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**Author(s): Stacey Nofziger**

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**Correlates and Consequences of Juvenile Exposure to Violence:  
A Replication and Extension of Major Findings from the National Survey of Adolescents.**

Final Technical Report

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Dr. Stacey Nofziger  
Department of Sociology  
University of Akron

**FINAL REPORT**

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## ABSTRACT

The purpose of this study is to examine the consequences of exposure to violence on juveniles using data from the 1995 National Survey of Adolescents (NSA). The first objective of this study is to replicate and extend the original analysis of the NSA, performed by Kilpatrick et al. (2000). The second objective of this study is to examine the context and consequences of violence that is experienced at school.

The initial study examined the relationship between posttraumatic stress disorder (PTSD) and alcohol or drug abuse or dependence. Using logistic regression analysis, this study finds important differences between the original study and the current analyses. Addition controls for family income, peer deviance and locations of witnessed violence eliminates the significance of PTSD in models of substance abuse / dependence. In addition, one of the strongest predictors in the original analyses was witnessing violence. However, when the specific location of the violence is considered, this form of exposure to violence is only a risk factor for marijuana. However, modification of the dependent variables from abuse / dependence to measures of use indicate that witnessing violence in different locations is an important predictor of substance use.

The second objective focuses on acts of violence that are witnessed in school. Students in all social and demographic groups are regularly exposed to a variety of acts of violence at school. Witnessing violence at school is a substantial risk factor for engaging in serious forms of delinquency, and increases the likelihood that juveniles believe there are serious problems with violence at school and in the community. Therefore, this study finds that while exposure to violence is a risk factor for various negative outcomes, it is important to consider where such violence occurs.

Within the field of juvenile delinquency, two topics consistently receive a great deal of attention: drug use and school violence. Studies seek to determine why juveniles initiate drug use (Zapata, Katims and Yin 1998; Caldwell and Darling 1999; Lipsey and Source 1999; Guerra et al. 2000), and examine the relationship between drug use or abuse and other crimes (Elliott and Huizinga 1984; Carpenter et al. 1988; Zhang, Wiexzorek and Welte 1997). School violence research examines links between violence at school and other forms of deviant behavior (DuRant et al. 1999; Lowry, Cohen and Modzeleski 1999), determines how common such problems are (Kaufman et al. 1998; DuRant et al. 1999), and studies how students view violence (Astor, Meyer and Pitner 2001; Price et al. 2002). A possible bridge to connect research in juvenile drug use and school violence is the importance of exposure to violence.

This study examines potential impacts of exposure to violence on various forms of delinquency, with particular attention paid to instances of violence that occur within the school setting. Specifically, this project reanalyzes data collected as part of the 1995 National Survey of Adolescents to meet two primary goals: (1) determine the impact of exposure to violent acts on juvenile use or abuse of drugs and (2) determine the context and consequences of witnessing violence in schools.

## EXPOSURE TO VIOLENCE

First hand experience with violence is an event that is all too common in our society. Nearly all children and adolescents in inner cities report they have encountered violence in their homes or communities (Koop and Lundberg 1992; Margolin and Gordis 2000; Purugganan, et al. 2000). This is not limited to older juveniles but reaches

juveniles at very young ages. For example, Hurt et al. (2001) found that by the age of 7, 75% of inner city children report they have heard gun shots, 18% have seen a dead body and 10% have been a witness to a shooting or stabbing in the home. The large number of juveniles who are exposed to violence raises concerns about potential behavioral consequences.

One established outcome of exposure to violence is increased risk of drug and alcohol problems among adolescents, young adults, and adults (Pelcovitz et al. 1994; Kaplan et al, 1998; Kilpatrick et al 2000; Berenson, Wiemann and McCombs 2001; Caetano, Field and Nelson 2003; Vermeiren et al. 2003). The link between exposure and drug use that has been proposed within the psychological and public health literature is that exposure to crime and violence leads to high levels of stress or strain. Individuals thus engage in a variety of drug related behaviors to reduce their stress levels (Brown 1989; Agnew and White 1992; Bean 1992; Ireland and Widom 1994; Kilpatrick et al. 1997). Therefore, understanding how exposure to violence is connected to drug use may assist in finding ways to eliminate or at least minimize this problem.

In spite of decades of efforts to prevent experimentation and initiation of drug use, American youth persist in the use and abuse of drugs. According to the 2002 Monitoring the Future study, 53% of 12<sup>th</sup> graders, 45% of 10<sup>th</sup> graders, and 24% of 8<sup>th</sup> graders reported that they had used an illicit drug at some point in the past (Johnston, O'Malley and Bachman 2003:Table 1). Although these figures indicate many juveniles are using drugs, this represents a slight overall decrease from past years. On a less positive note, several drugs continued a trend of slight increase in use and there continues to be a "flow of new drugs introduced onto the scene or of older ones being 'rediscovered' by young

people" (Johnston et al. 2003:4). Expanding research on reasons that juveniles use drugs to examine the influence of exposure to violence may provide important insights into this continuing social problem.

Another potential consequence of exposure to violence is delinquent offending. Several studies have established that violent victimization, one form of exposure to violence, increases the likelihood of aggressive or violent behaviors (Lauritsen, Sampson and Laub 1991; Lauritsen, Laub and Sampson 1992; Schwartz and Proctor 2000). This consequence may again be linked to feelings of stress or strain that have been found to increase deviance and violent behaviors (Mazerolle et al. 2000). Other forms of exposure to violence, including witnessing such an act, have also been found to increase the risk for aggression and violent behaviors (Buka et al. 2001; Halliday-Boykins and Graham 2001). Therefore, research on exposure to violence may also be useful for understanding a range of juvenile delinquency. One important consideration for how exposure to violence affects juveniles is where the violence occurs.

It is likely that violence that is witnessed in different settings may affect juveniles in different ways. Violence at home is likely to be family violence that the juvenile has little control over and which could create a high level of stress. In contrast, violence that is witnessed in the neighborhood and elsewhere may be more of an indicator of the deviant activities of the juvenile. If they spend a great deal of time hanging out in the neighborhood (as opposed to home or school), or even go farther away from any controlling influences of neighbors, their activities may be exposing them to opportunities for crime and violence to occur. In this case, witnessing violence may be

part of a lifestyle or routine that exposes the juvenile to criminal events, either as a witness, victim or perpetrator.

A final location where juveniles may be exposed to violence is within the school. Juveniles spend a great deal of their time within the school setting and, until they reach a certain age, are required by law to attend. In the past 10 years, our perception of our nation's schools has changed from assuming schools are places of safe learning to fear that schools are "a dominant source of violence" (Reed and Strahan 1995: 323). Many presumably innocent bystanders may therefore be exposed to violent outbursts within this setting. If such exposure is a contributor to juvenile drug use or other problem behaviors, schools may themselves have become a source of delinquency (Gottfredson 2001).

Although there is concern about violent youth in society, most studies find that only approximately 5% of all juveniles are violent offenders (Elliott, Huizinga and Morse 1986; Elliott 1994; Howell, Krisberg and Jones 1995). In addition violent crimes by juveniles have actually decreased since the mid 1990's (Snyder and Sickmund 1999:54, 62). However, violence by juveniles still accounts for over 25% of serious violent victimizations (Snyder and Sickmund 1999:62). Juveniles are disproportionately involved in serious crimes and represent a potentially serious problem in our society, particularly when this violence spills into the school setting.

The type of school violence that receives the most media attention is random or mass shootings, even though the majority of schools experience no problems with weapons of any kind. In fact, a nationwide survey found that only 13% of high schools, 12% of middle schools, and 2% elementary schools reported an incident of physical attacks with weapons (Kaufman et al. 1998:16). However, that does not mean that the

potential for such problems is not high. In 1996, 9% of male and slightly over 2% of female high school seniors, and a total of 8% of 9<sup>th</sup> through 12<sup>th</sup> graders reported carrying a weapon, including knives and guns, to school at least once within the 4 weeks prior to the study (Kaufman et al 1998: 28-29). When simple possession is included in reports of gun instances, the percentage of schools that have a problem with weapons raises substantially. In a 1996 survey, 58% of school administrators reported a "gun incident" on school grounds during the 3 years prior to the study (Sheley and Wright 1998:7).

Physical assaults are more common in schools than weapon incidents. Kaufman et al. (1998: 8-9) found that within the past 12 months, 12% of seniors in high school reported being intentionally injured in an attack at school that did not involve a weapon as opposed to only 5% who had been injured with a weapon such a knife, gun or club. This percent of injury without a weapon translates into the highest rates of victimization within schools, with theft falling to a fairly distant second (Kaufman et al. 1998:17). Extending the data to include all high school students, about 15% of juveniles in this age range report being in a physical fight at least once in the past 12 months (Snyder and Sickmund 1999:67). High school students are more likely to report physical fighting, but these behaviors are not limited to the oldest of our school children. While 55% of high schools, and 51% of middle schools reported problems with physical attacks or fights without weapons, 12% of elementary schools reported this type of violent behavior (Kaufman et al. 1998:16).

These studies indicate that a substantial portion of the student population may be exposed to violence within the school setting. However, it is unlikely that the risk of exposure is constant across all juveniles, or even among all students within one school.



The amount of violence in the community, the presence of gangs, or the size of the school and level of adult supervision may all influence how often violence is experienced by juveniles. One important factor that may influence exposure to violence is involvement in deviant activities by the juveniles' friends.

Although it is highly possible that juveniles who do not associate with deviant peers will be exposed to violence on occasion, it is much more likely that those who have friends that are deviant will experience a greater number of such incidents as part of their "routine activities" (Felson 1997). Friends who engage in violence may provide more opportunities for juveniles to witness acts of violence, or to become involved in violence as either perpetrators or victims. Therefore, associating with deviant peers on a regular basis would increase the level of exposure to violence and possibly even increase participation in such acts. Such an assumption is supported by findings that indicate "victims" of crime often lead lifestyles that expose them to greater risks (Hindelang, Gottfredson and Garafalo 1978; Jensen and Brownfield 1986; Mustaine and Tewksbury 1998a, 1998b).

The influence of deviant peers is also an important consideration for predicting juvenile use of drugs. Nearly every study finds that juveniles who have peers who use drugs are more likely to use themselves. This has been found true for alcohol (Epstein et al. 1999 ; Mason and Windle 2001), tobacco (Chassin et al. 1984; Stein, Newcomb and Bentler 1996; Lipsey and Source 1999), and a wide variety of illicit drugs (Stacy, Newcomb and Bentler 1992; Brook, Whitman and Balka 1998; Caldwell and Darling 1999). Examinations of juvenile exposure to violence or juvenile drug use would therefore be severely lacking if they fail to include controls for deviant peers.

## STUDY OBJECTIVES AND HYPOTHESES

The current study seeks to link juvenile drug use and school violence by examining the affects of exposure to violence on juveniles. The first objective of the study is to assess the impact exposure to violence has on juvenile alcohol and drug behaviors. Reanalysis of a study based on a nationally representative sample of juveniles seeks to determine whether exposure to violence increases the risk of juveniles abusing or being dependent on drugs or alcohol. In addition to adding new controls to the models in the previous study, the reanalysis also determines whether exposure to violence influences regular use of alcohol or drugs.

Hypothesis 1: Exposure to violence will increase abuse or dependence on drugs or alcohol, while controlling for demographic characteristics, family substance use, and peer deviance.

Hypothesis 2: Exposure to violence will increase regular use of drugs or alcohol, while controlling for demographic characteristics, family substance use, and peer deviance.

The second objective of this study is to develop a more complete picture of violence that occurs within schools and the consequences witnessing such violence has on juveniles. Contextual information includes the types of violence that are witnessed, how recently such incidents occurred, the relationship of both the offender and victim to the witness, and whether the witness felt at risk during the incident. In addition, consequences of this exposure, in the form of juveniles' perceptions of schools and communities as violent places and on juvenile deviance, will be examined.

Hypothesis 3: Witnessing violence in school will increase the likelihood of juveniles believing their schools and communities are violent places.

Hypothesis 4: Witnessing violence at school will increase the risk of juveniles engaging in deviant activities.

## DATA AND METHODS

### *DATA SOURCE*

The data for this project are drawn from Kilpatrick and Saunders National Survey of Adolescents in the United States, 1995 (NIJ grant 93-IJ-CX-0023). These data were collected through a national probability telephone sample of 4,023 juveniles between the ages of 12 and 17, with some over sampling of central city areas. In order to ensure that the sample is representative of the juvenile population, data are weighted by age, race and sex to be consistent with 1995 U.S. census estimates (Kilpatrick et al. 2000: 20-21)<sup>1</sup>. These data include information on the respondents' experiences with several forms of victimization and other forms of exposure to stressful life events, assessment of peer and family deviance, the juveniles own delinquent activities and numerous indicators of problematic use of drugs and alcohol.

The original analysis conducted by Kilpatrick et al. (2000) focused on determining the effects of victimization and other events that may cause posttraumatic stress disorder (PTSD) on drug or alcohol abuse or dependence. Measures of physical and sexual assault victimization were developed as well as measures of witnessing a variety of violent acts. The argument is that such activities, as well as other traumatic

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<sup>1</sup> A complete description of the methods and sample characteristics can be found in Kilpatrick et al. 2000.

experiences, would increase drug abuse or dependence as the juvenile attempts to cope with the stress generated by these events. Using measures of PTSD and substance abuse or dependence based on DSM-IV criteria, and performing a series of hierarchical logistic regressions, the authors found that juveniles who had experienced these types of victimization, and those who reported PTSD symptoms, were at higher risk for alcohol and drug abuse / dependence. Although this is an important addition to the understanding of juvenile drug behaviors, several limitations and omissions exist. The current study seeks to extend the analysis by incorporating several key controls and by reformulating the conceptualization of problem drug behaviors.

#### *MEASURES*

The data for the NSA, available through the National Archive of Criminal Justice Data, includes measures of most of the key variables for the current study. However, to ensure the accuracy of these measures, each was recreated following the procedures outlined in the appendix of Kilpatrick et al (2000). Several of these measures, such as the demographic characteristics, PTSD and various forms of victimization appeared consistent with the original variables. In these cases, the original measures provided within the data file were employed in the analyses in order to minimize repetition of variables in the data. However, there were several variables that could not be replicated to produce the same frequencies as reported by Kilpatrick et al. (2000). In addition, other key variables in the analyses are unique to the current study. Therefore, the coding procedures for the modified measures and new required measures are discussed below.

## DEMOGRAPHIC CHARACTERISTICS AND ORIGINAL CONTROLS

To conduct a secondary analysis that is as similar as possible to the original study, the current analysis followed the guidelines for coding all demographic characteristics and other controls as outlined by Kilpatrick et al. (2000: 21). Race was divided into three dummy variables of African American, Hispanic and Native American, with a collapsed variable of White/Caucasian that also included all Asian American respondents as the reference category. Other demographics in the original analysis are age at the time of the survey, and sex (male=0, female=1).

In addition to standard demographic controls, Kilpatrick et al (2000) controlled for a number of measures of exposure to violence and family deviance. Similarly to association with drug using friends, juveniles whose parents use drugs are more likely to experiment with drugs and have later problems with drug use or abuse (Hussong, Curran and Chassin 1998; Epstein et al. 1999; Hill and Yuan 1999; Jackson, Henricksen and Dickinson 1999; Chermack et al. 2000; Reinherz, Hauf and Carmola 2000). Therefore, parental drug and alcohol problems are important controls included in the original study and the reanalysis. PTSD, physical assault victimization, and sexual assault victimization are also controls utilized in the original analysis. A final control of witnessing violence is discussed in more detail below.

## ADDITIONAL CONTROLS

**FAMILY INCOME.** Socioeconomic status is a common control in studies of juvenile delinquency but was not included in the original models. Since family income could influence how commonly crime occurs in the community, and thus the juveniles' exposure to violence, this control is added to all but the replication models. Family

income is a preexisting ordinal variable in the data. The lowest category is \$0 to \$5,000 and the highest grouping is over \$100,000. This variable was part of the survey that collected data from the juveniles' parents, and thus avoids potential problems with juveniles' perceptions of family income.

**PEER DEVIANCE.** Although not included in the original analysis, one of the most common controls in studies of juvenile delinquency is peer deviance. For this study, peer deviance is formed as an additive scale of 13 items that indicates whether the respondents' friends have participated in various forms of deviance. These items include drug and alcohol use, property crime and violent acts committed by friends (see Appendix A for full description of items). Respondents indicated whether any of their friends participated in each act over the past 12 months. Although these items do provide a range of deviant behaviors, it is highly likely that juveniles are not fully aware of all the acts of deviance committed by friends, or that friends may exaggerate their delinquency. However, a reliability analysis of these 13 items results in an alpha of .81, indicating this is a highly reliable scale. Overall, respondents' peers are not highly deviant, with a mean of only 3.17, indicating the average respondent has friends who have only committed slightly over three of the possible thirteen acts of deviance.

**WITNESSING VIOLENCE.** Although various types of victimization increased drug abuse / dependence in the original study, witnessing violence was actually one of "the most powerful risk factors for substance use disorders, tripling risk of abuse/dependence for all substances after effects of demographics, familial substance use, and victimization were controlled" (Kilpatrick et al. 2000: 26). Therefore, an important extension of the original study is to examine the experience of witnessing violence in more detail.

Witnessing violence in the original study was measured by whether the respondent had ever witnessed any of five different acts of violence: shooting, stabbing, a threat made with a weapon, sexual assault, and a mugging or robbery. Since these are relatively rare events, this item was coded as a dichotomous variable indicating whether the respondent had at least seen one such event. For the sake of replication, this same variable was utilized in the first model that attempted to reanalyze the data using all the same variables. However, a sixth type of violence, seeing someone beat up someone else so they were hurt pretty badly, was asked on the survey. Although this may be interpreted by respondents as less serious skirmishes or minor fist fights, this is likely to be the most common type of violence experienced by juveniles and therefore should be included in analysis. Therefore, this sixth form of witnessed violence was included in all but the replication models.

A final modification to the measure of witnessing violence is to examine the affect of where the event occurred. For each type of violence the juvenile reported witnessing, they indicated in which of four different settings it took place: the home, at school, in the neighborhood and "somewhere else." Therefore, four variables are developed that indicate whether the juvenile has ever witnessed an act of violence in each of these four settings.

#### *DEPENDENT VARIABLES: DRUGS*

**NON-EXPERIMENTAL PAST-YEAR USE.** As a first step in assessing "problem use" of drugs or alcohol (Kilpatrick et al. 2000: 21), measures of "non-experimental past year use" are created for three substances: alcohol, marijuana and hard drugs. Separate survey

items ask if the juvenile has used a particular substance, how many times they used it, and the most recent time they used the substance<sup>2</sup>. Non-experimental past year use indicates the juvenile reports using the substance four or more times in the past year. However, the authors indicate that the measure of "hard drugs" includes both illicit drugs, such as cocaine and heroin, and misuse of prescription drugs (Kilpatrick et al. 2000: 21). This is problematic because items related to prescription drug misuse do not include a question about when the juvenile last used these drugs. Therefore, it is impossible to assess if the use occurred within the past year. In addition, there are a total of 113 respondents<sup>3</sup> who report misusing prescriptions four or more times. This figure, which does not include those using other hard drugs, is above the 93 reported as qualifying as "past-year hard drug" users in Kilpatrick et al (2000: 23, Table 1). In contrast, if only cocaine, PCP, heroin, LSD and inhalants are included in the "hard drug" category, an exact total of 93 respondents fit the criteria for past-year non-experimental user. Therefore, for the purposes of the current study, prescription drug misuse was excluded from the analyses.

ABUSE. Abuse of drugs or alcohol is defined by DSM-IV criteria as engaging in any of five types of behaviors: having major problems with family or friends due to substance use, being high in a situation where it may increase the risk of being hurt, being arrested in relation to the substance use, continuing to use drugs in spite of problems with family about the drugs, and driving under the influence (Kilpatrick et al. 2000: 29). The first four criteria each correspond to four survey items, asking if the specific problem has ever happened, which substance caused the problem, how old the

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<sup>2</sup> The questions were slightly different for alcohol use but the same types of information were gathered.

<sup>3</sup> These figures are unweighted to allow for direct comparison with Table 1 in Kilpatrick et al. 2000.



respondent was when the problem happened for the first time, and if this occurred in the past 12 months. Since it is possible to determine which substance is being referred to and whether the problem occurred in the past year, the abuse measure appears to be simple to replicate.

However, the fifth DSM-IV criterion for abuse, whether the respondent has driven under the effects of substances, presents several problems. One survey item on the NSA asks specifically about driving under the influence of alcohol and one additional question refers to driving under the effects of drugs. The possible responses range from "Daily" to "Never" with 157 respondents indicating they have driven under the influence of alcohol and 132 respondents reporting driving while feeling the effects of drugs at least once in the past year. Since it is possible to determine whether the respondent drove after drinking, the measure of alcohol abuse should be determined by an affirmative response to any of the five criteria for alcohol abuse. However, this process did not produce the same frequency of respondents with an alcohol abuse problem as that reported in the original study (Kilpatrick et al. 2000). In addition, because the survey did not distinguish between driving under the influence of different drugs, it did not seem possible to separate the respondents who drove under the influence of marijuana from those under the influence of other drugs. Therefore, several consultations with the original authors were required.

According to the original researchers, only those who had driven under the influence at least four times in the past year were coded as abusing alcohol or drugs for the fifth DSM-IV criterion. In addition, several assumptions were made regarding the item for driving under the influence of drugs. If the respondent was classified as a non-

experimental past-year hard drug user, it was assumed they were under the influence of these harder drugs when they drove, and if the respondent had not reported using hard drugs, they were assumed to be driving under the influence of marijuana. Although the second assumption is on fairly safe ground, the first is highly problematic. Of the 93 respondents who reported non-experimental use of hard drugs in the past year, 78 (84%) also reported non-experimental past year marijuana use. Thus, assuming that someone using both types of substances would only be driving while under the influence of hard drugs is highly problematic. However, since one task of the current study is to rerun the analyses as closely as possible to the original, and since there is no clear way to separate the type of drug the person was using at the time they drove, the current study employs these same methods of coding abuse.

**DEPENDENCE.** Dependence on alcohol, marijuana or hard drugs is a composite measure of more than 30 survey items corresponding to seven DSM-IV criteria. The respondent is classified as being dependent on a substance if she or he replies affirmatively to three or more of the seven criteria (see Appendix of Kilpatrick et al. 2000 for specific criteria). Coding for alcohol dependence is unproblematic because separate items ask specifically about experiences with alcohol, such as experiencing withdrawal symptoms or having to drink more to get the same effect. However, there is no separation between marijuana and other drugs for several key survey items assessing drug dependence. Only one criterion of dependence specifically allows for division of responses into marijuana or hard drug dependence.

For this criterion, respondents were asked a series of questions about whether they had ever cut down or stopped using a specific drug, if such a step made them

experience withdrawal symptoms, and whether they had ever used a drug to keep them from getting sick or having withdrawal symptoms. Since each of these three items ask for the specific drug involved, it should be possible to determine if dependence was on marijuana or hard drugs. However, the drug that made the individual sick when they cut down or stopped taking it was not necessarily the one they used to prevent withdrawal symptoms. In fact, although 18 of the respondents indicate they experienced withdrawal from marijuana, only five of them used marijuana to fight these symptoms. One respondent reported using pain medicines and one reported using LSD to combat their withdrawal from marijuana, and an additional 11 respondents were coded as "unknown" for which drug they took to avoid withdrawal symptoms. In comparison, the next most frequently reported drug that caused withdrawal symptoms was LSD. Of the two respondents who reported suffering such symptoms from LSD, one returned to LSD to stop the symptoms and the other used marijuana. Although these are very small numbers in comparison to the entire sample, it is impossible to determine which drug was selected by the original authors to be coded as dependence. Therefore, since it is logical that dependence is on the drug that caused the sickness or withdrawal, this item is used in the current study to divide respondents into either marijuana or hard drug dependence for this particular DSM-IV criterion.

Since none of the other criteria for dependence asked about the specific drug involved, a series of variables assessing whether the respondent met the criteria for dependence for either marijuana or hard drugs is created. Therefore, the measure of marijuana dependence is created by selecting respondents who are classified as dependent on at least three of the seven dependence criteria and who report that they

experienced these problems in the past year (a one item question on the survey). The same procedure was used to create the variable for hard drug dependence. Marijuana and hard drug dependence likely overlap to a great extent since only the one variable specifically asks about the drug being used. However, the final measures of abuse/dependence for the three substances of alcohol, marijuana or hard drugs attempt to more accurately divide these groups by drawing on the measures of past year non-experimental use.

ABUSE/DEPENDENCE. The final dependent variables of substance abuse or dependence are coded as one if the respondent met the criteria for either abuse or dependence and zero otherwise. To separate respondents into the three categories of alcohol, marijuana or hard drug abuse/dependence, the final variables were limited to those reporting non-experimental past-year use for each substance. For example, only those who had past-year non-experimental hard drug use and coded as one for hard drug abuse or one for hard drug dependence were ultimately coded as one for hard drug abuse/dependence. Although there are still slight differences in the final frequencies for these variables in comparison to those reported by Kilpatrick et al. (2000: Table 1, p. 20), this procedure brought the current figures much closer to the originals than any other attempt (see Table 1 for final frequencies).

<Table 1 about here>

A final extension of the original analysis involves reformulating the dependent variables. Although limiting the analysis to juveniles who have enough problems with drugs and alcohol to qualify as being abusers or dependent is one possible approach to assessing serious problems, such restrictions may be too limiting, and the inconsistencies

in the coding of the variables brings up serious questions about the validity of the findings. The NSA includes data on juveniles who are in both middle and high school (12 years old to 17 years old). Due to the age range, many of these juveniles would not yet be able to drive, so measures that include items about driving under the influence are irrelevant to a large portion of the sample. In addition, using drugs or alcohol regularly, or even experimenting with more serious drugs at these ages could be thought of as a serious problem and potentially an indication of future continuing problems. Therefore, a new series of dependent variables assessing different levels of use of alcohol and drugs are created for the current study (see Appendix B for full description of coding procedures).

ALCOHOL USE. Although expanding the range of the substance using behaviors is important, the main concern is still to focus on problem behaviors rather than very low levels of experimentation. For example, alcohol use is very common among juveniles, with nearly 54% of juveniles reporting drinking alcohol in the NSA, and almost 40% reported drinking alcohol at least once in the past year. Such widespread drinking may therefore not be an indication of problem behavior. To focus attention on more serious drinking patterns, the new measure of drinking was limited to those who reported regularly engaging in binge drinking behaviors. Juveniles reporting drinking five or more alcoholic beverages at one time at least 12 times in the past year (indicating binge drinking approximately once per month), or that they were "drunk or very high from alcohol" at least 12 times in the past year, were coded as "regular drinkers." This coding limits the analysis to those who have not just gone out once and gotten drunk, or who

drink infrequently and in small amounts, but those who engage in binge type drinking behavior regularly.

**MARIJUANA AND HARD DRUG USE.** After alcohol, marijuana is generally considered the drug of choice for experimentation among this age group. Two measures of marijuana use are developed for this study. The first includes only those who have "experimented" with marijuana, reporting having used it only one to three times. Since this is an illicit drug, it is important to determine how many juveniles have entered into illegal substance use. The second measures non-experimental use, or those who have used marijuana at least four times. Similarly, hard drug use is measured by two variables: the first indicating that the juvenile has ever used any of the five types of hard drugs included on the survey, and the second indicating that they have used at least one of these drugs four or more times.

*DEPENDENT VARIABLES: SCHOOL VIOLENCE CONSEQUENCES*

The final set of variables in the analyses address the consequences of witnessing violence in school. While drug use, abuse or dependence may all be affected by witnessing school violence, several other possible outcomes are also examined in the current study.

**VIOLENCE IN SCHOOL AND COMMUNITY.** Two items in the NSA ask the respondents how much of a problem violence is in their schools and communities. Four response categories were provided indicating "a very big problem," "a middle sized problem," "a fairly small problem," and "not a problem at all." For the purposes of this

study, these responses are dichotomized into two categories with responses of middle sized or big problems coded as one and small or no problem coded as zero.

JUVENILE DELINQUENCY. Although drug and alcohol use are often included in measures of delinquency, this study separates drug measures from other deviant acts recorded in the NSA. Seven different items, focusing on fairly serious acts, are combined into one measure of delinquency (see Appendix A). These acts include attempted or actual rape and motor vehicle theft with low reported participation rates. The type of delinquency that had the greatest percentage reported involvement (5.6%) was having been in a gang fight. Due to the rarity of participation in each act, respondents' deviance indicates whether the juvenile ever participated in any of these seven acts.

## *METHODS*

Frequencies and cross-tabular analysis provides descriptive information for the key variables in this study. In addition, Pearson correlation analyses are conducted to provide preliminary information about the relationships between various measures. The remaining analysis is divided into reanalysis and extension of the original study and examination of the context of school violence. Logistic regression analyses are performed to both replicate the original analysis on drug abuse / prevention and to extend the analysis by incorporating new controls and new dependent variables. To provide a clearer understanding of the structural relationship between peer deviance, exposure to violence, PTSD and measures of drug abuse / dependence or use, structural equation models using AMOS 4.0 are also examined. Finally, logistic regression analyses are performed to assess the effects of witnessing violence at school.

## RESULTS

### *DEPENDENT VARIABLES*

For the current study, there are three groups of dependent variables. The first group, measures of alcohol or drug abuse / dependence, are used to reanalyze the original models from the NSA as described in Kilpatrick et al. (2000). The second group focuses on differing levels of alcohol or drug use. The last group relates to the second stage of the project that examines the impacts of witnessing violence in school. Specifically, these dependent variables assess the juveniles' perceptions of violence in their schools and communities and the respondents' own involvement in delinquent acts. Table 2 provides descriptive statistics for the dependent variables used in these analyses. Since the measures for drug and alcohol use were intended to be less restrictive than the corresponding abuse / dependence measures, the number of respondents who met the use criteria are expected to be substantially higher than abuse or dependence. However, these descriptive data provide some unexpected results.

<Table 2 about here>

Regular binge drinking appears to be less common than any other form of drug use, with the exception of non-experimental hard drug use. A total of 182 respondents are regular binge drinkers, only nine more than the 173 respondents who have problems with alcohol abuse or dependence. This indicates that the new measure of alcohol use captures serious juvenile use of alcohol. The use measures for marijuana and hard drugs are more common than their corresponding abuse or dependence measures but less than ten percent of the sample report any of these levels of use. One interesting finding is that there is a higher percentage of the sample reporting non-experimental marijuana use than



experimental use. This indicates that juveniles who try marijuana are more likely to use it multiple times than just once or twice. This is opposite to the finding for hard drugs. While 211 respondents reported having ever tried hard drugs, only half that, 103 respondents, used at least one type of hard drug four or more times.

The last three dependent variables break from the focus on drug use and examine other types of consequences of exposure to violence. A substantial percent of the sample report that problems of violence and the community are either a “middle sized” or “a very big” problem as opposed to not a problem at all or a “fairly small” problem. Nearly 31% of the respondents report violence is a problem at school and 35% indicate similar concerns about violence in the community. The third variable, the respondents’ delinquency, is the least common of the outcomes examined in this portion of the study. Only 491 respondents, just over 12% of the sample, report engaging in any of the seven acts of delinquency included in this variable.

#### WITNESSING VIOLENCE

The respondents’ perceptions of schools and communities as violent are somewhat contradictory to the reality of where juveniles actually experience violence. Although more juveniles report problems of violence in the community, Figure 1 shows that approximately 48% of the acts of violence that are witnessed by the sample occur in school while only 24% occur in the neighborhood. Violence at home is least often reported by this sample, with only 2% of the acts of witnessed violence reported occurring in this setting.

<Figure 1 about here>

Witnessing violence is a fairly common occurrence for the respondents in this sample (Appendix A provides the frequency for each type of violence witnessed). A total of 72% of the sample report witnessing at least one of the six types of violence included on the survey. Although the survey format only allows for detailed information to be collected on one incident of each type of violence, it is apparent that respondents have often witnessed multiple incidents. One of the follow up questions in the series of questions about witnessing violence asks the respondent if they had ever witnessed the particular type of violence more than once. Figure 2 shows that between 30% and 66% of those witnessing each type of violence reported that they have seen such a thing multiple times. Therefore, concerns that the data are underestimating the number of acts of violence the juveniles are exposed to are substantiated.

<Figure 2 about here>

In order to ensure that the four measures of location of witnessed violence will not create problems of multicollinearity in analyses, the bivariate correlation coefficients between these four items, as well as other forms of exposure to violence, PTSD, and peer deviance are examined (Table 3). The highest correlation (.34,  $p < .001$ ), is between peer deviance and physical assault. None of the correlations appear to be of high enough magnitude to cause any problems in analyses. In fact, witnessing violence in the four locations are not even all significantly correlated with each other. Those acts that occur at home are significantly, and negatively, correlated only with witnessing violence at school.

<Table 3 about here>

Witnessing violence at school is negatively correlated with all three other locations of witnessing violence. This could indicate that juveniles who are not cutting school and hanging out in the neighborhood or "somewhere else," could only be exposed to violence at school. However, even if respondents stay in school, those witnessing violence are not necessarily "innocent bystanders," but within the limited opportunities in the school setting, some respondents are more likely to engage in activities that have the potential for violence. In fact, witnessing violence in school is positively and significantly correlated with both peer deviance and the respondents' own deviance.

*REPLICATION AND EXTENSION: DRUG ABUSE/DEPENDENCE AND USE*

Tables 4 through 6 provide the results of the replication and extension of the analysis of alcohol and drug problem behaviors. Each table provides the findings from four different models. The first model figures are not part of this study but are instead taken from the original study. The second model is as close to a reanalysis of the original models as possible given that slightly different coding of abuse or dependence were utilized. The remaining models are extensions of the original study. The first extension includes new controls for the location of witnessed violence, family income, and peer deviance on the various forms of substance abuse or dependence, and the final extension models change the dependent variables to different levels of substance use. For simplicity, the discussion of the findings is divided into the three types of substance: alcohol, marijuana and hard drugs.

## ALCOHOL

In logistic regression analysis predicting alcohol abuse or dependence, all measures that are statistically significant in the original analysis are also significant in the reanalysis (See Table 4). Slight differences in the magnitude of the effects are likely due to the difference in the measures of abuse / dependence but overall the findings from the replication mirror those of the original study.

<Table 4 about here>

This model indicates that family problem use of alcohol, being a victim of a sexual assault, and witnessing violence are the three variables with the greatest impact on alcohol abuse or dependence. Family alcohol problems increases the likelihood of alcohol abuse / dependence by 115%, sexual assault by 143% and witnessing violence by 94%. Thus, it is clear that these types of experiences, which may cause strain on the juvenile, do have a direct impact on alcohol abuse or dependence. However, PTSD does not significantly affect this type of alcohol problem.

In the first extended model with new controls, there are important changes in the findings. Being female is no longer a protection against this behavior and the effect of physical assault victimization falls to non-significance. In addition, although witnessing violence was one of the most important predictors in the first two models, none of the measures for the location of witnessed violence are significant. This could be due to the finding that peer deviance is in fact highly significant. If juveniles' experiences of witnessing violence depend to some extent on the deviance of their peers, then controlling for peer deviance would lessen the effect of witnessed violence on the dependent variable.

Peer deviance in this model has a very large impact on alcohol abuse or dependence. The odds ratio for each increase in peer deviance is 1.30, indicating that a one unit increase in peer deviance increases the likelihood of alcohol abuse or dependence by 30%. Since peer deviance is a continuous variable, the OR's increase exponentially for each unit increase. Therefore, a respondent who reports that their peers have engaged in all 13 of the possible acts of deviance, in comparison to one who reports no peer deviance, is 3,029% more likely to exhibit alcohol abuse or dependence. Since only .3% of the respondents actually report friends engaging in all 13 acts, a more useful comparison is between those who have reported no deviance of friends to the mean level of peer deviance. In this case, respondents with the mean for friends' total deviance (3.17) are 230% more likely to be abusing or dependent on alcohol than those with no peer deviance.

The final model in Table 4 provides the findings from the analysis on the new dependent variable of regular binge drinking behavior. Although there are some similarities between the two dependent variables in the patterns of significance, there are also important differences. As in previous models, older juveniles and those who have been a victim of sexual assault have a greater probability of being a binge drinker, and being female lessens the risk. In addition, as in the first extended model, peer deviance is a highly significant predictor, increasing the chance of regular binge drinking by 37% for each increase in peer deviance. However, three of the locations of witnessed violence, home, neighborhood, and somewhere else, are also significant. Witnessing violence at home has the highest odds ratio (3.85), placing the impact of this type of exposure over

that of sexual assault victimization. Therefore it does appear that witnessing violence has different impacts on binge drinking, depending on where such acts occurred.

#### MARIJUANA

Comparison of the models for marijuana abuse or dependence also provides slight differences between the original and replication and more substantial differences in the extension (Table 5). All the significant variables in the original model are significant in the replication. The magnitudes of the effects are also similar, with the biggest difference in magnitude found for witnessing violence. In the original, the OR for witnessing violence was 4.58 while the replication it only reaches 3.75. Exposure to violence remains important in the replication model, with witnessing violence increasing marijuana abuse or dependence by 275%, followed by 85% and 64% increases for physical and sexual victimization respectively. PTSD also has a significant impact (OR 2.78) and both measures of family alcohol or drug problems increase marijuana abuse or dependence.

<Table 5 about here>

In the first extended model, most of the variables that were significant in the original and replication fall to non-significance. The only variables that remain significant are age (OR 1.33) and African American (OR 0.33). Therefore, once controlling for the effects of where violence is witnessed, family income and peer deviance, violent victimization does not significantly affect marijuana abuse or dependence. Of the new controls, each increase in peer deviance increases the likelihood of this type of substance problem by 48% (16,346% for the full range of 13) and two of the specific locations of witnessed violence are significant; school and somewhere else

(OR's of 1.65 and 1.69 respectively). Therefore, even controlling for peer deviance, witnessing violence at school and somewhere else increase the likelihood of marijuana abuse or dependence.

Two separate measures of marijuana use were developed for the remainder of the analysis extension. Experimental marijuana use is only significantly predicted by four variables in the model: age, family alcohol problem, peer deviance, and witnessing violence at school. Since only one type of exposure to violence or other stressful life events is a significant risk factor, it appears that the influence of significant others (family and friends) are more important considerations in predicting experimental marijuana use. In contrast, several additional types of exposure to violence act as risk factors for non-experimental marijuana. Sexual assault returns as a significant risk factor, the first time this variable is significant in any of the marijuana models. Witnessing violence in the neighborhood and somewhere else also significantly increase the probability of being a non-experimental marijuana user. In addition, family drug problems and peer deviance both significantly increase the likelihood of non-experimental marijuana use (OR= 2.30 and 1.48 respectively).

#### HARD DRUGS

The final set of models related to drugs is for hard drugs. The replication models on abuse or dependence are expected to be most dissimilar due to the fact that Kilpatrick et al (2000) claimed to have used both hard illicit drugs and non-medical use of prescription drugs in their measure, and because this model has the smallest number of respondents who fit the criteria of abuse or dependence. As expected, there are

substantial differences in the logistic regression results. In the findings of Kilpatrick et al. (2000), the only variables that are not significantly related to hard drug abuse or dependence are sex, and the two ethnic categories of Hispanic and Native American. All other variables are significantly predictive, with witnessed violence having the greatest odds ratio followed by being the victim of a physical assault (see Table 6).

<Table 6 about here>

In the replication, using the modified measure of hard drug abuse or dependence, sex is significant, with females being 74% less likely to report hard drug abuse or dependence, and none of the racial groups are significantly different from Caucasians. In addition, family drug problems, physical assault, and PTSD fail to reach significance. Although witnessing violence is still highly significant, increasing the likelihood of hard drug abuse / dependence by 242%, the largest risk is from being sexually assaulted (OR=4.88). Therefore, the findings of this particular analysis are more dissimilar than the original study than the other two types of abuse / dependence.

In the extended model, being a victim of sexual assault is the only form of exposure to violence that remains significant (OR 5.69). None of the locations of witnessed violence are significant but peer deviance does increase the likelihood of hard drug abuse / dependence (OR 1.95). In addition, the effect of PTSD falls to non-significance. Although this item was never significant in the Alcohol models, it was in the original and replicated models for both marijuana and hard drugs. However, this effect did not remain significant in any of the extended models.

The final two models examine the predictors of ever using illicit hard drugs and using at least one such drug four or more times. For "ever use," African-Americans are



84% less likely than Caucasians to have tried hard drugs. Deviant family members and friends serve as poor models. Having a family member with a drug problem increases the risk of trying hard drugs by 102% and each increase in peer deviance boosts the likelihood of trying hard drugs by 44%. In addition, exposure to violence also serves as a catalyst for using hard drugs. Being the victim of physical assault, sexual assault, and witnessing violence in the neighborhood or somewhere else all significantly increase the likelihood of ever using hard drugs.

A similar pattern emerges for non-experimental use, with just slight shifts in significant variables. Race no longer is significant but age once again reaches significance, with each increase in age increasing the risk of non-experimental hard drug use by 50%. In addition, family drug use and peer deviance retain their significance. Although sexual victimization (OR 3.78,  $p < .001$ ), and witnessing violence in the neighborhood (OR 2.04,  $p < .01$ ), are still significant, the measures of physical victimization and witnessing violence somewhere else are not. However, witnessing violence at home becomes significant. Those who have witnessed violence at home are 255% more likely to engage in non-experimental hard drug use.

#### SUMMARY REPLICATION AND EXTENSION

Although there are some minor differences between the original findings and the replication, similar patterns emerge. Females, and occasionally members of different ethnic groups (as opposed to Caucasians), are somewhat protected from substance abuse or dependence. Older juveniles, those with family members have drug or alcohol problems, and those who are exposed to various forms of violence are generally more

likely to experience substance abuse / dependence. PTSD, the variable of key interest in the original study, only reaches significance in the replication model for marijuana abuse / dependence.

In the models with new controls, PTSD never reaches significance for either abuse / dependence or use measures. This could be due to the overwhelming influence of peer deviance on all the dependent variables. Having deviant peers is consistently one of the most important predictors of all types of substance abuse / dependence or use. Poor family models are also regularly significant in the extended models, indicating that in spite of the influence of peers, families still do exert some independent influence, even if such influence is negative. In addition, although having ever witnessed the five more serious acts of violence was significant in all the replicated models, examining the impacts of all six forms of witnessed violence in different locations found mixed results. Witnessing violence at home is only significant in models of regular binge drinking and non-experimental hard drug use while witnessing violence at school, the location of interest in the current study, is a significant risk factor only for marijuana abuse / dependence and experimental marijuana use. Witnessing violence in the neighborhood and somewhere else appear to be the key locations that influence juvenile drug behaviors.

#### STRUCTURAL EQUATION MODELS

As a last step in the extension of the original study, the nature of the relationships between the key variables of peer deviance, exposure to violence, and PTSD are explored in addition to their ability to predict substance abuse / dependence or substance use through structural equation models. The fit of each model is assessed with the normed fit

index (NFI) in addition to the RMSEA (root mean squared error approximation). A NFI of .90 and above is used as the cut off point for all models (Bentler and Bonett 1980: 600). Assessment of fit using the RMSEA is based on the guidelines suggested by Browne and Cudeck (1993): a RMSEA of .05 or less indicates a close fit, .08 or less indicates a reasonable error of approximation, and a value of .1 or higher is considered to be a poor fit. All of the structural equation models are estimated with AMOS 4.0, using maximum likelihood estimation and standardized regression coefficients. The data for the structural models is not weighted.

Figure 3 displays the structural relationships in the three models to be estimated<sup>4</sup>. Each of these models is estimated for substance abuse/dependence and for substance use. Table 7 provides the standardized coefficients for each path in the three models for each type of substance involvement. Table 8 decomposes the indirect, direct and total effects for each model.

<Figure 3, Table 7 and 8 about here>

Based on the criteria selected for this analysis, all six models represent a reasonable fit. The worst fitting model (NFI .90, RMSEA .07) is model one in the prediction of abuse or dependence. This model only includes direct pathways between exposure to violence and PTSD to Abuse / Dependence. The strongest indicators of fit are for the third models, which include measures of peer deviance and allow more complex relationships between the key variables<sup>5</sup>. In addition to the measures for the

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<sup>4</sup> The measurement models are not included in these figures for the sake of clarity. The full list of variables in these models is listed in Appendix C.

<sup>5</sup> Earlier analysis did include several attempts at recursive models with pathways moving both ways between peer deviance and exposure to violence, and between peer deviance and the measure of substance abuse/dependence or abuse. Although these models were identified, they were unstable, with stability indexes well over acceptable levels.

model fit, Table 7 also provides the  $R^2$  associated with the measure of substance abuse/dependence or use for each model. Model 3 clearly provides a better model, with just under 35% of the variance in abuse/dependence being explained and approximately 45% for substance use.

In all but the first set of models, the direct effect of PTSD on the dependent variable falls to non-significance. PTSD significantly increases substance abuse or dependence in both Models 1 and 2 ( $p < .001$  and  $p < .05$ ) and predicts substance use in Model 1 ( $p < .001$ ). Therefore, it does not appear that PTSD exerts an independent effect on use or abuse of drugs but that any relationship is indirect through the other variables in the model. However, Table 8 does indicate that PTSD continues to have some minor positive direct effect on abuse/dependence and actually exerts a small negative effect on the measures of substance use in Model 3.

One interesting set of findings is that there is a direct effect of peer deviance on exposure to violence. This study proposes that exposure to violence may be influenced by the juveniles' association with deviant peers. If the juvenile associates with friends who regularly engage in violence, or who spend time "hanging out" in unsupervised areas (away from school, home and the immediate neighborhood), opportunities to be exposed to violence, either as victims or witnesses, would also increase. This proposition appears to be supported in these models.

The results of the structural analysis indicate that, similar to the logistic regression findings, the model proposed in the original study is missing key relationships. PTSD itself fails to significantly predict the dependent variables in several of the models and models without peer deviance do not fit the data as well and explain less of the variance

in the dependent variables. Therefore, studies employing use of PTSD or ideas of stress or strain to explain juvenile use or abuse of drugs and alcohol must still consider the importance of peers.

### *THE CONTEXT OF SCHOOL VIOLENCE*

In the previous analysis, where violence is witnessed is an important consideration. Based on these findings, violence witnessed in the neighborhood or “somewhere else” seem to most consistently be associated with engaging in a variety of drug behaviors. In comparison, witnessing violence at school only appears to be a risk factor for marijuana abuse or dependence and experimental marijuana use. Therefore, it does not appear that exposure to violence at school should be a major concern for anti-drug programs. However, since school is the location where the majority of acts of violence are witnessed (see Figure 1), it may be important to further explore the context of these acts and to determine whether witnessing violence at school has consequences other than drug use. Therefore, the second main component of this study is to provide a description and analysis of acts of violence that are witnessed at school as reported by juveniles in the NSA.

For each act of violence witnessed at school, respondents indicated whether they were afraid during the event, how long ago they witnessed the particular act of violence, and the respondents’ relationship to both the actual combatants. This contextual information may provide a better understanding of why witnessing such events may be associated with the juveniles’ behaviors and attitudes.

Juveniles in the NSA have been exposed to a great deal of violence in the school setting. A total of 1921 respondents, 47.7 percent of the sample, reported witnessing at least one of the six different types of violence at school. These juveniles witnessed a total of 2467 acts, with a mean of 1.28 incidents per juvenile. Although over half of the sample had never witnessed any one of these acts, these findings indicate that violence is occurring with disturbing regularity in schools.

It is important to note that this violence is not only limited to simple fist fights in the halls. Figure 4 displays the distribution of the types of violence witnessed at school. By far the most common type of violence witnessed is an incident of one person beating another person so they were hurt pretty badly. A total of 42% of the full sample indicated they have seen such an incident at school and 69% of the incidents at school fit this description. However, it is not unheard of for more serious acts of violence to take place. Although witnessing threats with weapons (491 incidents) is more common than seeing weapons used, 134 acts of violence involved the actual use of a weapon (24 shootings and 110 stabbings).

<Figure 4 about here>

It is possible that serious acts of violence remain in the memory of juveniles for an extended period of time, which may bring into question the validity of reports of shootings or other violent acts at school. However, Figure 5 demonstrates that violence is consistently occurring in schools. Of acts that were witnessed at school, nearly 66% of the incidents occurred within the past six months, and only 13% occurred more than a year prior to the survey.

<Figure 5 about here>

Although respondents regularly witnessed violence, such events did not often result in high levels of fear by the respondent. Only 304 of the witnesses to school violence reported any type of fear during the incident, with 9% reporting they were afraid they might be injured, less than .5% reporting they were afraid of being killed and 3% reporting they feared both these outcomes. Although respondents may be somewhat reluctant to admit fear, part of this lack of fear may also be related to who is actually involved in school violence.

Overwhelmingly, the perpetrators of violent acts at school are not adult strangers who come in off the street with clear intention to do harm. Instead, the offender is very regularly the respondents' friends or at least other students who they know. Table 9 displays whom the respondents report as offenders and victims in the acts of violence that were witnessed. A total of 551 victims and 291 offenders (22% and 12% respectively) in acts of violence at school were friends of the respondent. In addition, nearly 55% of the victims and 62% of the offenders were other children. Although it is impossible to determine if those in the "stranger" category were juveniles or adults, it is likely that at least a substantial portion is made up of other juveniles. Therefore, it is clear that violence at school is largely an affair between juveniles. However, there are several exceptions. Fourteen teachers were listed as victims of violence and, perhaps more alarmingly, two incidents listed a teacher as the offender.

<Table 9 about here>

One of the assumptions of studies of school violence is that certain populations, such a poorer, minority males, are at higher risk. This assumption is addressed in this study by comparing the exposure to violence at school across different demographic

groups. Table 10 provides a descriptive analysis of the violence witnessed by each demographic group and Table 11 provides the Pearson Correlations for each of these groups for witnessing any violence, total acts of violence, and the type of violence witnessed.

<Tables 10 and 11 about here>

Witnessing any type of violence in school is spread fairly evenly across boys and girls (52% boys) but this distribution shifts based on the type of violence. Sexual assaults have the highest percent of girls as witnesses (69%) and muggings have the highest percent of boys (66%). Acts of violence are witnessed by all age groups, with very little difference across the types of violence. However, one interesting finding is that the most shootings (7 incidents, 29% of the total), are witnessed by the youngest age group of 12 year olds. With this exception, the younger groups tend to have somewhat lower percentages reporting having witnessed violence at school. Although our society expects school safety to be related to income of those who attend the schools, this assumption is not supported by this analysis. In fact, the smallest percentage of any of the income groups reporting witnessing violence in school is for the lowest income category (33% of those in this category have witnessed violence). In comparison, 48% of those in the highest income category have witnessed violence at school. Therefore, income does not appear to be a clear correlate for this type of exposure to violence.

Race appears to be one risk factor that does seem to follow a predictable pattern, with higher concentrations of violence witnessed by minority groups. Caucasians represent the highest percent of all incidents witnessed in school but racial minorities are often over represented. For example, although Caucasians witness 54% of all the



stabbings, these 59 individuals represent only 2% of the total Caucasian respondents, while the 32 African-Americans who have witnessed stabbings (29% of all stabbings), represent over 5% of respondents in this racial group. Overall, African-Americans represent approximately 15% of the total sample<sup>6</sup>, Hispanics 8%, Native-Americans almost 4% and Caucasians 73%. When these figures are compared to the percentages across the table for each type of violence, Caucasians never approach representation with the exception of witnessing beatings. African-Americans are over represented in all types of violence except threats with weapons and beatings, Hispanics are over represented in all but threats with weapons, and Native Americans are over represented in all but beatings and stabbings. Therefore, being a racial minority is associated with witnessing violence in schools.

To further examine these demographic risk factors, correlations with witnessing school violence are conducted. If violence is concentrated within certain groups, those respondents should report more total acts even if there are not substantial differences in the number of respondents reporting witnessing any act of violence. In the first correlation analysis, I find that only age and income are positively correlated with ever seeing violence in school. Although it makes some sense that older students are more likely to report witnessing violence, both due to the longer time they have been attending school and the common finding that older juveniles are more involved in violence, the fact that higher income groups are also more likely to witness violence is unexpected. Examining the correlation between demographics and the total number of acts witnessed at school provides slightly different findings. Again, age is positively correlated with witnessing violence but in this case income does not reach significance. However, being

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<sup>6</sup> These figures are based on cases that have complete data for race.

Hispanic is significantly correlated with the number of acts, indicating that if there is concentration of violence among any group, it is among Hispanic youth, not other racial minorities. None of the other major correlates of crime (sex, income, or the other racial groups) are significantly correlated with the number of acts witnessed at school.

However, when the type of violence that is witnessed at school is examined, the picture becomes more complicated. In this analysis, age is positively correlated with witnessing stabbings, threats, and beatings and income is only significantly correlated with beatings. These findings are fairly consistent with the correlation analysis for any act of violence. It appears that the relationship between income and violence is dominated by beatings. For all other types of violence, the correlation terms are negatively related to income, though not significant. Therefore, it is the most common type of violence that is associated with higher income. For the other demographic characteristics, no consistent pattern emerges. Being female is positively correlated with sexual assaults, possibly indicating the victims are more often female and that such assaults happen within group settings where other girls may become witnesses. Female is negatively correlated with witnessing muggings, indicating that this is more of a male dominated type of violence. For each racial group, some types of violence are significantly correlated and others are not. Caucasians have the highest number of significant correlations, with negative correlations for shootings, stabbings, sexual assaults, and muggings and positive correlation with beatings. In contrast, the only type of witnessed violence that is significant for Native-Americans is having seen someone threaten someone else with a weapon.

### *CONSEQUENCES OF WITNESSING VIOLENCE AT SCHOOL*

Although witnessing violence in school could have many consequences, including causing stress leading to drug abuse, the first part of this study found that witnessing violence at school was not consistently a risk factor for most drug using behaviors. Witnessing violence at school was only a significant predictor of marijuana abuse/dependence and marijuana experimental use. Therefore, the remaining analysis examines two other types of possible consequences of witnessing violence at school. Specifically, perceptions of schools and communities as violent places and the juveniles' delinquency are examined.

As a first step to establish a general understanding of the relationship of witnessing violence in school to these outcomes, the univariate odds ratios are examined through a series of single-predictor logistic regressions. Witnessing violence in school is a significant risk factor for all three outcomes, but by far has the most impact on perceptions of violence in school. The likelihood of believing school violence is a problem increases 145% if the respondent witnessed violence in this setting. In comparison, witnessing school violence increases the likelihood of thinking violence in the community is a problem by only 38% and increases the juveniles' participation in delinquency by 63%.

To determine the impact of school violence on these outcomes controlling for other predictors, logistic regression analyses are performed on each dependent variable. Controls for demographic characteristics, family and peer deviance measures, violent victimization, and exposure to violence in other settings are included along with the

experience of witnessing violence in school. Table 12 provides the results of this analysis.

<Table 12 about here>

Attitudes about how violent schools or communities are appear to be closely related to experiences of violence in these locations. Juveniles who witness violence in school are 172% more likely to believe that school violence is a middle sized or big problem. This variable generates the largest OR within this model. Similarly, witnessing violence in the neighborhood has the highest OR in the model predicting perceptions of problems of violence in the community (OR 2.64). Thus, where juveniles witness violence directly and substantially influence their perceptions of the location as a violent place.

Unlike every other model in this study, peer deviance is not a risk factor for attitudes about school violence. In addition, each additional increase in peer deviance only increases the likelihood of thinking community violence is a problem by 3%, a very small increase compared to the effect of peer deviance on drug behaviors. Therefore, peer deviance is not as important a risk factor for juveniles' perceptions as it is for their actual behaviors.

The respondents' own participation in delinquency is affected by several standard demographic characteristics, exposure to violence, and deviant peers and family members. Being female serves as a protection against committing delinquency (OR 0.23), and all the minority groups are at higher risk for delinquency than Caucasians, with Native-Americans being 267% more likely than Caucasians to commit serious acts of delinquency. Family members with alcohol problems or drug problems increase the risk

of juvenile delinquency by 75% and 56% respectively, and each increase in peer deviance increases the risk of delinquency by 37%. Finally, exposure to violence also increases the possibility that juveniles will engage in serious delinquency. Being the victim of a physical assault, and witnessing violence in the neighborhood, somewhere else, and at school all significantly predict the likelihood of delinquency.

This analysis indicates that witnessing violence at school does influence juveniles' perceptions of violence and their own deviance, even while controlling for other relevant predictors. However, violence that occurs within this setting is not the only important form of exposure to violence. Juveniles who witness violence in other settings and who are victimized also report greater concern with violence and greater delinquency.

## DISCUSSION

Juvenile drug use and delinquency are topics that are studied extensively, but few new ideas are available that can inform criminal justice policy, guide counselors, or help implement prevention programs. The NSA may provide some new and important ideas to be developed. For example, the emphasis on exposure to various forms of violence in the survey allow researchers to both study the causes of such exposure and the possible consequences on the juveniles' behaviors. In addition, the original study using the NSA was the first national survey to examine the effects of PTSD on drug abuse or dependence (Kilpatrick et al. 2000: 26). Juveniles exhibiting such symptoms were found to be at greater risk for various forms of drug abuse or dependence. Thus, if school

officials, counselors, or family members identify PTSD symptoms early enough, one source of problem drug behavior could be curtailed.

However, several major findings generated by the current study question the importance of PTSD for juvenile abuse or dependence on drugs. My findings indicate that the effect of PTSD is not significant in any models of alcohol or drug abuse or dependence, or use measures, when the affects of peer deviance and location of witnessed violence are controlled. Kilpatrick et al. acknowledged peer deviance could be an important potential addition for further study by stating that exposure to violence, one potential type of stressful event that could generate PTSD symptoms, may be influenced by association with peers who engage in deviance (2000:26). Association with deviant peers has long been known to be a direct contributor to all forms of deviance, including drug and alcohol use. Therefore, one contribution of the current study is the finding that the affect of PTSD and exposure to violence on drug behaviors are at least partially dependent on association with deviant peers. This is demonstrated in regression models when the magnitudes of the ORs for these variables decrease, or even fail to reach significance, when peer deviance is controlled.

Another contribution of the current study is the detailed assessment of the affects of witnessing violence. This type of exposure to violence had the greatest impact on alcohol and drug abuse/dependence in the original study. Kilpatrick et al. argued that witnessing violence, particularly in the home environment where these events are "typically ongoing" and the juvenile has limited "ability to escape" (2000: 26) the situation, generate a great deal of stress that is managed through maladaptive coping strategies of drug abuse/dependence. If such affects of this type of exposure may be

more potent in some settings than others, as implied by such comments, it is important to examine the relative effects separately.

The findings of this study indicate that where violence is witnessed does have different effects on alcohol and drug behaviors, on perceptions of school and communities, and on juveniles' own participation in delinquency. Witnessing violence in the home rarely serves as a risk factor for increased drug or alcohol measures and is not significant in any of the models predicting juvenile delinquency or perceptions of schools and communities. In contrast, witnessing violence in the other three settings are significant risk factors for at least half of the dependent variables in this study. These findings indicate that further attention needs to be given to the context of the event and the location where violence occurs.

One setting in particular that deserves further attention is the school. Juveniles spend a great deal of their day in this setting and are regularly exposed to the potential for violence. This study provides a more complete picture of the context of violence that occurs within the school by not only reporting how many incidents and what types of violence are a problem in school, but also who is involved as the victim and offender and how witnessing such acts affect the juvenile. Witnessing violence in school is found to be a significant risk factor for several of the potential consequences in this study. The risks for believing violence is a problem in the school or community and juvenile participation in fairly serious forms of delinquency are all significantly increased among those who have witnessed violence in school. However, most drug using activities are not related to exposure to violence in this setting. Therefore, further study on why

exposure to violence at school leads to some forms of delinquency but not others is warranted.

Finally, the importance of families cannot be overlooked in this study. Family members that have problems with alcohol or drugs are significant risk factors for many of the dependent variables in this study. Family deviance may increase juveniles' deviant behaviors in several ways. First, family members serve as a model for juveniles' behaviors. Second, problem use of drugs or alcohol by parents or other family members may also provide opportunities for juveniles to participate in drug use, by providing direct access to substances within the home setting, or by not providing adequate monitoring of juveniles' behaviors when they leave the house. Finally, as speculated by Kilpatrick et al. (2000: 26), parents who have problem with drugs or alcohol may also increase the risk of exposing the juvenile to physical or sexual abuse by family members. The NSA is an excellent source of future research to better examine the role of families on juvenile deviance.

## LIMITATIONS

Several limitations of the NSA may influence the findings both of the current study and any future work with these data. For the purposes of the current study, the most serious concern is the way in which data were collected and coded for the acts of violence witnessed by juveniles. On the survey, juveniles were asked if they had ever witnessed each of the six types of violence. If they responded yes, a series of follow up questions were asked. The first follow up question asked whether the respondent had witnessed such an act more than once and the second, "When was the last time this



happened?" Although not specifically prompted to only refer to this most recent event, following questions ask for detailed information about only one event and imply the respondent should report on the most recent occurrence. Since there is no survey loop to ask about additional occurrences of the same type of act, respondents were only able to give contextual information on one incident for each type of violence and were never asked how many times they had observed such an event. Therefore, all the variables for witnessing violence are likely to be underestimating the total number of acts of violence actually witnessed.

This limitation could be important for the division of witnessed violence into specific locations because juveniles may have witnessed one type of violence in a number of settings. Although it is difficult to determine if the juveniles are more or less likely to remember and report on incidents in one setting versus another, it is possible that juveniles may be more willing to report on incidents in settings such as school or neighborhood as opposed to acts of violence that occur in the home. Although several steps were taken to ensure the respondent could answer freely (Kilpatrick et al 2000: 22) the interviews were conducted in the home and a parent or guardian was present, since adult permission had to be obtained prior to the interview. Respondents may have felt uncomfortable reporting on violence in the home or may have been concerned about possible repercussions for their family members. Therefore, interpretation of the findings related to the location of witnessed violence must consider these limitations.

A second concern is that the measures of both peer deviance and juvenile delinquency in this study are limited to the few items that were available on the survey. For friends' deviance, the items that are used to create the scale in this study do cover a

range of activities, including drug or alcohol use, theft and other property crimes, and violent crimes. However, juveniles may not be aware of the total activities engaged in by their friends or their friends may exaggerate their own activities in order to gain status or prestige within a peer group. Therefore, although the scale itself is highly reliable, the validity of the measure of peer deviance may be subject to question. In addition, the measures available for the respondents' own deviance focus on fairly serious acts of delinquency, corresponding to crimes such as motor vehicle theft, robbery and rape. Since so few respondents committed such acts, a measure including more mundane types of juvenile delinquency, such as skipping school or petty theft, may provide substantially different findings regarding the importance of exposure to violence.

## POLICY IMPLICATIONS

Research in drug use and school violence often fails to make clear conceptual distinctions among the adolescent activities that are being studied. Drug problems can range from experimentation to abuse. School violence may be limited to acts involving weapons or include bullying such as teasing and name-calling. The causes and consequences of drug use or school violence, and what can be done about these problems, may vary widely depending on how these activities are conceptualized. This is an important consideration because the conclusions of this study prove to be susceptible to the way the key ideas are conceptualized. These findings have policy implications for two separate areas: working with juvenile drug problems, and preventing problems of violence in school.

This study demonstrates that how juvenile drug use is conceptualized is crucial in determining the risk factors for the behavior. Predictors of drug or alcohol abuse/dependence are quite different than predictors of use of these substances. This is important for social policies because how we prevent juvenile drug problems depends on how we conceptualize the idea of drug problems. If the focus is on preventing experimentation with drugs, the findings of this study indicate that programs should work with family members to emphasize the importance of providing good role models to their children and work more extensively with juveniles who have been victims of sexual assault or physical violence. If regular drug use is the concern, the emphasis should shift slightly to provide intervention programs to juveniles who experience violence in the home. This type of exposure to violence is one of the most substantial risk factors for binge drinking and non-experimental use of hard drugs. Programs to rehabilitate juveniles who are abusing or dependent on drugs should emphasize how to cope with stressful events without relying on the escapist qualities of drugs and alcohol. This is recommended because several models in this study indicate exposure to violence as witnesses or victims increase the risk of abusing or being dependent on drugs or alcohol. In sum, it is erroneous to assume that factors that lead a juvenile to experiment with drugs are the same factors that push the individual into problematic levels of use or dependence. Prevention, intervention or rehabilitation policies need to be clear about what form of "drug problem" is being addressed in order to tailor the policy to focus on the relevant risk factors and most effectively meet the needs of the juveniles.

Although there are distinct risk factors for the different conceptualizations of drug problems, one consistent finding is the influence of deviant peers. Association with

deviant friends significantly increases the risk of all the measures of alcohol and drug behaviors in this study. Therefore, helping juveniles resist the influence of deviant friends, the mainstay of most current programs, remains an important element for addressing juvenile drug problems. However, this study also demonstrates that only focusing on peers is not enough to prevent alcohol and drug problems. It is also important to enhance the ability of juveniles to resist poor models at home.

Family members with alcohol or drug use problems increase the risk of juvenile substance problems. Any anti-drug policy that only works with juveniles and does not address the needs of their families is therefore unlikely to be successful. Schools or other anti-drug program providers should encourage or even require parental participation and ideally provide adolescents' family members with information and access to rehabilitation or counseling. Addressing this risk factor, along with emphasizing resistance to deviant peers and coping with stress, may create anti-drug programs that are more successful than our current models.

The second policy implication of this study is to suggest changes in how schools prevent violence. Schools have implemented many new policies over the last decade to minimize the potential for violence. However, often schools use approaches that do not target the most common problems. For example, some schools have focused on preventing weapons from getting on school grounds by using security systems or metal detectors (Devine 1996:75-82). However, as the findings of this study demonstrate, even if schools did prevent all weapons from entering the school, they would still not be effective in stopping the most common types of violence that occur in school.

Any type of violent behavior in schools can create an atmosphere of intimidation that disrupts the ability of students to succeed in school. This study finds that witnessing violence at school increases the risk of delinquency and some forms of drug or alcohol use, as well as generates perceptions of school and community as violent places. Thus, instead of simply stopping fights and reprimanding those directly involved, school officials should evaluate all those who witnessed these acts. This would allow the schools to identify juveniles who may be indirectly involved in the event, through encouraging their friends toward violence, or provide counseling or assistance to those who feel traumatized.

One specific type of violence that needs to receive more attention in schools is sexual assault prevention. Classes need to discuss sexual assault in order to enhance social awareness of this potential danger and provide a source of support and assistance. Special programs could be introduced that teach adolescents what sexual assault is, how to avoid situations that may increase the risk of sexual victimization, and perhaps even encourage development of self-defense skills. This type of violent exposure can be particularly traumatic if the perpetrator is someone whom the student believed they should be able to trust, such as a teacher or school official. In the NSA data, teachers were identified as being the perpetrator of two sexual assaults witnessed by the juvenile.

Any school policy to prevent violence will have only limited success if it fails to account for the experiences the students have within their families and communities. Although violence within the home is relatively rare in this study, a significant amount of violence is witnessed in the communities. Schools are not responsible for protecting students in such settings but it is important to convey to students that the school

administrators and teachers are concerned with their students' safety (Gottfredson and Gottfredson 1985). Schools need to provide students with accessible resources for coping with violent incidents, no matter where such events may occur. Having a person or place to turn for advice and counseling may prevent students who have felt traumatized by violence from turning to drugs or other deviant coping responses.

## CONCLUSION

In order to examine how exposure to violence, particularly witnessing violence, may affect juveniles, four specific hypotheses were tested in this study. The first two focus on how exposure influences varying levels of problem drug behaviors.

H1: Exposure to violence will increase abuse or dependence on drugs or alcohol, while controlling for demographic characteristics, family substance use, and peer deviance.

H2: Exposure to violence will increase regular use of drugs or alcohol, while controlling for demographic characteristics, family substance use, and peer deviance.

In analyses both these hypotheses were partially supported. No type of exposure to violence was a significant risk factor for all the measures of drug and alcohol abuse / dependence or use. Both measures of exposure through victimization were significant in some of the models. Being the victim of a sexual assault significantly increased the risk of all types of alcohol and hard drug related behaviors but only influenced non-experimental marijuana use. In addition, physical assault victimization was only significant for a few of the measures of drug or alcohol behaviors. Therefore, victimization as a form of exposure to violence is not consistently related to drug or alcohol using behaviors but sexual assault in particular should be considered a risk for the more serious types of drug problems.

The other form of exposure to violence, witnessing violence, was also not a significant predictor for all forms of alcohol and drug behaviors. Although the models that reanalyzed the original study using the NSA did find that witnessing violence was a significant risk for all forms of abuse / dependence, additional controls and assessing the impact of where violence was witnessed changed these results. Witnessing violence in any of the four possible locations was only a significant predictor of abuse / dependence for marijuana. Alcohol and drug use measures also found mixed results for the importance of witnessing violence in each location. In none of the four locations was witnessing violence always significant. Witnessing violence at home is only significant for binge drinking and non-experimental hard drug use. The school location only predicts marijuana abuse / dependence and experimental marijuana use. Witnessing violence in the neighborhood did not affect any form of abuse / dependence but does serve as a risk factor for binge drinking, non-experimental marijuana use and both use measures for hard drugs. Finally, witnessing violence “somewhere else” predicts abuse / dependence only for marijuana but is a significant risk for binge drinking, non-experimental marijuana use and ever using hard drugs. Therefore, witnessing violence does appear to serve as a general form of risk for drug or alcohol behaviors but no one location is clearly generating a larger risk than others.

The final two hypotheses focused on the importance of witnessing violence at school on juvenile perceptions of violence and delinquency.

H3: Witnessing violence in school will increase the likelihood of juveniles believing their schools and communities are violent places.

H 4: Witnessing violence at school will increase the risk of juveniles engaging in deviant activities.

Although other forms of exposure to violence also serve as risk factors for these outcomes, witnessing violence at school was found to be a significant predictor of all three outcomes. Therefore, both these hypotheses were supported, indicating that violence that occurs at school can have important consequences for juveniles. If students believe school is a violent place, they may be more apt to stay away from school or have difficulty functioning adequately in this setting. Schools should thus continue to devote resources to minimizing the likelihood of violence.

Although many types of exposure to violence are significant risk factors for the various outcomes in this study, the conclusion reached by this study is that the affect of where violence occurs on behaviors and attitudes is not related to how traumatized the juvenile may be by witnessing violence in the location but by the opportunities for delinquent opportunities in these settings. That is not to say that stress generated by witnessing violence has no impact on juveniles. Witnessing violence in the home does substantially increase the risk of serious levels of alcohol and marijuana use. Therefore, witnessing violence in this setting may increase stress levels and lead juveniles to use drugs that are fairly accessible as a way of coping. However, witnessing violence in other settings, while arguably still stressful, is more likely linked to deviant behavior through other mechanisms. Juveniles spending a greater amount of time in locations away from home, and out of their neighborhoods, may be more exposed to violence and opportunities to partake of drugs as part of their routine lifestyles and activities. The relationship between witnessing violence and problem behaviors may thus simply be an indication of the level of opportunity or the juveniles' own deviant tendencies.



Appendix A: Measures of Witnessing Violence, Friends' Delinquency, Family Drug or Alcohol Problems, and Juvenile Delinquency

**Witnessed violence<sup>1</sup>**

<u>Have you ever seen (in real life, not on TV or in movies)</u>	Freq	%
(Each item states "not counting incidents you already told me about")		
--someone actually shoot someone else with a gun?	200	5.0
--someone actually cut or stab someone else with a knife?	425	10.6
--someone being sexually assaulted or raped?	111	2.8
--someone being mugged or robbed?	418	10.4
--someone threaten someone else with a knife, a gun, or some other weapon?	1345	33.4
--someone beaten up, hit, punched, or kicked such that they were hurt pretty badly?	2735	68.0

**Friends' Delinquency**

Coded as an additive scale to indicate the number of different types of deviance juveniles' friends are involved in.

<u>Have your friends ever...</u>	Freq	%
--used marijuana or hashish?	1488	37.0
--used alcohol?	2115	52.6
--sold hard drugs such as heroin, cocaine or LSD?	289	7.2
--gotten drunk once in awhile?	1807	44.9
--used prescription drugs such as amphetamines or barbiturates when there was no medical need for them?	250	6.2
--sold or given alcohol to kids under 18?	667	16.6
--purposely damaged or destroyed property that did not belong to them?	1274	31.7
--stolen something worth less than \$5?	1711	42.5
--broken into a vehicle of building to steal something?	441	11.0
--stolen something worth more than \$50?	604	15.0
--hit or threatened to hit someone without any reason?	811	20.2
--pressured or forced someone to do more sexually than he / she wanted to?	164	4.1
Friend specified as offender in witnessed violence.	547	13.6

**Family Drug or Alcohol Problems**

Two dichotomous items coded 1=yes, 0=no

<u>Family Drinking and Drugs</u>	Freq	%
Has anyone either in your family or who lived with you, not counting you, drink alcohol so much that it became a problem? (For example, did anyone drink so much they got into fights with other people, or started to beat the kids, or couldn't get out of bed the next day, or had difficulty holding a job?)	528	13.1
Did anyone in your family or who lived with you, not counting yourself, use hard drugs, such as heroin, cocaine, speed or uppers or downers, or have a drug problem?	358	8.9

<sup>1</sup> The statistics for witnessed violence include all types of witnessed violence in all locations.

Appendix A, Cont: Measures of Witnessing Violence, Friends' Delinquency, Family Drug or Alcohol Problems, and Juvenile Delinquency

**Juvenile Delinquency:**

Coded as a dichotomous variable - 1= ever engage in any of following, 0=none of following

Have you ever...	Freq	%
--stolen or tried to steal something worth more than \$100?	111	2.8
--stolen or tried to steal a motor vehicle such as a car or motorcycle?	68	1.7
--broken or tried to break into a building or vehicle to steal something or just to look around?	185	4.6
--been involved in gang fights?	226	5.6
--used force or strongarm methods to get money or things from people?	84	2.1
--had or tried to have sexual relations with someone against heir will?	3	.1
--attacked someone with the idea of seriously hurting or killing that person?	174	4.3

Appendix B: Description of Drug and Alcohol Use Measures

**Regular Drinking**

<u>Variable</u>	<u>Description</u>	<u>Coding</u>
q28d	During the past year, on how many days did you have five or more drinks of alcoholic beverages?	Regdrink=1 if q28d ge 12 (once per month)
q28f	During the past year, on how many days have you gotten drunk or very high from alcohol?	mdrunk=1 if q28f ge 12 (once per month)
DRINK	If respondent has either had 5 or more drinks or been drunk at least once per month.	If (mdrunk=1 or regdrink=1)

**Marijuana Use**

<u>Variable</u>	<u>Description</u>	<u>Coding</u>
q32ba	Some people nowadays use other drugs that are not prescribed by a doctor, have you ever used Marijuana	1=1-3 times 2=4-10 times 3=more than 10 times
NEMAR	Non-experimental Marijuana Use	If (q32ba=2 or q32ba=3)
EXPMAR	Experimental Marijuana Use	If q32ba=1

**Illicit Drug Use**

<u>Variable</u>	<u>Description</u>	<u>Coding</u>
	Some people nowadays use other drugs that are not prescribed by a doctor, have you ever used...	0=Never 1=1-3 times 2=4-10 times 3=more than 10 times
q32bb	Cocaine or crack	
q32bc	Angel dust or PCP	
q32bd	LSD or other hallucinogenics, like peyote, psilocybin or mushrooms	
q32be	Heroin or methadone	
q32bf	Inhalants, like glue, nitrous oxide, amyl nitrate, paint or gasoline	
NEILL	Non-experimental Illicit Drug Use (Any illicit drugs used 4 or more times)	If (q32bb or... q32bf >1)
EVERILL	Ever Used Illicit Drug	If (q32bb or ... q32bf >0)

## Appendix C: List of Variables and relationships in Measurement Models

Exposure to Violence → WVSchool<sup>1</sup>  
Exposure to Violence → WVHome  
Exposure to Violence → WVNeighborhood  
Exposure to Violence → WVSomewhere Else  
Exposure to Violence → Sexual Assault  
Exposure to Violence → Physical Assault

Peer Deviance → Friends' Violent Crime  
Peer Deviance → Friends' Property Crime  
Peer Deviance → Friends' Drug Related Crime

Abuse/Dependence → Alcohol Ab/Dep  
Abuse/Dependence → Marijuana Ab/Dep  
Abuse/Dependence → Hard Drug Ab/Dep

Substance Use → Regular Binge Drinking  
Substance Use → Non-Experimental Marijuana Use  
Substance Use → Ever Used Hard Drugs

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<sup>1</sup> All measures of witnessing violence count the total number of acts witnessed in each location.

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Table 1: Variables Reproduced from Kilpatrick et al 2000 study (Un-weighted Frequencies and Percentages).

<u>Variable</u>	<u>Frequency</u>	<u>Percent</u>
Sexual Assault (SA) <sup>1</sup>	327	8.1
Physical Assault (PA)	734	18.2
Witnessed Violence	1663	41.3
Any Victimization	1995	49.6
Familial Alcohol Abuse	562	14.0
Familial Drug Use	401	10.0
Current PTSD	211	5.2
Past-Year Alcohol Use	606	15.1
Past-Year Marijuana Use	400	9.9
Past-Year Illicit	93	2.3
Alcohol Abuse / Dependence	173	4.3
Marijuana Abuse / Dependence <sup>2</sup>	168	4.2
Hard Drug Abuse / Dependence <sup>3</sup>	40	1.0

<sup>1</sup> The variables Sexual Assault, Physical Assault, Witnessed Violence, and Current PTSD were available as preexisting variables in the data set and were not recreated.

<sup>2</sup> A total of 181 respondents classify as meeting the criteria for marijuana abuse or dependence. However, if this item is limited to those reporting past year, non-experimental marijuana use, only 168 respondents qualify.

<sup>3</sup> A total of 73 respondents classify as meeting the criteria for hard drug abuse or dependence. However, if this item is limited to those reporting past year, non-experimental hard drug use, only 40 respondents qualify.

Table 2: Descriptive Statistics for Dependent Variables

<u>Dependent Variables<sup>1</sup></u>	<u>Frequency</u>	<u>Percent</u>
<i>Original study</i>		
Alcohol abuse/dep	179	4.4
Marijuana abuse/dep	165	4.1
Hard drug abuse/dep	41	1.0
<i>Replication</i>		
Alcohol abuse/dep	173	4.3
Marijuana abuse/dep	168	4.2
Hard drug abuse/dep	40	1.0
<i>Extension</i>		
RegDrinking	182	4.5
ExpMarijuana	216	5.4
NexpMarijuana	365	9.1
EverHard	211	5.2
NexpHard	103	2.6
<i>School Violence</i>		
SchViolProblem	1233	30.7
CommViolProblem	1399	34.8
Delinquency	491	12.2

<sup>1</sup> Dependent variables are all dichotomous. Except for the measures of abuse / dependence for both the original and replicated items, frequencies are weighted by age, sex and race based on 1995 census data.

Table 3: Correlation Matrix for Location of Witnessed Violence and other key Variables

	<u>WH</u>	<u>WS</u>	<u>WN</u>	<u>WE</u>	<u>PD</u>	<u>SA</u>	<u>PA</u>
Witness Home	1.00						
Witness School	-.04*	1.00					
Witness Neigh	.00	-.12***	1.00				
Witness Else	.01	-.10***	.09***	1.00			
Peer Deviance	.03	.19***	.27***	.28***	1.00		
Sexual Assault	.08***	.06***	.12***	.11***	.20***	1.00	
Physical Assault	.11***	.12***	.27***	.18***	.34***	.23***	1.00
PTSD	.06***	.08***	.09***	.11***	.25***	.20***	.19***

\*p<.05, \*\*p<.01, \*\*\*p<.001

Table 4: Final Model Odds Ratios for Original, Replicated and Extended Analyses for Alcohol: Logistic Regression Analyses<sup>1</sup>

Variable	Abuse or Dependence			
	Original <sup>2</sup> OR	Replication OR	Controls <sup>3</sup> OR	Binge Drinking OR
Age	1.91***	1.94***	1.66***	1.64***
Female	0.58**	0.61*	0.74	0.52***
African-Am	0.34**	0.34***	0.30**	0.06***
Hispanic	0.62	0.63	0.59	1.00
Native-Am	0.50	0.53	0.60	1.05
Family Alcohol	2.13***	2.15***	1.68*	1.26
Family Drug	0.85	0.77	0.65	1.15
Physical Assault	1.71**	1.97***	1.55	0.98
Sexual Assault	2.40**	2.43***	2.03**	1.83*
Witness Violence	2.73***	1.94***	---	---
PTSD	1.56	.613	0.81	1.01
Family Income			0.99	1.00
Peer Deviance			1.30***	1.37***
Witness Home			1.47	3.85**
Witness School			0.96	0.81
Witness Neigh			1.50	1.89***
Witness Else			1.16	1.53*

\*p<.05, \*\*p<.01, \*\*\*p<.001

<sup>1</sup> To be consistent with Kilpatrick et al (2000), analysis is limited to cases with complete data for age and race (N=3,904) and cases are weighted by age, sex and race.

<sup>2</sup> Original model figures are taken from Table 4 in Kilpatrick et al (2000: 25).

<sup>3</sup> The extended model drops the original measure of witnessed violence and adds in new controls of location of witnessed violence, family income, and peer deviance.

Table 5: Final Model Odds Ratios for Original, Replicated and Extended Analyses on Marijuana: Logistic Regression Analyses<sup>1</sup>

Variable	Abuse or Dependence			Use Measures	
	Original <sup>2</sup> OR	Replication OR	Control <sup>3</sup> OR	Experiment OR	Non-Exp OR
Age	1.52***	1.61***	1.33***	1.34***	1.43***
Female	0.59**	0.63*	0.66	1.19	0.87
African-Am	0.25***	0.22***	0.33**	1.11	0.45***
Hispanic	1.06	0.97	0.95	1.39	0.97
Native-Am	1.08	0.91	1.30	1.77	1.88
Family Alcohol	1.42	1.50	1.22	1.51*	1.23
Family Drug	2.11***	2.02**	1.48	0.86	2.30***
Physical Assault	1.76**	1.92***	1.36	0.84	1.17
Sexual Assault	1.56	1.58	1.42	1.28	2.08***
Witness Violence	4.58***	3.75***	---	---	---
PTSD	2.86***	2.78***	1.52	0.61	0.85
Family Income			1.00	0.99	1.00
Peer Deviance			1.48***	1.15***	1.48***
Witness Home			2.08	1.51	1.61
Witness School			1.65*	1.38*	1.30
Witness Neigh			1.31	1.29	1.46*
Witness Else			1.60*	1.13	1.95***

\*p<.05, \*\*p<.01, \*\*\*p<.001

<sup>1</sup> To be consistent with Kilpatrick et al (2000), analysis is limited to cases with complete data for age and race (N=3,904) and cases are weighted by age, sex and race.

<sup>2</sup> Original model figures are taken from Table 4 in Kilpatrick et al (2000: 25).

<sup>3</sup> The control and new dependent variable models drop the original measure of witnessed violence and add in new controls of location of witnessed violence and peer deviance.

Table 6: Final Model Odds Ratios for Original, Replicated and Extended Analysis on Hard Drugs: Logistic Regression Analyses<sup>1</sup>

Variable	Abuse or Dependence			Use Measures	
	Original <sup>2</sup> OR	Replication OR	Controls <sup>3</sup> OR	Ever Used OR	Non-Exp OR
Age	1.61***	1.97***	1.69**	1.13	1.50***
Female	0.63	0.36**	0.38*	0.87	0.61
African-Am	0.10**	0.00	0.00	0.16***	0.00
Hispanic	0.67	0.82	0.81	0.64	0.73
Native-Am	0.94	0.96	1.51	1.09	1.10
Family Alcohol	2.57*	2.39*	1.40	1.32	1.47
Family Drug	2.54*	1.79	1.64	2.02***	2.06*
Physical Assault	3.28**	1.64	0.97	1.71**	1.12
Sexual Assault	2.56*	4.88***	5.69***	2.21***	3.78***
Witness Violence	4.15*	3.42**	---	---	---
PTSD	2.41*	1.84	0.72	0.92	0.66
Family Income			1.00	0.99	0.99
Peer Deviance			1.95***	1.44***	1.59***
Witness Home			0.00	2.16	3.55*
Witness School			1.08	1.15	1.45
Witness Neigh			0.99	1.64*	2.04**
Witness Else			1.54	1.62*	1.34

\*p<.05, \*\*p<.01, \*\*\*p<.001

<sup>1</sup> To be consistent with Kilpatrick et al (2000), analysis is limited to cases with complete data for age and race (N=3,904) and cases are weighted by age, sex and race.

<sup>2</sup> Original model figures are taken from Table 4 in Kilpatrick et al (2000: 25).

<sup>3</sup> The extended model drops the original measure of witnessed violence and adds in new controls of location of witnessed violence and peer deviance.

Table 7: Standardized Coefficients for Structural Parameters in Models of Abuse / Dependence and Substance Use: Findings from Three Models<sup>1</sup>

Relationship	Model 1		Model 2		Model 3	
	AD <sup>2</sup>	Use	AD	Use	AD	Use
Exposure->	.393	.498	.467	.559	.226	.194
PTSD->	.155	.120	.060 <sup>.05</sup>	.004 <sup>ns</sup>	.038 <sup>ns</sup>	-.010 <sup>ns</sup>
Exp->PTSD			.359	.369	.374	.375
Peer->Exp					.381	.773
Peer->					.773	.515
R <sup>2</sup>	.179	.262	.242	.314	.346	.453
NFI	.90	.92	.93	.94	.94	.95
RMSEA	.07	.07	.06	.06	.06	.06

<sup>1</sup> All coefficients are significant at p<.001 except where indicated

<sup>2</sup> AD indicates abuse or dependence measure.



Table 8: Decomposition of Structural Effects in Models on Substance Abuse / Dependence and Use: Standardized Coefficients

Abuse / Dependence Models

	<u>Endogenous Constructs</u>								
	PTSD			Exposure			Ab/Dep		
	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>
Model 1									
PTSD							.155	.155	
Exposure							.359	.359	
R <sup>2</sup>									.179
Model 2									
PTSD								.060	.060
Exposure		.359	.359				.021	.467	.489
R <sup>2</sup>			.129						.242
Model 3									
PTSD								.038	.038
Exposure		.373	.373				.014	.226	.241
PeerDev	.288		.288	.773	.773		.186	.381	.567
R <sup>2</sup>			.139		.597				.346

Substance Use Models

	<u>Endogenous Constructs</u>								
	PTSD			Exposure			Use		
	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>
Model 1									
PTSD							.120	.120	
Exposure							.498	.498	
R <sup>2</sup>									.262
Model 2									
PTSD								.004	.004
Exposure		.369	.369				.002	.559	.560
R <sup>2</sup>			.136						.314
Model 3									
PTSD								-.010	-.010
Exposure		.375	.375				-.004	.194	.190
PeerDev	.288		.288	.773	.773		.147	.515	.662
R <sup>2</sup>			.141		.598				.453

Table 9: Relationship of Respondent to Victim and Offender in Acts of Witnessed Violence that Occurred at School

	Victim		Offender	
	<u>Frequency</u>	<u>Percent</u>	<u>Frequency</u>	<u>Percent</u>
Family Member	12	0.5%	5	0.2%
Friend	551	22.5%	291	12.1%
Teacher	14	0.6%	2	0.1%
Other Child	1342	54.7%	1484	61.6%
Stranger	364	14.8%	397	16.5%
Other / DK	171	7.0%	232	9.6%
Total*	2454		2411	

\* Numbers of Victims and Offenders and not identical due to weighting and missing data.

Table 10: Witnessing Violence at school by Demographic Characteristics\*

	Any Viol		Shooting		Stabbing		Sex Assault		Mugging		Threat		Beating	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<b>Sex</b>														
Male	1003	52%	11	46%	56	51%	14	31%	60	66%	272	55%	877	52%
Female	917	48%	13	54%	54	49%	31	69%	31	34%	219	45%	825	48%
<b>Age</b>														
12	227	12%	7	29%	10	9%	9	20%	11	12%	24	5%	216	13%
13	319	17%	0	0%	17	15%	3	7%	11	12%	71	14%	297	17%
14	366	19%	3	13%	19	17%	12	27%	15	16%	99	20%	327	19%
15	333	17%	5	21%	14	13%	9	20%	26	29%	95	19%	289	17%
16	362	19%	5	21%	29	26%	7	16%	13	14%	107	22%	309	18%
17	309	16%	4	17%	21	19%	5	11%	15	16%	94	19%	260	15%
<b>Race</b>														
Cauc	1387	74%	10	42%	59	54%	20	45%	41	48%	345	71%	1266	76%
Black	262	14%	6	25%	32	29%	11	25%	21	25%	74	15%	212	13%
Hispanic	167	9%	6	25%	15	14%	9	20%	18	21%	40	8%	143	9%
Native-Am	70	4%	2	8%	3	3%	4	9%	5	6%	26	5%	52	3%
<b>Income</b>														
\$0-5K	44	2%	2	9%	2	2%	2	5%	3	4%	18	4%	34	2%
\$5-10K	71	4%	1	4%	4	4%	4	10%	5	6%	20	4%	62	4%
\$10-20K	171	9%	2	9%	11	10%	1	3%	9	11%	35	7%	149	9%
\$20-30K	300	17%	3	13%	24	23%	5	13%	19	23%	87	18%	263	16%
\$30-40K	307	17%	4	17%	15	14%	6	15%	12	14%	73	15%	282	18%
\$40-50K	243	13%	2	9%	14	13%	9	23%	2	2%	72	15%	212	13%
\$50-60K	395	22%	8	35%	26	25%	9	23%	21	25%	98	21%	350	22%
\$75-100K	198	11%	1	4%	9	8%	2	5%	10	12%	57	12%	178	11%
>\$100K	73	4%	0	0%	1	1%	1	3%	3	4%	11	2%	66	4%

\* All total numbers not identical due to weighting and missing data.

Table 11: Correlation of Witnessing Violence in School to Major Demographic Characteristics: Any and Total Acts and By Type of Act Witnessed.

	Any Act	Total Acts
1. Age	.094***	.094***
2. Female	-.017	-.017
3. Income	.033*	.018
4. Caucasian	.003	-.026
5. African-Am	-.031	-.008
6. Hispanic-Am	.030	.046**
7. Native-Am	.009	.010

\*p<.05, \*\*p<.01, \*\*\*p<.001

By Type

	<u>Shooting</u>	<u>Stabbing</u>	<u>Sex Assault</u>	<u>Mugging</u>	<u>Threat</u>	<u>Beating</u>
1. Age	.004	.043**	-.008	.020	.109***	.051***
2. Female	.009	.001	.042**	-.044**	-.030	-.003
3. Income	-.005	-.013	-.012	-.014	-.004	.042**
4. Caucasian	-.053***	-.075***	-.066***	-.085***	-.019	.045**
5. African-Am	.019	.067***	.032*	.042**	.002	-.057***
6. Hispanic-Am	.046**	.037*	.047**	.074***	.004	.016
7. Native-Am	.021	-.006	.026	.015	.035*	-.020

\*p<.05, \*\*p<.01, \*\*\*p<.001

Table 12: Odds Ratios from Logistic Regression Analysis Examining the Consequences of Witnessing Violence at School<sup>1</sup>.

<u>Variables</u>	<u>School Violence OR</u>	<u>Community Violence OR</u>	<u>Delinquent Involvement OR</u>
Age	0.94*	0.96	0.94
Female	1.31***	1.35***	0.23***
African-American	1.18	1.52***	1.60**
Hispanic	1.14	1.46**	1.76**
Native-American	1.42	1.13	3.67***
Income	1.00	1.00	1.00
Peer Deviance	1.02	1.03*	1.37***
Family Drink	1.03	1.04	1.75***
Family Drugs	1.32*	1.33*	1.56*
Sexual Assault	0.79	0.94	1.29
Physical Assault	1.56***	1.39**	3.22***
Witness Home	1.07	1.18	1.64
Wit Neighborhood	1.58***	2.64***	2.64***
Witness Else	1.26*	1.42***	2.34***
Witness School	2.72***	1.58***	1.50**

\*p<.05, \*\*p<.01, \*\*\*p<.001

<sup>1</sup> To be consistent with Kilpatrick et al. (2000), analysis is limited to cases with complete data for age and race (N=3,904) and cases are weighted by age, sex and race.

Figure 1: Distribution of Witnessed Violence by Location

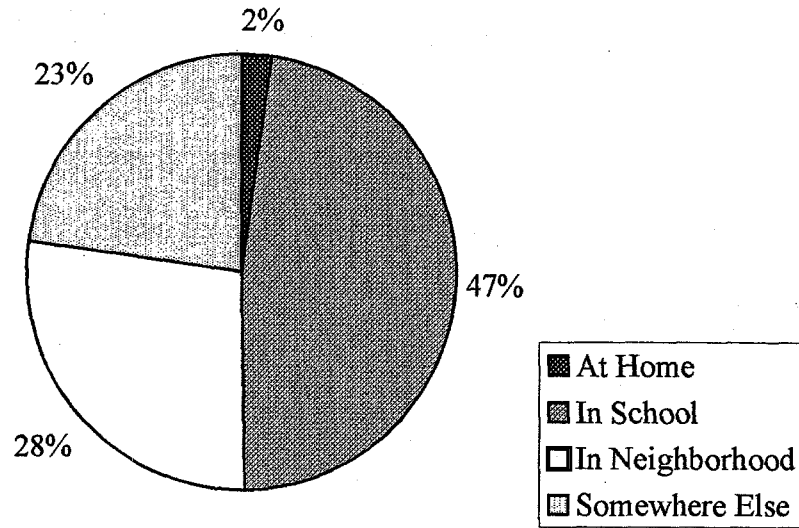


Figure 2: Percent of Witnesses who Report more than one Incident for each Type of Violence

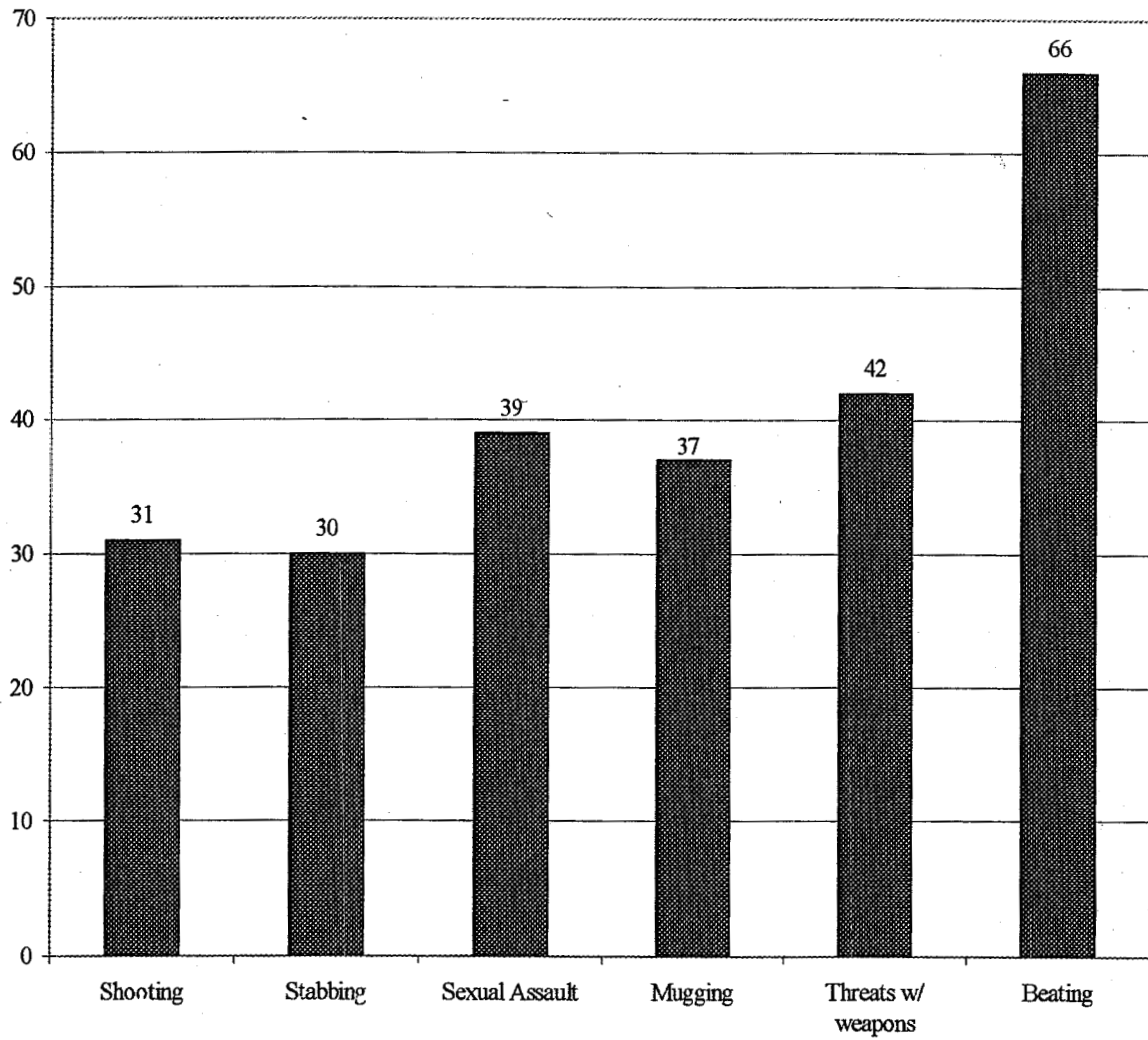
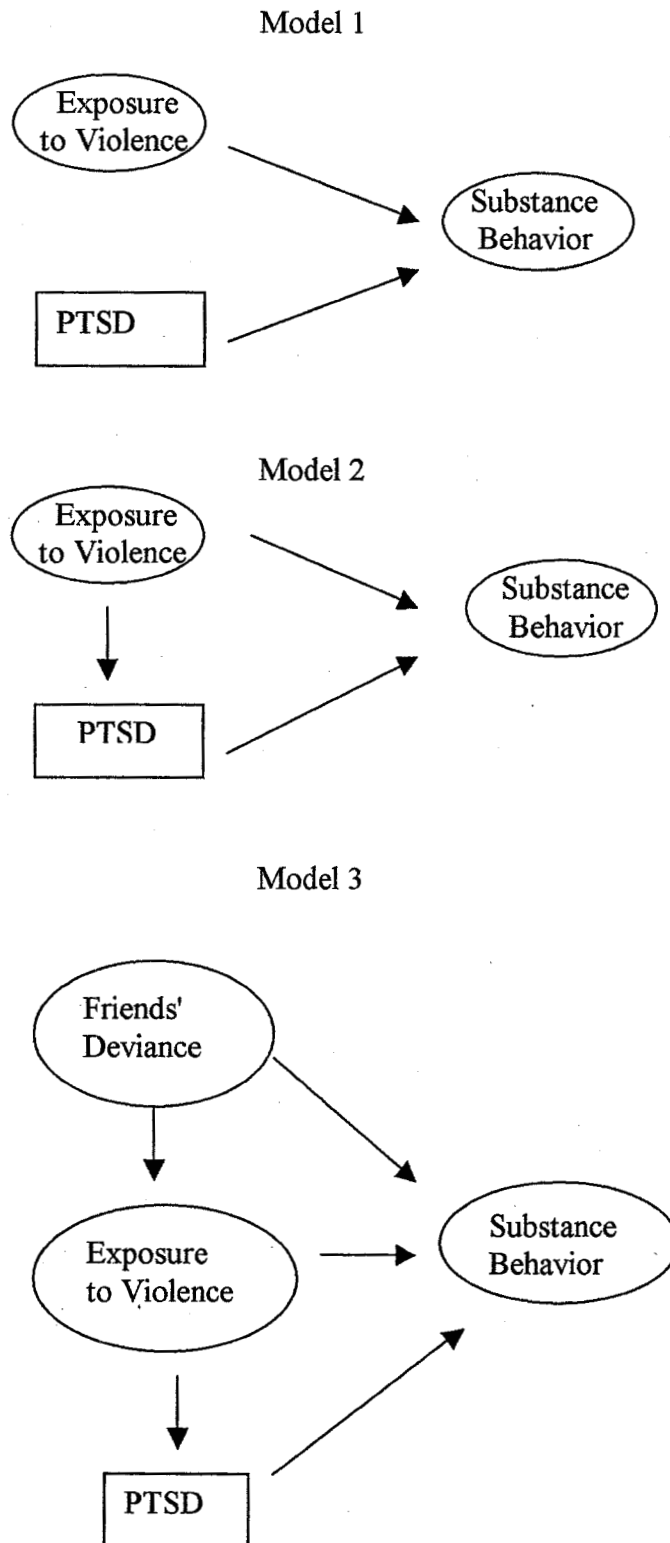


Figure 3: Structural Models for Substance Abuse/Dependence or Use<sup>1</sup>



<sup>1</sup> Only the structural portion of the models is shown. A full list of the exogenous variables used to construct the endogenous variables of peer deviance, exposure to violence, abuse/dependence or use is available in Appendix C.



Figure 4: Type of Violence Witnessed at School

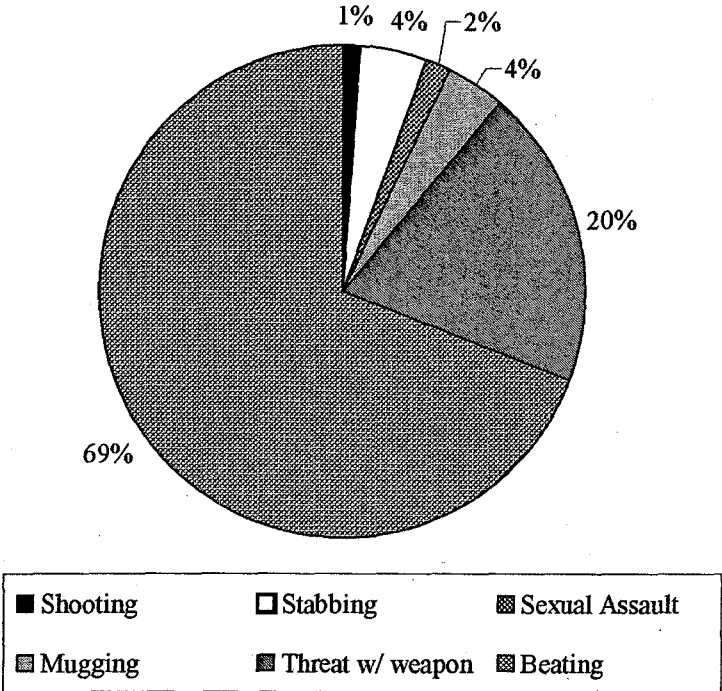


Figure 5: Most Recent Event of Violence Witnessed at School by When it Occurred

