Sexual-Orientation Disparities in School: The Mediational Role of Indicators of Victimization in Achievement and Truancy Because of Feeling Unsafe

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Early school experiences lay the foundation for long-term life success. Studies reveal school success is a strong indicator of overall adolescent well-being and predicts numerous health, social, and behavioral outcomes in both the short term and long term.[1,2]

Truancy, or any unexcused absence from school, has been consistently linked with numerous negative health and developmental outcomes such as delinquent behaviors,[1,2] substance use,[3–5] social problems,[6] and later difficulties in adult life.[2] Several studies have shown truancy to be positively associated with use of alcohol, marijuana, tobacco, and other drugs.[3–5] Finally, truancy has also been found to be a warning sign for later problems in adulthood such as marital instability, unemployment, criminality, and incarceration.[6] Beyond truancy, academic achievement is also another important school outcome. Along with lower academic and professional success later in life, poor grades have been associated with increased substance use[3] and mental health problems.[7]

Recent research indicates that lesbian, gay, and bisexual (LGB) adolescents are at increased risk of poor school outcomes in comparison with heterosexual youths. According to a survey of Massachusetts high school students, students identifying as LGB were over 4 times more likely than students identifying as heterosexual to not attend school because of feeling unsafe.[8] In a survey of Wisconsin youths, both middle school and high school LGB-identified adolescents reported higher prevalence of truancy as well as lower attitudes about acceptance compared with heterosexual students.[9] In an earlier article utilizing this data set the association between sexual orientation and prevalence of truancy was examined. Results indicated higher prevalence of truancy and indicators of victimization in LGB compared with heterosexual students.[10] In addition

Objectives. We examined sexual-orientation identity disparities in truancy and academic achievement, and the mediational role of victimization in a large high-school sample.

Methods. We utilized pooled data, measuring sexual identity, from the 2005 and 2007 Youth Risk Behavioral Surveillance System Surveys. Multilevel logistic regression modeling estimated the odds of low grades and truancy because of feeling unsafe comparing lesbian/gay, bisexual, (LGB) and unsure students to heterosexuals. We stratified models by gender. Indicators of victimization were examined to mediate the relationship between identifying as a sexual minority and school achievement or truancy.

Results. LGB-identified youths reported significantly elevated odds of truancy and low grades (odds ratios = 1.6–3.2; all *P* < .05). Additionally, both genders noting uncertainty about their sexual identity showed increased odds of truancy. Victimization indicators mediated the relationship between identifying as a sexual minority and experiencing negative school outcomes, with greater victimization indicators being associated with increased truancy and lower grades, and the extent of mediation differed by gender.

Conclusions. As early disparities in academic achievement and school engagement have indicated a lifetime of increased health and behavioral risk factors, early intervention targeting school victimization is necessary. (*Am J Public Health.* 2014; 104:1124–1128. doi:10.2105/AJPH.2013.301785)

to truancy, LGB students have also been shown to have more negative school attitudes, more school troubles, and lower grade point averages than non-LGB students.[11]

Some research suggests that the sexual orientation disparities in school outcomes may be explained by the negative climate many sexual minorities face at school.[9,11–15] In a study of Wisconsin middle-school students, LGB students were more likely than heterosexual students to be truant if they were also the victim of homophobic harassment. Likewise, LGB students were also more likely to be truant when they reported their school climate to be negative.[14] Additional protective factors for LGB youths have been examined, such as school connectedness and relationships to peers and teachers.[15,16] Taken together, these studies suggest how factors of the school environment can impact poor school outcomes in LGB youths. Our current study advances this research by first

describing the disparities in school-related outcomes between heterosexual and LGB students, and then examining the hypothesis that victimization accounts for (i.e., mediates) the relationship between LGB-identification and risk for negative school outcomes.

Few population-based surveys of adolescent health include measures of sexual identity, and those studies that do measure sexual identity are typically inadequate to separate their analyses by sexual identity groups. Instead of examining possible heterogeneity across subgroups, lesbian, gay, and bisexual individuals are typically classified together. Furthermore, students uncertain of their sexual orientation are often overlooked, or are not analyzed separately, despite research which suggests that they differ from heterosexually-identified youths.[14] The current study advances previous work by utilizing a large population-based health survey to compare adolescents who

identify as LGB, or unsure of their sexual orientation to heterosexual adolescents.

METHODS

For the present study, data were gathered from US high-school students in 2005 and 2007 as part of the CDC's Youth Risk Behavior Surveillance Survey (YRBSS). The YRBSS utilizes a 2-stage, cluster sampling design in each jurisdiction (city or state) to generate a representative sample of students in grades 9 through 12. Although the larger YRBSS pooling project included 14 jurisdictions collected across 2 years,[17] for this paper only data from jurisdictions which administered the item on sexual orientation identity were used. Data were pooled across 2 years and 9 jurisdictions, which consisted of 4 cities (Boston, MA; Chicago, IL; New York City, NY; and San Francisco, CA) and 5 states (Delaware, Maine, Massachusetts, Vermont, and Rhode Island). Multilevel analyses were conducted with jurisdiction as the clustering variable. Details about pooling methods used and characteristics of jurisdictions included in analyses are available elsewhere.[17]

Measures

Students in participating high schools completed self-report surveys assessing sexual orientation, demographic characteristics, and health-related behaviors and exposures. An item assessing sexual orientation identity asked students to indicate which best described them. Options included heterosexual, bisexual, lesbian/gay, and unsure, with heterosexuals being the referent category. Race/ethnicity was categorized into African American, Hispanic, Asian, Other and White, which was the referent category. The Other racial category consisted of all students not fitting into another larger racial/ethnicity category, including: American Indian, Alaska Native; Native Hawaiian, other Pacific Islander; Multiple-Hispanic; Multiple-Non-Hispanic. Students also reported their age. Further description on the measurement and the coding of sexual orientation and other demographics as well as descriptive information on prevalence rates of these items are described elsewhere in this issue.[17,18] Only jurisdictions which administered the sexual identity item were included in the sample (n = 61 173), and individuals missing responses on

key variables were excluded from analysis (sexual identity, 3.8%; birth sex, 1.4%; race, 3.2%; victimization, 0.8%; truancy, 1.4%). Additionally, although truancy-and-victimization-indicator items were administered in all surveys that administered the sexual identity item, grades were not assessed in either Chicago or New York City in 2005 or 2007. Therefore, for the analyses on the academic achievement results, Chicago and New York City were dropped from analysis. The final analytic samples were n = 56 989 for truancy and n = 36 915 for academic grades.

Truancy. A single-item was included which examined truancy: "During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school? (0 days; 1 day; 2 or 3 days; 4 or 5 days; 6 or more days)." Responses were dichotomized with 0 = if a student did not skip any days of school in the last 30 days and 1 = if a student skipped at least 1 day in the past 30 days.

Academic Grades. A single-item was included which examined academic grades: "During the past 12 months, how would you describe your

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TABLE 1—Prevalance of Truancy, Poor Grades, and Victimization in High School Students Across Sexual Identity and Race/Ethnicity: Pooled Youth Risk Behavior Surveys, United States, 2005-2007

	Females (n = 29 169)				Males (n = 27 820)			
	Total, % (No.)	Truancy[a] (n = 29 169), %	Poor Grades[b] (n = 18 778), %	Victimization[c] (n = 29 169), %	Total, % (No.)	Truancy[a] (n = 27 820), %	Poor Grades[b] (n = 18 137), %	Victimization[c] (n = 27 820), %
Overall	100 (29 169)	6.3	5.8	28.8	100 (27 820)	6.2	10.1	46.2
Sexual Identity								
Lesbian	1.0 (300)	13.1	15.7	50.1	1.5 (383)	19.2	13.1	46.8
Bisexual	5.2 (1522)	10.1	17.8	52.4	1.7 (514)	20.5	17.7	56.3
Unsure	2.4 (800)	17.8	2.8	36.9	2.3 (645)	16.9	11.3	48.4
Heterosexual	91.4 (26 547)	5.8	5.2	27.1	94.5 (26 278)	5.5	9.9	45.9
Race/ethnicity[d]								
African American	22.9 (4725)	8.8	9.3	40.0	20.7 (4257)	6.9	18.5	50.9
Hispanic	17.0 (4228)	7.9	13.3	31.4	16.2 (3824)	9.5	20.5	59.8
Asian American	6.3 (2532)	4.2	4.1	16.2	7.8 (2757)	7.5	6.1	32.4
Other	8.6 (3571)	10.0	10.7	40.8	8.3 (3512)	10.0	17.6	56.7
White	45.2 (14 113)	3.9	4.3	21.6	47.0 (13 470)	3.8	7.5	43.2

Note. All numbers are unweighted while all percentages utilize adjusted sampling weights.
[a]Truancy defined as not going to school for ≥ 1 day in the past 30 days because of feeling unsafe.
[b]Poor Grades defined as receiving mostly D's and F's over the past 12 months.
[c]Victimization defined in this table as indicating any fighting/victimization across the seven scale items.
[d]Other ethnicity defined as Native Hawaiian, Pacific Islander, American Indian, Alaska Native, or multiple ethnicity groups. May not total to full number because of missing values on the race/ethnicity item.

TABLE 2—Multivariable Hierarchical Linear Models Estimating Odds of Truancy and Poor Grades, With Age and Race/Ethnicity Entered as Covariates: Pooled Youth Risk Behavior Surveys, United States, 2005-2007

Variable	Truancy		Poor Grades	
	OR (95% CI)	Mediated Model, OR (95% CI)	OR (95% CI)	Mediated Model, OR (95% CI)
Females				
Age, y	1.03 (0.965, 1.098)	1.04 (0.973, 1.114)	0.87 (0.817, 0.925)	0.87 (0.816, 0.927)
Race/ethnicity				
African American	1.64 (1.246, 2.149)	1.41 (1.065, 1.869)	1.97 (1.554, 2.509)	1.82 (1.425, 2.318)
Hispanic	1.87 (1.403, 2.502)	1.35 (1.352, 2.440)	2.48 (1.931, 3.198)	2.41 (1.867, 3.113)
Asian American	0.78 (0.548, 1.103)	0.87 (0.610, 1.233)	0.50 (0.344, 0.725)	0.53 (0.365, 0.773)
Other	2.66 (2.073, 3.423)	2.26 (1.737, 2.933)	2.03 (1.579, 2.601)	1.78 (1.377, 2.303)
White (Ref)	1.00	1.00	1.00	1.00
Sexual orientation identity				
Lesbian	2.81 (1.641, 4.825)	1.77 (0.972, 3.218)	3.11 (1.879, 5.133)	2.24 (1.310, 3.820)
Bisexual	2.02 (1.504, 2.708)	1.33 (0.961, 1.838)	2.94 (2.270, 3.797)	2.36 (1.811, 3.092)
Unsure	2.02 (1.363, 2.984)	1.49 (0.966, 2.308)	0.85 (0.493, 1.494)	0.62 (0.338, 1.122)
Heterosexual (Ref)	1.00	1.00	1.00	1.00
Victimization		2.54 (2.261, 2.862)		1.94 (1.747, 2.152)
Males				
Age, y	1.05 (0.986, 1.129)	1.07 (0.993, 1.145)	0.97 (0.925, 1.020)	0.96 (0.917, 1.014)
Race/ethnicity				
African American	1.79 (1.390, 2.302)	1.62 (1.242, 2.109)	1.95 (1.623, 2.342)	1.83 (1.514, 2.201)
Hispanic	2.68 (2.085, 3.456)	2.62 (2.002, 3.418)	2.13 (1.721, 2.637)	2.09 (1.680, 2.595)
Asian American	1.92 (1.423, 2.577)	2.09 (1.526, 2.868)	0.60 (0.453, 0.801)	0.62 (0.467, 0.832)
Other	1.91 (1.980, 3.269)	2.04 (1.563, 2.650)	1.90 (1.555, 2.342)	1.59 (1.288, 1.972)
White (Ref)	1.00	1.00	1.00	1.00
Sexual orientation identity				
Gay	3.25 (2.082, 5.086)	2.75 (1.689, 4.475)	1.77 (1.141, 2.755)	1.42 (0.893, 2.266)
Bisexual	3.19 (2.052, 4.951)	1.72 (1.039, 2.859)	1.63 (1.078, 2.451)	1.13 (0.727, 1.765)
Unsure	2.84 (1.928, 4.189)	2.28 (1.489, 3.480)	1.18 (0.746, 1.870)	0.97 (0.596, 1.575)
Heterosexual (Ref)	1.00	1.00	1.00	1.00
Victimization		1.97 (1.838, 2.119)		1.62 (1.535, 1.708)

Note. CI = confidence interval; OR = odds ratio. Subsequent analysis included Binge Drinking and Marijuana Use as covariates within these models, but their inclusion did not impact our results. Specifically, ORs for all models remained significant and in the same direction as the model reported here.

grades in school? (1 – Mostly A's, 2 – Mostly B's, 3 – Mostly C's, 4 – Mostly D's, 5 – Mostly F's, 6 – None of these grades, 7 – Not Sure)". Responses were dichotomized so 0 = on average received A's, B's, or C's and 1 = on average received D's and F's. Students who indicated uncertainty or received none of these grades were excluded from analysis.

Indicators of Victimization. A scale developed by Russell et al.[10] was utilized as a measure of indicators of victimization and fighting. The scale comprises 7 items related to indicators of victimization and fighting in the previous 12 months. Sample items include "During the past 12 months, how many times were you in a physical fight on school property?" and "During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?" Response options range from 1 (0 times) to 8 (12 or more times) and mean scores were utilized. An α coefficient of 0.78 was found in the pooled sample.

Statistical Analysis

Descriptive analyses were conducted using SPSS versions 20 and 21 (IBM, Somers, NY) and the Complex Samples software package was utilized to account for the complex sample design of the YRBSS. Final models were run using the multilevel software Hierarchical Linear Modeling (HLM) version 7 (Scientific Software International, Lincolnwood, IL) to fit multivariable logistic models. All HLM analyses accounted for the complex sampling design of the YRBS by adjusting the relative weights and altering the effective sample size using design effects calculated for each jurisdiction. The approach to calculating design effects and accounting for the clustering of the data are described in detail elsewhere in this issue.[17] Models were sex-stratified for both outcome variables, and controlled for age and race/ethnicity. We accounted for jurisdiction by setting it as a level-2 variable and allowing for clustering. Logistic models were used to first examine the rates of outcome variables for sexual-minority-identified youths versus heterosexual youths, then to examine the relationship between indicators of victimization and the school outcomes, and finally, to examine how indicators of victimization mediate the relationship between sexual minority identity and negative school outcomes.

Mediation occurs when a variable transmits the effect of an independent variable onto a dependent variable.[19] A method for testing for mediation is the product test of multiplying the a and b parameters together and testing if the result is significantly different from zero.[19] The a parameter is a regression coefficient which indicates the relationship of the independent variable to the mediator. The b parameter is a regression coefficient that indicates the partial relationship of the mediator to the outcome when controlling for the independent variable. Based on recommendations by MacKinnon et al.,[19,20] the confidence limits of the product of "ab" were examined using the PRODCLIN script developed by MacKinnon et al.[20] If the 95% confidence intervals did not include zero, then the mediation effect was considered significant at $P < .05$.

RESULTS

Table 1 contains descriptive statistics for sexual identity and race/ethnicity categories for each variable, stratified by sex. Consistent with

the previous report in this issue,[10] LGB students and individuals who were unsure of their sexual identity, experienced greater prevalence of both truancy because of feeling unsafe in school and indicators of victimization. Additionally, LGB students on average were more likely to report lower academic achievement than heterosexual students. Gay and bisexual boys in particular reported the highest prevalence of truancy although lesbian and bisexual girls and gay and bisexual boys reported the greatest prevalence of poor grades. Racial differences were also found with Asian American and White students reporting the least prevalence of truancy, poor grades, and indicators of victimization, although Asian American boys showed increased prevalence of truancy.

Sex-stratified logistic models showed that while controlling for age, race, and ethnicity, significant disparities exist for LGB-identified youths across both truancy and poor grades (Table 2). Additionally, individuals who indicated uncertainty about their sexual identity also showed increased odds of truancy but not poor grades. Next, the relationship between sexual identity and indicators of victimization was examined with an ordinary least squares multilevel model. Results indicated that girls and boys who identify as a sexual minority or unsure have higher severity of indicators of victimization. And finally, the indicators of victimization scale was included in the models to examine it as a mediator of the relationship between sexual identity and both truancy and low grades. The indicators of victimization scale was a significant predictor of both truancy and poor grades while controlling for age, race, and sexual identity. Additionally, indicators of victimization completely mediated the relationship in females between being a lesbian, being bisexual, or having an unsure identity and truancy. Boys on the other hand displayed a partial-mediation effect, where experiencing indicators of victimization partially mediated the relationship between identifying as gay, bisexual, or unsure and truancy. Partial mediation was established if the relationship between the independent variable and the dependent variable remained significant after the mediator was entered into the multilevel regression model.[19,20] For the grade analysis, victimization was found to completely mediate the relationship in males between being gay or

bisexual and having poor grades. Girls, on the other hand, displayed a partial mediation effect, where experiencing-victimization indicators partially mediated the relationship between identifying as lesbian or bisexual, and poor grades. Included in Table 3 are the a and b parameters of the proposed mediation model, along with their corresponding standard errors and the 95% confidence intervals of the mediation effect, as calculated using the PRODCLIN program.[20] This table indicates mediation effects were significant in all models.

DISCUSSION

In the past 2 years there has been significant public attention to homophobic bullying in schools, and the implications for sexual-minority student well-being. Using a database that draws from population-based surveys that include measures of sexual identity, we demonstrate that LGB youths were more likely to experience victimization at school, and were also more likely to report truancy and lower grades. Furthermore, the disparity in truancy and academic grades was largely mediated by experiences of victimization. Thus, this study

builds on prior work[14] by using a geographically diverse, population-based sample.

Among girls, indicators of school victimization fully mediated the elevated truancy levels of lesbians, bisexuals, and girls with an unsure orientation, as well as partially mediated the lower academic achievement of lesbians and bisexuals. By contrast, for boys, indicators of school victimization fully mediated the lower academic achievement of gays and bisexuals, and partly mediated elevated levels of truancy. Results support the hypothesis that victimization experienced by LGB adolescents in school directly impacts their school safety concerns, which significantly increases their likelihood of truancy and compromises their ability to perform academically. Youths identifying as sexual minorities are especially vulnerable to being victimized because of stigma associated with their minority sexual orientation that is present at the peer, school, and societal levels.[14,21,22] Not only may classmates target LGB students because of prejudiced attitudes, but schools often lack policies to protect these students, and teachers may also lack training in dealing with these issues. This research shows that preventing victimization could significantly

TABLE 3—Tests of Mediation and Confidence Interval of the Indirect Effect Estimated With PRODCLIN: Pooled Youth Risk Behavior Surveys, United States, 2005-2007

	a (SE)	b (SE)	95% CI of Mediation Effect
Truancy			
Female			
Lesbian	0.25 (0.09)	0.93 (0.06)	0.02, 0.13
Bisexual	0.27 (0.04)	0.93 (0.06)	0.17, 0.34
Unsure	0.17 (0.06)	0.93 (0.06)	0.05, 0.28
Male			
Gay	0.21 (0.07)	0.68 (0.04)	0.05, 0.24
Bisexual	0.48 (0.06)	0.68 (0.04)	0.23, 0.43
Unsure	0.24 (0.06)	0.68 (0.04)	0.08, 0.25
Grades			
Female			
Lesbian	0.38 (0.08)	0.66 (0.05)	0.14, 0.39
Bisexual	0.31 (0.04)	0.66 (0.05)	0.14, 0.27
Unsure	0.20 (0.06)	0.66 (0.05)	0.06, 0.22
Male			
Gay	0.30 (0.06)	0.48 (0.03)	0.08, 0.21
Bisexual	0.41 (0.05)	0.48 (0.03)	0.14, 0.26
Unsure	0.18 (0.06)	0.48 (0.03)	0.03, 0.15

Note. CI = confidence interval.

improve the academic experience and achievement of LGB students.

We note that although victimization is important to school outcomes, other factors besides victimization also impact LGB students' educational outcomes. Factors outside of the measurements in our study may contribute to increased truancy for boys and worse grades for girls. For example, recent research indicates victimization specific to one's LGB status is particularly deleterious to youth well-being.[23,24] As our measure of victimization indicators is not specific to LGB discrimination, we may not be fully capturing the discriminatory dimensions of victimization that are particularly harmful to minorities. Furthermore, other factors beyond school environment—experiences of stigma in the home or neighborhood—may contribute to compromised educational outcomes for LGB individuals. These explanations deserve further study.

In addition to limitations in measurement, 2 other key limitations exist. First, the jurisdictions of the YRBSS that examined sexual identity were limited to 4 cities and 5 states and, therefore, are not representative of a true national population. Additionally, because this is a cross-sectional analysis, it is impossible to absolutely conclude that sexual minority students first experience victimization and then negative outcomes, and not vice versa. Future work should examine this mediational relationship over time in LGB youths.

In summary, using a geographically diverse, population-based sample of 9th through 12th graders, this study confirms previous reports of higher indicators of school victimization and compromised school outcomes among sexual minority youths. Additionally, this analysis suggests that increased victimization experiences mediated the increased rates of truancy and lower academic achievement in LGB youths. Measures to reduce and eliminate school victimization should be a public health priority to promote the well-being of all youths. ∎

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Contributors
M. Birkett conceptualized the idea, as well as contributed to and directed all aspects of the article, including conducting the data analyses. All authors contributed to interpreting the data, editing, and revising the article.

Human Participant Protection
Protocol approval was not necessary because de-identified data were obtained from secondary sources. Data use agreements were obtained from all departments of health which required them for access to YRBS data at the time of the data request, including the Vermont Department of Health and the Rhode Island Department of Health.

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