poverty rates in rural areas with higher levels of violent offenses. From the bivariate coefficient of 3.955, it follows that a 17.5% increase in the rate of poverty would be associated with a doubling of the violent crime index.

Proximity to metropolitan areas. Whether or not a rural county is adjacent to a metropolitan area appears to have no bearing on its rate of juvenile arrests for either violent or property offenses. All of the coefficients for this explanatory variable are small, and none reach statistical significance.

Population size or density. As noted above, we used the size of the juvenile population as a proxy for population density because the two are essentially indistinguishable within each state. The relationship of population size to juvenile arrest rate is curvilinear for many of the offenses, so the coefficients of Table 4 are not especially helpful for judging either the magnitude or statistical significance of the contribution of population size. The model comparisons of Table 2 provide appropriate significance tests. Graphs are more helpful for ascertaining the strength and form of the relationships, and Figure 4 illustrates the findings with graphs for four of the offenses.

As can be seen in Figure 4, arrest rates for juvenile violence vary dramatically with differences in the sizes (or densities) of juvenile populations. For all violent offenses except homicide, variation in the size of counties' juvenile populations produces at least three fold differences in juvenile arrest rates. Figure 4 shows that annual arrest rates for juvenile violence are uniformly lower in the rural counties with the

smallest populations. Per capita arrest rates rise with increases in juvenile population in the range from 50 (the smallest) up to about 4,000. Beyond this level, increasing population has little impact on arrest rates for violent offenses other than robbery. For the violence index, rape, and aggravated assault, arrest rates appear to decline somewhat in the upper range of juvenile population sizes, but it is unlikely that these decreases would be statistically significant.

Conclusions

Social disorganization theory. Our findings indicate that the themes of social disorganization theory, developed in comparisons among urban neighborhoods, generalize quite well to rural communities. In our rural counties, per capita rates of juvenile arrest for violent offenses are significantly and consistently associated with family disruption, ethnic heterogeneity, and poverty. Due to a lack of variability, our sample was not well suited to studying structural correlates of unemployment.

Our main failure to support social disorganization theory is a lack of relationship between rates of mobility and delinquency. This is surprising because mobility is a robust correlate in most urban studies, and it plays a key role in ecological theories of crime and delinquency (esp. Stark, 1987). Perhaps mobility is simply less important outside of metropolitan areas. Other studies that included rural areas (Sampson, 1985; Petee and Kowalski, 1993) have found strong relationships between mobility and crime, however, indicating that such a conclusion would be premature.

From the strength and consistency of the findings, it appears that family disruption is an especially critical element of social disorganization in these communities. In terms of social disorganization theory, this suggests that parental

resources play a critical role in bringing formal and informal controls to bear on the behavior of children.

Population size. Our findings concerning the relationship of juvenile violence to the size and density of the juvenile population have interesting theoretical implications. From the premises of social disorganization theory, we hypothesized that high population density would interfere with social organization by creating anonymity and by increasing the difficulty of supervising children and adolescents. This reasoning implies that problems would accelerate at especially high densities. Yet the curvilinear relationship we did observe is of an opposite form: Population size makes little difference after reaching the modest density of about 4,000 juveniles in an entire county. Clearly another dynamic must be at work.

We believe that two opportunity explanations would be more plausible. The first, following Sampson (1983), would be that opportunities for offending increase as population density increases. A small population reduces the chances that a potential robber would randomly encounter a likely victim or that two rivals would chance to meet in an unguarded setting conducive to an assault (Cohen and Felson, 1979). Furthermore, the company of peers provides support for engaging in delinquent behavior (Osgood, et al., 1996), and a very low population density will increase the difficulty of getting together with peers.

A second opportunity explanation would focus on opportunities to detect and report offenses. In a community with a very sparse population, there would be fewer likely witnesses who could observe offenses. In this case, population density would influence enforcement rather than violations of the law. This explanation would be least

plausible for the most consistently reported offenses, such as homicide and robbery.

A third possibility is that the relationship of population size to crime rates is spurious because adolescents in small communities venture to larger communities to commit their crimes, and it is there that their arrests are recorded. In this case the relationship would reflect the displacement of crime rather than a true relationship of population size to crime. Though we cannot rule out this possibility, one piece of evidence weighs against it. We would expect this dynamic to be most evident for rural counties adjacent to metropolitan areas, which should offer the greatest opportunity for displacement. Adjacency was included in our models, and we found no such relationship, which casts doubt on this interpretation.

Violent and property offenses. A secondary purpose of this study was to assess the consistency of findings across violent versus property offenses and across the different offenses in each category. Our negative binomial statistical model aided us in this regard because arrest counts for several of the specific offenses were too sparse for meaningful analysis with ordinary least squares.

Our two strongest findings are quite general across types of offenses. Rates of all offenses were higher in counties with larger populations of juveniles and in counties with larger proportions of female headed households with children. The sole exception is the offense of homicide, for which we have no meaningful results, probably due to the extremely low rate of this offense compared to others. The effect of population size is significant for all other offenses, both violence and property. The bivariate relationship (controlling only state and population size) between proportion of female headed households and delinquency rates was significant for all offenses except burglary, and

the multivariate relationship was significant for all offenses except robbery (in which case ethnic heterogeneity dominated over proportion of female headed households).

Ethnic heterogeneity and poverty were more strongly and consistently related to violent offending by juveniles in these rural counties than to property offending. The difference is most easily seen in the bivariate relationships presented in Table 3, which are considerably more stable than the multivariate relationships. Rates of all the violent offenses are positively related to both ethnic heterogeneity and the poverty rate, and even the few non-significant coefficients are relatively large. All of the coefficients for property offenses are smaller than those for the violent offenses, and none are statistically significant. It is especially striking that the data give no hint of a relationship between poverty and juvenile property offending in these rural counties.

It is interesting to see that our findings are consistent across the violent offenses. Many researchers limit their analyses to a few offenses presumed to be most reliably recorded, such as homicide and robbery. Indeed, there can be little doubt that law enforcement officers have much less discretion in deciding whether to make an arrest for these offenses than for simple assault, and we must assume that victims and bystanders are more likely to report these serious offenses. Even so, the relationships of structural characteristics to the rate of simple assaults are nearly identical those for the other violent offense categories such as rape and aggravated assault. Thus, instead of finding idiosyncratic and meaningless results for less serious offenses, we obtained additional confirmation for the overall pattern of our findings. That pattern includes both similarities and differences in the structural correlates for juvenile violence and juvenile property offending.

Future directions. We believe that we have been successful in our first step toward extending research on communities and crime beyond a narrow focus on urban centers to include the full range of communities in which Americans live. Our study illustrates that themes from social disorganization theory have broader application to communities of all sizes. Thus, social disorganization and related theories (e.g., Sampson and Wilson, 1995; Stark, 1987; Taylor, 1997) appear to be appropriate starting points for developing either theories of crime specific to rural settings or theories of communities and crime that are general across settings. The critical task of developing such theories will require a firm grounding in the modern realities of settings ranging from small cities to isolated farming communities to suburbs ringing urban cores. These theories will need to take into account the diversities of lifestyles and of meanings of community and neighborhood, both between these types of settings and across communities of the same type. For too long theories of communities and crime have limited their attention to an image of small, dense urban neighborhoods that fully encompassed the lives of their inhabitants, an image that now applies to few communities in the United States.

There are many possibilities for further research on crime in rural or non-metropolitan communities. A straightforward starting place would be to extend the present study in several ways. First, it would be worth expanding the sample of counties to insure that findings generalize beyond these specific states. With a larger sample of states, one could use hierarchical linear modeling to determine whether the correlates of county crime rates vary across states. The recent version of Bryk, Raudenbush, and Congdon's (1996) HLM program is capable of estimating a

hierarchical version of our Poisson-based statistical model. Second, it would be useful to expand the range of structural variables included in our analysis. The current analysis is limited by assessing ethnic heterogeneity only in terms of white versus non-white, and we have not examined some variables found to be important in other studies, such as structural density defined by the proportion of multiple-dwelling housing units (Sampson, 1983). Third, it is important to validate these findings based on arrest rates by conducting comparable analyses of other measures of offending, such as self reports of offending and victimization surveys.

The field also needs research on crime in rural communities that reaches the full level of sophistication now found in research on large urban centers. This will require using multiple methods of assessment to go beyond census data in order to measure the social characteristics of communities that theories specify as directly affecting rates of crime and delinquency (Bursik, 1988; Sampson, 1987). Such research must also involve the integration of individual and community levels of analysis, which has contributed so much to the growing sophistication of research on urban communities (Elliott, et al., 1996; Gottfredson et al., 1991; Sampson and Groves, 1989; Sampson et al., 1997; Simcha-Fagan and Schwartz, 1986).

Finally, our statistical approach of analyzing per capita offense rates by applying negative binomial regression to offense counts is an important advance for research on aggregate crime data, and it has broad applicability. Standard analytical approaches require that data be highly aggregated across either offense types or large population units. Otherwise offense counts are too small generate per capita rates that have appropriate distributions and adequate stability to justify least squares analysis. Our

negative binomial approach frees researchers to investigate a much broader range of data because it is appropriate for analyzing smaller population units and less common offenses.

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Table 1. Descriptive statistics for the sample of rural counties from four states.

	Florida		Georgia		South Carolina		Nebraska	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Population at Risk	2941	2074	2287	1940	4926	2621	1091	1152
Log Population at Risk	7.76	.69	7.45	.76	8.35	.58	6.51	1.05
Number of Counties	31		116		30		87	
Explanatory Variables								
Mobility	.26	.06	.18	.07	.13	.06	.16	.05
Female Headed Households	.18	.04	.22	.07	.24	.05	.09	.04
Unemployment	.08	.02	.07	.01	.08	.02	.03	.01
Ethnic Heterogeneity	.28	.10	.37	.15	.45	.06	.03	.04
Poverty Rate	.16	.04	.19	.05	.19	.06	.12	.04
Adjacent to Metro. Area	.74	.44	.53	.50	.80	.41	.14	.35
Annual Arrest Rates per 100,000								
Violent Offenses								
UCR Violent Crime Index	72.0	70.0	25.4	22.9	49.3	28.9	5.5	8.9
Homicide	2.4	3.4	1.0	2.0	2.1	2.4	.2	.8
Rape	3.9	4.9	1.6	2.5	5.1	4.0	.6	1.7
Robbery	15.7	19.9	4.7	7.2	8.5	6.3	.6	1.8
Aggravated Assault	50.0	47.5	17.9	16.7	33.5	21.2	4.2	7.2
Weapons	9.0	10.5	7.4	9.9	17.8	9.6	4.6	9.3
Simple Assault	34.0	40.0	31.9	32.8	68.8	68.4	36.5	63.7
Property Offenses								
Burglary	108.4	77.3	44.9	31.5	82.9	60.8	43.1	55.1
Larceny	139.2	103.9	86.0	88.7	151.1	126.7	142.0	194.4
Vehicle Theft	22.4	24.3	11.0	10.7	17.8	15.8	15.5	18.5

Table 2. Model comparisons for significance tests of the relationship of arrest rates to size of population at risk and to other explanatory variables.

	Violent Offenses							Property Offenses		
	Violent Crime Index	Homicide	Rape	Robbery	Aggr. Assault	Weapons	Simple Assault	Burglary	Larceny	Vehicle Theft
Linear Effect of Log Population: df = 1										
χ^2	31.62	1.96	4.16	24.63	20.84	14.23	32.46	18.75	79.78	13.09
p	.000	.162	.041	.000	.000	.000	.000	.000	.000	.000
Cubic Vs. Linear Effect of Log Population: df = 2										
χ^2	9.14	2.30	5.73	2.95	7.91	2.53	7.90	.06	6.49	8.60
p	.010	.317	.057	.229	.019	.282	.019	.969	.039	.014
Additional Explanatory Variables: df = 6										
χ^2	36.91	9.01	27.23	27.82	30.66	19.81	32.79	7.67	30.75	13.07
p	.000	.173	.000	.000	.000	.003	.000	.263	.000	.042
-2 Log Likelihood for Overall Models										
Base Model	1658.64	486.80	674.76	950.88	1508.64	1206.12	1937.47	2100.43	2505.82	1483.13
Full Model	1570.81	474.72	631.77	898.09	1436.12	1159.28	1839.41	2058.04	2337.48	1433.81

Table 3. Bivariate relationships of explanatory variables to arrest rate, controlling for size of population at risk and state, from negative binomial regression.

Explanatory Variable	Violent Crime Index	Homicide	Rape	Robbery	Aggr. Assault	Weapons	Simple Assault	Burglary	Larceny	Vehicle Theft
	Violent Offenses							**Property Offenses**		
Mobility										
b	-1.255	-2.378	1.024	-3.159	-1.049	-1.409	.127	.482	1.205	1.303
s.e.	1.012	2.034	1.530	1.614	1.110	1.165	1.003	1.032	1.084	1.272
p	.215	.242	.503	.050	.345	.227	.899	.641	.266	.306
Female Headed Households										
b	5.483	2.962	6.010	6.942	5.190	5.225	5.109	1.645	3.751	2.797
s.e.	.988	2.146	1.769	1.796	1.005	1.535	1.261	1.134	1.018	1.238
p	.000	.167	.001	.000	.000	.001	.000	.147	.000	.024
Unemployment										
b	2.397	4.920	2.361	2.505	1.292	3.403	-1.123	2.907	.882	-.835
s.e.	4.297	8.044	5.976	5.990	4.367	6.636	4.556	4.266	4.876	5.070
p	.577	.541	.693	.676	.767	.608	.805	.496	.856	.869
Ethnic Heterogeneity										
b	2.556	2.614	2.635	3.732	2.213	2.814	2.701	.344	1.127	.871
s.e.	.487	1.575	1.102	.881	.488	.754	.817	.563	.790	.809
p	.000	.097	.017	.000	.000	.000	.001	.542	.154	.281
Poverty Rate										
b	3.955	5.144	2.006	6.821	3.089	3.467	1.728	.017	.813	.615
s.e.	1.415	2.816	2.013	2.110	1.486	2.106	1.574	1.263	1.340	1.716
p	.005	.068	.319	.001	.038	.100	.272	.990	.544	.720
Adjacent to Metropolitan Area										
b	-.048	.368	-.150	-.323	.028	-.156	.016	.042	-.073	.060
s.e.	.135	.317	.199	.194	.138	.185	.154	.106	.127	.158
p	.723	.246	.452	.096	.837	.400	.915	.688	.563	.704

Table 4. Multivariate relationships of explanatory variables to arrest rate from negative binomial regressions.

Explanatory	Violent Offenses							Property Offenses		
Variable	Violent Crime Index	Homicide	Rape	Robbery	Aggr. Assault	Weapons	Simple Assault	Burglary	Larceny	Vehicle Theft
Mobility										
b	.394	-1.405	2.477	-1.170	.396	-.417	1.265	1.051	2.412	2.122
s.e.	1.047	3.013	1.404	1.764	1.203	1.715	1.320	1.225	1.403	1.467
p	.706	.641	.078	.507	.742	.808	.338	.391	.086	.148
Female Headed Households										
b	5.152	-2.864	9.519	3.174	6.044	4.882	6.365	3.308	7.476	5.428
s.e.	1.467	3.839	2.616	2.669	1.551	2.444	1.770	1.522	1.583	2.001
p	.000	.456	.000	.234	.000	.046	.000	.030	.000	.007
Unemployment										
b	.558	-3.508	4.549	-.836	-.041	2.673	-.604	4.094	2.591	1.365
s.e.	4.235	8.341	6.545	6.694	4.436	6.912	4.820	4.653	5.287	5.402
p	.895	.674	.487	.901	.993	.699	.900	.379	.624	.801
Ethnic Heterogeneity										
b	1.505	2.316	1.184	2.903	.984	2.177	1.781	-.170	-.033	-.073
s.e.	.628	2.022	1.248	1.108	.635	.988	.894	.615	.775	.978
p	.017	.252	.343	.009	.121	.027	.046	.783	.966	.941
Poverty Rate										
b	-2.409	5.056	-6.599	-.215	-3.477	-4.357	-5.023	-2.367	-5.119	-3.139
s.e.	1.952	4.802	3.317	3.414	2.124	3.370	2.162	1.664	2.085	2.657
p	.217	.292	.047	.950	.102	.196	.020	.155	.014	.237
Adjacent to Metropolitan Area										
b	-.190	.364	-.261	-.447	-.106	-.334	-.157	-.038	-.237	-.042
s.e.	.137	.310	.198	.217	.142	.202	.146	.130	.146	.170
p	.165	.240	.188	.040	.458	.098	.283	.772	.104	.803

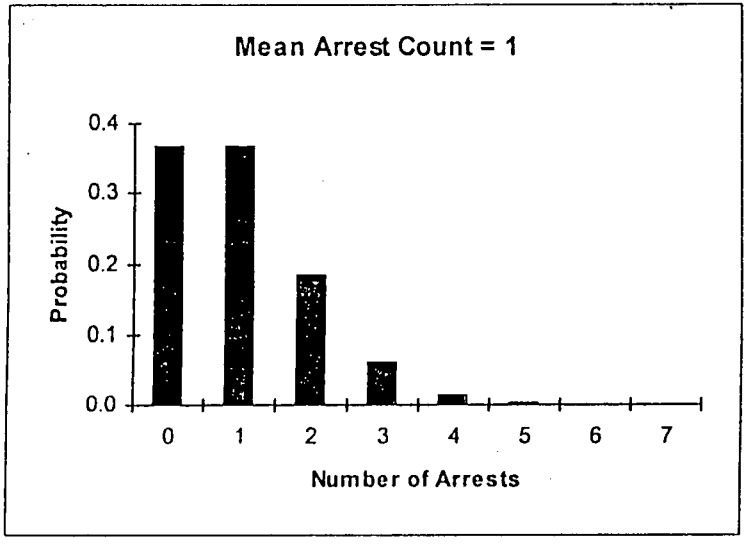
Table 4. (Continued)

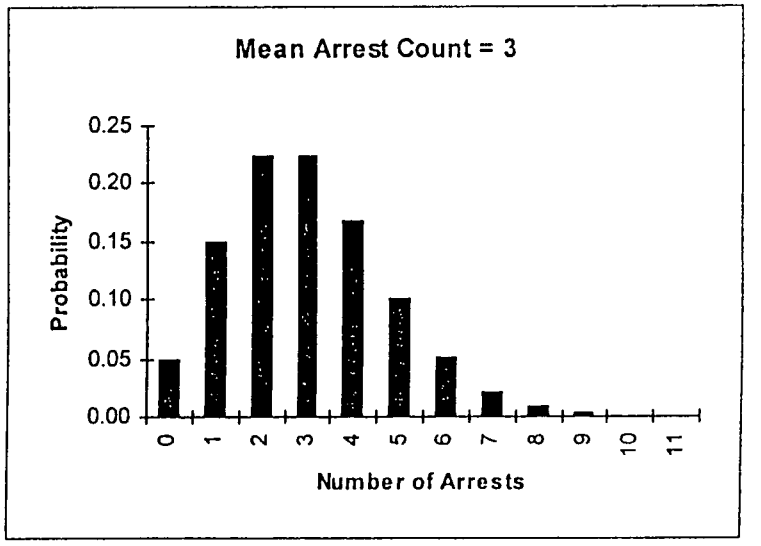
Explanatory Variable	Violent Offenses							Property Offenses		
	Violent Crime Index	Homicide	Rape	Robbery	Aggr. Assault	Weapons	Simple Assault	Burglary	Larceny	Vehicle Theft
Population at Risk Log										
b	1.770	1.262	1.783	1.740	1.694	1.465	1.826	1.338	1.931	1.522
s.e.	.146	.231	.350	.159	.147	.134	.162	.074	.150	.192
p1	.000	.128	.013	.000	.000	.000	.000	.000	.000	.003
Log Squared										
b	-.189		-.253		-.203		-.157		-.139	-.240
s.e.	.103		.556		.163		.069		.068	.141
p	.066		.649		.215		.024		.041	.089
Log Cubed										
b	-.038		-.052		-.028		-.076		-.027	.011
s.e.	.078		.240		.099		.063		.054	.095
p	.622		.827		.777		.228		.615	.910
Constant										
b	-13.745	-12.079	-17.562	-14.852	-13.242	-12.787	-15.037	-9.235	-14.860	-12.643
s.e.	1.449	2.661	3.275	1.785	1.508	1.561	1.731	.923	1.568	2.009
p	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
a^2	.464	.809	.452	.849	.491	.900	.760	.533	.647	.726

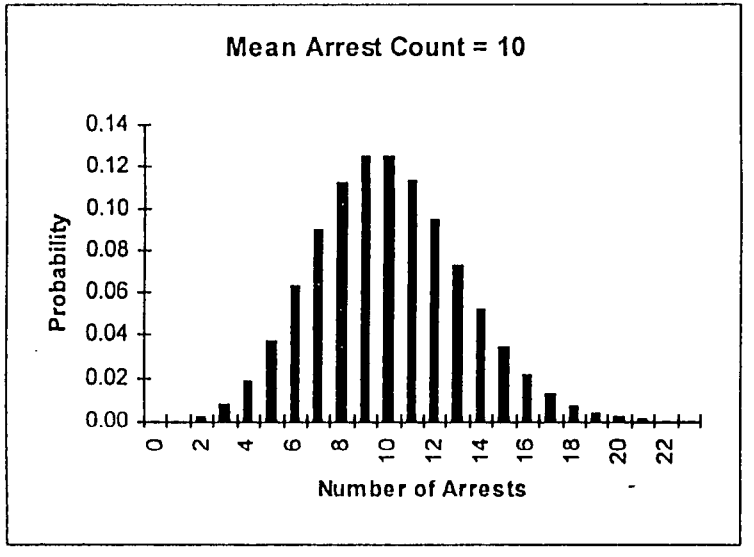
[1]Significance test for difference of b from 1 rather than difference of b from 0.

[2]a reflects unexplained variance residual variance beyond that expected from a simple Poisson process.

Figure 1. Poisson distributions for four mean arrest counts.







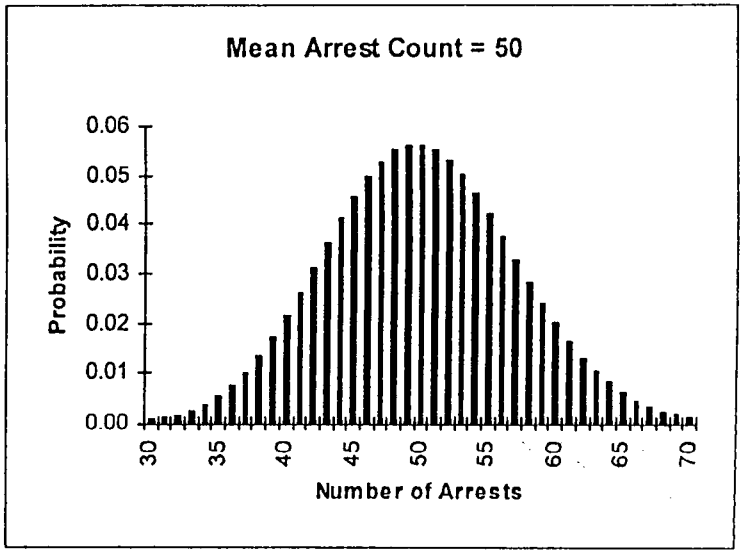
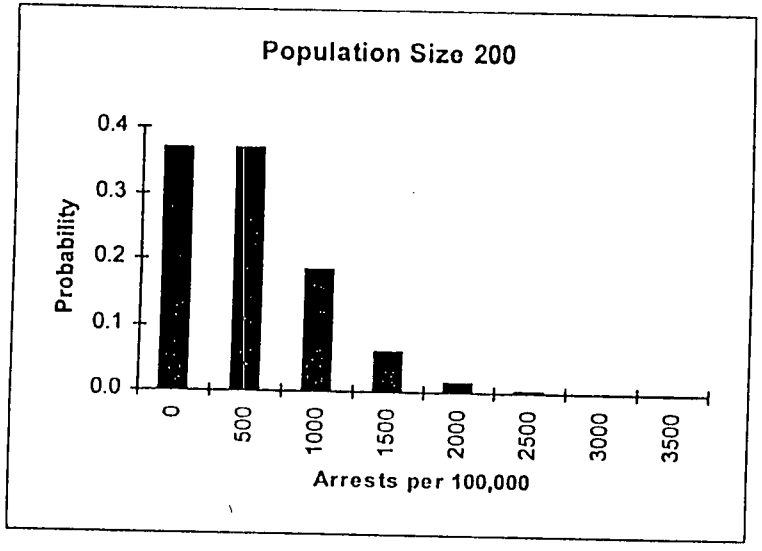
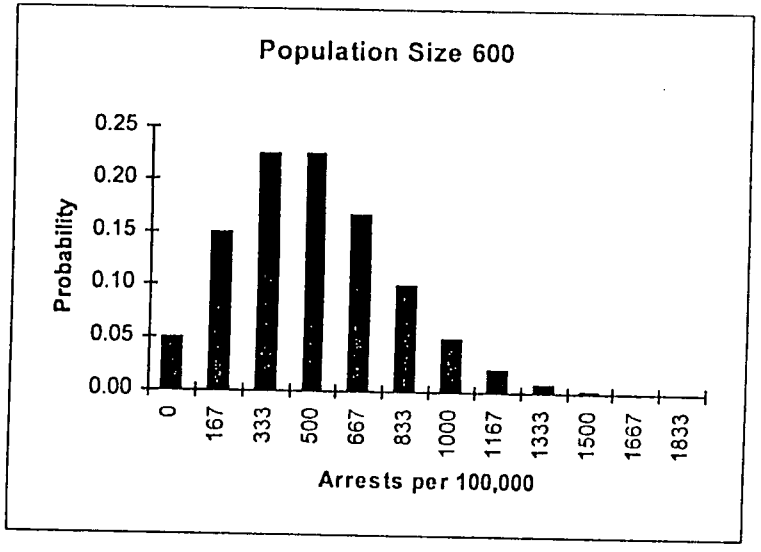
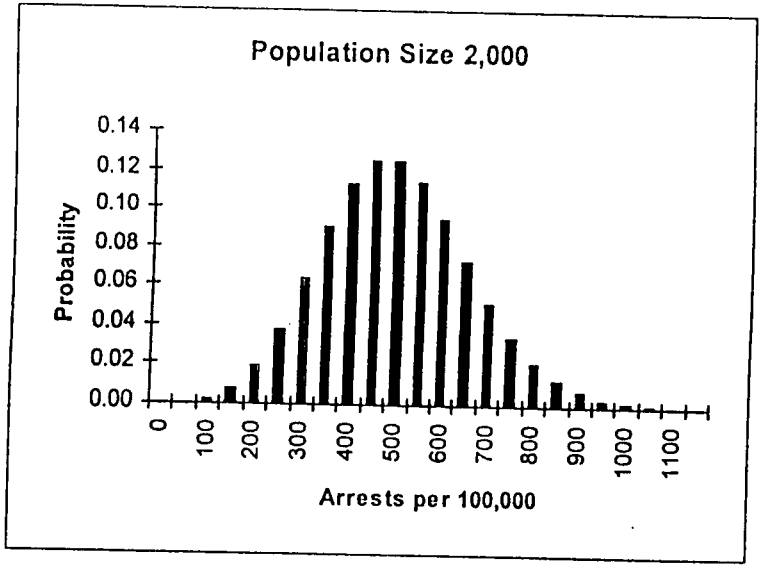


Figure 2. Poisson distributions of arrest rates for four population size, given a mean rate of 500 arrests 100,000 population.







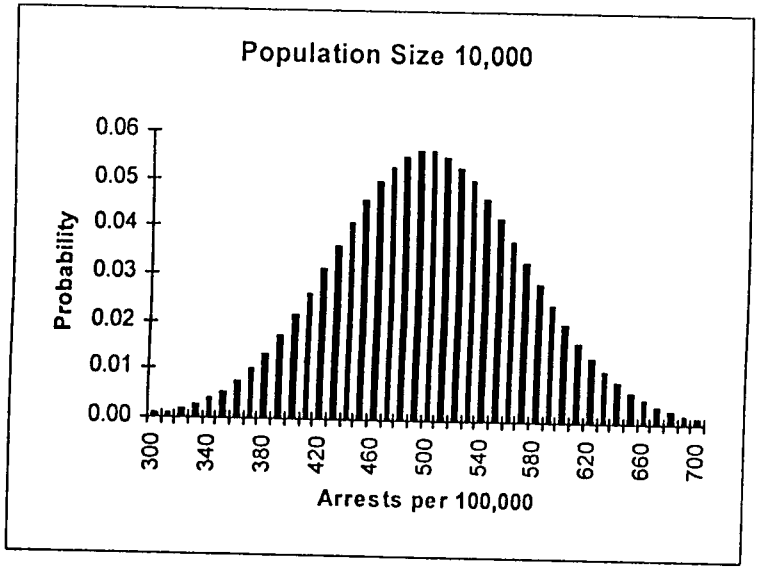


Figure 3.

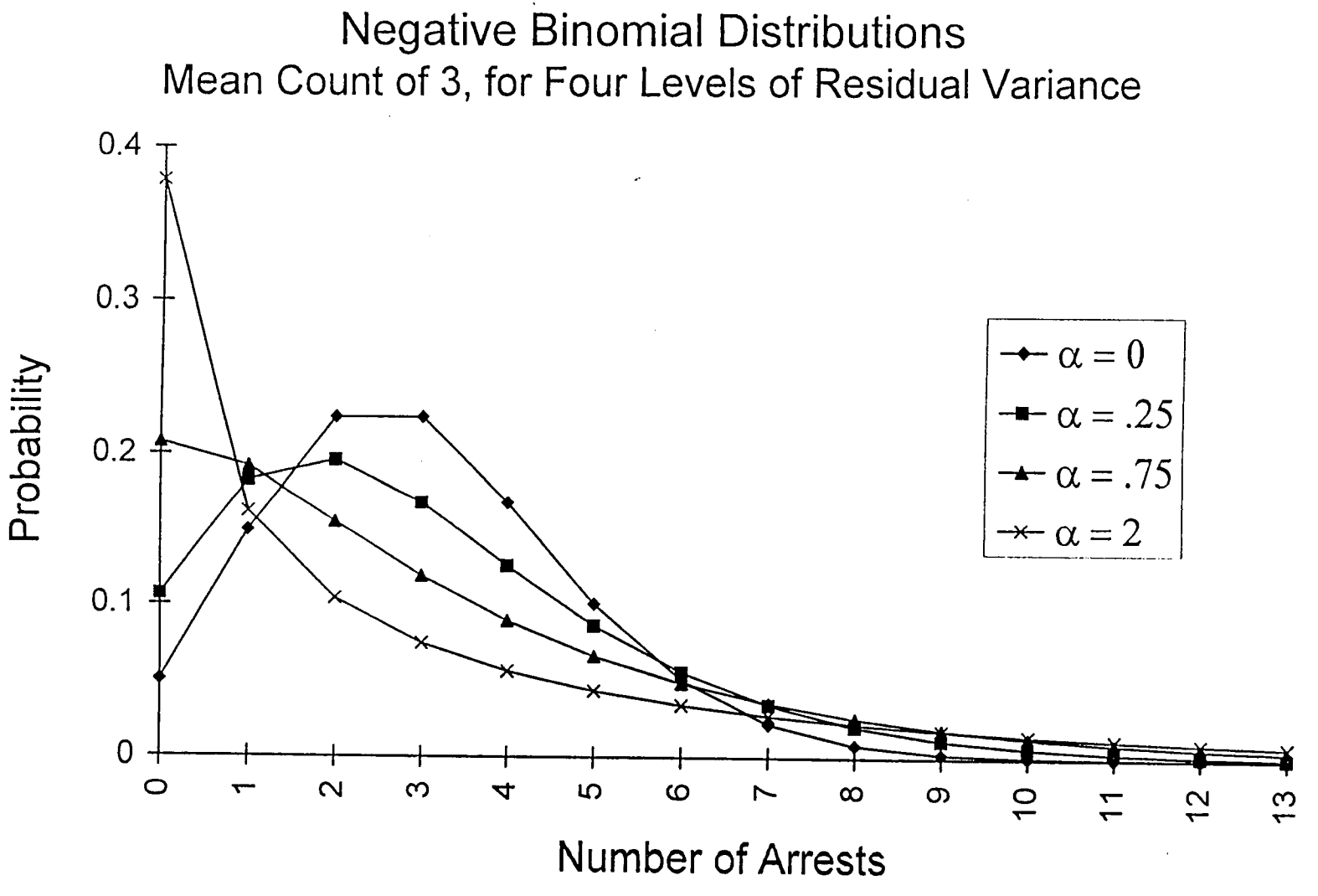
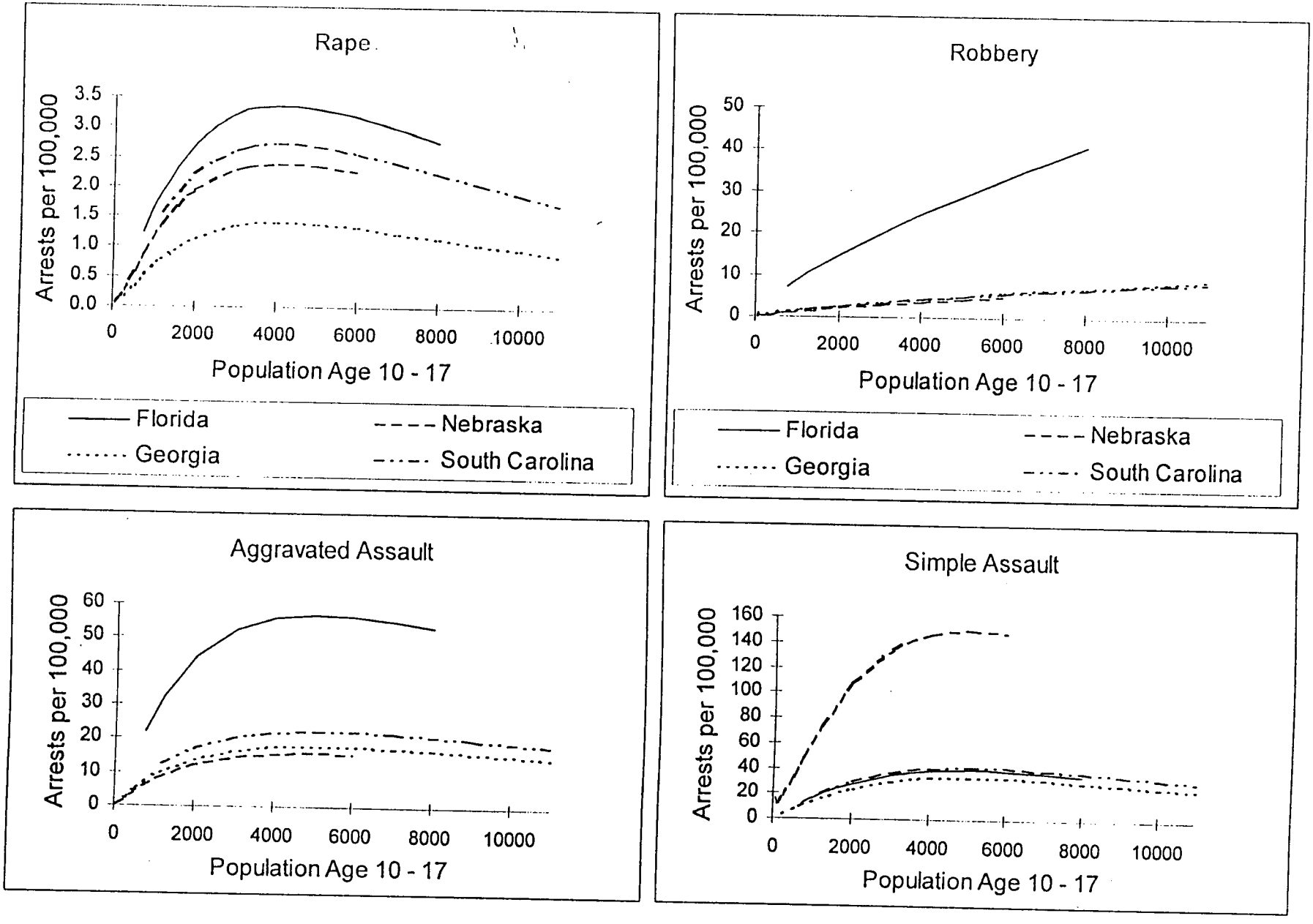

Negative Binomial Distributions
Mean Count of 3, for Four Levels of Residual Variance
Probability
0.4
0.3
0.2
0.1
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Number of Arrests
α = 0
α = .25
α = .75
α = 2

Figure 4. Relationship of population size to arrest rates for four violent offenses, controlling for other explanatory variables.



Appendix A

Interstate Highways and Juvenile Arrest Rates

The original proposal for this study stated that we would investigate whether the presence of an interstate highway in a county is associated with a higher juvenile arrest rate. These analyses were not included in the main body of this report because they did not prove productive and because this variable is not directly pertinent to the theoretical issues the report addresses. For completeness, these analyses appear in this appendix.

The analyses concerned interstate highways and juvenile arrest rates are a direct extension of the analyses reported in the main body of the paper. We used the same sample of counties, the same statistical approach, and the same controls for the size of the juvenile population and for differences between states. As with the other analyses, we considered both the bivariate relationship and multivariate relationship between the presence of an interstate highway and arrest rates.

The results of these analyses appear in Table A. The bivariate coefficients (b) reflect the difference in the natural log of the mean rates for counties that do versus do not contain an interstate highway, adjusted for size of the juvenile population and for differences between states. None of the coefficients is statistically significant, and almost all are quite small. The largest is for homicide (-.424, corresponding to 35% lower rates in counties with interstate highways), but the standard error is quite large because homicides are rare. Seven of the 10 coefficients are negative. Though there is no clear pattern

in the results, most coefficients would reflect slightly lower rates of arrest in counties with interstate highways.

We obtained similar results for the multivariate analysis of the relationship between the presence of an interstate highway and juvenile arrest rates. This analysis differs bivariate analysis in that it controls for the other explanatory variables, as well as for population size and differences between states (see Table 4). Though the coefficient for homicide now approaches statistical significance ($p = .07$), this must be considered in light of the fact that not even one out of the twenty coefficients considered in Table A was statistically significant at the conventional .05 level, . Most of the coefficients are negative, suggesting slightly lower arrest rates in counties with interstate highways. Overall, however, we must conclude that there is only a chance relationship between the presence of an interstate highway and county's juvenile arrest rates.

Table A. The relationship of the presence of an interstate highway to the juvenile arrest rate.

Bivariate relationships, controlling for population size and state.

	b	SE	t	p
Violent Crime Index	-0.058	0.143	-0.404	0.69
Homicide	-0.424	0.303	-1.400	0.16
Rape	-0.092	0.199	-0.460	0.65
Robbery	0.070	0.185	0.377	0.71
Aggravated Assault	-0.094	0.149	-0.631	0.53
Weapons	0.050	0.190	0.264	0.79
Simple Assault	0.111	0.155	0.718	0.47
Burglary	-0.232	0.160	-1.447	0.15
Larceny	-0.096	0.175	-0.547	0.58
Motor Vehicle Theft	-0.099	0.177	-0.559	0.58

Multivariate Relationships, controlling for population size, state, and other explanatory variables.

	b	SE	t	p
Violent Crime Index	-0.070	0.149	-0.467	0.64
Homicide	-0.533	0.293	-1.815	0.07
Rape	-0.103	0.196	-0.528	0.60
Robbery	-0.035	0.201	-0.172	0.86
Aggravated Assault	-0.087	0.155	-0.562	0.57
Weapons	-0.003	0.196	-0.017	0.99
Simple Assault	0.039	0.168	0.232	0.82
Burglary	-0.239	0.161	-1.484	0.14
Larceny	-0.062	0.168	-0.371	0.71
Motor Vehicle Theft	-0.130	0.180	-0.722	0.47

Notes

[1] A related but distinct tradition of research uses entire cities rather than neighborhoods as the unit of analysis (e.g., Blau and Blau, 1982; Messner, 1982; Shihadeh and Steffensmeier, 1994). This tradition of research emphasizes the contribution of inequality and crime, and analyses typically use samples of cities with 100,000 population or more. There is also an emphasis on explanatory variables entailing higher order comparisons among geographical subareas and subpopulations of cities (e.g., racial segregation or income inequality). We cast our research in the social disorganization tradition because the population sizes of rural and nonurban communities more closely match those of neighborhoods in social disorganization research and because social disorganization theory is more suited to our interests in adolescent offending, socialization, and social control. Nevertheless, the considerable overlap in the structural correlates of crime identified by the two traditions shows that they have much in common.

[2] Many other states would be appropriate for this purpose as well. These four were chosen because we had access to the necessary data.

[3] Crane (1991) has argued that the relationship of community characteristics to negative outcomes such as delinquency will be non-linear, with problems especially prevalent under extreme conditions of deprivation. If he is correct (and our non-linear statistical model assumes that he is), then combining diverse communities within aggregate units will attenuate the strength of our results. Thus, more precise definition of communities would be preferable. Even so, our results would be misleading only if the presence of extremely

disorganized communities was unrelated to the average level of disorganization in the remainder of the a county. It is not plausible that this would be the case, and we shall see that it is inconsistent with our results.

Homicides Committed by Juveniles

Although juvenile homicide represents a relatively small percentage (14%) of all homicides committed (Sickmund, Snyder, & Poe-Yamagata, 1997), these acts are of tremendous concern because of both their seriousness and the youthfulness of the offender (Rowley, Ewing, & Singer, 1987). Concern regarding adolescent homicide is not novel. Indeed, as early as 1642, adolescents have been committed to death in the United States for committing such acts (Crespi & Rigazio-DiGilio, 1996). However, the tremendous growth in juvenile homicides during the mid-1980s and mid-1990s brought particular attention to these crimes in recent years.

Prevalence of Juvenile Homicide

In 1984, juvenile offenders were known to be involved in 5% of all homicide cases, representing approximately 800 homicides in the United States (Sickmund et al., 1997). Between 1984 and 1994, homicides committed by juveniles grew tremendously, both in number and in proportion to the total number of homicides committed (Fox, 1996; Sickmund et al., 1997; Smith & Feiler, 1995) and reached 2,300 by 1994 (16% of all homicides) (Sickmund et al., 1997). An examination of the characteristics of homicides committed during this period indicates that the growth was largely attributable to increases in males (and particularly, black males) killing acquaintances or strangers. All of the increase in juvenile homicides between 1987 and 1994 was related to firearm use (Sickmund et al., 1997).

After more than 10 years of increase, homicides committed by juveniles

dropped significantly in 1995. The most recent national statistics indicate that juvenile offenders were responsible for 14% (1,900) of all homicides in 1995 (Sickmund et al., 1997). The decline was related to decreases in homicides committed with guns by black males of non-family members, (Sickmund et al., 1997).

Geographic Concentration of Juvenile Homicides

Juvenile homicides, like other serious offenses committed by juveniles, tend to be concentrated in certain inner cities in the United States (Loeber, Farrington, & Waschbusch, 1998; Sickmund et al., 1997). In 1995, 25% of all known juvenile homicide offenders resided in five counties (containing the cities of Los Angeles, Chicago, Houston, Detroit, and New York). Eighty-four percent of the counties in the United States reported no juvenile homicide offenders, while an additional 10% reported only one homicide offender (Sickmund et al., 1997).

Literature on Juvenile Offenders, Their Families, and Circumstances of the Homicide

The literature on juvenile homicide spans some 60 years. Although much of the early research involved case studies of small clinical samples of juvenile murderers, more recent studies have employed regional or national data bases to examine patterns of offending among juveniles. In order to understand better the phenomenon of juvenile homicide, researchers increasingly have recognized the importance of examining differences in patterns of offending between juvenile

homicide perpetrators and adults who have committed similar crimes (e.g., Cheatwood & Block, 1990; Cornell, 1993; Crespi & Rigzio-DiGilio, 1996), between juvenile homicide offenders and juveniles who have committed other types of offenses (e.g., Cornell, 1990; Cornell, Benedek, & Benedek, 1987), and between male and female juvenile homicide perpetrators (e.g., Loper & Cornell, 1996).

Although commentators have recognized that multiple factors may contribute to serious violent behavior, including homicide, among youth (Hawkins, Herrenkohl, Farrington, Brewer, Catalano, & Harachi, 1998; Heide, 1997), most studies of juvenile homicide have focused on individual characteristics of offenders, characteristics related to the homicide, and, less frequently, characteristics of offenders' families.

Individual Characteristics

In longitudinal studies examining predictors of youth violence, a number of individual factors have been linked with subsequent violent activity, including male gender, hyperactivity, risk taking, drug selling, early violence initiation (by age 12-13), and proviolence attitudes among children (Hawkins et al., 1998). Studies that have examined individual characteristics of juvenile homicide perpetrators have focused primarily on the gender, age, and race of the offender, his or her criminal background, and his or her history of educational difficulties and alcohol abuse.

Gender, age & race of the offender. Perpetrators of juvenile homicide

are overwhelmingly male (Cheatwood & Block, 1990; Fox, 1996; Meloff & Silverman, 1992; Sickmund et al., 1997), and during the last decade, offenders have been predominantly black (Cheatwood & Block, 1990; Cornell, 1993; Fox, 1996; Goetting, 1989; Hawkins, Laub, & Lauritsen, 1998; Loper & Cornell, 1996; Sickmund et al., 1997). There is recent evidence that this racial difference is narrowing, however. The marked 17% decrease in juvenile homicides between 1994 and 1995 has been largely attributed to a drop in homicides committed by black males (Sickmund et al., 1997).

Not surprisingly, the likelihood of a youth committing a homicide is greater among older adolescents (Meloff & Silverman, 1992; Sickmund et al., 1997). In examining case records of juvenile homicide offenders versus nonviolent youth offenders, Cornell and colleagues (Cornell, Benedek, & Benedek, 1987) observed a mean age for homicide perpetrators of 16.7 years, significantly lower than the age of non-violent offenders.

Criminal activity. Research that has examined the careers of serious and violent offenders suggests that an early onset of delinquency and violent behavior predicts more chronic and serious violence among youth (Hawkins et al., 1998; Thornberry, Huizinga, & Loeber, 1995). Researchers who examined the ages of onset of serious delinquency for juvenile offenders in urban areas found that by age 14, boys who eventually became persistent serious offenders had committed their first serious nonviolent offense (85% in Pittsburgh, approximately 65% in Denver and Rochester; Stouthamer-Loeber, Loeber, Huizinga, & Porter, 1997, cited in Loeber, et al., 1998).

Relatively few studies have examined patterns of delinquent and criminal activity among juvenile homicide perpetrators. However, a study by Snyder suggested that chronic offenders account for the majority of serious crimes, including assaults, homicides, rapes, robbery, and burglary. In an analysis of Phoenix data, Snyder (1988) found that chronic juvenile offenders accounted for 54% of juvenile homicide offenses; chronic juvenile male offenders accounted for 60% of all aggravated assaults, and 64% of rapes and robberies. Among a sample of youth in Utah, Snyder (1988) observed that chronic juvenile male offenders accounted for 73% of homicide offenses, 64% of aggravated assaults, and 72% of rapes and robberies. On the other hand, there is some limited evidence that many juvenile homicide offenders do not have extensive criminal histories. Goetting (1989) observed that for a large percentage of juvenile homicide offenders in urban Detroit (59%), homicide was their first known offense. Moreover, Cornell and his colleagues concluded that juvenile homicide perpetrators exhibited less criminal activity in their past than youth who had committed non-violent offenses (Cornell et al., 1987) or youth who had committed assaults (Cornell, 1990). Clearly, additional research is warranted to clarify histories of offending among juvenile perpetrators of homicide.

Educational difficulties and alcohol abuse. Although a number of studies of juvenile homicide have reported significant educational difficulties (e.g., Busch, Zagar, Hughes, Arbit, & Bussell, 1991) or alcohol abuse among juvenile perpetrators (e.g., Busch et al., 1991, Fendrich, Mackesy-Amiti, Goldstein, Spunt, & Brownstein, 1995), available research suggests that these

characteristics are no more common among juvenile homicide perpetrators than among other juvenile offenders. Indeed, Cornell (1990) observed no differences between youth who had committed homicide and those who had committed assaults regarding their school adjustment (a composite measure of grades and school behavior problems). Moreover, in a study of 72 juvenile murderers, juvenile homicide perpetrators exhibited *fewer* school-adjustment problems than did non-violent offenders (Cornell et al, 1987).

Family Characteristics

In a review of longitudinal studies of predictors of violence among youth, Hawkins and colleagues (1998) identified a number of family factors that have been linked with subsequent youth violence, including parental violence, parental criminal history, sibling delinquency, poor family management, family conflict, parents' proviolence attitudes, and residential mobility. A number of studies of juvenile homicide cases have focused on several of these family characteristics, including the presence of child maltreatment and other violence within the home (Bailey, 1996; Kashani, Darby, Allan, Hartke, & Reid, 1997), a history of violent criminal activity among parents (Bailey, 1996), and composite measures of family dysfunction (Cornell, 1990). However, more research is needed in order to further examine the links between these and other familial factors and the commission of homicide by youth, and particularly in contrast to the commission of other forms of juvenile violence or juvenile delinquency.

Situational Characteristics

In recent years, researchers have focused much attention on

characteristics associated with the homicide incident, including characteristics of the victim, the motive for the crime, the presence of multiple offenders, the method used in the homicide, and the location of the killing.

Victim characteristics. Most commonly, studies have revealed that victims of juvenile homicide are of the same race (Cheatwood & Block, 1990; Goetting, 1989; Loper & Cornell, 1996) and gender (e.g., Loper & Cornell, 1996) as the perpetrators. The most likely victims of juvenile homicide are acquaintances, followed by strangers, and family members (Cornell, 1993; Loper & Cornell, 1996; Fox, 1996; Meloff & Silverman, 1992; Rowley, Ewing, & Singer, 1987; Sickmund et al., 1997; but see Goetting, 1989). The most recent national data indicate that in 1995, 54% of victims were acquaintances, 36% were strangers, and 10% were family members (Sickmund et al., 1997). This study also examined the ages of victims, revealing that 27% of victims were under the age of 18; 30% were between the ages of 18 and 24; one third (33%) were between 25 and 49, and 9% were over the age of 50 (Sickmund et al., 1997).

Motive. A number of studies have examined the motives of juvenile perpetrators of homicide and have observed a distinction between homicides related to crime and those related to conflict (Baily, 1996; Cornell, 1990; Cornell, 1993; Loper & Cornell, 1996). Loper and Cornell (1996) analyzed the FBI Supplemental Homicide Reports for 1984 and 1993 and observed that 59% of the homicides committed by boys in the course of another criminal act (such as robbery or rape) and 43% were related to conflict. Research by Cornell and

colleagues indicated that boys are more likely than girls and adult male perpetrators to commit crime-related offenses (Cornell, 1993; Loper & Cornell, 1996). Moreover, crime-related homicides appear to be committed by youth who have a more extensive history of delinquent activity (Cornell, 1990).

Multiple offenders. Perhaps related to boys' propensity to commit crime-related homicides, statistics suggest that juvenile murders are likely to involve more than one offender (Loper & Cornell, 1996; Sickmund et al., 1997). Juveniles appear to be significantly more likely than adults to act with an accomplice (Cheatwood & Block, 1990; Cornell, 1993), who frequently are adults. Sickmund and colleagues (1997) observed that in nearly one-third (32%) of all juvenile homicides, adult offenders also were implicated.

Weapon used. In studies conducted in the U.S., researchers have found consistently that the most common weapon used in cases of juvenile homicides are firearms (Cornell, 1993; Fox, 1996; Loper & Cornell, 1996; Sickmund et al., 1997), and specifically, handguns (Cornell, 1993; Loper & Cornell 1996). For example, in their analysis of FBI Supplemental Homicide Report data from 1995, Sickmund and colleagues (1997) observed that 79% of victims of juvenile homicide offenders were slain with a firearm. Research suggests that juveniles are significantly more likely than adults to use a handgun in the commission of a homicide (Cornell, 1993), and boys are more likely than girls to do so (Loper & Cornell 1996).

Location. Few researchers have examined the specific locations of

homicides committed by juveniles. In one study conducted in metropolitan Detroit, Goetting (1989) observed that 19% of juvenile homicides took place in the residence of the victim, 17% occurred in the home of the offender, and 15% occurred in another residence.

The Current Study

As Hawkins and colleagues (Hawkins et al., 1998) noted in their recent review of the literature, in order to better understand predictors of youth violence, more research is needed that examines factors related to the commission of different *types* of offenses by juveniles. The purpose of this study was to expand our knowledge about several individual, familial, and case characteristics of youth who commit homicide versus youth who commit other serious offenses.

Method

The subjects of focus of this study are minors who committed homicides in a three-year period in a southeastern state. Computerized case record information was obtained from the state Department of Juvenile Justice for 98 youth who committed homicide between 1992 and 1994. For the purposes of these analyses, only the data for the male youth ($\underline{n}$ = 86, 88% of the total sample) will be reported. Case record information included limited demographic information about the youth and his family and a complete listing of referrals to the state solicitor (including dates for each offense, solicitor decisions, and dispositions). In order to obtain additional information pertaining to the circumstances surrounding the homicides, we obtained all available newspaper accounts of the homicides ($\underline{n}$= 34).

Computerized case record information also was obtained for two additional groups of youth who had been referred for serious and/or violent offenses: (a) 77 male youth who had been referred for assault and battery with intent to kill (assault and battery group), and (b) 87 male youth who had committed other serious offenses (other serious offense group) exclusive of homicide or assault and battery with intent to kill.[6] These data were obtained to permit comparisons between the case histories of youth who had committed homicides and those of youth who had committed other serious and/or violent offenses. Case records for the assault and battery group and other serious offense group were randomly selected from the total sample of youth referred for these offenses between 1992 and 1994.

Results

Demographic Information

The ethnicity of the sample of youth referred for homicide offenses was predominantly black (82%); 16% of the youth were white, and 2% represented other races. Yearly family incomes typically were quite low; 44% of the youths' family incomes were below $10,000. An additional 22% had annual family incomes between $10,000 and $14,999, 12% had yearly incomes between $15,000 and $19,999. Less than one-quarter of the youth's families had annual incomes in excess of $20,000. Prior to their referral, one-third (34%) of youth

[6]This third grouping of offenses includes the three most serious categories of offenses as determined by the state. These offenses correspond generally to the category of "serious offenses" described by Loeber, Farrington, & Waschbusch (1998) and others.

lived with their mother, 11% lived with both biological parents, 11% lived with other relatives, 8% lived with their mother and a step-father, and 8% lived in other circumstances. Data regarding living arrangement was missing for 28% of the youth. Examination of the marital status of the youths' parents indicates that 15% of the youth's biological parents were married, 36% were divorced or separated, and 32% were living apart from each other. For 15% of the youth, one or both parents were deceased.

No differences were observed between the three groups (homicide vs. assault and battery vs. other serious offenders) with regard to family income, $F(2,214) = 2.10$, parental marital status, $X^2(14) = 11.44$, or family living arrangement, $X^2(18) = 17.32$. However, significant group differences were observed for the race of the youth (see Table 1), $X^2(4) = 18.70$, $p < .001$, indicating that black youth were somewhat overrepresented in the homicide and assault and battery groups compared to the other serious offender group.

Insert Table 1 About Here

The home county of each youth was recorded and assigned a Beale code[7]

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[7]Beale codes are classification codes that describe counties by degree of urbanization and nearness to metropolitan areas. The 10 county types identified vary from central counties of metropolitan areas with a population of one million or more (code = 0) to completely rural counties or those with an urban population of less than 2,500 (code = 9). Beale codes were prepared in the Rural Economy Division, Economic Research Service, U.S. Department of Agriculture (http//usda.mannlib.cor.../rural/89021/readme.doc.)

designation (0-9, where scores of 0-3 represent metropolitan counties, 4-5 represent non-rural counties, and 6-9 represent rural counties). Sixty percent (n = 150) of the full sample resided in metropolitan counties in the state, 8% resided in non-metropolitan counties, and 28% resided in rural counties (n = 70). The home counties of 4% of the sample was missing. There were no significant differences among the three groups regarding the degree of urbanization-ruralness of their home counties, $F(2,239) = 2.93$.

Criminal status of parents. One quarter of the homicide group (25.6%) had at least one parent with a known criminal record. Corresponding percentages were 28.6% and 24.1% for the assault and battery group and the serious offender group, respectively. No significant differences among the groups were observed, $F(2,249) = .21$.

Criminal status of siblings. Similarly, one quarter of the homicide group (25.6%), 32.5% of the assault and battery group, and 20.7% of the serious offender group had at least one sibling with a known criminal or juvenile record. There were no significant differences among the groups regarding the criminal status of siblings, $F(2,249) = 1.48$.

Youth's Offense History

We examined urban-rural differences between the groups with regard to variables related to the youth's offense history. The urbanization-ruralness of the youth's home county was not significantly related to any of the variables described below.

Age of first referral. The average age of first referral was 14.0 years for youths in the homicide group, 14.2 years for youth in the assault and battery group, and 14.1 years for youth in the other serious assault group. There were no significant differences in the ages of first referral among youth in these three groups, F (2, 244) = .18.

Type of first offense. We further examined the type of the first offense committed by youth in the three groups (See Table 2). In the event that more than one type of offense was referred on a given date, the most serious type of offense was recorded (offenses against persons, followed by property offenses, offenses against the public order, other juvenile offenses, and status offenses).

For youth in the homicide group, their first offense most typically was an offense against persons (33.3%). In every instance, this offense against persons was the target homicide offense. The next most frequent type of offense was an offense against the public order (31.0%) (e.g., making a bomb threat, driving under the influence), followed by property offenses (16.7%) (e.g., burglary, arson), other juvenile offenses (10.7%) (e.g., blackmail or extortion, driving under a suspended license), and status offenses (8.3%) (curfew violation, runaway, truancy). The homicide offense was the first referral for 34.9% of the youth.

For youth in the assault and battery with intent to kill group, the most frequent first offense also was an offense against persons (39.5%, all of which were the target offense of assault and battery with intent to kill), followed by property offenses (22.4%), other juvenile offenses (17.1%), public order offenses

(14.5%), and status offenses (6.6%).

Finally, for the other serious offense group, the most frequent offense was a property offense (31.8%), followed by offenses against persons (28.2%), public order offenses (27.1%), other juvenile offenses (8.2%), and status offenses (4.7%). For two-thirds of the group their first referral was for the target offense.

History of status offenses. We further examined the numbers of status offenses, other juvenile offenses, property offenses, public order offenses, and offenses against persons for which youth were referred, as well as the age at which they were first referred for each of these offenses.

The type of offense that appeared least frequently in youths' case histories was status offenses. Youth in the homicide group had been referred for 0 to 3 status offenses, with a mean of .36. For youth in the assault and battery with intent to kill group, the range of status offense referrals was 0-4, with a mean of .38. Finally, youth in the serious offense group had been referred for 0-5 status offenses, with a mean of .36. There were no significant differences among the three groups regarding the total numbers of status offense referrals, $F(2,249) = .02$.

Insert Table 2 About Here

The average age at first referral for a status offense was 14.2 for the homicide group and the assault and battery group, and 14.7 for the other serious assault group. There were no significant differences between the groups in the

age at first status offense, $F(2,59) = .37$.

Insert Table 3 About Here

History of other juvenile offenses. Prior referrals for other juvenile offenses were somewhat more common. Youth in the homicide group had an average of 1.24 such referrals (range of 0-8), youth in the assault and battery group had 1.08 referrals for other juvenile offenses (range of 0-7), and youth in the serious offense group had an average of 1.29 referrals (range of 0-6). There were no significant differences in the numbers of these referrals between groups, $F(2,249) = .37$.

The average age at first referral for an other juvenile offense was 14.3 years for the homicide group, 14.0 years for the assault and battery group, and 14.6 years for the other serious offense group. No significant age differences were observed among the three groups, $F(2,129)=1.13$.

History of property offenses. Youth in the homicide group had a total of 1.91 property offense referrals (range of 0-11), while the assault and battery group had a mean of 1.22 referrals (range of 0-7), and the other serious offense group had an average of 1.47 (range of 0-8). The difference among groups approached significance, $F(2,249) = 2.49$, $p = .08$, with youth in the homicide group committing slightly more property offenses than youth in the assault and battery group.

The average age of referral for first property offense was 14.5 years for the homicide group (range of 9.4 years to 16.9 years), 14.3 years for the assault and battery group (range of 10.3 years to 17.0 years), and 14.2 years for the other serious offense group (range of 9.4 years to 17.4 years). There were no significant age differences among the groups, $F(2,144) = .49$.

History of public order offenses. On average, youth were referred for 1.78 offenses against the public order. Youth in the homicide group had an average of 1.50 such referrals (range of 0-9), youth in the assault and battery group had a mean of 2.09 referrals (range of 0-9), and youth in the other serious offense group had 1.79 referrals for offenses against the public order (range of 0-10). There were no differences in the frequency of public order referrals for the three groups, $F(2,249) = 1.33$.

The average age of referral for a first offense against the public order was 14.0 years for the homicide group (range of 8.4 years to 16.8 years), 14.7 years for the assault and battery group (range of 10.8 years to 17.6 years), and 14.6 years for the other serious offense group (range of 8.7 years to 17.0 years). Age differences were not significant, $F(2,157) = 2.30$.

History of offenses against persons. On average, youth were referred for 1.34 crimes against persons, including the target offense. Youth in the homicide group were referred for a total 1.8 offenses against persons (range of 1-7), boys in the assault and battery group were referred for 1.69 offenses against persons (range of 0-4), and youth in the other serious offense group were

referred for .60 offenses against persons. Significant group differences in the frequency of such referrals emerged, $F(2,249) = 37.5$, $p < .001$. Tukey's post-hoc test revealed that youth in the homicide and assault and battery groups having more referrals for crimes against persons than did youth in the other serious offense group ($p < .05$).

The average age of boys' first referral for an offense against persons was 15.3 years. The mean age for the homicide group was 15.5 years (range of 11.4 years to 17.1 years); 15.4 years for the assault and battery group (range of 6.8 years to 10.8 years); and 14.7 years for the other serious offense group (range of 10.1 years to 16.7 years). We observed a significant difference among groups regarding the age of first referral for offense against persons, $F(2,200) = 5.08$, $p < .01$. Youth in the homicide and assault and battery groups were referred for offenses against persons at older ages than the youth in the offense against persons group (Tukey's post-hoc test, $p < .05$).

Total offenses. On average, youth had been referred for a total of 6.39 offenses. The mean total offenses was 6.94 (range of 1 to 25) for youth in the homicide group, 6.76 for youth in the assault and battery group (range of 1 to 22), and 5.53 for boys in the other serious offense group (range of 1 to 25). There were no significant group differences in the total numbers of offenses referred, $F(2,245) = 1.74$, NS.

Youth had, on average, 2.2 charges *prior* to the target offense. The average number of prior charges was 2.6 for youth in the homicide group, 2.2 for youth in the assault and battery group, and 1.6 for boys in the other serious

offense group. There were no significant group differences in the number of prior charges, $F(2,206) = 1.80$.

We further examined the extent to which youth in the three groups appeared to be chronic offenders (i.e., had five or more prior charges or 10 or more prior charges). Prior to the target offense, 13% of the youth in the homicide group had five or more charges, and 3.5% had ten or more prior charges. For youth in the assault and battery with intent to kill group, 9.1% of the sample had five or more charges prior to their target offense, and 2.6% had ten or more prior charges. Finally, 8% of youth in the other serious offense group had five or more charges prior to the target offense, and 2.3% had ten or more prior charges. There were no significant differences among groups regarding the frequency with which youth had five or more prior charges, $X^2(2) = 2.37$.

Current Offenses

We next examined the age of boys at the time of the final target offense (i.e., the final homicide, assault and battery with intent to kill, or other serious offense), and observed that youth who were referred for other serious offenses (mean = 15.1 years) were younger than youth referred for homicide (mean = 15.8 years) or for assault and battery with intent to kill (mean = 15.6 years), $F(2,244) = 7.00$, $p < .005$.

We also examined the total number of offenses referred at the time of the final target offense and observed that on average, 2.05 offenses were referred (including the target offense), with a range of 1 to 7 referrals. Among the homicide group, there were, on average, 2.14 referrals at the time of the final

target offense, compared with 2.26 for the assault and battery group, and 1.75 for the other serious offense group. We observed significant differences in the number of referrals across group, $F(2,234) = 3.28$, $p < .05$. Tukey's post-hoc test revealed that the assault and battery with intent to kill group had more referrals at the time of the target offense than did the other serious offense group ($p < .05$).

Characteristics of the Homicide

Since the case record information did not contain information about the homicide incident, additional information about the crime was collected from newspaper accounts (which, as noted above, were available for 40% ($n = 34$) of the homicide cases). Given the small sample size, the following results should be interpreted cautiously.

Characteristics of the victim. The victim of the homicide was most frequently a male (82%). In most cases (59%), the victim was a stranger to the juvenile offender; in 12% of the cases, the victim was a family member, and in 29% of the cases, the victim was a friend or acquaintance. In nearly one-quarter of the cases (22%), the newspaper account indicated that the homicide was related to known ongoing conflict between the victim and perpetrator. The age of the victims ranged from 2 to 75, with an average age of 29.6 years. Nearly three-quarters of the victims (71%) were older than the perpetrator, 17.6% were approximately the same age as the offender, and 8.8% were younger. In all but one case, the deceased was the intended victim.

Type of weapon used in the homicide. The vast majority of homicides

were committed using guns (76% used handguns, 6% used rifles or shotguns); 3% involved knives, 9% involved automobiles, and 6% involved other means.

Involvement of multiple perpetrators. In 37% of the cases, another individual also was charged in the homicide. Most typically, the co-accused were friends (56%); 17% were acquaintances, and 17% were relatives.

Location of the homicide. Half (50%) of the homicides were committed in businesses; 16 were committed in the home of the victim, 25% were committed in another residence, and 9% were committed in other locations.

Discussion

In this sample of youth from metropolitan, non-metropolitan, and rural communities, we examined characteristics of cases of homicide by juvenile male offenders, as well as differences between boys who had been referred for homicide and boys who had been referred for assault and battery with intent to kill or other serious offenses with respect to demographic and family background variables.

Regardless of offense group or the type of community in which the youth lived (rural, non-metropolitan, or metropolitan), the picture that emerged from case record information is one that is consistent with the findings of others. The majority of youth were black and were from relatively poor families (two-thirds had annual incomes below $15,000). Only one-quarter resided with two parents (including stepparents). Strikingly, substantial percentages of the youth (regardless of group) had family members with criminal backgrounds. More than

one quarter of the boys had at least one parent with a known criminal record; a similar percentage of youth had at least one sibling with a history of known delinquent or criminal offenses. Future investigations into the nature and extent of family members' criminal involvement would be useful in order to better understand the ecologies of these families and to develop interventions to support to prosocial development of children.

Similarly, few group differences were observed related to boys' offense histories. Regardless of group, boys received their first referral to the solicitor at 14 years of age (14.1 years). The average age at which boys were referred for homicides or assault and battery with intent to kill was approximately 15 ½ years. These youth were somewhat older than youth referred for other serious offenses. For a substantial number of youth, the homicide or assault and battery with intent to kill represented their first referral; approximately one-third of youth in these groups had no prior referrals to the solicitor.

On average, youth had just over two referrals prior to their target offense. With one exception, there were no differences among groups in the number of different types of offenses in their histories. Youth in all three groups had been referred for similar numbers of status offenses, other juvenile offenses, property offenses, and public order offenses. Perhaps unsurprisingly, youth in the homicide and assault and battery groups were referred for significantly more offenses against persons than were youth in the other serious offense group. However, those youth in the other serious offense group who had a referral for a crime against persons were younger than their counterparts in the other groups.

Failure to find differences in offense histories between youth in the homicide group and boys in the assault and battery with intent to kill group was expected, since the only apparent difference between the two offenses is the success of the perpetrator in carrying out the crime. The lack of differences between these youth and the youth in the serious offense group is of greater interest, however, as it suggests a basic similarity in offense history, at least with respect to age of onset, the numbers and types of prior referrals, and the ages at which youth commit different types of crimes. Future investigations should examine aspects of youths' offense history in greater detail, including dispositions for prior offenses. It also should be emphasized that the group distinctions in this study are by no means definitive. Future studies are needed to further examine differences between juvenile homicide perpetrators and youth who have been convicted of different types of serious violent offenses (e.g., assaults) or youth who have committed non-violent offenses.

Our findings regarding the characteristics of homicide cases should be considered very cautiously, given the small sample size of 34. They are, however, generally consistent with the findings of others regarding the age and gender of the victim, the involvement of multiple perpetrators in approximately one-third of all cases, and the overwhelming use of handguns (76%) in commission of the crime. Our results related to the identity of the victim were somewhat inconsistent with the findings of others, however. Within our sample, the majority of victims were strangers to the perpetrator (59%) and less frequently were friends or acquaintances (29%) or family members (12%). When

these findings are combined with our observations regarding the location of juvenile homicides (50% took place in businesses) and the fact that many youth received multiple referrals at the time of the homicide, they suggest that many of these homicides likely took place during the commission of other crimes such as robbery. Such observations are consistent with Cornell's (1990, 1993) conclusions that substantial proportions of juvenile homicides are committed during the commission of other crimes. Cornell (1990) also observed that youth who commit crime-related homicides appear to have a more established record of prior criminal activity and have more substance abuse problems than do youth who commit conflict-related homicides. Additional information about specific types of juvenile murderers will assist in the development of targeted prevention and intervention strategies.

Archival studies such as this one are vulnerable to potential biases and errors in record-keeping as well as problems associated with missing data. Moreover, it should be kept in mind that this study focused on referrals for offenses and not convictions, thereby potentially inflating the number of offenses reported. Nevertheless, our findings present important information about the offense histories of youth who have been referred for homicide. Although recent statistics suggest a decline in rates of homicide by juveniles, the numbers of youth in the United States who commit homicide are still alarmingly high. Additional research is needed to illuminate the individual, familial, peer, situational, community, and societal factors that contribute to these violent acts. Nevertheless, as emphasized in an earlier discussion (see p. 53), it is clear that

violence prevention and intervention efforts that are targeted at such youth are likely to fall short if they do not embrace a comprehensive strategy that focuses on risk factors within the many different contexts in which the youths interact (family, peer, school, neighborhood).

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Table 1. Race of juveniles referred for different offenses

Race	Homicide	Assault & Battery	Other Serious Offenses
Black	69 (80.2%)	55 (71.4%)	53 (60.9%)
White	15 (17.4%)	22 (28.6%)	33 (37.9%)
Other	2 (2.3%)	0 (0%)	1 (1.1%)

Table 2. Numbers of referrals for different types of offenses.

Type of Offense	Homicide	Assault & Battery	Other Serious Offenses
Status Offenses	.36	.38	.36
Other Juvenile Offenses	1.24	1.08	1.29
Property Offenses	1.91	1.22	1.47*
Public Order Offenses	1.50	2.09	1.70
Offenses Against Persons	1.80	1.69	.60**
Total Offenses	6.94	6.76	5.53

* $p = .08$
** $p < .001$

Table 3. Age at first referral for different types of offenses

Type of Offense	Homicide	Assault & Battery	Other Serious Offenses
Status Offenses	14.2	14.2	14.7
Other Juvenile Offenses	14.3	14.0	14.6
Property Offenses	14.5	14.3	14.2
Public Order Offenses	14.0	14.7	14.6
Offenses Against Persons	15.5	15.4	14.7*

*$p < .01$