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School Victimization and Substance Use among Lesbian, Gay, Bisexual, and Transgender Adolescents

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Abstract

Lesbian, gay, bisexual, and transgender (LGBT) adolescents are at increased risk for substance use, relative to their heterosexual counterparts. Although previous research has demonstrated that experiences of anti-LGBT harassment, discrimination, and victimization may explain some of this disparity, little is known about the mechanisms whereby such mistreatment leads to substance abuse. This study aimed to examine whether mechanisms suggested by the Social Development Model might explain the links between school-based victimization and substance use in this population. Five hundred and four ethnically diverse LGBT adolescents ages 14–19 reported their experiences with school victimization, substance abuse, school bonding, and deviant peer group affiliation. Anti-LGBT victimization in school was associated with substance abuse, and although causality cannot be established, structural equation modeling confirmed that the data are consistent with a theoretical model in which this association was mediated by increased affiliation with deviant peers. Preventive interventions for LGBT adolescents must not only attempt to make schools safer for these youth, but also help keep them engaged in healthy peer groups when they are confronted with mistreatment in school.

Keywords

Lesbian; gay; bisexual; transgender; substance abuse; discrimination; victimization; bullying

Introduction

Accumulating evidence documents that lesbian, gay, bisexual, and transgender (LGBT) adolescents are at increased risk for both experimental and heavy substance use, as well as alcohol and tobacco use, when compared to their heterosexual counterparts (Blake et al., 2001; Faulkner & Cranston, 1998; Marshal et al., 2008; Russell, Driscoll, & Truong, 2002). The prevailing theoretical explanation for these risks is that LGBT adolescents are exposed to greater levels of minority stress as a result of their sexual orientation (e.g., discrimination), and that these stressful experiences accumulate to lead to health challenges (Meyer, 2003). Consistent with this theory, a large body of research conducted with

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numerous minority populations, including LGBT adults and ethnic minority individuals, documents that perceived discrimination is related to poor health outcomes (for a review, see Pascoe & Smart Richman, 2009).

Despite this growing literature linking discrimination (broadly assessed) to health outcomes, we know little about the mechanisms that link the unique forms of discrimination that occur within a specific setting to subsequent health disparities. In the case of understanding substance use among LGBT adolescents, it is reasonable to expect that the discrimination adolescents experience in certain settings (e.g., families vs. schools vs. churches) is phenomenologically and functionally different, each with the potential to trigger a unique cascade of risk factors for substance use. Research on both adolescent and adult smoking has shown that racist discrimination experienced in some settings is associated with smoking, whereas racist discrimination in other settings is not, suggesting that understanding discrimination's effects requires attention to the context in which discrimination occurs and the processes that are likely to result when one is mistreated in that context (Purnell et al., 2012; Wiehe, Aalsma, Liu, & Fortenberry, 2010). Understanding these processes is critical to designing and targeting preventive interventions.

One setting in which LGBT adolescents are particularly vulnerable to mistreatment is the school. Studies continue to show that use of anti-gay language in schools is ubiquitous (e.g., saying "that's so gay" to communicate displeasure with something). Eighty-five percent of LGBT adolescents report being the victims of verbal harassment in school, and 40% report physical harassment (e.g., pushing) because of their sexual orientation (Glsen, 2010). Moreover, when population-based samples compare school experiences of heterosexual vs. LGBT adolescents, the LGBT youth consistently fare worse (Bontempo & D'augelli, 2002; Faulkner & Cranston, 1998; Garofalo, Wolf, Kessel, Palfrey, & Durant, 1998; Russell, Franz, & Driscoll, 2001). For example, between 25% and 38% of LGBT adolescents report being involved in a fight in school during the past year, relative to between 7% and 19% of other adolescents (Faulkner & Cranston, 1998; Garofalo et al., 1998).

At present, we were able to identify a handful of studies that tested whether school victimization was associated with substance use in LGBT adolescents. Using data from a population-based sample of high-school students, Bontempo & D'Augelli (2002) found that disparities in substance use across sexual orientation groups were explained by victimization in schools. Similarly, in a large study of high school students, Espelage and colleagues (2008) found that a single-item assessing homophobic teasing was associated with alcohol and marijuana use among all students, independent of sexual orientation, but that the association was strongest for LGB and "questioning" students. Finally, a recent study of LGB students in Canada documented an association between victimization and substance use, and found that having a supportive teacher could buffer that association (Darwich, Hymel, & Waterhouse, 2012). Each of these findings is consistent with a larger literature on victimization and bullying in predominately heterosexual samples that consistently shows associations between being mistreated by peers at school and both substance use and abuse (Litwiler & Brausch, 2013; Luk, Wang, & Simons-Morton, 2010; Radliff, Wheaton, Robinson, & Morris, 2012).

Although these studies are beginning to suggest some connection between school-based mistreatment and substance use or abuse for LGBT youth, the mechanisms underlying that association remain unknown. The lack of research on mechanisms is not unique to the literature on anti-LGBT victimization, but is a largely unexplored question in the larger literature linking school victimization to student health more broadly. Several scholars have suggested that stigma-related processes, such as discrimination, likely affect LGBT individuals' health through their association with risk factors known to impact health in the general population (Diamond, 2003; Hatzenbuehler, 2009). Thus, anti-LGBT victimization in schools might contribute to LGBT adolescents' substance use through mechanisms that are known to be risk factors for substance use in the general population of adolescents. Two likely candidates are adolescents' relationships with their schools and with their peers. According to the Social Development Model (Hawkins & Weis, 1985), adolescents learn patterns of behavior in the context of the various socialization units to which they are bonded (e.g., family, school, peers). School bonding is comprised of two related components: *attachment*, which involves having positive affect toward school and teachers, and *commitment*, which is an investment in doing well at school (Catalano, Kosterman, Hawkins, Newcomb, & Abbott, 1996). Bonds to schools (and other prosocial units) inhibit delinquent behavior as adolescents feel compelled by such bonds to conform to the norms and values of those institutions. Similarly, bonds to anti-social units (e.g., deviant peers) facilitate delinquent behavior through an adolescent's investment in the behaviors, norms, and values of those peers. Empirical work has identified results which are consistent with this theory, as increased deviant peer affiliations and decreased school bonding are both associated with increased drug and alcohol use in samples of adolescents (Fergusson, Swain-Campbell, & Horwood, 2002; Maddox & Prinz, 2003).

Applying the Social Development Model to the experience of LGBT adolescents, we might expect that when these adolescents experience anti-LGBT victimization in school, it could change their orientation toward school and peers in a manner that facilitates substance abuse. Consistent with this notion, LGBT adolescents do report less "school belonging" (a construct similar to "attachment") relative to heterosexual students (Rostosky, Owens, Zimmerman, & Riggle, 2003; Russell, Seif, & Truong, 2001), and that this can result from school-based victimization (Murdock & Bolch, 2005). Similarly, studies of heterosexual youth have also found that students who are bullied at school are also less bonded to their schools – they report both less commitment and less attachment to school (Hoglund, 2007; Popp & Peguero, 2012; Ripiski & Gregory, 2009). Finally, at least one study has documented a connection between school belonging and substance use among LGBT adolescents (Rostosky et al., 2003). Together, these findings support the assertion that school victimization could contribute to adolescent substance use and abuse by decreasing LGBT adolescents' feelings of bonding to school.

In addition, victimization at school also might facilitate LGBT adolescents' entry into more deviant peer groups. Multiple studies have documented that youth who experience both harassment and more severe forms of victimization at the hands of their peers subsequently begin to affiliate with deviant social groups (Ford, Elhai, Connor, & Frueh, 2010; Rusby, Forrester, Biglan, & Metzler, 2005). If these findings generalize to LGBT adolescents, it

could provide another plausible link between school victimization and substance abuse in this population.

In the present study, we aimed to test associations between school victimization and substance abuse in a sample of LGBT adolescents. In addition, we explored whether these relations would be mediated by adolescents' feelings of school bonding and affiliations with deviant peers (see Figure 1). We hypothesized that adolescents who experienced greater anti-LGBT mistreatment in school would feel less bonded to their schools and would affiliate more with deviant peers; these factors, in turn, would be associated with greater substance abuse.

Method

Procedure

Sexual minority adolescents between the ages of 14–19 were recruited for participation in what we dubbed the “Diversity Adolescent Sexuality and Health (DASH)” study. Participants were eligible for the study if they either (a) self-identified as gay, lesbian, bisexual, or queer, OR (b) reported any same-sex sexual contact within the past year. Recruitment for the study occurred in: Indianapolis, IN, Boston, MA, and Philadelphia, PA. In each city, one community-based organization for sexual minority adolescents served as the base for recruitment and interviewing. We advertised the project through fliers, online social networking sites (i.e., MySpace and Facebook), direct outreach to youth who attended programming at the community-based organizations, and through word-of-mouth from peer to peer.

Adolescents who arrived at the organizations were approached by a member of our team who explained the study and assessed interest in participating. Interested youth were then directed to a staff member at the community organization to discuss whether he/she should participate in the study. This afforded an opportunity to speak with someone who was unbiased and unaffiliated with the study about the risks and benefits of participation. Waiver of parental permission for participation was obtained for youth under age 18, justified by the facts that the study was classified as low-risk, and that obtaining parental permission would involve disclosing to parents that a youth was LGBT, potentially placing them at risk. If the youth reported ongoing interest after their interaction with the youth center staff member, the study representative brought the adolescent to a private room and obtained verbal consent (for those ages 18–19) or assent (for those ages 14–17). Eighty-eight percent of the youth approached agreed to participate.

Following the consent/assent procedures, participants were oriented to Audio Computer Assisted Self-Interview (ACASI) systems, and were left alone in the room to complete the assessment. The ACASI system allows the interviewee to simultaneously read and listen to questions being read through a headset, reducing difficulties with reading comprehension. Participants enter their responses directly into the computer. The increased privacy of this data collection method has been found to elicit higher response rates from adolescents in potentially sensitive domains such as same-sex sexual behaviors, substance use, and depression (Supple, Aquilino, & Wright, 1999; Turner & Gervai, 1995). Participants

required between 35 and 65 minutes to complete the questions, and were compensated with a \$25 gift card for completion of any portion of the survey. All study procedures were approved by the institutional review board at the Principal Investigator's home institution.

Sample

Five hundred and four adolescents completed the assessment (Boston: $n = 159$, Philadelphia: $n = 205$, Indianapolis: $n = 140$). Participants ranged in age from 14–19 ($M = 17.4$, $SD = 1.4$); 42.7% identified their current gender as female, 50.2% as male, and 7.1% as transgender. Most identified their sexual orientation as gay or lesbian (59.7%), although bisexual adolescents represented 26.2% of the sample, and 14.1% identified as “queer” or some “other” sexual orientation. This represents a similar breakdown to other large studies of LGBT youth (e.g., one study of 5420 LGBT youth found that 53.9% identified as gay or lesbian and 46.1% who identified as bisexual or something else (Kosciw, Greytak, & Diaz, 2009). The sample was ethnically diverse, with 34.9% identifying as White, 30.4% as mixed ethnicity, 22.8% as African American, 6.7% as Latino, 2.4% as Asian or Pacific Islander, and 2.8% as another ethnicity. Compared to the demographics of the three cities from which we sampled, our sample contains a greater proportion of nonwhite youth, in particular African American youth.

Measures

School Victimization—Experiences of school victimization perceived to be resulting from LGBT status, and victimization attributed to other causes, were assessed with nine questions that assessed the frequency with which a variety of events had occurred during their school years (Harris Interactive, 2005; Toomey, Ryan, Diaz, Card, & Russell, 2010). For example, “While at school (on school property or at a school event), have you been pushed, shoved, slapped, hit, or kicked by someone who wasn't just kidding around.” Table 1 contains a full list of victimization items. Participants who indicated that any of these events had occurred were then asked to report how often they happened (a) “because someone knew or assumed you were LGBT” and (b) “for other reasons (e.g., your race, weight).” Responses for each were provided on a four-point scale ranging from “Never” to “Many times.” For the present study, we computed separate scores for victimization believed to occur because of known or suspected LGBT status and victimization believed to occur for other reasons. Previous research has shown that this measure has good reliability and predictive validity in samples of LGBT young adults (Toomey, et al., 2010).

School Bonding—School bonding was assessed using 6 items originally developed by Arthur and colleagues (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002), and subsequently recommended for use by the Substance Abuse and Mental Health Services Administration (Samhsa, 2005). Participants indicated how often they felt specific ways about their school and school work (e.g., “How often do you try your hardest in school?” “How often did you enjoy being in school?”), using a 5-point response scale ranging from 1 (“Never”) to 5 (“Always”). Previous research has demonstrated that the scale has good reliability, and is invariant across age, gender, and multiple ethnic groups (Glaser, Horn, Arthur, Hawkins, & Catalano, 2005). Cronbach's alpha in this sample was .78.

Affiliation with Deviant Peers—The degree to which adolescents affiliated with deviant peers was assessed using 6 items developed by Dishion (1991). Participants were asked how many of their friends engaged in each of a variety of antisocial behaviors (e.g., “stole something worth more than \$5”), and responded on 4-point scales ranging from 1 (“none of them”) to 4 (“more than 10”). Previous research has demonstrated that this measure is reliable, and has good convergent validity with both parent and teacher ratings of peer group anti-social behavior (Dishion, Patterson, Stoolmiller, & Skinner, 1991). Cronbach’s alpha in this sample was .73.

Substance Abuse—Five separate indicators of substance abuse were obtained, each taken from measures used in the National Longitudinal Study of Adolescent Health (Harris et al., 2009) or recommended for use with youth by SAMHSA (Samhsa, 2005). Given that experimental substance use is common among youth and may be even more common among LGBT youth, the measures for this study were selected to be sensitive enough to detect variability in the sample at the more extreme levels of use, where use begins to become problematic and more consistent with conceptualizations of “substance abuse.” These measures included single item assessments of smoking frequency (number of days smoked in the past month), drinking frequency (number of days in the past year they consumed alcohol), and frequency of binge drinking in the past year (i.e., consuming five or more drinks in a row on a single occasion). In addition, participants reported whether they had tried each of 14 different illegal drugs in the past year, and this number was summed to reflect the total number of illegal substances used. Finally, participants reported whether in the previous year they had experienced each of nine different negative outcomes as a result of their alcohol or drug use (e.g., been hung over, been in a sexual situation they regretted). This value was also summed to reflect the total number of negative substance-related consequences experienced in the previous year.

Data Analysis

Structural equation modeling (SEM) was used to characterize the relationships among the variables in this study. We first assessed components of the measurement model, then made model modifications, followed by a structural equation model that specified the hypothesized relationships among latent variables (Anderson & Gerbing, 1988). Both models were estimated using the WLSMV estimator in *Mplus* version 6.1, which allows for items with limited response scales (e.g., four or five point) to be treated as categorical variables (Muthen & Muthen, 2006).

To evaluate global model fit, we report the chi-square test of model fit. Because the chi-square test may be sensitive to trivial departures of model-data fit, especially in large samples (Bollen & Long, 1993), we also report several descriptive indices of approximate model-data fit: the Comparative Fit Index (CFI; Bentler & Bonnett, 1980), the Root Mean Square Error of Approximation (RMSEA; Browne & Cudek, 1993) and the weighted root mean square residual [WRMR; (Yu, 2002)]. Yu (2002) conducted simulations using the WLSMV estimator and dichotomous data to suggest appropriate fit statistics for this scenario. However, we are aware of no simulations that apply to the WLSMV estimator and ordinal indicators. Yu suggests that in alternate scenarios such as this reasonable fit might be

suggested by CFI values at .95 or .96, RMSEA values at .05 or .06, and WRMR values at .95 or 1.0. Hu and Bentler note that descriptive fit statistics are best considered collectively: if any two of the three meet cutoff thresholds, the model is said to have fit the data well on an approximate basis (1999).

For indirect effects used to assess mediation, distributions of parameter estimates are not symmetric and thus inference should be based not on the usual Z-statistic representing the parameter estimate divided by its standard error, but instead based on a method that generates optimal asymmetric confidence intervals. Following the recommendation of MacKinnon and colleagues (Mackinnon, Lockwood, & Williams, 2004), we used the bias-corrected bootstrap to obtain asymmetric 95% confidence intervals; 95% confidence intervals for indirect effects that did not include zero were deemed to be statistically significant at $p < .05$. A confidence interval bounded by exactly zero can be considered significant at $p = .05$.

Results

Preliminary Analyses and Measurement Model

Descriptive statistics for the victimization and substance use items are presented in Table 1. As a first step to the analysis, we generated correlations among study variables (the complete correlation matrix is available from the first author). Participant age was significantly related to indicators of both substance use and affiliation with deviant peers, and so it was utilized as a covariate in the final SEM. No other demographic variables (i.e., ethnicity, gender) were associated with variables of interest and were therefore not included as covariates.

We first constructed a measurement model consisting of latent factors for affiliation with deviant peers, school bonding, and substance use. The two victimization scales were treated as measured, composite indices, rather than latent variables, because the disparate victimization experiences assessed by our items were unlikely to be caused by some underlying latent construct reflecting “victimization” (Bollen & Bauldry, 2011). The fit of the original measurement model was suboptimal ($\chi^2 [116] = 458.76, p < .001$; CFI = 0.94, RMSEA = 0.08, and WRMR = 1.52), and thus, we explored modification indices to identify the source of misfit. Upon inspection, it became apparent that a single item from the school bonding scale (“How often did you hate being in school?”) and a single item from the affiliation with deviant peers scale (“How many of your friends cheated on tests?”) loaded relatively weakly on their specified factors (and did not load on other factors). The school bonding item (hating being at school) reflected a more extreme manifestation of poor bonding than other items (e.g., “how often was your schoolwork meaningful?”) which might have contributed to its weak loading. Similarly, as cheating becomes a more ubiquitous behavior, it might no longer distinguish deviant peers the way other behaviors do (e.g., stealing). Hence, we dropped these two items and reevaluated the fit of the measurement model. The fit of the modified model met criteria for good global model fit: $\chi^2(87) = 239.31, p < .001$; CFI = 0.97, RMSEA = 0.06, and WRMR = 1.14. Factor loadings and inter-factor correlations from this measurement model are available from the first author.

Structural Equation Model

Following satisfactory fitting of the measurement model, we specified the paths suggested by our hypotheses (see Figure 1). Specifically, we examined whether anti-LGBT school victimization was associated with substance use both directly, and through indirect associations with school commitment and affiliation with deviant peers.¹ We utilized the measure of victimization for reasons other than LGBT status as a separate predictor in this analysis in order to demonstrate the unique effects of LGBT-based victimization. The fit of this model was also good: $\chi^2(123) = 372.687, p < .001$; CFI = 0.95, RMSEA = 0.06, WRMR = 1.21. Factor loadings and path coefficients from this model appear in Table 2. Decomposing the effect of anti-LGBT school victimization on substance use via affiliation with deviant peers and school bonding revealed a significant total mediated effect ($B=0.064$; 95% CI = 0.014, 0.130). The indirect effect of anti-LGBT victimization on substance use via deviant peers was statistically significant ($B=0.059$; 95% CI = 0.022, 0.116). The indirect effect via school bonding was not significant ($B=0.005$; 95% CI = -0.020, 0.035). When these indirect paths were specified, the remaining direct effect of anti-LGBT victimization on substance use was not significant [$B = 0.04$; $SE(B) = 0.06$; $Z = 0.73, p = .47$]. Decomposing the effect of school victimization perceived to occur for reasons other than being LGBT revealed a similar pattern. Other victimization had a significant total effect on substance use ($B=0.066$; 95% CI = 0.000, 0.142), and although the association between other victimization and deviant peer affiliation was only marginally significant ($p=0.06$), the full mediated path linking victimization to substance use through deviant peers was significant ($B=0.046$; 95% CI = 0.001, 0.105). The mediated path through school bonding was not significant ($B=0.020$; 95% CI = -0.007, 0.064). The remaining direct effect of other victimization on substance use was not significant when these paths were accounted for [$B = 0.11$; $SE(B) = 0.07$; $Z = 1.56, p = .12$].

To ensure that the model we presented was the best possible representation of these data, we undertook a series of steps to explore any causes of model misfit. Examination of modification indices suggested no theoretically consistent or empirically robust paths to add to the model. No residual correlations were greater than 0.19, and only 10 (7.2%) were greater than 0.10. We also modeled two additional theoretically plausible models to examine if either fit better than our proposed model. We must note that our proposed model was saturated, which means that any model with greater constraints would necessarily appear to be a poorer fit to the data. A model in which the effects of school victimization on substance abuse were fully mediated sequentially through school bonding and then affiliation with deviant peers did not meet criteria for good fit: $\chi^2(128) = 458.53, p < .001$; CFI = 0.94, RMSEA = 0.07, WRMR = 1.53. We also modeled one in which the effects of school victimization were fully mediated sequentially through affiliation with deviant peers and then school bonding, and this model was also did not meet the criteria for good fit: $\chi^2(128) = 524.94, p < .001$; CFI = 0.93, RMSEA = 0.08, WRMR = 1.64.

¹We also informally tested whether this model was invariant across ethnic groups (i.e., White, African American, and Mixed ethnicity) by constructing separate models by group. Although power was insufficient to conduct a formal multiple group SEM, no obvious ethnic differences in model paths were observed.

Discussion

LGBT adolescents who reported more anti-gay victimization in their schools also exhibited more severe substance abuse. This was also true for victimization perceived to occur for other reasons (e.g., ethnicity or weight). In addition school-based victimization of all types was associated with affiliation with deviant peers, but not school bonding. The relation between victimization and substance abuse was mediated by affiliation with deviant peers. Although causality cannot be established from these cross-sectional data, our findings are consistent with a theoretical model in which adolescents who are victimized begin affiliating with deviant peer groups, and entry into these groups then facilitates substance abuse.

These findings add to a small, but growing, body of work documenting the harms that school-based mistreatment can inflict on LGBT adolescents (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009; Birkett, Espelage, & Koenig, 2009; D'augelli, Pilkington, & Hershberger, 2002; Hershberger & D'augelli, 1995). Previous work has demonstrated that discrimination and victimization in schools is also associated with other mental health outcomes, such as suicidal ideation and self-harm (Almeida et al., 2009; Hershberger & D'augelli, 1995), symptoms of PTSD (D'augelli et al., 2002), and general psychological distress (Birkett et al., 2009; Hershberger & D'augelli, 1995). Our findings of an association between school victimization and substance abuse are consistent with this literature, and once again point to the importance of making schools a safer environment for sexual minority students.

In addition, this study adds to another emerging literature examining the mechanisms whereby discrimination works to affect health outcomes. We found that LGBT adolescents' experiences with anti-gay victimization in schools are associated with at least one well-established risk factor for poor adolescent health outcomes – affiliations with deviant peers. Consistent with the larger adolescent literature, this risk factor contributed to the variability in LGBT adolescents' reports of substance abuse. Deviant peer affiliation is theorized to have its impact on substance use by shifting the normative context in which the adolescent operates (Hawkins & Weis, 1985). One recent study documented that LGBT adolescents making the transition from high school to college reported more permissive alcohol-related norms among their friends than did heterosexual adolescents (Hatzenbuehler, Corbin, & Fromme, 2008). Our results converge with these findings in suggesting one plausible path to the more permissive social norms that those authors observed – when LGBT adolescents are victimized in schools they might become more influenced by the substance-tolerant norms of deviant peer groups.

Our hypothesis about the relation between anti-LGBT victimization and school bonding was not confirmed. Although no research we are aware of has examined this link explicitly, one study of LGBT youth did find an association between victimization and school *belonging* (Murdock & Bolch, 2005). Belonging is roughly akin to school *attachment* (e.g., feeling good about being in school), which is just one component of school bonding as conceived in the Social Development Model. The other component is *commitment* to school (e.g., wanting to do well on school work). Interestingly, a recent study of college-aged gay men found that growing up in invalidating contexts was associated with greater investment of

one's self-worth in academic endeavors (Pachankis & Hatzenbuehler, 2013). Thus, pursuing academic success might be one way in which LGBT youth cope with difficult experiences, essentially increasing their commitment to school. This might begin explain why we failed to see an association between victimization and school bonding, whereas studies of heterosexual youth have found this effect (Hoglund, 2007; Popp & Peguero, 2012; Ripiski & Gregory, 2009).

Although our findings suggest that peer group affiliation mediates some of the relation between school victimization and substance abuse, a portion of the direct effect remained. Thus, other mechanisms might also be at work. One possibility is that individuals who experience stressful experiences, such as discrimination or victimization, use substances as a coping strategy to blunt the negative affective states that result from these stressful experiences (Hatzenbuehler, Corbin, & Fromme, 2011). Future research will be required to test whether this pathway accounts for some of the association between school-based victimization and substance abuse, as well as to identify other potential mechanisms.

Although this investigation focused on the implications of anti-LGBT victimization for adolescent substance abuse, our findings suggest that there may be other health consequences as well. Victimization was associated with a well-established risk factor for a variety of negative health outcomes (affiliation with deviant peers), suggesting that for LGBT youth, victimization also might be associated with other health risks that co-occur with deviant peer group affiliation, such as sexual risk behavior, delinquency, depression, or suicidality.

Limitations

Our findings must be qualified by a number of limitations. First, the data are cross sectional, and therefore care must be taken in drawing conclusions about causality. Although our data are consistent with a theory-based model for how victimization might lead to subsequent changes in substance use, other temporal configurations of the variables are possible. For instance, it might be that LGBT youth who affiliate with more deviant peer groups and/or who abuse substances are more likely to be mistreated as a result of these activities. Future longitudinal studies will be required to more definitely establish the direction of effects that are suggested by these data. Moreover, our study did not measure every possible mechanism that might link victimization and substance use, and so future research must explore these additional mechanisms (e.g., using substances to numb emotional distress). Consistent with this idea, in our SEMs, approximate model-data fit goals were attained, but exact fit was not attained, which suggests while our models fit the data reasonably well, there is room for additional improvements in subsequent research to sharpen the fit of the model through theory refinement, measurement refinement, or both. With respect to our sampling strategy, although we went to great lengths to ensure that our participants were diverse with respect to ethnicity, gender, and geographical locale, they were not randomly sampled, and thus share all of the limitations common to convenience samples. Importantly, because participants had to come to LGBT youth centers in order to participate, we likely undersampled youth who would be uncomfortable visiting these centers (e.g., those who were less open about their sexual orientation). Although these design limitations are essential to weigh, they are also

shared by virtually every other study of LGBT adolescents, given the challenges associated with recruiting representative samples of sexual minority youth, as well as with developing and retaining longitudinal cohorts of LGBT youth under age 18.

Conclusions

LGBT youth face considerable challenges, as is evidenced by the accumulating evidence for their elevated health risks, relative to heterosexual adolescents (Institute of Medicine, 2011). However, this study adds to a growing body of research documenting that these risks are correlated with exposure to hostile social settings (Almeida et al., 2009; Bontempo & D'augelli, 2002; Espelage, Aragon, & Birkett, 2008; Murdock & Bolch, 2005; Ryan, Huebner, Diaz, & Sanchez, 2009). This work provides some hope, as it lays the groundwork for preventive interventions that have potential to improve the health of this population. As more research documents the health correlates of school-based mistreatment for LGBT youth, it becomes clearer that improving the quality of school climate for LGBT youth might decrease their health risks.

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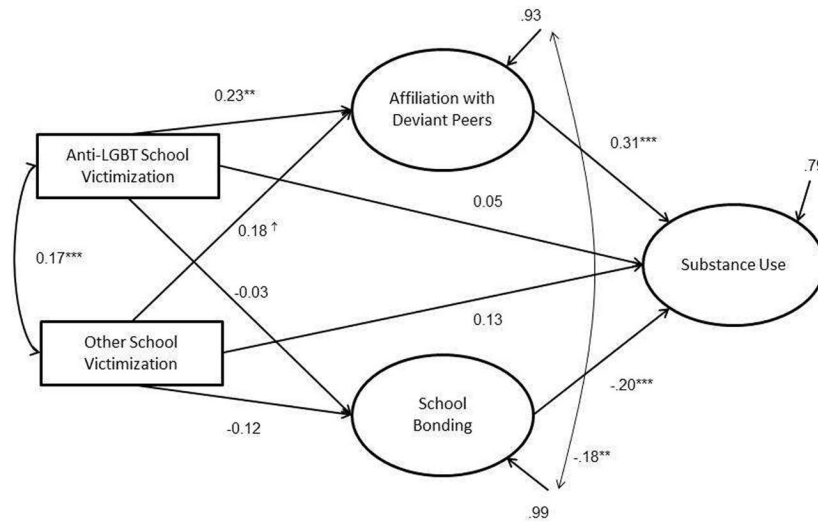


Figure 1. SEM Illustrating Associations Among Victimization, School Bonding, Affiliation with Deviant Peers, and Substance Use

Note: Estimates illustrated are the standardized path coefficients from the SEM.

†p=0.06, *p< .05, **p < .01, ***p < .001.

Table 1

Frequency of Victimization Experiences and Substance Use (n = 504)

	n reporting	Percent of sample
Anti-LGBT victimization at school		
Pushed, shoved, hit or kicked	179	35.5
Threatened or injured with a weapon	62	12.3
Afraid of being beaten up	156	31.0
Been in a physical fight	338	67.1
Had mean rumors or lies spread about you	350	69.4
Had sexual jokes, comments, or gestures made at you	242	48.0
Been made fun of because of your looks or speech	100	19.8
	265	42.6
Victimization at school for other reasons (e.g., race, weight)		
Pushed, shoved, hit or kicked	174	34.5
Threatened or injured with a weapon	52	10.3
Afraid of being beaten up	157	31.1
Been in a physical fight	241	47.8
Had mean rumors or lies spread about you	227	45.0
Had sexual jokes, comments, or gestures made at you	210	41.7
Been made fun of because of your looks or speech	89	17.7
	209	41.5
Number days smoked past month		
None	265	52.6
1–5	54	10.7
5–15	31	6.2
15–29	49	9.7
Every day	105	20.8
Drinking frequency past year		
None	138	27.4
1–2 times	120	23.8
Once a month or less (3–12 times)	78	15.5
2–3 days a month	58	11.5
1–2 days a week	72	14.3
3–5 days a week	30	6.0
Daily or almost daily	8	1.6
Binge drinking (5+ drinks in one sitting) past year		
None	297	58.9
1–2 times	92	18.3
Once a month or less (3–12 times)	30	6.0
2–3 days a month	32	6.4

	n reporting	Percent of sample
1–2 days a week	25	5.0
3–5 days a week	21	4.2
Daily or almost daily	7	1.4
Number of illegal substances tried in past year	$\underline{M} = 1.23, SD = 1.99$	
Number of negative substance use consequences	$\underline{M} = 1.69, SD = 2.53$	

Note: For victimization variables, percentages reported in this table reflect the proportion of adolescents who endorsed ever experiencing the event; however, analyses utilized reports of frequency from an ordinal scale.

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Table 2 SEM Illustrating Associations Among Mistreatment, School Commitment, Affiliation with Deviant Peers, and Substance Use

Variable	B	SE	Z	P	β
<i>Factor Loadings</i>					
School Bonding					
School Bonding Item 1	1.00	—	—	—	0.76
School Bonding Item 2	1.02	0.04	23.88	<0.001	0.78
School Bonding Item 3	0.89	0.05	19.63	<0.001	0.67
School Bonding Item 4	0.84	0.05	17.45	<0.001	0.64
School Bonding Item 5	0.83	0.05	18.26	<0.001	0.63
<i>Affiliation with Deviant Peers</i>					
Affiliation Item 1	1.00	—	—	—	0.52
Affiliation Item 2	1.71	0.16	10.86	<0.001	0.88
Affiliation Item 3	1.70	0.15	11.09	<0.001	0.88
Affiliation Item 4	0.77	0.10	7.79	<0.001	0.40
Affiliation Item 5	1.23	0.13	9.41	<0.001	0.63
<i>Substance Use</i>					
Binge Drinking	1.00	—	—	—	0.83
Number of illicit substances	1.16	0.12	9.62	<0.001	0.96
Smoking frequency	0.78	0.09	8.50	<0.001	0.64
Drinking frequency	1.20	0.12	9.62	<0.001	0.99
Substance use consequences	1.17	0.12	9.47	<0.001	0.97
<i>Correlations</i>					
Anti-LGBT Victimization <-> Other Victimization	0.17	0.02	8.27	<0.01	0.17
Affiliation with Dev Peers <-> School Bonding	-0.07	0.02	-3.00	<0.01	-0.18
<i>Directional Structural Effects</i>					
Anti-LGBT Victimization -> School Bonding	-0.02	0.05	-0.43	0.67	-0.03
Anti-LGBT Victimization -> Affiliation with Dev Peers	0.12	0.04	2.94	<0.01	0.23
Other Victimization -> School Bonding	-0.09	0.06	-1.49	0.14	-0.12
Other Victimization -> Affiliation with Dev Peers	0.09	0.05	1.91	0.06	0.18

Variable	B	SE	Z	P	β
Anti-LGBT Victimization -> Substance Use	0.04	0.06	0.73	0.47	0.05
Other Victimization -> Substance Use	0.11	0.07	1.56	0.12	0.13
School Bonding -> Substance Use	-0.22	0.06	-3.40	< 0.001	-0.20
Affiliation with Dev Peers -> Substance Use	0.50	0.11	4.73	< 0.001	0.31

Notes: $N = 504$. B = Unstandardized regression weight; SE = standard error of B (derived from normal theory); Z = Z-test of $B = 0$; P = p-value for Z-test; β = standardized regression coefficient.