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School Climate and Adolescent Drug Use: Mediating Effects of Violence Victimization in the Urban High School Context¹

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This study tested the mediating effects of violence victimization in the relationship between school climate and adolescent drug use. The hypothesized path model fit data collected from a probability sample of urban high school students (N = 586) participating in an evaluation of a violence prevention program funded by the Substance Abuse and Mental Health Services Administration. Findings indicated that the lack of enforcement of school rules and the presence of unsafe places in and around the school influenced adolescent drug use directly and indirectly through their effects on violence victimization.

Editors' Strategic Implications: This research confirms the importance of the environment as a contributor to violence victimization. Violence victimization is obviously of concern in its own right, but in addition, these data indicate that it also contributes to adolescent drug use. School administrators should be aware that unsafe places in schools and the failure to enforce school rules may affect such victimization and drug use.

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School-related exposure to violence is a common occurrence for children and adolescents growing up in many U.S. urban areas. A recent survey of high school students, *Youth Risk Behavior Surveillance* (Centers for Disease Control and Prevention (CDC), 2004), suggests that more than one-third of respondents reported being in a physical fight at school in the past 12 months, with 4% of these resulting in serious injuries requiring medical attention. The magnitude of this problem stimulated Federal legislation, the Safe and Drug-Free Schools and Communities Act (SDFSC), which specified that by the year 2000 “every school in the United States will be free of violence and unauthorized presence of firearms, drugs, and alcohol and will offer a disciplined environment conducive to learning” (National Education Goals Panel, 1999, p. 4). A concomitant problem plaguing at least 9.5 million students across the U.S. (60%) is the availability and prevalence of illicit substances on high school campuses. Recent findings from the National Survey on Drug Use and Health (Substance Abuse and Mental Health Services Administration (SAMHSA), 2003) highlight a link between youth violence and substance use by showing that youths aged 12–17 who reported violent behaviors in the past-year also reported higher rates of past-year illicit drug use compared with youths who did not report violent behaviors.

Key to addressing successfully these twin scourges will be evidence-based programs and policies aimed to develop school capacity to implement and sustain effective programs (Mihalic, Abigail, Irwin, Ballard, & Elliot, 2004). To meet this objective, SAMHSA has initiated the National Registry of Effective Prevention Programs project as a systematic way to identify, promote, and implement model violence and substance abuse prevention programs. Model program status requires that protocols are carefully implemented, thoroughly evaluated, and produce consistent, positive, and replicable results, which are readily disseminated to the broader prevention community. Consistent with the mandates stipulated by the Blueprints for SDFSC, the U.S. Department of Education has emphasized the importance of adopting prevention protocols with proven effectiveness (U.S. Department of Education, 2002). However, a 1998 Department of Education study found that only 58% of school districts considered research on the effectiveness of prevention-related activities, and only 35% of districts defined research-based prevention in a way that is as rigorous as the Department’s guidelines.

Research examining possible links between violence and drug use has consistently found a strong relationship among adolescents and young adults (Ellickson & McGuigan, 2000; Elliott, Huizinga, & Menard, 1989; Kingery, Mirzaee, Pruitt, & Hurley, 1991; Valois, McKeown, Garrison, & Vincent, 1995). Elliott et al. (1989) presented national baseline epidemiological and etiological data showing the joint occurrence of delinquent behavior and alcohol and drug use. Their seminal work further revealed that not only was there a relationship

between delinquent behavior and drug use, but that there was an escalation from minor delinquency and “gateway” drug use to more serious offenses and increased use of illicit substances. Kingery et al. (1991) surveyed 1,004 eighth and tenth grade students in 23 rural communities and found that youths who took drugs also took more risks, carried weapons more often, engaged in more fights, and were more likely to be victimized. In a representative sample of U.S. 8th and 10th graders, Kingery, Pruitt, and Hurley (1992) examined the relationship between violence, drug use, and victimization. They found that adolescent drug users were more inclined to engage in physical altercations with their peers, take more risks that made them susceptible to assault, and were also more likely to be assaulted at school and victimized outside of school supervision. Similarly, Valois et al. (1995) analyzed the prevalence and correlates of violent behavior in a sample of high school students who completed the Youth Risk Behavior Survey administered by the Centers for Disease Control and Prevention (CDC). Among a sample of 4,147 White and Black adolescents in 9th through 12th grade, the strongest predictors of fighting and carrying a weapon were binge drinking and alcohol use respectively. These findings were replicated in another study that examined data from the 1995 Youth Risk Behavior Survey (Lowry et al., 1999). Additionally, Furlong, Caas, Corral, Chung, and Bates (1997) reported findings from the California Drug Use Survey and the California School Climate Survey that indicated both self-reported substance use and perception of frequency of substance use on school property were significantly associated with school violence.

Although prior research and logic suggest a relationship between drug use and school violence, the SDFSC was established without direct evidence of this relationship and without an understanding of possible and important nuances involved in such a relationship (National Center on Addiction and Substance Abuse (CASA) at Columbia University, 2001; Furlong et al., 1997). Although interpersonal violence has been extensively studied in some community settings, fewer studies have addressed how this relationship manifests in school settings (Lowry et al., 1999), particularly in urban high schools. It should also be noted that a majority of these prior studies measured perceptions of how frequently school violence occurred and on students’ involvement as perpetrators of violence at school, not personal experiences of violence victimization and school climate. Our study attempts to enhance understanding of this critical public health issue by exploring the experiences of violence victimization and school climate among a racially and ethnically diverse sample of urban high school students.

Our study adopts a conceptual framework that was originally proposed by Pentz and colleagues (1989) to guide the development of a multi-community trial for the primary prevention of adolescent drug use. Findings from this comprehensive community-based program, that included media/publicity campaigns, education services for youth and parents, prevention-related skills development,

community organizing, and advocacy of substance abuse policy changes, were an early suggestion that preventive interventions aimed at the individual should also consider the counteracting social and physical environment influences that may contribute to violence.

Pentz (1995, 1999) described this integrated theoretical perspective as the interaction of person (P), situation (S), and environment factors (E) that are bounded by a community. Although Pentz's P, S, E framework was originally developed for the context of a substance abuse prevention program, it provides a conceptual lens to examine school violence by suggesting both risk factors and protective factors, termed "intervention mediators" (Pentz, 1995). As shown in a recent study conducted by CASA (2001), one person-related risk factor was perceptions of minimal consequences associated with drug use. In this study, students were more likely to smoke, drink, or use drugs when they believed the harm associated with use was low. Possible person-related intervention mediators relevant for violence prevention might include participation in extracurricular activities, such as school clubs, organizations, and volunteer activities (Peterson & Reid, 2003). Importantly, from a primary prevention perspective, situation-related risk factors include variables such as verbal bullying while on the school premise (e.g., name calling, laughing at you), or being the victim of a violent act (e.g., pushed, slapped on purpose). Situation-related intervention mediators could include curricula on social skills development, efforts to change social norms about bullying, development of clear and specific rules and consequences, and increased supervision and presence from parents (Nansel et al., 2001; Spivak & Prothrow-Stith, 2001). Pentz's model also suggests that the physical environment may serve as a risk factor for both school violence and adolescent drug use through unsafe or "unowned" places in schools, such as hallways, dining areas, and parking lots, where school personnel are not typically present (Astor, Meyer, & Behre, 1999). Conversely, environment-related intervention mediators might include teacher-generated and implemented interventions that increase the role of students and other school community members in reclaiming "unowned" school territories (Astor et al., 1999).

To inform prevention programs about how to implement robust programs that promote safe school climates, there is a need to understand the subtle interplay of individual, situational, and environmental factors involved in violence and substance abuse within school contexts. In the present study, we employed a path model to examine suggested P, S, and E relationships among a sample largely comprised of Hispanic and African American students. Person-related (i.e., participation in extracurricular activities), situation-related (i.e., verbal bullying, violence victimization, and social norms against drug use), and environment-related (i.e., unsafe places in and around the school and lack of enforcement of school rules) variables were used as predictors of adolescent drug use with violence victimization and verbal bullying as mediators. We assessed whether violence victimization and verbal bullying were critical

mechanisms through which the school environment affected adolescent drug use.

METHOD

Sample

Data were collected in 2002 as part of a larger study evaluating the effects of a Substance Abuse Mental Health Services Administration (SAMHSA) violence prevention program targeting a northeastern high school in an at-risk urban community. The sample setting was chosen because it is considered to be one of the top thirty poorest districts in this northeastern locale. These districts have been legally mandated to implement specific educational measures and programs for students residing in the State's most economically disenfranchised communities. A total of 586 high school students (approximately 25% of the school's population) participated in the survey (response rate = 74%). The sample was 63% female and 68% Hispanic or Latino. Thirteen percent were Black or African American, 9% were Asian, 4% were bi-racial or multi-racial, and 2% were White. Ninth graders comprised 20% of the sample, 27% were 10th graders, 29% were 11th graders, and 24% were 12th graders.

Measures and Procedures

Seven variables were assessed, and adolescent drug use served as the criterion. The six predictors were: participation in extracurricular activities, verbal bullying, violence victimization, social norms against drug use, unsafe places in and around the school, and lack of enforcement of school rules. Measures were adapted from existing surveys in collaboration with students, staff, and parents. Scores represented the mean of items for each scale. Students responded using a four-point, Likert-type scale (1 = strongly agree, 4 = strongly disagree). The measure of adolescent drug use ($M = 1.28$, $SD = 1.07$) was adapted from items contained in the Monitoring the Future Questionnaire (Johnston, O'Malley, & Bachman, 2001) and included nine items (Cronbach's alpha = .83) that asked students to indicate the frequency of their drug use (e.g., cigarettes, alcohol, etc.) over the previous 30-day period. Participation in school-year extracurricular activities ($M = 1.35$; $SD = 1.60$) was assessed using five items (Cronbach's alpha = .93) that asked students their involvement in clubs, organizations, after-school programs, and volunteer activities. The measure of verbal bullying ($M = 1.18$; $SD = 1.19$) included four items (Cronbach's alpha = .72) that asked students to indicate how often they had been a victim of verbal bullying (e.g., name calling, laughing at

you) while at school during the previous 30-day period. Violence victimization ($M = .31$; $SD = .60$) was assessed using five items (Cronbach's alpha = .78) that asked students how often they had been a victim of violence (e.g., pushed, slapped on purpose) while at school during the previous 30-day period. The measure of social norms against drug use ($M = 1.46$; $SD = .35$) included six items (Cronbach's alpha = .80) that asked students to indicate the extent to which social factors (e.g., disapproval from friends, family) might prevent them from using drugs. Lack of enforcement of school rules ($M = 2.58$; $SD = .89$) was assessed using four items (Cronbach's alpha = .75) that asked students to indicate the extent to which school rules were enforced by school staff during the school year. The measure of unsafe places in and around the school ($M = 1.87$; $SD = .22$) consisted of six items (Cronbach's alpha = .70) that asked students to indicate how safe they believed places were in the school building (e.g., cafeteria, restroom, hallways) and on school grounds (e.g., entrance to the school, street corner of the school). The survey was self-administered in English and Spanish to students in randomly selected health education classes at the school.

RESULTS

We performed a structural equation modeling (SEM) procedure with observed variables using AMOS 4.0 (Arbuckle, 1997). We analyzed the variance-covariance matrix using maximum likelihood estimation. The over-identified path model, shown in Fig. 1, includes only significant paths. The path coefficients shown are statistically significant standardized beta weights. The model was found to fit the data from the sample, $\chi^2(10) = 14.82$, $p = .14$; NFI = .99; RFI = .99, and accounted for 20% of the variance in adolescent drug use.

As can be seen in Fig. 1, lack of enforcement of school rules was found to predict adolescent drug use directly, as well as indirectly through its relationships with social norms against drug use and violence victimization. Students reporting weaker enforcement of school rules tended to experience violence more frequently, perceive weaker social norms against drug use, and use drugs more often than students who reported stronger enforcement of school rules. Participation in extracurricular activities also predicted adolescent drug use directly and indirectly through its relationship with violence victimization. Students with higher levels of participation in extracurricular activities tended to experience violence less frequently and used drugs less often than students with lower levels of participation in extracurricular activities. In addition, the presence of unsafe places in and around school directly predicted adolescent drug use and verbal bullying victimization. Students who reported more unsafe places in and around the school tended to experience verbal bullying more frequently and used drugs more often than students who reported fewer unsafe places in and around the school. Verbal bullying victimization also predicted violence victim-

ization. Students who experienced verbal bullying more frequently tended to be victims of violence more often than students who experienced verbal bullying less frequently.

DISCUSSION

The principal objective of this study was to examine the role of violence victimization in the relationships between school climate and adolescent drug use in an urban high school context. Findings showed that violence victimization mediated the effects of three variables on adolescent drug use: lack of enforcement of school rules, social norms against use, and participation in extracurricular activities. Specifically, students who perceived greater lack of enforcement of school rules tended to experience greater violence victimization, which was then associated with increased drug use. Similarly, students who perceived weaker social norms against use experienced greater violence victimization, which again was associated with greater drug use. Moreover, students who reported greater participation in extracurricular activities experienced less violence victimization, which was then associated with less drug use. Finally, unsafe places in and, importantly, around the school affected both adolescent drug use and verbal bullying victimization, while verbal bullying victimization affected adolescent drug use indirectly through its relationship with violence victimization. In sum, an ecologically oriented model that included person, situation, and environmental influences

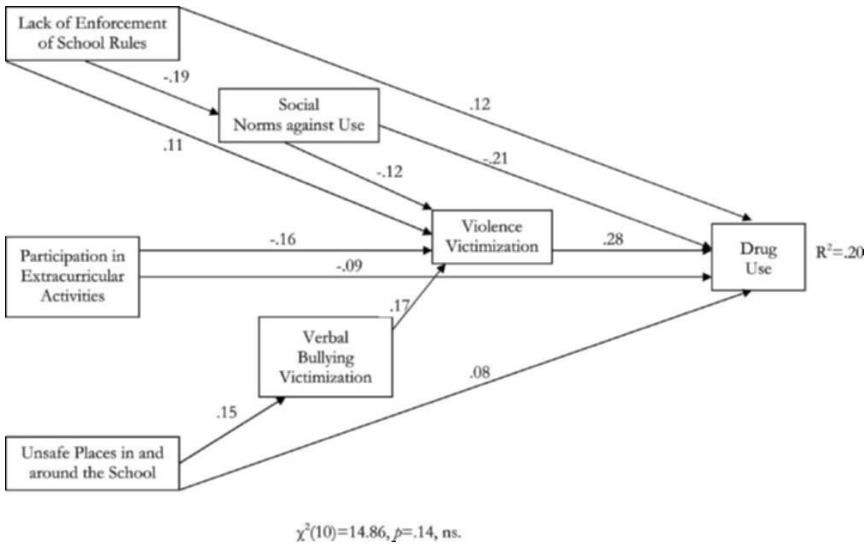


Fig. 1. Path Model Predicting Adolescent Drug Use.

on violence and substance abuse was supported. Our findings recommend that schools develop the capacity to ensure that violence and substance abuse prevention programs are chosen on the basis of research-based evidence, integrated into the multiple facets of school environments and instructional programs, and evaluated for their efficacy in reducing violence and related behaviors among their students.

From an ecological standpoint, viewing school violence and substance abuse as part and parcel of school life in general has much to recommend it. Our findings suggest that violence and drug abuse are co-occurring elements in a standing pattern of behavior, sustained by the physical milieu of unsafe places and reinforced by extra-individual patterns of relationships that promote bullying. Viewing schools as a cluster of behavior settings might allow prevention scientists to leverage a fuller range of intervention options that capture the natural rhythms of student life and provide more robust preventive interventions. Behavior setting theory is explicitly environment oriented in a way that integrates both physical and social aspects of environments. As suggested by this study, manipulation of the “setting programs” in schools that sustain violence and substance abuse (Barker, 1968, 1987) could take the form of alterations in the physical environment, development of a broader range of extracurricular options, and intentional development of role structures and norms keyed to the customary phases of the school day (Maton, 1988). Given the synomorphic nature of the environment-behavior relations, one intervention strategy could focus on identification and transformation of places in and around schools that serve as niches for violence and substance abuse. Key to this strategy will be a simultaneous focus on place and behavior. In our opinion it will not be sufficient to simply identify or alter places that have the potential to act as niches. Rather, space that regularly contains violence and substance abuse should be targeted for multi-level intervention. A potentially powerful point of intervention suggested by our findings is development of alternative settings e.g., extracurricular settings. The ecological value of these is obvious, and their most important value would be that they capitalize on natural control over direct and indirect forms of victimization. These may at once eliminate both bullying and actual physical violence. However, mere encouragement without making these settings a regular and sustained feature of student life with overt physical boundaries will dilute their effect.

Overlaying the elimination or establishment of settings are institutional practices as reflected in norms and enforcement of school rules. One finding in our study suggests that norms against violence or drug use might be strengthened by stronger enforcement of school rules. These may be more directly under the control of schools; but as we indicated above, established regularities in the use of research based prevention protocols may make changing these a particularly challenging prospect. Nevertheless, the literature on empowerment may provide some indications about how to promote anti-drug/violence norms and stiffen enforce-

ment of school rules. Recent work on organizational empowerment (Peterson & Zimmerman, 2004) describes possible organizational empowerment features that could be manipulated. For instance, establishing and sustaining formal positions or roles in schools could influence the extent to which students, teachers, administrators, and parents assume control of tasks and achieve positive outcomes (Gummer, 1998; Speer, Hughey, Gensheimer, & Adams-Leavitt, 1995). Extending these ideas to the current context, schools seeking to enhance enforcement of school rules and strengthen anti-violence norms might be encouraged to form diverse groups of students, teachers, and administrators for examination of rule making, enforcement issues, and norms. These groups might research existing policies and practices in schools and jointly devise, implement, and participate in the evaluation of innovations.

The empowerment literature indicates that how these groups go about their work will be an important element in their success. Fashioning social regularities (Seidman, 1988) in these groups that transcend the strict role boundaries of student, teacher, administrator could be achieved by creating opportunity role structures characterized by rotation of roles with e.g., students rotating through the role of, say, rules committee chair and later assuming leadership of an environmental design options group. Such a group might work to enact modest physical design/re-design changes and couple these to norms enforcement with respect to mutually identified violence “hot spots.” The same dynamic could be applied to other roles customarily occupied by teachers or administrators. Changes made as a result could then be evaluated, but it is important to assert that carefully organized, prospective, and experimental studies of interventions be conducted. Given the constellation of variables related to violence victimization and substance abuse, it is also recommended that interventions simultaneously target not only norms and rule enforcement but, as previously mentioned, extracurricular settings and physical environment.

These recommendations ought to, of route, be tempered by limitations of our study. Its cross-sectional design precluded a causal interpretation of these data and allowed for the possibility of other plausible interpretations. Previous research has proposed several causal mechanisms between violence and substance abuse (Goldstein, 1985; National Research Council, 1993). One alternative model recently proposed by Kodjo, Auinger, and Ryan (2003) included a violence-related indicator (i.e., weapon carrying at school) as the criterion variable in their analysis. Using cross-sectional data from the 1994–1995 National Longitudinal Study of Adolescent Health (Kodjo et al., 2003), these researchers showed that substance use served as a significant predictor of weapon carrying for adolescents. To infer causal relationships and control for rival explanations, future studies should employ designs that allow for stronger causal inferences. Other methodological trade-offs we faced concerned the instrument adapted for the study and the generalizability of our findings. In consideration of the study population, we developed in-

strumentation in collaboration with a school-based violence prevention task force comprised of school administrators and community representatives. As noted by Kumpfer et al. (1993), few instruments had been created for use specifically with racial and ethnic minority populations, and few had been developed by racial and ethnic minority investigators. It is conceivable that our attempt to use culturally appropriate measures may have come at the cost of generalizability to other populations. The path model may have accounted for additional variance in adolescent drug use if more validated measures of these variables had been incorporated into our instrumentation. Additionally, there was the difficulty introduced with self-report survey data in which students may have over reported or under reported certain individual behaviors (i.e., degree of drug use). However, researchers have argued that adolescents are often the best informants of their own situations, behavior, and feelings (Garbarino, Stott, & The Faculty of the Erikson Institute, 1989).

Although prior research has suggested that school-related violence and drug use among adolescents are problems that are endemic to many U.S. urban high schools (CDC, 2001; SAMHSA, 2003), there remains a shortage of rigorous empirical evidence that has examined the specific link between violence victimization and adolescent drug use within the environments of urban high schools (Furlong et al., 1997). Our study was able to clarify some relationships among factors related to violence and substance abuse by showing that lack of enforcement of school rules and the presence of unsafe places in and around schools influenced adolescent drug use directly and indirectly through their effects on violence victimization. These findings are potentially important for prospective prevention and intervention programming efforts. Traditionally, conflict resolution and violence prevention programs that are implemented in many U.S. high schools do not include substance abuse components in their curricula, nor do they routinely account for the physical environment. Current prevention protocols rarely draw this connection, and there is a pressing need to design and implement effective prevention protocols that cast a more ecologically expansive and valid net. Taken together, these recommendations will require a combined effort from students, teachers, parents, school officials, and community organizations to mitigate the complex problems experienced by vulnerable populations of youth.

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