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Sexual Minority Youth at Risk of Early and Persistent Alcohol, Tobacco, and Marijuana Use

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Abstract

The current study sought to examine substance use disparities among sexual minority youth. The current subsample of 348,175 students participated in the Youth Risk Behavior Surveillance System (YRBSS) study from years 2005 to 2015 (biennially) in jurisdictions that asked at least one question about sexual minority status. Latent class analysis was used to identify implicit classes of sexual minority youth, based on respondents' sexual identity and sexual behavior. Sex-stratified regression models were run to determine the association between class membership and age of onset and persistent use of alcohol, tobacco, and marijuana. Findings showed that sexual minority female subgroups were primarily distinguished by sexual identity (e.g., "lesbian," "bisexual"), whereas sexual minority male subgroups were primarily distinguished by sexual behavior. Female lesbian and bisexual youth were at risk of initiating substance use at younger ages and, among lifetime users, were more likely to persist in their tobacco and marijuana use over time, relative to sexually active female heterosexual youth. Among lifetime users, male youth with partners of both sexes were at greater risk of persistent use of alcohol, tobacco, and marijuana over time and earlier ages of first use. Recommendations for intervention and prevention programs geared toward reducing sexual minority youth substance use are provided.

Keywords

Substance use; Adolescent; Sexual orientation; Sexual behavior; Youth Risk Behavior Surveillance System

Introduction

Population-level data suggest that adolescents who identify as non-heterosexual or who report same-sex sexual attraction or behavior (i.e., sexual minority youth, SMY) may be at greater risk of alcohol and substance misuse (e.g., Fish & Pasley, 2015; Kerr, Ding, & Chaya, 2014; Lowry, Johns, Robin, & Kann, 2017; Marshal, Friedman, Stall, & Thompson, 2009), relative to their heterosexual-identified peers who only report opposite-sex attraction and behavior. Indeed, meta-analytic findings indicate that SMY have increased odds of reporting lifetime and recent alcohol and other drug use relative to their heterosexual counterparts (Marshal et al., 2008).

Previous work with the Youth Risk Behavior Surveillance System (YRBSS), which administers a national high school survey biennially in the U.S., has supported that sexual

orientation-related disparities are apparent, with regard to alcohol use, marijuana use, and cigarette use (e.g., Robin et al., 2002; Talley, Hughes, Aranda, Birkett, & Marshal, 2014; Veliz, Epstein-Ngo, Zdroik, Boyd, & McCabe, 2016). Despite consistent evidence of risk for alcohol, tobacco, and other drug (ATOD) disparities among SMY, previous work has focused on single-item indicators of sexual orientation (e.g., identity, behavior) to examine "snapshots" of youths' substance use behavior. The current work seeks to extend this literature by examining persistent use of ATOD among empirically identified subgroups of SMY.

The most common theoretical explanation for ATOD disparities seen in sexual minority subpopulations is provided by the minority stress framework (Meyer, 1995, 2003). Minority stress theory posits that both internal (i.e., proximal) and external (i.e., distal) sources of minority stress, uniquely experienced by those with marginalized social identities, including SMY, can potentiate the use of ATOD as a means to alleviate associated feelings of distress or sadness (Hatzenbuehler, 2009; Talley & Littlefield, 2014). Other explanations for substance-related disparities in sexual minority subpopulations reinforce the idea that individuals from these populations report using substances as a means for affect regulation, cognitive escapism, or simply due to more permissive norms for ATOD use (see also Hatzenbuehler, Corbin, & Fromme, 2008; McKirnan, Ostrow, & Hope, 1996; Talley & Littlefield, 2014).

Cross-sectional examinations between major facets of sexual orientation (e.g., sexual identity, attraction, behavior) and ATOD outcomes are widespread in the extant literature (e.g., Brewster & Tillman, 2012; Newcomb, Birkett, Corliss, & Mustanski, 2014; Russell, Driscoll & Truong, 2002; Talley et al., 2014). Previous findings also suggest somewhat weaker disparities for substances that are commonly used among adolescents, such as alcohol and marijuana, and relatively stronger disparities with substances that are less commonly used among youth, including tobacco (see Marshal et al., 2008). These major facets of sexual orientation, which are not necessarily considered to be isomorphic with each other, show distinct associations with ATOD outcomes. Indeed, Marshal et al. meta-analytic findings suggested that sexual minority identity status was one of the strongest predictors of adolescent substance use, followed by sexual minority behavior and attraction, respectively. Based on the extant literature, we expected that SMY subgroups which are defined primarily along identity-based dimensions will show the strongest relations with early onset and persistent use of alcohol, tobacco, and marijuana use, whereas those defined along behavior-based dimensions will show relatively weaker associations.

Previous work has also attempted to examine temporal patterns of ATOD use among non-clinical samples of SMY to determine the ways in which patterns of substance use may or may not relate to essential features of one's sexual orientation self-concept over time (e.g., Corliss, Rosario, Wypij, Fisher, & Austin, 2008; McCabe, Hughes, Bostwick, West, & Boyd, 2009; Talley, Sher, & Littlefield, 2010). Findings from such studies have shown that sexual minority individuals generally are at risk of elevated substance use involvement, and that patterns of use fluctuate over time, as do self-reported changes in facets of sexual orientation. Indeed, previous longitudinal work indicates that incongruity across facets of sexual orientation or fluctuations in sexual identity characteristics, may potentiate increased

risk of alcohol and other substance misuse (Talley et al., 2014; Talley, Aranda, Hughes, Everett, & Johnson, 2015). In addition to incongruence among facets of sexual orientation, meta-analytic findings also suggest that merely self-identifying as bisexual or engaging in sexual activity with same-sex persons or both will increase risk of substance misuse, particularly among women (Marshal et al., 2009).

Given that the multitude of comparisons between various observed facets of sexual orientation and substance use outcomes often result in equivocal findings, increasingly, work has attempted to empirically identify homogenous latent subgroups of SMY on the basis of their self-reported sexual orientation self-concept facets (identity, attraction, behavior; e.g., Fergusson, Horwood, Ridder, & Beautrais, 2005; Garnett et al., 2014; Rosario, Schrimshaw, & Hunter, 2008; Talley, Sher, Steinley, Wood, & Littlefield, 2012). Fergusson et al., for example, conducted a latent class analysis of young adults and found three homogeneous groups, which he referred to as “exclusively heterosexual,” “predominately heterosexual,” and “predominately homosexual.” Interestingly, these groups did not differ with regard to prevalence of alcohol use disorder. In contrast, Talley et al. conducted longitudinal latent class analysis, using self-reported sexual identity, sexual attraction, and sexual behavior, to identify four classes of female youth, referred to as “lesbian/bisexual,” “mostly straight,” and “increasingly mostly straight” with a referent cluster composed of women who identified as “exclusively heterosexual” and who only reported opposite-sex attractions and behaviors. Similarly, four classes of male young adults, referred to as “gay/bisexual,” “mostly straight,” “increasingly [sexual] minority,” and “exclusively heterosexual” were distinguished. Women in the “lesbian/bisexual” subgroup were not at elevated risk of alcohol misuse and negative alcohol-related consequences during the first year of college, relative to exclusively heterosexual female youth, but women in the “mostly straight” subgroup were. Moreover, women who increasingly acknowledged same-gender attractions or behaviors, or a sexual minority identity, as college progressed (i.e., “increasingly mostly straight”) were at risk of reporting elevations in negative alcohol-related consequences throughout their undergraduate years. Taken together, results supported the idea that incongruences among facets of sexual orientation, which are believed to occur more commonly among sexually fluid and bisexual individuals (Talley & Stevens, 2015), may more robustly predict risk of ATOD use among SMY. Equivocal findings shown in the extant literature between facets of sexual orientation and risk of ATOD use may reflect idiosyncratic sample characteristics. The current work argues that independent replications of previous findings are necessary to further understand how constellations of sexual orientation facets may predict risk of persistent alcohol, tobacco, and marijuana use in adolescence.

Current Study

The current study utilized latent class analysis (LCA) to identify homogenous groups of sexual minority youth on the basis of two major sexual orientation facets (identity, behavior), using multiple waves of YRBSS data sets to identify disparities with regard to age of initiation and patterns of persistent substance use across time. Male and female youth were analyzed separately given previous research suggesting distinct patterns of sexual identity development and substance use patterns/behaviors on the basis of gender (e.g.,

Marshal et al., 2008; Talley et al., 2012). The primary goal was to develop an empirically derived understanding of subgroups of SMY and examine associations with age of first use, as well as persistent use over time, across a number of substances.

Given previous work suggesting that adolescent females are more likely to self-ascribe a non-heterosexual identity label prior to engagement in same-sex behavior (Savin-Williams & Diamond, 2000), we hypothesized that clusters of female SMY would primarily be defined along lines of sexual self-identification (e.g., “lesbian,” “bisexual”) and be at risk of early and persistent alcohol, tobacco, and marijuana use. By contrast, given previous work suggesting that adolescent males are more likely to engage in same-sex behavior prior to self-labeling with a non-heterosexual identity (Savin-Williams & Diamond, 2000), we hypothesized that male SMY would primarily be defined with regard to sexual behavior and those with partners of both sexes would be at risk of early and persistent alcohol, tobacco, and marijuana use. Finally, given the ubiquitous consumption of alcohol among youth in the U.S., alcohol and marijuana disparities were anticipated to be tenuous, compared to effects for tobacco and marijuana use (see also Marshal et al., 2009).

Method

Sample

The YRBS is a biennial national survey that has been conducted by the Centers for Disease Control and Prevention since 1991 to collect health data on students in grades 9–12 (Brener et al., 2013). The YRBS monitors priority health-related behaviors among youth, such as alcohol use, experiences with violence, suicidal ideation, drug use, sexual behaviors, and eating habits, among others (Kann, 2011). For this study, we used data from local versions of the YRBS, which are administered on a state, large urban school district, or county level by departments of education or health; in this implementation, jurisdictions use a two-stage cluster sample design to identify a sample of students (Brener et al., 2013). In the first stage, schools are selected with a probability proportional to their enrollment; in the second stage, classes of a required subject or during a required period are randomly selected, and all students within these classes are eligible to participate. A new sample is selected in this manner each year that the survey is administered; the same students are not followed over time.

Local YRBS data were pooled across multiple jurisdictions (city and state) and years (biennially from 2005 to 2015). Jurisdictions that asked at least one question about sexual minority status from years 2005 to 2015 were included. The entire dataset consists of 47 jurisdictions across 10 years, and 541,410 adolescents. A total of 114 jurisdiction years assessed sexual identity, and 115 jurisdiction years assessed gender of sexual contact, resulting in a sample size of 98 jurisdiction years assessing both gender of sexual contact and sexual identity. For the present analysis, students were excluded if they were missing any of the sexual orientation variables or primary demographic variables of interest (sexual identity: 12.14%; sexual behavior: 26.39%; race/ethnicity: 2.58%; sex: 0.18%; and age: 0.15%; not mutually exclusive) resulting in a sample size of 348,175 students.

Measures

Sexual Identity—Sexual identity was assessed by a question asking, “Which of the following best describes you?” Response options were “Heterosexual (straight),” “Gay or lesbian,” “Bisexual,” and “Not sure.”

Sexual Behavior—Sexual contact was measured by the question, “During your life, with whom have you had sexual contact?” Students could respond “I have never had sexual contact,” “Females,” “Males,” or “Females and males.” This variable was recoded by combining responses with the students’ reported sex. Students who reported only having sexual contact with individuals of a different sex were identified as “Different sex only.” Students who reported only having sexual contact with individuals of the same sex were coded as “Same sex only.” Finally, students who indicated having sexual contact with both males and females were coded as “Different and same sex.”

Age of onset and persistent use were examined separately for alcohol, tobacco, and marijuana.

Age of Onset

In three separate questions, respondents were asked how old they were when they first had/used alcohol, tobacco, and marijuana. Response options were “Never had/used,” “8 years old or younger,” “9 or 10 years old,” “11 or 12 years old,” “13 or 14 years old,” “15 or 16 years old,” and “17 years old or older.” Students who selected “Never had/used” were set to missing, and age of onset was assessed among users.

Persistence

Two items were used to assess persistent substance use. Respondents were asked about lifetime use and past 30 days use. Students were considered persistent users if they reported any lifetime use as well as any past 30 days use. Students who reported no lifetime use were coded as missing, and persistence was assessed among users.

Demographics

Age—Respondents were asked, “How old are you?” The seven response options ranged from 12 years old or younger to 18 years old or older. Three of the items for age were collapsed into a single category resulting in an age variable with five categories: “14 or younger,” “15 years old,” “16 years old,” “17 years old,” and “18 and older.”

Race/Ethnicity—To assess ethnicity, respondents were asked if they identified as Hispanic or Latino. Additionally, respondents could select all races that applied from the list of “American Indian or Alaska Native,” “Asian,” “Black or African American,” “Native Hawaiian or Other Pacific Islander,” and “White.” Using CDC’s classification, these variables were combined into the following racial/ethnic groups: (1) “American Indian or Alaska Native,” (2) “Asian,” (3) “Black or African American,” (4) “Native Hawaiian/Other Pacific Islander,” (5) “White,” (6) “Hispanic/Latino,” and (7) “Multiple-Non-Hispanic.”

Sex—Respondents were asked to identify their sex with the item “What is your sex?” Response options were “Female” and “Male.”

Statistical Analysis

Latent Class Analysis

LCA was used to identify implicit classes based on respondents’ sexual identity and sexual behavior. This model highlights the set of identified latent classes rather than considering the observed indicators separately as do logistic or linear regression models (McCutcheon, 1987). Input variables for LCA included facets of sexual orientation (identity and behavior) for a total of eight indicators. LCA was conducted separately for females (n = 181,430) and males (n = 166,745). Initially, three-class models were fit and successive models incorporated an increasing number of latent classes to the most parsimonious model that adequately fit the data. Goodness of model fit statistics were examined to compare various models, beginning with those that extracted three classes up to models that extracted six classes. Model fit statistics, including Akaike information criteria (AIC), Bayesian information criteria (BIC), entropy values, and Lo–Mendell–Rubin tests, were examined to determine the best-fitting class solutions (Akaike, 1973; Celeux & Soromenho, 1996; Lo, Mendell, & Rubin, 2001; Schwarz, 1978). We used Mplus version 7.31 (Muthén & Muthén, 1998–2017) to execute analyses because it can accommodate the YRBS’ complex sampling design. The YRBS data weights were adjusted for student non-response and distribution of students by grade, sex, and race/ethnicity in each jurisdiction (Brener et al., 2013).

Regression Analysis

All data cleaning and recoding were conducted in SAS Version 9.4 (SAS Institute, 2013). Analyses were carried out using SAS-Callable SUDAAN Version 11.0.1 (RTI International, Research Triangle Park, NC) to appropriately weight estimates and to account for the complex sampling design of the YRBS.

First, descriptive statistics were calculated for all measures stratified by sex. Next, sex-stratified regression models were run to determine the association between the five latent classes and age of onset and persistence of alcohol, tobacco, and marijuana use. Multivariable logistic models were used to estimate odds of alcohol, tobacco, and marijuana persistence among the latent classes. The class containing heterosexual students with different-sex partners was the reference group. To investigate the association between age of onset and persistence of substance use between the five latent classes, linear regressions were used. All models adjusted for age and race/ethnicity.

Results

Sample descriptive statistics are provided in Table 1. As shown, data from 181,430 female and 166,745 male youth were available across waves of the YRBS. The racial and ethnic makeup of the female and male subsamples was approximately equivalent, with almost half of respondents identifying as White and a quarter identifying as Hispanic/Latino. Sizable proportions of Black/African-American and Multiracial youth are also represented. Approximately a quarter of respondents were 15 years of age, a quarter were 16, and a

quarter were 17 at the time of survey completion, suggesting a relatively even distribution of youth at various ages in adolescence.

Latent class analysis was conducted separately in the female and male subsamples, among participants who indicated a non-heterosexual sexual identity or a history of same-sex behavior. Individuals who self-identified as heterosexual and only reported sexual contact with different-sex partners were not included in the LCA and were preassigned to a class labeled, Heterosexual with Different-sex Partners. Similarly, individuals who self-identified as heterosexual and reported no history of sexual contact were not included in LCA and were preassigned to a class labeled, Heterosexual Virgins. Goodness of model fit statistics were examined to compare various models, beginning with those that extracted three classes up to models that extracted six classes. Among both female and male youth, a three-class solution was shown to (1) appropriately distinguish classes based on behavior and identity, as indicated by Entropy values (Female, 3-class Entropy: 1.00; Male, 3-class Entropy: 1.00) and (2) improve overall fit to the observed data, as indicated by nested model comparisons. Sensitivity analyses were conducted to compare these current results with mixture model solutions that included heterosexual-identified youth who reported only different-sex partners or who had not yet had sexual contact; the empirically identified clusters of SMY were replicated (available upon request).

The proportion of youth falling into each class is provided in Table 2, separated by youth's self-identified sex. The known classes were made up of youth who identified as heterosexual and had only reported different-sex partners and youth who identified as heterosexual but had not yet engaged in sexual activity. Close to 38% of youth were classified into the group of Female Heterosexual with Different-Sex Partners, and 44% of youth were classified as Female Heterosexual Virgins. By contrast, close to 49% of male youth were classified as Male Heterosexual with Different-Sex Partners, and 42% of male youth were classified as Male Heterosexual Virgins.

With regard to sexual minority subgroups, empirically identified by LCA, female youth were mostly distinguishable on the basis of their self-labeled sexual identity. Specifically, all of the female youth in Class 1 indicated they were "Not Sure" of their sexual identity. Among female youth "Not Sure" of their sexual identity, approximately half were likely to report being virgins (57%), with close to a quarter reporting a history of different-sex partners (24%), and smaller proportions reporting partners of the same-sex (3%) or both sexes (16%). This class will be referred to as the Female Unsure Identity class (4.6% of female youth). Another class included primarily lesbian-identified female youth (39%), with a majority of youth in this class reporting only same-sex partners (40%) or partners of both sexes (45%). This class will be referred to as the Female Lesbian Identity with Same-Sex Partners class (4.7% of female youth). Finally, bisexual-identified female youth comprised the remaining class, with a large proportion reporting partners of both sexes (42%) and smaller proportions reporting either only different-sex partners (22%) or no lifetime sexual activity (29%). This class will be referred to as the Female Bisexual Identity class (8.7% of female youth).

Among male youth, as anticipated, sexual minority classes identified by LCA were mostly distinguishable on the basis of sexual behavior. For example, all of the male youth in Class 1

indicated they had sexual contact with partners of both sexes; whereas the distribution of self-identifications in this class was primarily “Bisexual” (40%) or “Heterosexual” (28%). This class will be referred to as Males with Partners of Both Sexes (2.0% of male youth). Class 2 includes men who have only had sex with other men; male youth in this class identify as “Gay” (40%) or “Heterosexual” (37%). Male youth in this class will be referred to as Males with Only Same-Sex Partners (2.1% of male youth). Finally, the last class was primarily made up of virgins (63%) who self-identified as either “Not Sure” (47%), “Bisexual” (32%), or “Gay” (22%)—called Male Sexual Minority Virgins (4.4% of male youth).

We outputted the most likely class probability for each respondent in the data set, and then used empirically identified or known class membership to examine age of first use and persistent use of ATOD among adolescents. As stated earlier, we sought to examine outcomes related to alcohol, tobacco, and marijuana use among youth based on sexual minority class membership. For each substance, we examined age of onset and persistence in use over time, including recent use in the past-month. This latter outcome is intended to serve as a severity indicator, to highlight homogenous groups who are at risk of both initiation and maintenance of substance-related behavior over time. Percentages of endorsement of various substance-related outcomes are contained in Table 1, presented separately for female and male youth. All subsequent analyses adjusted estimates for youths’ race/ethnicity and age at the time of the survey.

Female Youth Substance Use

Alcohol Use Outcomes

Age of Onset: Compared to youth in the Female Heterosexuals with Different-Sex Partners class, all sexual minority female subgroups reported a lower age of first alcohol use (see Table 3).

Persistence in Alcohol Use: Among female youth who had reported a history of alcohol use, Female Heterosexual Virgins were at lower risk of reporting persistent use of alcohol over time, relative to Female Heterosexuals with Different-Sex Partners, OR = 0.43, SE = .09, 95% CI (0.36, 0.52), $p < .001$. No other comparisons were significant, suggesting that subgroups of female SMY are not at greater risk of reporting persistent use of alcohol over time, compared to sexually active, heterosexual female youth.

Tobacco Use Outcomes

Age of Onset: Compared to Female Heterosexuals with Different-Sex Partners, all other classes of female youth reported a lower age of tobacco use onset (see Table 3).

Persistence in Tobacco Use: Among female youth who had reported a history of tobacco use, those in the Female Lesbian Identity with Same-Sex Partners were more likely to persist in their tobacco use over time, compared to Female Heterosexuals with Opposite-Sex Partners, OR = 1.52, SE = .13, 95% CI (1.18, 1.96), $p < .001$.

Similarly, those in the Female Bisexual Identity class were at greater risk of persistent tobacco use, compared to Female Heterosexuals with Different-Sex Partners, OR = 1.97, SE = .17, 95% CI (1.43, 2.73), $p < .001$. Finally, youth in the Female Heterosexual Virgins subgroup were at lower risk of endorsing persistent tobacco use, compared to Female Heterosexuals with Different-Sex Partners, OR = 0.40, SE = .13, 95% CI (0.31, 0.51), $p < .001$.

Marijuana Use Outcomes

Age of Onset: Compared to Female Heterosexuals with Different-Sex Partners, all other classes of female youth, except Female Heterosexual Virgins, reported a lower age of marijuana use onset (see Table 3).

Persistence in Marijuana Use: Among female youth who had reported a history of marijuana use, those in the Female Lesbian Identity with Same-Sex Partners were more likely to persist in their marijuana use over time than Female Heterosexuals with Different-Sex Partners, OR = 1.30, SE = .07, 95% CI (1.13, 1.51), $p < .001$.

Similarly, those in the Female Bisexual Identity subgroup were at greater risk of persistent marijuana use, compared to Female Heterosexuals with Different-Sex Partners, OR = 1.54, SE = .10, 95% CI (1.27, 1.87), $p < .001$. Finally, youth in the Female Heterosexual Virgins and Female Unsure Identity subgroups were both at lower risk of endorsing persistent marijuana use, compared to Female Heterosexuals with Different-Sex Partners, OR = 0.18, SE = .06, 95% CI (0.16, 0.20), $p < .001$ and, OR = 0.56, SE = .12, 95% CI (0.44, 0.71), $p < .001$, respectively.

Male Youth Substance Use

Alcohol Use Outcomes

Age of Onset: Compared to Male Heterosexuals with Different-Sex Partners, Males with Partners of Both Sexes, $\beta = -0.76$, SE = .06, 95% CI (− 1.00, − 0.53), $p < .001$, reported a younger age of alcohol use onset (see Table 4).

Persistence in Alcohol Use: Among male youth who had reported a history of alcohol use, those in the Males with Partners of Both Sexes class were at greater risk of endorsing persistent use of alcohol over time, compared to Male Heterosexuals with Different-Sex Partners, OR = 1.95, SE = .22, 95% CI (1.26, 3.01), $p = .003$. By contrast, youth in the Male Heterosexual Virgins class, OR = 0.35, SE = .08, 95% CI (0.30, 0.42), $p < .001$, and in the Male Sexual Minority Virgins class, OR = 0.42, SE = .15, 95% CI (0.31, 0.56), $p < .001$, were at lower risk of endorsing persistent use of alcohol, compared to Male Heterosexuals with Different-Sex Partners. No other comparisons were significant, suggesting that, as with female SMY, Males with Only Same-Sex Partners were not at greater risk of reporting persistent use of alcohol over time, compared to sexually active male youth who identify as heterosexual.

Tobacco Use Outcomes

Age of Onset: Among male youth, compared to Male Heterosexuals with Different-Sex Partners, those in the Males with Partners of Both Sexes class, β = − 0.67, SE = .12, 95% CI (− 0.91, − 0.44), p < .001, and Male Sexual Minority Virgins class, β = − 0.42, SE = .15, 95% CI (− 0.72, − 0.11), p = .006, reported a lower age of tobacco use onset (see Table 4).

Persistence in Tobacco Use: Among male youth who had reported a history of tobacco use, those in the Males with Partners of Both Sexes class were more likely to persist in their tobacco use over time, relative to Male Heterosexuals with Different-Sex Partners, OR = 2.69, SE = .26, 95% CI (1.60, 4.52), p < .001. Finally, youth in the Male Heterosexual Virgins class were at lower risk of endorsing persistent tobacco use, compared to Male Heterosexuals with Different-Sex Partners, OR = 0.36, SE = .16, 95% CI (0.27, 0.49), p < .001.

Marijuana Use Outcomes

Age of Onset: Compared to Male Heterosexuals with Different-Sex Partners, those in the Males with Partners of Both Sexes class, β = − 0.48, SE = .10, 95% CI (− 0.68, − 0.29), p < .001, reported a younger age of marijuana use onset, whereas those in the Male Heterosexual Virgins class reported an older age of onset, β = 0.22, SE = .05, 95% CI (0.13, 0.31), p < .001 (Table 4).

Persistence in Marijuana Use: Among male youth who had reported a history of marijuana use, those in the Males with Partners of Both Sexes class were more likely to persist in their marijuana use over time, compared to Male Heterosexuals with Different-Sex Partners, OR = 2.27, SE = .24, 95% CI (1.43, 3.61), p < .001. Finally, youth in the Male Heterosexual Virgins class were at lower risk of endorsing persistent marijuana use, compared to Male Heterosexuals with Different-Sex Partners, OR= 0.61, SE =.12, 95% CI (0.49, 0.76), p < .001.

Discussion

Findings highlight the importance of self-identification as a lesbian or bisexual for the early initiation and persistent use of tobacco and marijuana among female SMY, as well as the importance of engaging in sexual behavior with both sexes for the early initiation and persistent use of substances among male youth. Female SMY in the YRBSS data were clearly empirically identified on the basis of sexual identity, with varying endorsements of sexual behavior across identity groups. By contrast, male SMY in the YRBSS data were clearly defined on the basis of their sexual behavior, with varying endorsements of sexual identity across behavior groups. These findings are consistent with the sexual identity development literatures that suggest sexual minority males often engage in same-sex sexual behavior prior to self-labeling as gay (Savin-Williams & Diamond, 2000), whereas sexual minority females often self-label with a non-heterosexual minority identity prior to engaging in same-sex sexual behavior in adolescence (Savin-Williams & Diamond, 2000).

Regardless of gender, we expected that youth who identified as bisexual or who reported partners of both sexes would be at greatest risk of early and persistent alcohol, tobacco, and marijuana use (Marshal et al., 2008). Female youth who identified as bisexual or lesbian were at heightened risk of reporting persistent tobacco and marijuana use over time, compared to their sexually active heterosexual counterparts. Among male youth, those reporting partners of both sexes were at risk of reporting tobacco and marijuana use disparities with regard to age of first use as well as more persistent alcohol, tobacco, and marijuana use over time. These results are generally consistent with previous findings, suggesting relatively weaker effects for substances more commonly used among adolescents, such as alcohol, and relatively stronger effects for substances less commonly used among youth, such as tobacco (see Marshal et al., 2008). The extant literature affirms that bisexual youth often face prejudice from both their heterosexual and gay/lesbian peers (D'Augelli, Pilkington, & Hershberger, 2002; DuRant, Krowchuk, & Sinal, 1998; Rivers & D'Augelli, 2001; Savin-Williams, 1994) and report incongruence among facets of their sexual orientation (Talley & Stevens, 2015; see also Talley et al., 2014, 2015), which may exacerbate their risk of using substances in adolescence. Nevertheless, because the YRBSS questionnaires do not include assessments of anti-bisexual prejudice or sexual self-concept ambiguity, we were unable to test this supposition with the current data. This hypothesis, regarding bisexual subgroup disparities, will be key for future work in this area (Ross et al., 2018).

Notably and consistent with other work in the SMY literature (Ford & Jasinski, 2006; Kerr et al., 2014; Rhodes, McCoy, Hergenrather, Omli, & DuRant, 2007; Robin et al., 2002; Schauer, Berg, & Bryant, 2013), findings suggest that male youth with a history of only same-sex partners generally initiate substance use at commensurate ages and are at equal risk of reporting persistent, recent substance use over time as sexually active male youth who identify as heterosexual. This is in direct contrast to findings from female SMY in which self-identified lesbian and bisexual youth were both at risk of early and persistent ATOD use. Notably, although a sizable subset of bisexual- and lesbian-identified female SMY reported both same- and opposite-sex partners, findings suggest that female sexual identity development and self-identification as non-heterosexual may be more intimately tied to risk for early and persistent ATOD use than it is for male youth.

Across analyses, virgins were at lowest risk of persistence in substance use disparities, suggesting that desistence of substance use over time is likely for non-sexually active heterosexual and SMY. It may be the case that accessibility to substances and parental monitoring behaviors are more proximal predictors of substance use initiation and maintenance among adolescents with no reported history of sexual behavior (Beck, Boyle, & Boekeloo, 2004; Boislard & Poulin, 2011). Nevertheless, additional work is needed in this area to better understand protective factors for substance use behavior among adolescents who are not yet sexually active, regardless of their sexual self-identification.

Limitations to the current research are notable. First, persistence in ATOD use was coded based on reported lifetime use and reported recent use in the month prior to the survey. Thus, we have little information on whether the respondents were consistently consuming substances throughout the relevant reporting period. Second, the empirical identification of

latent clusters is always dependent on the sample from which the solutions are derived. It is unclear whether these same homogenous clusters of SMY would be identified across all jurisdictions in the U.S. Although clusters were hypothesized to align with gender differences in sexual identity development, results may not be expected to generalize beyond the jurisdictions where questions regarding sexual orientation were included in YRBSS surveys. Nevertheless, given that YRBSS data were culled from a national, cross-sectional sample of youth, findings are expected to be relatively reflective of the general population of U.S. adolescents. Ultimately, cluster-based approaches can improve our understanding of homogenous patterns of sexual orientation identity development among youth in adolescence and refine the literature that informs intervention and prevention efforts. Finally, population-based studies are necessarily limited by depth of questioning that may be adequately incorporated into the study protocol. However, epidemiological data may point to fruitful avenues for public health efforts that seek to provide interventions for sizable subpopulations that appear to be most at risk of substance misuse in adolescence.

Conclusions

Findings suggest that young girls who self-identify as lesbian or bisexual are at risk of initiating substance use at younger ages and, among lifetime users, are also more likely to persist in their smoking behavior (i.e., tobacco and marijuana use) over time relative to sexually active heterosexual girls. Findings also suggest that male youths' sexual behavior may provide the best indicator of risk for earlier initiation of smoking behavior. Specifically, among lifetime users, boys who report sexual partners of both sexes are more likely to persist in their substance use over time. These findings are essential for advancing intervention efforts and early identification of SMY adolescents at risk of problems with substance use.

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Table 1.

Characteristics of Students, 2005–2015 pooled YRBS, by sex (N=348,175).

	Females (n=181,430)		Males (n=166,745)	
Variable	**#**	**%**	**#**	**%**
Demographics:				
LCA Group				
Class 1	7168	4.6	69339	42.35
Class 2	9325	4.71	82286	49.09
Class 3	67376	37.94	3667	1.98
Class 4	81525	44.07	3899	2.14
Class 5	16036	8.67	7554	4.43
Race/Ethnicity				
American Indian/Alaskan Native	2518	0.96	2896	1.19
Asian	12070	5.6	11882	5.98
Black	31398	15.02	26976	13.92
Hispanic/Latino	46235	26.73	41399	26.55
Native Hawaiian/Other Pacific Islander	2869	0.77	2833	0.88
White	77463	47.5	73473	48.44
Multiple Races	8877	3.44	7286	3.05
Age (years)				
14 or younger	31316	13.24	26150	11.77
15	47349	26.15	41883	25.5
16	46654	25	42860	25.04
17	40396	23.26	37842	23.31
18 or older	15715	12.35	18010	14.38
Tobacco Use:				
Age of Onset				
8 or younger	2486	5.71	4458	9.52
9 or 10	2530	5.86	3122	8.3
11 or 12	5742	16.1	5880	14.83
13 or 14	12575	33.61	10934	30.5
15 or 16	9938	29.89	9327	27.96
17 or younger	2151	8.84	2566	8.89
Persistence				
Yes	10724	30.63	11279	35.2
No	25776	69.37	22732	64.8
Frequency				
0 days	157842	90.63	139738	88.0
1 or 2 days	5877	3.31	5290	3.81
3 to 5 days	2719	1.47	2666	1.79
6 to 9 days	1684	1.00	1860	1.2
10 to 19 days	1842	0.91	2058	1.29

Variable	Females (n=181,430) #	Females (n=181,430) %	Males (n=166,745) #	Males (n=166,745) %
20 to 29 days	1433	0.8	1684	1.07
All 30 days	3687	1.88	4993	2.86
Alcohol Use:				
Age of Onset				
8 or younger	7637	6.68	10958	10.44
9 or 10	6603	5.38	7825	7.96
11 or 12	14365	12.12	13629	13.75
13 or 14	38090	35.46	28769	31.86
15 or 16	32388	33.7	24345	29.69
17 or younger	5169	6.65	4566	6.3
Persistence				
Yes	32788	52.88	27085	52.44
No	28136	47.12	23738	47.56
Frequency				
0 days	113543	66.97	106456	69.74
1 or 2 days	31666	18.74	22513	14.61
3 to 5 days	12889	7.77	11177	7.27
6 to 9 days	6311	3.68	6289	4.35
10 to 19 days	3168	2.02	3637	2.51
20 to 29 days	743	0.45	934	0.58
All 30 days	717	0.36	1877	0.93
Marijuana Use:				
Age of Onset				
8 or younger	1532	2.27	3923	5.18
9 or 10	1864	2.28	3441	4.88
11 or 12	7237	10.53	9147	14.06
13 or 14	25362	39.18	23213	37.83
15 or 16	22421	37.73	18151	30.92
17 or younger	3630	8.02	3200	7.13
Persistence				
Yes	23091	54.43	24740	58.54
No	19462	45.57	17022	41.46
Frequency				
0 times	144421	80.4	125738	77.65
1 or 2 times	13786	8.13	10447	6.66
3 to 9 times	9021	5.27	8449	5.23
10 to 19 times	4211	2.42	4963	2.96
20 to 39 times	2678	1.56	3917	2.35
40 or more times	4119	2.22	8396	5.15

Unweighted frequencies (#) are provided; percent (%) reflect adjusted sampling weights

Table 2.

Latent class analysis results, 2005–2009 pooled YRBS dataset, by sex (N=348,175).

	Females (n=181,430)					Males (n=166,745)				
	Results in Probability Scale									
	Class 1	**Class 2**	**Class 3**	**Class 4**	**Class 5**	**Class 1**	**Class 2**	**Class 3**	**Class 4**	**Class 5**
Sexual identity										
Heterosexual	0	0.607	1	1	0	1	1	0.281	0.374	0
Gay/Lesbian	0	0.393	0	0	0	0	0	0.126	0.400	0.221
Bisexual	0	0	0	0	1	0	0	0.401	0.144	0.323
Not Sure	1	0	0	0	0	0	0	0.193	0.081	0.456
Sexual behavior										
No Sex	0.565	0.109	0	1	0.290	1	0	0	0	0.632
Same Only	0.029	0.403	0	0	0.067	0	0	0	1	0
Both Sexes	0.162	0.453	0	0	0.420	0	0	1	0	0
Different Only	0.243	0.034	1	0	0.222	0	1	0	0	0.368
Model Fit										
AIC	617228.286					433769.699				
BIC	617674.0810					434212.09				
Entropy	0.996					1.00				
Lo-Mendell-Rubin	0.0125					<0.001				

Table 3.

Association between latent classes and substance use age of onset, persistence, and frequency in female youth 2005–2015 pooled YRBS (n=181,430).

	Age of Onset				Persistence				
Parameters	**β**	**95% CI**	**SE**	**p-value**	**β**	**SE**	**p-value**	**OR**	**95% CI**
	Alcohol Use								
LCA Group									
Class 1: Unsure Identity	**−0.59**	**(−0.74, −0.45)**	**0.08**	**<0.001**	−0.23	0.18	0.2072	0.8	(0.56, 1.13)
Class 2: Lesbian with Same-Sex Partners	**−0.49**	**(−0.61, −0.38)**	**0.06**	**<0.001**	0.00	0.13	0.9764	1.00	(0.77, 1.131)
Class 3: Heterosexual with Different-Sex Partners				1.00					1.00
Class 4: Heterosexual Virgins	**−0.17**	**(−0.22, −0.11)**	**0.03**	**<0.001**	**−0.84**	**0.09**	**<0.001**	**0.43**	**(0.36, 0.52)**
Class 5: Bisexual Identity	**−0.46**	**(−0.57, −0.34)**	**0.06**	**<0.001**	−0.01	0.11	0.9037	0.99	(0.79, 1.23)
Race/Ethnicity									
American Indian/Alaskan Native	**−0.26**	**(−0.42, −0.10)**	**0.08**	**0.0018**	−0.3	0.23	0.1846	0.74	(0.47, 1.15)
Asian	0.12	(−0.24, 0.47)	0.18	0.5237	**−0.64**	**0.23**	**0.0047**	**0.53**	**(0.34, 0.82)**
Black	**−0.20**	**(−0.27, −0.12)**	**0.04**	**<0.001**	**−0.25**	**0.08**	**0.0016**	**0.78**	**(0.67, 0.91)**
Hispanic/Latino	**−0.21**	**(−0.30, −0.13)**	**0.04**	**<0.001**	0.09	0.11	0.4319	1.09	(0.87, 1.37)
Native Hawaiian/Other Pacific Islander	−0.04	(−0.38, 0.30)	0.17	0.8176	−0.49	0.47	0.292	0.61	(0.24, 1.53)
White				1.00					1.00
Multiple Races	**−0.17**	**(−0.33, −0.01)**	**0.08**	**0.0389**	−0.13	0.17	0.449	0.88	(0.63, 1.22)
Age									
14 or younger					−0.16	0.15	0.281	0.85	(0.63, 1.14)
15					−0.08	0.13	0.5223	0.92	(0.71, 1.19)
16					−0.08	0.14	0.5459	0.93	(0.72, 1.19)
17					−0.01	0.14	0.5459	0.99	(0.76, 1.30)
18 or older									
	Tobacco Use								
LCA Group									
Class 1: Unsure Identity	**−0.61**	**(−0.83, −0.39)**	**0.11**	**<0.001**	0.17	0.22	0.4387	1.18	(0.77, 1.81)
Class 2: Lesbian with Same-Sex Partners	**−0.36**	**(−0.53, −0.19)**	**0.09**	**<0.001**	**0.42**	**0.13**	**0.001**	**1.52**	**(1.18, 1.96)**

	Age of Onset				Persistence				
Parameters	**β**	**95% CI**	**SE**	**p-value**	**β**	**SE**	**p-value**	**OR**	**95% CI**
Class 3: Heterosexual with Different-Sex Partners				1.00					1.00
Class 4: Heterosexual Virgins	**−0.35**	**(−0.49, −0.22)**	**0.07**	**<0.001**	**−0.92**	**0.13**	**<0.001**	**0.4**	**(0.31, 0.51)**
Class 5: Bisexual Identity	**−0.48**	**(−0.63, −0.33)**	**0.08**	**<0.0001**	**0.68**	**0.17**	**<0.001**	**1.97**	**(1.43, 2.73)**
Race/Ethnicity									
American Indian/Alaskan Native	−0.24	(−0.68, 0.19)	0.22	0.2689	0.15	0.42	0.7151	1.17	(0.51, 2.65)
Asian	0.15	(−0.23, 0.52)	0.19	0.4392	**−0.83**	**0.19**	**<0.001**	**0.44**	**(0.30,0.64)**
Black	**−0.44**	**(−0.59, −0.29)**	**0.08**	**<0.001**	**−1.58**	**0.12**	**<0.001**	**0.21**	**(0.16, 0.26)**
Hispanic/Latino	−0.08	(−0.22, 0.05)	0.07	0.2366	**−0.76**	**0.12**	**<0.001**	**0.47**	**(0.37, 0.59)**
Native Hawaiian/Other Pacific Islander	**−0.96**	**(−1.59, −0.32)**	**0.32**	**0.0032**	−0.71	0.38	0.0602	0.49	(0.24, 1.03)
White				1.00					1.00
Multiple Races	**−0.33**	**(−0.49, −0.16)**	**0.08**	**0.0001**	**−0.42**	**0.15**	**0.0059**	**0.65**	**(0.48, 0.88)**
Age									
14 or younger					0.18	0.19	0.3402	1.2	(0.83, 1.73)
15					−0.11	0.15	0.4802	0.9	(0.66, 1.21)
16					−0.21	0.13	0.1032	0.81	(0.63, 1.04)
17					−0.25	0.16	0.1047	0.78	(0.57, 1.05)
18 or older									1.00
	Marijuana Use								
LCA Group									
Class 1: Unsure Identity	**−0.32**	**(−0.46, −0.18)**	**0.07**	**<0.001**	−0.04	0.17	0.8333	0.97	(0.69, 1.34)
Class 2: Lesbian with Same-Sex Partners	**−0.41**	**(−0.53, −0.29)**	**0.06**	**<0.001**	**0.27**	**0.12**	**0.0197**	**1.31**	**(1.04, 1.65)**
Class 3: Heterosexual with Different-Sex Partners				1.00					1.00
Class 4: Heterosexual Virgins	0.01	(−0.08, 0.11)	0.05	0.7938	**−0.44**	**0.08**	**<0.001**	**0.64**	**(0.55, 0.75)**
Class 5: Bisexual Identity	**−0.37**	**(−0.47, −0.28)**	**0.05**	**<0.001**	**0.43**	**0.1**	**<0.001**	**1.53**	**(1.25, 1.87)**
Race/Ethnicity									
American Indian/Alaskan Native	**−0.40**	**(−0.56, −0.23)**	**0.09**	**<0.001**	−0.20	0.28	0.4639	0.82	(0.47, 1.41)
Asian	**0.34**	**(0.02, 0.65)**	**0.16**	**0.035**	−0.18	0.38	0.6386	0.84	(0.40, 1.76)

	Age of Onset				Persistence				
Parameters	**β**	**95% CI**	**SE**	**p-value**	**β**	**SE**	**p-value**	**OR**	**95% CI**
Black	−0.05	(−0.11, 0.01)	0.03	0.1316	**−0.20**	**0.1**	**0.0498**	**0.81**	**(0.66, 1.00)**
Hispanic/Latino	**−0.20**	**(−0.31, −0.10)**	**0.06**	**0.0002**	−0.14	0.09	0.1358	0.87	(0.73, 1.04)
Native Hawaiian/Other Pacific Islander	−0.19	(−0.57, 0.20)	0.2	0.3492	−0.69	0.45	0.1276	0.5	(0.21, 1.22)
White				1.00					1.00
Multiple Races	**−0.18**	**(−0.36, −0.01)**	**0.09**	**0.0405**	0.04	0.19	0.8356	1.04	(0.72, 1.51)
Age									
14 or younger					**0.55**	**0.16**	**0.0006**	**1.73**	**(1.26, 2.36)**
15					0.21	0.12	0.0778	1.23	(0.98, 1.54)
16					0.09	0.1	0.3606	1.09	(0.90, 1.33)
17					0.04	0.12	0.729	1.04	(0.83, 1.31)
18 or older									1.00

[a] Bold text is used to denote statistically significant effects, $p < .05$.

Table 4.

Association between latent classes and substance use age of onset, persistence, and frequency in male youth 2005–2015 pooled YRBS (n=166,745).

	Age of Onset				Persistence				
Parameters	**β**	**95% CI**	**SE**	**p-value**	**β**	**SE**	**p-value**	**OR**	**95% CI**
				Alcohol Use					
LCA Group									
Class 1: Heterosexual Virgins	0.05	(−0.06, 0.17)	0.09	0.2557	**−1.04**	**0.08**	**<0.001**	**0.35**	**(0.30, 0.42)**
Class 2: Heterosexual with Different-Sex Partners				1.00					1.00
Class 3: Partners of Both Sexes	**−0.76**	**(−1.00, −0.53)**	**0.06**	**<0.001**	**0.67**	**0.22**	**0.0027**	**1.95**	**(1.26, 3.01)**
Class 4: Only Same-Sex Partners	**−0.19**	**(−0.40, 0.02)**	**0.06**	**<0.001**	0.15	0.24	0.5263	1.16	(0.73, 1.87)
Class 5: Sexual Minority Virgins	−0.40	(−0.58, −0.22)	0.08	0.6856	**−0.87**	**0.15**	**<0.001**	**0.42**	**(0.31, 0.56)**
Race/Ethnicity									
American Indian/Alaskan Native	**−0.26**	**(−0.47, −0.11)**	**0.08**	**0.0018**	**−0.87**	**0.32**	**0.0061**	**0.42**	**(0.23, 0.78)**
Asian	0.12	(−0.52, 0.26)	0.18	0.5237	**−0.44**	**0.19**	**0.0215**	**0.64**	**(0.44, 0.94)**
Black	**−0.20**	**(−0.39, −0.20)**	**0.04**	**<0.001**	**−0.6**	**0.11**	**<0.001**	**0.55**	**(0.44, 0.69)**
Hispanic/Latino	**−0.21**	**(−0.35, −0.07)**	**0.04**	**<0.001**	−0.27	0.21	0.1973	0.76	(0.51, 1.15)
Native Hawaiian/Other Pacific Islander	−0.04	(−0.44, 0.26)	0.17	0.8176	−0.06	0.37	0.8624	0.94	(0.45, 1.94)
White				1.00					1.00
Multiple Races	**−0.17**	**(−0.40, −0.05)**	**0.08**	**0.0389**	−0.13	0.17	0.8624	0.87	(0.63, 1.22)
Age									
14 or younger					**−0.54**	**0.18**	**0.0023**	**0.58**	**(0.41, 0.82)**
15					**−0.48**	**0.15**	**0.0019**	**0.62**	**(0.46, 0.84)**
16					**−0.30**	**0.13**	**0.0259**	**0.74**	**(0.57, 0.96)**
17					−0.14	0.14	0.2996	0.87	(0.67, 1.13)
18 or older									
				Tobacco Use					
LCA Group									
Class 1: Heterosexual Virgins	0.03	(−0.18, 0.23)	0.1	0.8034	**−1.02**	**0.16**	**<0.001**	**0.36**	**(0.27, 0.49)**
Class 2: Heterosexual with Different-Sex Partners				1.00					1.00

	Age of Onset				Persistence				
Parameters	**β**	**95% CI**	**SE**	**p-value**	**β**	**SE**	**p-value**	**OR**	**95% CI**
Class 3: Partners of Both Sexes	**−0.67**	**(−0.91, −0.44)**	**0.12**	**<0.001**	**0.99**	**0.26**	**0.0002**	**2.69**	**(1.60, 4.52)**
Class 4: Only Same-Sex Partners	−0.02	(−0.27, 0.23)	0.13	0.8719	0.07	0.2	0.7352	1.07	(0.72, 1.59)
Class 5: Sexual Minority Virgins	**−0.42**	**(−0.72, −0.112)**	**0.15**	**0.0059**	0.06	0.15	0.6815	1.07	(0.79, 1.44)
Race/Ethnicity									
American Indian/Alaskan Native	**−0.32**	**(−0.59, −0.05)**	**0.14**	**0.0217**	−0.13	0.23	0.5715	0.88	(0.57, 1.37)
Asian	−0.38	(−1.40, 0.65)	0.52	0.4714	−0.58	0.33	0.0826	0.56	(0.29, 1.08)
Black	**−0.32**	**(−0.46, −0.18)**	**0.07**	**<0.001**	**−0.92**	**0.13**	**<0.001**	**0.4**	**(0.31, 0.52)**
Hispanic/Latino	−0.01	(−0.15, 0.13)	0.07	0.8703	**−0.49**	**0.11**	**<0.001**	**0.61**	**(0.50, 0.75)**
Native Hawaiian/Other Pacific Islander	0.22	(−0.46, 0.91)	0.35	0.524	−0.32	0.4	0.4231	0.72	(0.33, 1.60)
White				1.00					1.00
Multiple Races	−0.24	(−0.50, 0.03)	0.13	0.0791	−0.34	0.22	0.1117	0.71	(0.46, 1.08)
Age									
14 or younger					**−0.61**	**0.19**	**0.0011**	**0.54**	**(0.38, 0.78)**
15					**−0.66**	**0.14**	**<0.001**	**0.52**	**(0.40, 0.68)**
16					**−0.45**	**0.12**	**0.0002**	**0.64**	**(0.51, 0.81)**
17					**−0.39**	**0.13**	**0.0027**	**0.68**	**(0.52, 0.87)**
18 or older									1.00
	Marijuana Use								
LCA Group									
Class 1: Heterosexual Virgins	**0.22**	**(0.13, 0.31)**	**0.05**	**<0.001**	**−0.5**	**0.12**	**<0.001**	**0.61**	**(0.49, 0.76)**
Class 2: Heterosexual with Different-Sex Partners				1.00					1.00
Class 3: Partners of Both Sexes	**−0.48**	**(−0.68, −0.29)**	**0.1**	**<0.001**	**0.82**	**0.24**	**0.0005**	**2.27**	**(1.43, 3.61)**
Class 4: Only Same-Sex Partners	−0.21	(−0.53, 0.10)	0.16	0.1764	0.18	0.18	0.3254	1.2	(0.84, 1.71)
Class 5: Sexual Minority Virgins	−0.22	(−0.45, 0.01)	0.12	0.0638	−0.08	0.14	0.5523	0.92	(0.69, 1.22)
Race/Ethnicity									
American Indian/Alaskan Native	**−0.79**	**(−1.33, −0.25)**	**0.28**	**0.0044**	0.32	0.26	0.2266	1.38	(0.82, 2.32)
Asian	**0.30**	**(0.00, 0.59)**	**0.15**	**0.0481**	−0.18	0.39	0.6514	0.84	(0.39, 1.80)

	Age of Onset				Persistence				
Parameters	**β**	**95% CI**	**SE**	**p-value**	**β**	**SE**	**p-value**	**OR**	**95% CI**
Black	**−0.30**	**(−0.37, −0.22)**	**0.04**	**<0.001**	−0.01	0.08	0.9266	0.99	(0.85, 1.16)
Hispanic/Latino	**−0.21**	**(−0.32, −0.11)**	**0.05**	**0.0001**	−0.2	0.12	0.1175	0.82	(0.64, 1.05)
Native Hawaiian/Other Pacific Islander	0.07	(−0.37, 0.52)	0.23	0.7486	**0.61**	**0.24**	**0.0119**	**1.85**	**(1.15, 2.98)**
White				1.00					1.00
Multiple Races	**−0.26**	**(−0.45, −0.06)**	**0.10**	**0.0109**	−0.1	0.19	0.5994	0.9	(0.62, 1.31)
Age									
14 or younger					−0.08	0.24	0.7428	0.92	(0.58, 1.48)
15					−0.04	0.17	0.7935	0.96	(0.69, 1.33)
16					0.08	0.19	0.695	1.08	(0.74, 1.58)
17					0.08	0.18	0.6648	1.08	(0.76, 1.52)
18 or older									1.00

[a]Bold text is used to denote statistically significant effects, $p < .05$.