



Published in final edited form as:

J Sch Health. 2010 August ; 80(8): 387–393. doi:10.1111/j.1746-1561.2010.00518.x.

School disrepair and substance use among regular and alternative high school students

Rachel A. Grana, MPH,

Doctoral Student, University of Southern California, 1000 Fremont Ave., Unit 8, Alhambra, CA 91803, Phone: 626-457-5855, Fax: 626-457-4012

David Black, MPH,

Doctoral Student, University of Southern California, 1000 Fremont Ave., Unit 8, Alhambra, CA 91803, Phone: 626-457-6142, Fax: 626-457-4012

Ping Sun, PhD,

Assistant Professor, University of Southern California, 1000 Fremont Ave., Unit 8, Alhambra, CA 91803, Phone: 626-457-4116, Fax: 626-457-4012

Louise A. Rohrbach, PhD,

Associate Professor, University of Southern California, 1000 Fremont Ave., Unit 8, Alhambra, CA 91803, Phone: 626-457-6642, Fax: 626-457-4012

Melissa Gunning, MPH, and

Doctoral Student, University of Southern California, 1000 Fremont Ave., Unit 8, Alhambra, CA 91803, Phone: 626-457-4205, Fax: 626-457-4012

Steven Sussman, PhD

Professor, University of Southern California, 1000 Fremont Ave., Unit 8, Alhambra, CA 91803, Phone: 626-457-6129, Fax: 626-457-4012

Rachel A. Grana: grana@usc.edu; David Black: davidbla@usc.edu; Ping Sun: grana@usc.edu; Louise A. Rohrbach: grana@usc.edu; Melissa Gunning: grana@usc.edu; Steven Sussman: grana@usc.edu

Abstract

Background—The physical environment influences adolescent health behavior and personal development. This paper examines the relationship between level of school disrepair and substance use among students attending regular (RHS) and alternative (AHS) high schools.

Methods—Data were collected from students (N=7,058) participating in two randomized controlled trials of a school-based substance abuse prevention program implemented across the United States. Students provided substance use and demographic information on a self-reported survey. Data for the physical disrepair of schools were collected from individual rater observations of each school environment. We hypothesized that school disrepair would be positively associated with substance use controlling for individual characteristics and an SES proxy. Multilevel mixed modeling was used to test the hypothesized association and accounted for students nested within schools.

Results—Findings indicated that students attending AHS with greater school disrepair were more likely to report the use of marijuana and other illicit drugs (i.e., cocaine, heroin). Students attending RHS with greater school disrepair were less likely to report smoking cigarettes.

Correspondence to: Rachel A. Grana, grana@usc.edu.

This study was approved by the University of Southern California Institutional Review Board.

Conclusions—Differences in findings between RHS and AHS students are discussed, and implications for substance use prevention programming are offered. Students attending AHS with greater school disrepair may require more substance abuse prevention programming, particularly to prevent illicit substance use.

Keywords

Child and adolescent health; drugs; research; public health

INTRODUCTION

Physical environments, and the social interactions occurring within their context, impact the health and well being of people in both negative and positive ways. The physical environment has gained increasing attention as to how and when it influences mental and physical health.^{1,2,3} Research has shown that adolescents are highly perceptive of the quality, safety, and physical disorder of their surroundings and perceive those factors to play an important role in their personal development.^{4,5} Moreover, adolescents spend a substantial amount of their time within the confines of the school environment. Students typically spend 6.5 to 8 hours per day, 32.5 to 40 hours per week and over 8,000 hours during their adolescent years in school.^{6,7} This highlights the school environment as a central environmental influence on adolescents' well-being and consequent behavior. Over 30 percent of schools, affecting about 14 million students, report extensive building disrepair,⁸ especially among high schools where over 65 percent have at least one unacceptable physical or structural condition related to cleanliness, vandalism, and/or disrepair.⁹ The physical environment of the school including building conditions and maintenance are important aspects of the school environment that can promote health, safety, and learning among students. When students and teachers feel more physically and emotionally safe, both teaching and academic performance improve.¹⁰ However, much like neglectful or dysfunctional school climate, the physical aspects of schools in disrepair may have a detrimental impact on student behavior including substance using behavior.

Previous studies have identified an association between components of the physical environment and gonorrhea,¹¹ crime,^{12,13} 14 premature mortality,¹⁵ reduced physical activity,^{16,17} and adult substance use.^{18,19} However, few studies have specifically examined the impact of the physical environment on adolescent substance use, particularly the school physical environment, and researchers have stated concerns over the lack of this type of research.²⁰ Of the studies conducted with adolescents, one study examined student perceptions of the school environment (e.g., safety) and found an association with increased smoking and being drunk.²¹ Two studies found that the amount of cigarette refuse on a high school campus was a robust proxy measure of cigarette smoking among high school students.^{22,23} More recently, a nationally representative study of 8th, 10th, and 12th grade students found an association between the school physical environment and problem behavior, including alcohol use, among 10th and 12th graders.²⁴

How the Physical Environment Impacts Youth Substance Use

The *Broken Windows* theory¹³ can offer an explanation for how deteriorating school physical environments can influence the uptake of substance use among child and adolescent students. The theory asserts that the presence of buildings with broken windows signals a low level of local concern about the condition of the neighborhood and can engender larger social problems, such as crime. Conversely, an orderly environment provides visual cues suggesting the area is safe and there are rules and standards for the environment. Moreover, the appearance of the physical environment may regulate risk

behavior by sending messages to youth regarding the acceptability of behaviors and how deviance is tolerated. The physical environment can also impact mental health, which in turn can influence substance use.⁵ For example, adolescents in poor quality neighborhoods marked by graffiti, low residential stability, and considered dangerous have higher levels of anxiety, depression, and conduct disorders than those in orderly neighborhoods after controlling for SES⁴ and may be subject to psychopathology¹⁹.

Consequently, it is postulated that youth may use substances to relieve the stress caused by their environment and the resulting psychopathology. This notion is supported by the tension hypothesis, which suggests that people use substances to relieve their stressful life events.²⁶⁻²⁷

The impact of the school environment on youth substance use may also function through other factors. For example, lacking of a sense of ownership and personal control over ones surroundings have been discussed as important mediators of the association between the physical environment and mental health outcomes.²⁸⁻²⁹ Youth who feel invested and emotionally connected to their school may be less likely to degrade the school, more likely to report peers' deviant behavior, and less likely to use substances than students who feel disconnected from their school. False perceptions of peer substance use prevalence rates due to visual cues of deviance, such as vandalism, may also make students feel substance use behavior is popular and acceptable. These perceived norms have been strongly linked to youth substance use behavior and beliefs about the acceptability of substance use.³⁰⁻³¹ Also, vandalism may be a sign of the presence of substance using social networks that provide a greater opportunity for youth to interact with these social networks and obtain substances. Finally, prosocial activities such as sports, which can protect against substance use,³² may be limited in schools with poor physical environments (i.e., schools with buildings in disrepair may be a proxy for a lack of other resources such as a well-kept and equipped gymnasium).

This paper responds to a review by Galea et al. (2005),³³ which called for a better understanding of the role of the physical environment in shaping substance use and misuse. We expand upon the growing physical environment literature by examining the association between school disrepair and substance use among high school students. It is especially important to examine the impact of the school physical environment on substance use since the school is recognized as context where youth are influenced to use substances.³⁴⁻³⁵ We hypothesize that the disrepair of school facilities will be positively associated with substance use among regular (RHS) and alternative (AHS) high school students after controlling for individual and school characteristics. Separate analyses are conducted for AHS and RHS students since AHS students tend to have higher rates of substance use compared to RHS students.³⁶ We define school disrepair as the disrepair of the physical structure and other characteristics of physical environment (i.e., presence of courtyards, presence of modular facilities) at the schools as observed by independent raters who visually inspected the school grounds.

METHODS

Subjects

All students obtained written parental consent and provided assent to participate in the study before data collection began. Data from two study trials of Project Towards No Drug Abuse (TND) -- a substance abuse prevention program for youth based on a motivation-skills-decision-making curriculum -- were collected from 7,058 students attending regular (n=5,947) and alternative (n=1,111) schools in cities across the United States. The sample from the first trial was recruited from 17 Southern California high schools (9 AHS) from

2000–2003. The sample from the second trial was recruited from 64 schools (2 AHS) across the United States from 2004 to 2008.

Procedures

Study participants were administered a self-report paper-and-pencil survey in their classrooms by a TND project staff member. Participants were assured that their survey responses were confidential and that participation was voluntary, and they were allowed to withdraw from the study at any time. Student surveys were delivered during one 50-minute class period, and contained 56 questions that assessed a variety of risk behaviors and psychosocial measures. TND staff members, who served as independent raters, collected data regarding the condition of each school's physical environment. The raters walked the grounds of each school and used a checklist to record specific physical problems with the schools including broken windows, graffiti, etc. Two raters completed identical checklists at 40 out of the 81 schools to ensure consistency across raters and independent assessments (49% of all schools; 100% of schools from the first trial had 2 raters; see Furr-Holden et al., 2008 for a similar method³⁷), whereas one rater recorded the physical conditions of the remaining 41 schools.

Instruments

Two main survey instruments were completed as part of this study: 1) the self-report paper-and-pencil survey completed by the students and 2) the checklist assessing school disrepair completed by study staff. Details about the items contained in both instruments are provided below.

School disrepair index—Project staff served as the physical environment raters, and completed a self-reported checklist containing indicators of school disrepair. The checklist contained 14 items with Yes/No response categories, which assessed the state of the buildings and campus grounds for each high school (see Table 1 for items; e.g., “Did you observe any graffiti on the school grounds?”). Two items were removed from the index due to very low agreement between raters and missing values. Thus, the final measure included 12 dichotomous (1=yes, 0=no) items, which were summed into a single *school disrepair index*. Prior to creating the school disrepair index, inter-rater reliability was calculated for the 12 items. In the first 17 schools with two ratings per school, the total standardized Kappa coefficient for the 12 items was 0.66 and in the second set of 23 schools with two ratings per school the standardized Kappa coefficient was 0.63. The similarity of these results across schools indicates similar fidelity to the observation procedures across the two research trials in all the participating schools. According to Landis and Koch (1977)³⁸ these Kappa coefficients are considered indicative of “substantial” inter-rater reliability. Therefore, although two ratings were not completed for all of the schools in the second study, but the Kappa statistic for the sample of schools with two raters was adequate, only one set of rater data was used to comprise the summary index of each school's level of disrepair.

Past 30-day substance use—Students were asked how many times in the last 30 days they used cigarettes, alcohol, marijuana and other illicit drugs (i.e., cocaine, hallucinogens, heroin, etc.). Response options ranged from 0=zero times to 7=more than 100 times. Due to the skewness of their distributions toward low use, we dichotomized each of the four substances (1=used the substance, 0=did not use the substance) for use as outcomes in the regression analyses.

School poverty index—A variable was created to represent the percent of each schools population that is eligible to receive free or reduced price school lunch from the district

(possible range 0–100 percent). This served as a proxy variable for the socioeconomic status (SES) of the students within each school.

Demographics—Age (in years), gender, and ethnicity were self-reported. A dichotomous ethnicity variable was created to indicate if the student was white (1) or non-white (0).

Data Analysis

Univariate statistics were calculated to present the demographic data of students. All analyses used cross-sectional data collected at baseline from both program trials. The school disrepair index served as the main independent variable and past 30-day substance use served as the dependent variable. The school disrepair index, demographic variables, and school poverty index were standardized (mean=0, standard deviation=1) and entered simultaneously into each multilevel regression analysis for each drug use outcome (e.g., cigarettes, alcohol, marijuana and other illicit drugs). Since schools were the unit of random assignment and students were the unit of statistical analysis, all multilevel logistic regression analyses were conducted with the proc glimmix command in SAS v. 9.1.339 to account for nesting students within schools and all Beta coefficients with one-tailed p-values <.05 were considered statistically significant. Since we found significantly elevated drug use levels among AHS students (all p's <.0001; Table 2), we conducted separate analyses for RHS (n=5947) and AHS (n=1111) students.

RESULTS

The students in the present study were an average of 15.0 years old, 49.7% male and 25.5% white (see Table 3). Of the AHS sample, 60.1% were male, mean age 16.7 years, and 18.8% were White and 81.2% were non-White. Of the RHS sample, 48% were male, mean age 14.7 years, and 28% were White and 72% were non-White. The mean school disrepair index for all schools in the present study was 3.1 (out of a possible 12). However, the mean school disrepair score of was significantly higher among AHS compared to RHS (3.3 v. 2.9, respectively; $p<.0001$).

Table 4 and Table 5 provide the multiple logistic regression coefficients for RHS and AHS students, respectively. The stratified analyses demonstrate some statistically significant relationships between school disrepair and drug use. Among RHS students, there was a statistically significant inverse association between school disrepair and past 30-day cigarette smoking ($\beta=-.15$, $SE=.07$, $p<.05$). Among AHS students, there was a significant positive association between school disrepair and 30-day marijuana use and other illicit drug use ($B=.21$, $SE=.10$, $p<.05$ and $B=.24$, $SE=.12$, $p<.05$, respectively).

DISCUSSION

The findings presented in this paper suggest that the association between high school disrepair and student substance use differs across school settings. Despite controlling for a proxy of student SES, an association remained between school disrepair and substance use for AHS students, indicating that school disrepair accounts for additional variance in substance use beyond student SES and is an important indicator of drug use at those high schools. For AHS students, greater school disrepair was related to a greater likelihood of marijuana smoking and other illicit drug use. However, the statistically significant relationship found between school disrepair and cigarette use among RHS students was unexpectedly an inverse relationship, as in a higher disrepair was associated with lower likelihood of smoking cigarettes. It is possible that the substance use policies at the regular high schools are being more strictly enforced at schools with higher disrepair and the students who are using are being caught and sent to alternative high schools. Also, it is

possible that students engage in cigarette use at school more often than the other substances and thus the varying enforcement has a differential effect on removing the smokers from the schools or discouraging smoking on campus. Our study adds to the previous literature that has identified the school physical environment as a factor in adolescent substance use. Previous studies have linked aspects of the school physical environment to alcohol use, drunkenness^{24,21} and cigarette use.^{22,23} This study uncovered a new association between the school physical environment and illicit drug use (i.e., marijuana and other illicit drugs) among AHS students.

The discrepancy in findings between AHS and RHS can be explained by their unique contexts and student composition. AHS students are known to have higher substance use rates than RHS students; and this was verified in our study for cigarette, alcohol, marijuana, and other illicit drug use. The proportion of AHS students using illicit drugs other than marijuana in the past 30-days was almost three times higher than the proportion of RHS students using illicit drugs other than marijuana (Table 2). As indicated by individual raters, school disrepair was also significantly higher for AHS compared to RHS settings. Hence, a greater number of substance using students attend AHS schools in greater disrepair than RHS students. In addition, AHS contained students who were older and contained a larger male to female ratio than RHS. Among adolescents, being older and male is positively associated with substance use.⁴⁰ From this, it seems that AHS tend to cluster higher-risk students together (e.g., substance users, males, older students, academic under performers), perhaps making illicit substances more readily available in this setting, and this may be amplified by positive substance use norms held by higher-risk students. Moreover, AHS students may have limited access to prosocial activities that can protect against substance use team sports and organized social events relative to RHS settings.

The physical school environment should be considered in future substance use prevention efforts implemented in schools. Alongside prevention efforts focused on the individual level, efforts can also be taken within schools to develop physical environments that promote health and prevent substance use among students. For example, Mair (2003)⁴¹ has documented how changes to the environment -- physical design, boundaries, space, and building disrepair -- can reduce crime and violence in various settings. Moreover, Edmondson (2007)⁴² has provided practical recommendations regarding how the school physical environment can be altered to promote the health and safety of students, and states that grant funding can be obtained for these projects. Future studies should investigate potential mediators of the relationship between school disrepair and substance use, such as lacking of a sense of ownership and personal control over ones surroundings and norms about the acceptability of substance use and tagging (or other forms of vandalism). The results presented in our study emphasize the need to conduct additional research, including studies with longitudinal designs, with both regular and alternative high schools to better determine how the two environments shape substance using behavior with two different populations of students. Moreover, the lack of statistical significance of the proxy variable for SES (percent eligible for free/reduced price lunch) in our regression models for both AHS and RHS indicates that the larger context of neighborhood SES may not be as important as the immediate context of the school disrepair in accounting for the variance in substance use, demonstrating the need for additional research to tease out the relative contributions of macro-and micro-environmental factors for adolescent substance use.

Limitations

The findings of this study are limited mainly due to study design and measurement issues. The cross-sectional analysis limits our ability to infer causality between the physical environment and substance use. It is possible that substance use can contribute to some aspects of the school environment such as refuse on the school grounds (e.g., cigarette butts)

or vandalism. Although the Kappa coefficients were of adequate strength, there may be some remaining measurement error in the school disrepair scale, and future studies are needed to further develop adequate measures of the observed school environment. The school ratings given by project staff may possibly lack reliability due to observing different locations within the school. Future studies also need to examine drug use norms, substance availability, and psychosocial variables to elucidate the mechanism linking school disrepair and substance use.

CONCLUSION

School substance use prevention efforts have mainly focused on educating students and developing their skills to prevent or reduce their substance use. Few programs have addressed issues contributing to substance use in the larger school environment. Our results suggest that these programs should also address features of the school physical environment. Special attention needs to be paid to AHS since they are in greater disrepair than RHS and have higher rates of substance using students. Measures of school disrepair may be helpful in identifying schools that can benefit most from substance use prevention programs.

IMPLICATIONS FOR SCHOOL HEALTH

While there are a number of interpretations of these findings, one may conjecture that that school physical environment represents to youth an aspect of the quality of concern and attention an administration, teachers, and other adults have for their students. When a school environment is attractive, respectful of students, and conducive to learning, students may be more likely to take care of their health, academic issues, and upkeep of the school environment. However, if the school is in a relative state of disrepair, youth may be more apathetic, and even express their discontent through drug misuse which is a relatively prevalent and visible within that school context (e.g., illicit drug use at AHSs, and cigarette smoking at RHSs). Thus, to the extent that school beautification programs are taken seriously at the school campus (e.g., through use of gardens, up-to-code structures, art), youth may respond accordingly through decreases or elimination of drug use, possibly decreases in graffiti at the school, and increases in attempts to work hard in school. Certainly, much research is needed and these suggestions are speculative and partly based on our anecdotal experiences out at schools. However, taken together with the findings presented in this paper, school personnel should at least consider the likelihood that a quality school physical environment would be optimal for their students.

Acknowledgments

This research was supported by grants from the National Institute on Drug Abuse (Grant numbers 5R01-DA016090 and 5R01-DA013814).

References

1. Evans GW. The built environment and mental health. *J Urban Health*. 2003; 80(4):536–55. [PubMed: 14709704]
2. Ozer EJ. The effects of school gardens on students and schools: Conceptualization and considerations for maximizing healthy development. *Health Educ Behav*. 2007; 34(6):846–63. [PubMed: 16861584]
3. McNeill LH, Kreuter MW, Subramanian SV. Social environment and physical activity: A review of concepts and evidence. *Soc Sci Med*. 2006; 63(4):1011–22. [PubMed: 16650513]
4. Aneshensel CS, Sucoff CA. The neighborhood context of adolescent mental health. *J Health Soc Behav*. 1996; 37(4):293–310. [PubMed: 8997886]

5. Schaefer-McDaniel N. "They be doing illegal things": Early adolescents talk about their inner-city neighborhoods. *J Adolesc Res.* 2007; 22(4):413.
6. Arnold, D. National Education Association; [Accessed February 11, 2009]. Longer school days affect everyone: Consider all options before enacting a law. Available: <http://www.nea.org/home/14511.htm>
7. Rutter, M.; Maughan, B.; Mortimore, P., et al. *Fifteen thousand hours: Secondary schools and their effects on children.* London: Open Books; 1979.
8. *School Facilities: Condition of America's Schools.* Report to Congressional Requestors (GAO/HEHS-95-61). Washington, DC: U.S. General Accounting Office (GAO); 1995.
9. Planty, M.; DeVoe, JF. U.S. Department of Education, National Center for Education Statistics. Washington, D.C: U.S. Government Printing Office; 2005. An examination of the conditions of school facilities attended by 10th grade students in 2002 (NCES 2006 302).
10. Telljohann, SK.; Symons, CW.; Pateman, B. *Health education: Elementary and middle school applications.* MA: McGraw-Hill; 2004.
11. Cohen D, Spear S, Scribner R, et al. "Broken windows" and the risk of gonorrhea. *Am J Public Health.* 2000; 90(2):230–6. [PubMed: 10667184]
12. LaGrange RL, Ferraro KF, Supancic M. Perceived risk and fear of crime: Role of social and physical incivilities. *Journal of Research on Crime and Delinquency.* 1992; 29(3):24.
13. Wilson JQ, Kelling GL. Broken Windows. *The Atlantic Monthly.* 1982:1–10.
14. Wilcox P, Augustine MC, Clayton RR. Physical environment and crime and misconduct in Kentucky schools. *The Journal of Primary Prevention.* 2006; 27(3):293–313. [PubMed: 16596467]
15. Cohen DA, Mason K, Bedimo A, et al. Neighborhood physical conditions and health. *Am J Public Health.* 2003; 93(3):467–71. [PubMed: 12604497]
16. Sallis JF, Conway TL, Prochaska JJ, et al. The association of school environments with youth physical activity. *Am J Public Health.* 2001; 91(4):618–20. [PubMed: 11291375]
17. Evenson KR, Birnbaum AS, Bedimo-Rung AL, et al. Girls' perception of physical environmental factors and transportation: Reliability and association with physical activity and active transport to school. *Int J Behav Nutr Phys Act.* 2006; 3:28. [PubMed: 16972999]
18. Bernstein KT, Galea S, Ahern J, et al. The built environment and alcohol consumption in urban neighborhoods. *Drug Alcohol Depend.* 2007; 91(2–3):244–52. [PubMed: 17644274]
19. Galea S, Ahern J, Rudenstine S, et al. Urban built environment and depression: A multilevel analysis. *J Epi Commun Health.* 2005; 59(10):822–7.
20. Allison KW, Crawford I, Leone PE, et al. Adolescent substance use: Preliminary examinations of school and neighborhood context. *Am J Commun Psychol.* 1999; 27(2):111–41.
21. McLellan L, Rissel C, Donnelly N, et al. Health behaviour and the school environment in new south Wales, Australia. *Soc Sci Med.* 1999; 49(5):611–9. [PubMed: 10452417]
22. Charlin VL, Sussman S, Dent CW, et al. Three methods of assessing adolescent school-level experimentation of tobacco products. *Eval Rev.* 1990; 14(3):297.
23. Sussman S, Stacy AW. Five methods of assessing school-level daily use of cigarettes and alcohol by adolescents at continuation high schools. *Eval Rev.* 1994; 18(6):741–55.
24. Kumar R, O'Malley PM, Johnston LD. Association between physical environment of secondary schools and student problem behavior: A national study, 2000–2003. *Environ Behav.* 2008; 40(4): 455.
25. Galea S, Freudenberg N, Vlahov D. Cities and population health. *Soc Sci Med.* 2005; 60(5):1017–33. [PubMed: 15589671]
26. Conger JJ. Alcoholism: Theory, problem and challenge. II. Reinforcement theory and the dynamics of alcoholism. *Q J Stud Alcohol.* 1956; 17(2):296–305. [PubMed: 13336262]
27. Wills TA. Stress and coping in early adolescence: relationships to substance use in urban school samples. *Health Psychol.* 1986; 5(6):503–529. [PubMed: 3492372]
28. Evans GW, Wells NM, Moch A. Housing and mental health: A review of the evidence and a methodological and conceptual critique. *J Soc Issues.* 2003; 59(3):475–500.
29. Ng SH, Kam PK, Pong RWM. People living in ageing buildings: Their quality of life and sense of belonging. *J Environ Psychol.* 2005; 25(3):347–360.

30. Botvin GJ, Botvin EM, Baker E, et al. The false consensus effect: Predicting adolescents' tobacco use from normative expectations. *Psychol Rep.* 1992; 70(1):171–8. [PubMed: 1565717]
31. Sussman S. Two social influence perspectives of tobacco use development and prevention. *Health Educ Res.* 1989; 4(2):213–223.
32. Pate RR, Trost SG, Levin S, Dowda M. Sports participation and health-related behaviors among US youth. *Arch Pediatr Adolesc Med.* 2000; 154(9):904–11. [PubMed: 10980794]
33. Galea S, Freudenberg N, Vlahov D. Cities and population health. *Soc Sci Med.* 2005; 60(5):1017–33. 34. [PubMed: 15589671]
34. Abbey A, Jacques AJ, Sobock J. Predictors of early substance use among African American and Caucasian youth from urban and suburban communities. *Merrill Palmer Quarterly.* 2006; 52(2): 305.
35. Kuntsche E, Jordan MD. Adolescent alcohol and cannabis use in relation to peer and school factors. Results of multilevel analyses. *Drug Alcohol Depend.* 2006; 84(2):167–74. [PubMed: 16542799]
36. Sussman S, Dent CW, Stacy AW. Project towards no drug abuse: A review of the findings and future directions. *Am J Health Behav.* 2002; 26(5):354–365. [PubMed: 12206445]
37. Furr-Holden CDM, Smart MJ, et al. The nifty method for environmental assessment of neighborhood-level indicators of violence, alcohol, and other drug exposure. *Prev Sci.* 2008; 9(4): 245–255. [PubMed: 18931911]
38. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics.* 1977; 33(1):159–174. [PubMed: 843571]
39. SAS Institute Inc. Base SAS® 9.1.3 procedures guide. 2. Vol. 1, 2, 3, and 4. Cary, NC: SAS Institute Inc; 2006.
40. CDC. Youth Risk Behavior Surveillance – 2005. Morbidity and Mortality Weekly Report (MMWR) 06/09/2006:57(SS-5). [Accessed: March 5, 2009]. Available at: <http://www.cdc.gov/mmwr/PDF/SS/SS5505.pdf>
41. Mair JS, Mair M. Violence prevention and control through environmental modifications. *Annual Rev Public Health.* 2003; 24:209–25. [PubMed: 12428032]
42. Edmondson L, Fetro JV, Drolet JC, et al. Perceptions of physical and psychosocial aspects of a safe school. *Am J Health Stud.* 2007; 22(1):1.

Table 1

School Disrepair Scale (all response choices are dichotomous: (1=Yes, 0=No))

1. Did you observe any broken windows at the school (cracked, shattered, or missing)?
2. Does the location of the school seem hidden away (e.g., down an alley, or parking lot)?
3. Does the school seem cramped, cluttered, or in need of more space?
4. Are there a lot of bungalows at the school (e.g., more than two)?
5. Did you observe any graffiti on the school grounds?
6. Did you observe any refuse lying around n the grounds or piled up garbage cans?
7. Does the school need to be painted (e.g., cracked paint, old paint)?
8. Was the coloration of the school structures on the outside or in the hallways dull on over half of the buildings (e.g., white-washed or grey)?
9. Was the coloration of the school structures inside the classrooms or offices dull, minimum of two classrooms (e.g., white-washed or grey)?
10. Did the school fail to have a courtyard area for students?
11. Is there a lack of trees, flowers, plants, or bushes (full or patchy grass, lots of dirt)?
12. Overall did the school building environment seem dreary or drab?

Table 2

Sample demographic data and differences between school type

<i>Variable</i>	Total Percent (%) and N	RHS^a Percent (%) and N	AHS^a Percent (%) and N	P value^b
Past 30-day cigarette smoking	15.2 N=1032	11.5 N=664	36.8 N=368	**
Past 30-day alcohol use	35.2 N=2390	31.8 N=1822	56.6 N=568	**
Past 30-day marijuana use	18.1 N=1218	14 N=804	41.4 N=414	**
Past 30-day other illicit drug use	7.3 N=494	5.4 N=310	18.5 N=184	**

^aRHS=Regular High School; AHS=Alternative High School

^bComparison between regular and alternative high school students,

* p<.01,

** p<.0001

Table 3

Sample demographic data and differences between school type

	Total (n=7058)	RHS^a (n=5947)	AHS^a (n=1111)	P value^b
<i>Variable</i>	Mean(SD) or %	Mean(SD) or %	Mean(SD) or %	
Age	15.0(1.2)	14.7(0.91)	16.7(0.87)	**
White (%)	25.5	28	18.8	**
Male gender (%)	49.7	48	60.1	**
Poverty index	49.9	50.5	47.7	*
School Disrepair	3.1(3.0)	2.9(3.1)	3.3(2.4)	**

^aRHS=Regular High School; AHS=Alternative High School

^bComparison between regular and alternative high school students,

* p<.01,

** p<.0001

Table 4

Multilevel Logistic regression of school disrepair on past 30-day substance use among RHS students

	Cigarettes (n=5481)	Alcohol (n=5496)	Marijuana (n=5472)	Other illicit Drugs (n=5471)
School Disrepair	-0.15(0.07) *	-0.001(0.06)	0.05(0.08)	-0.01(0.06)
Age	0.27(0.03) ***	0.13(0.03) ***	0.15(0.04) ***	0.12(0.03) **
White	0.15(0.04) ***	0.06(0.04)	0.08(0.04) †	-0.002(0.04)
Male	-0.002(0.03)	-0.14(0.03) ***	0.08(0.04) *	-0.07(0.03) *
Poverty index	-0.002(0.08)	-0.02(0.06)	-0.02(0.08)	-0.08(0.06)

Note: All variables are standardized with a mean of 0 and standard deviation of 1;

† p<0.10,

* p<0.05,

** p<0.01,

*** p<0.001

Table 5

Multilevel Logistic regression of school disrepair on past 30-day substance use among AHS students

	Cigarettes (n=989)	Alcohol (n=992)	Marijuana (n=987)	Other Illicit Drugs (n=982)
School Disrepair	0.14(0.17)	0.08(0.12)	0.21(0.10)*	0.24(0.12)*
Age	0.10(0.08)	0.14(0.07) [†]	-0.01(0.07)	-0.02(0.09)
White	0.28(0.07)***	0.11(0.07)	0.20(0.07)**	0.20(0.08)**
Male	0.02(0.07)	0.07(0.07)	0.10(0.07)	-0.07(0.08)
Poverty index	-0.04(0.18)	0.06(0.12)	-0.004(0.11)	-0.10(0.12)

Note: All variables are standardized with a mean of 0 and standard deviation of 1;

[†]
p<0.10,*
p<0.05,**
p<0.01,***
p<0.001