



# Mate Choice, Exposure to Violence, Victimization, and Substance Use: A Comparison of Heterosexual and Sexual Minority Experiences

Patrick Seffrin<sup>1</sup> · Joseph Teeple<sup>2</sup>

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## Abstract

Heterosexual men and women who report more than the average number of sexual partners also report greater exposure to interpersonal violence and substance use. This relationship is less well-understood in sexual minorities (e.g., gay, lesbian, and bisexual). In the current study, data from 12,407 participants from four waves of the National Longitudinal Study of Adolescent to Adult Health were examined. Psychological and sociological risk factors were controlled for in the analyses which included self-control, religiosity, depression, marital and cohabiting status, educational attainment, and employment. While exceptions are noted, the results overall lend support to the hypothesis that relationships with the opposite sex carry a greater risk of exposure to violence and substance use than do same-sex relationships. This was the case for heterosexual men and women, and also held true within some groups of sexual minorities. Among hetero and mostly heterosexual men, competition for women was found to be especially risky for violence perpetration, perhaps because the likely rivals would include other heterosexual men. The significant effects of same-sex partners were largely limited to women but were also significant and negative for heterosexual men's drug use. Mostly heterosexual and bisexual individuals were found to have experienced more violence/victimization, used more drugs, and drank to the point of getting drunk more often (on average) than other sexual minorities. Controlling for psychological and sociological risk factors did not explain the effects of sexual orientation or sexual experience. Limitations and directions for future research are discussed.

**Keywords** LGBTQ · Mate choice · Violence · Substance use

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✉ Patrick Seffrin  
Seffrin@marywood.edu

<sup>1</sup> Social Sciences, Marywood University, 2300 Adams Ave, Scranton, PA, USA

<sup>2</sup> Psychology and Counseling, Marywood University, Scranton, USA

## Introduction

Men and women who report more than the average number of sexual partners also report more interpersonal violence and substance use as compared to peers with fewer partners (Nedelec & Beaver, 2012; Rowe et al., 1997; Yao et al., 2014). Whether sexual minorities, including lesbian women, gay men, and those who identify as bisexual, have similar experiences has yet to be investigated. Data drawn from the National Longitudinal Study of Adolescent to Adult Health found heterosexual men to be the most violent according to their own self-reports, gay men were the least violent, and lesbian and bisexual women reported significantly more involvement in crime than heterosexual women (Beaver et al., 2016). Large-scale victimization surveys find similar results for women's violence and victimization, that it tends to be greater among lesbian women when compared to their heterosexual counterparts (Walters et al., 2013). Furthermore, data drawn from samples of prison inmates have found lesbian women to be statistically overrepresented within the criminal justice system as compared to the average rate for women in the population (Jonsson, 2019).

Variable rates of violent victimization and substance use among sexual minorities have previously been explained in terms of social and psychological risk factors associated with sexual minority status (Boyle et al., 2020 and McKay et al., 2019). However, reviews by Boyle et al., 2020 and McKay et al., 2019 revealed that most prior studies of sexual minority violence and substance use relied on convenience samples, used cross-sectional analyses, focused mostly on sexual identity/orientation rather than sexual behavior, and made no direct comparisons with heterosexuals. Furthermore, in studies that have used large, representative samples of the population (e.g., Beaver et al., 2016), the number and choice of partners have not been systematically evaluated in their effects on violence and substance use among sexual minorities. In the current study, we explored whether differences in exposure to violence and substance use may reflect variations in the number and choice of partners among individuals of varying sexuality statuses.

## Background

With the publication of a long-term follow-up study of delinquent boys, Sampson and Laub (1990) identified the prosocial role that marriage played in lives of men with criminal histories. In addition to generating a specific interest in how marriage affects criminal behavior, this research also raised broader questions about heterosexual relationships and their connection to patterns of risky behavior over the life course (e.g., McCarthy & Casey, 2008, Seffrin, 2017). A central finding of this research is that committed relationships tend to reduce violence and other high-risk behavior, whereas having many short-term partners does the opposite. The predominant view within the social sciences (e.g., criminology and sociology) is that monogamous relationships are a form of social control that reduces crime and other risky behavior (Sampson & Laub, 1990), while promiscuity is a by-product of low self-control, analogous to a criminal act (Gottfredson & Hirschi, 1990). While this

view may be supported with available data, it paints an incomplete picture by ignoring the process by which partners are acquired, which includes the competition for and selection of mates.

Parallel lines of research developed within the field of evolutionary psychology have taken a Darwinian view of the linkages between human sexuality and crime (e.g., Buss, 2006; Daly & Wilson, 1988). Competition for and selection of sexual mates is central to this perspective. For one, potential mates are not equally desirable and are therefore subject to unequal selection, which may lead to violent conflict between rivals. Second, because women are more selective than men when choosing a mate, the problem of unequal selection falls disproportionately on men, who compete more aggressively and violently than women do (on average) with their rivals. Third, displays of reckless and/or high-risk behavior may, itself, be attractive to potential mates as indicators of genetic fitness (Zahavi, 1975). This further encourages men, in particular, to risk bodily harm while in pursuit of mates. Moreover, the pursuit of short-term mates in a modern social context or “hook-up culture” (Garcia et al., 2012), is often accompanied by the use of drugs and alcohol, which may further exacerbate the risk of interpersonal violence (Duke et al., 2018).

So, while evolutionary theory sees mate competition and selection as being central to understanding variable rates of interpersonal violence and other high-risk behavior, whereas criminological theories generally do not, whether this view applies to sexual minorities is unclear. Evolutionary perspectives (when applied to humans) were developed largely with heterosexual people in mind (Baily & Zuk, 2009). Furthermore, differences between gay and straight people that are by-products of culture, rather than biology, are just as relevant for understanding whatever linkages there may be between human sexuality and high-risk behavior. The cultural practice of monogamous marriage reduces men’s risk of serious criminal involvement (Craig et al., 2014), but was not made legally available to most sexual minorities within the United States until recently. Religious affiliation reduces high-risk behavior, but religious attendance and belief are low among LGBTQ individuals as compared to the general population (Lefevor et al., 2021). Furthermore, most sexual minorities view major religions as being non-friendly towards the LGBTQ community (Barringer, 2020). Alienation from these deeply entrenched cultural practices may contribute to sexual minority stress (Meyer, 2003), which negatively affects mental health and may, in turn, increase the risk of violence, victimization, and substance use. In the current study, perspectives from the social sciences are combined with evolutionary science to address the question of whether links between sexual behavior, violence, and substance use are similar, regardless of sexual orientation.

## Theoretical Perspectives

Central to Darwin’s theory of evolution (1871), is the observation that when selecting mates, women are usually choosier than men and tend to be hypergamous, preferring high status males. Men evolved, accordingly, to be the more aggressive sex in the competition for mates (Buss, 2016; Daly & Wilson, 1988). Physical attractiveness is generally desirable in both sexes, but any number of qualities could

make some mates more desirable than others, such as high social status for men and young age or youthful appearance for women. This unevenness leads, inevitably, to competition for the limited number of desirable mates available. Even in the age of online-dating, competition to attract desirable mates is unavoidable (Hitsch et al., 2010), and if potential mates ever wish to meet in public spaces such as bars and nightclubs, they run the risk of encountering unwelcome attention from potential mate rivals. Evolutionary theorizing further suggests that reckless and aggressive behavior within public spaces, especially among men, is a costly but effective advertisement of genetic fitness (Borkowska & Pawlowski, 2014; Griskevicius, 2007; Kacir, 2010; Zahavi, 1975). Reckless behavior may also include drug and alcohol use, which according to this same line of evolutionary theorizing, sends a signal to potential mates that the user is healthy enough to absorb the costs imposed on the brain and body by mood-altering substances.

The Darwinian view, outlined above, was formulated with heterosexuals in mind. However, sexual minorities also compete for mates, and within this competition there are routines that might increase the risk of violence and substance use (e.g., Miller, 2013). Routine activity theory (Cohen & Felson, 1979) is a school of criminological thought that emphasizes the social circumstances of crime and criminal behavior. The social circumstances of crime, according to this view, include three major elements: (1) the presence of available targets for victimization, (2) those who would guard or protect the targets, and (3) those motivated to attack or exploit the targets. Transposed onto the realm of mate choice and competition, potential mates become targets, mate rivals become guardians, and mate-seekers are motivated offenders. Now, consider this framework when applied to individuals of varying sexuality statuses. Gay men's usual mating rivals are other gay and bisexual men, making their rivals potential mates as well. In contrast, the usual mating rivals of heterosexual men are other heterosexual men, which makes them unequivocal rivals.

Asymmetries in mate competition also exist between gay and straight women, and between lesbian women and gay men. Like gay men, the usual rivals of lesbian women are other lesbian or bi women (i.e., potential mates); however, sexual minority women also compete against heterosexual men for female partners (Luoto et al., 2019). Research by Luoto and colleagues (2019) offers a Darwinian view on lesbian women, which suggests that having faced mate competition from both sexes over the course of human evolution, lesbian women may have evolved aggressive tendencies that are readily observable in heterosexual men but markedly less pronounced in heterosexual women. Moreover, competition for women seems especially likely to increase the risk for interpersonal violence as the likely mate rivals would include heterosexual men.

The mating rivals of heterosexual women, by comparison, are usually circumscribed to other straight women, hence less of a need for physically aggressive mating tactics, although a greater aptitude and reliance on psychological tactics may have evolved instead (Campbell et al., 2001). Finally, bi or pan-sexual individuals, are, in effect, competing in multiple dating arenas, and may have more mating choices but also face potential rivalry from both sexes (Litschi et al., 2014). These are stereotypical examples of mate competition to be sure, however they suggest

that such asymmetries may contribute to different rates of violence among sexual minorities.

The environments where sex partners are pursued also likely to contribute to varying levels of violence and substance use. Often referred to as “hook-ups”, the pursuit of casual or short-term mates at bars, nightclubs, and house parties is frequently accompanied by excessive use of drugs and alcohol (Garcia et al., 2012). These spaces are commonly understood to facilitate heterosexual mating but are also frequented by sexual minorities (Browne & Bakshi, 2013). Repeated attempts at pursuing sexual partners within these risky settings might expose sexual minorities to heterosexual mate competition, and by extension, higher rates of violence and substance use. (Boyle, et al., 2020; Duke et al., 2018; Quigg et al., 2020; Taggart et al., 2019).

As stated at the outset, risk factors specific to sexual minorities that are better understood as by-products of culture rather than biology, such as minority stress (Meyer, 2003), also require consideration. Sexual minority stress has been linked to the abuse of drugs and alcohol and negative mental states such as depression, which is itself associated with interpersonal violence and substance use (Krueger et al., 2020; Marshal et al., 2008; Ozkan et al., 2019).

Alienation of sexual minorities from social and cultural institutions may be a significant source of minority stress (Kahle et al., 2020; Rostosky & Riggle, 2017). Marriage among straight men has historically been pro-social, leading to reduced rates of criminal offending (Craig et al., 2014). But same-sex marriage was not legally permitted in the United States until recently, and remains illegal in many countries, thus leaving gay and lesbian people to legally unrecognized non-marital cohabitating unions, which do not appear to have the same deterrent effect on crime and risky behavior as legally recognized marriages (Gottlieb & Sugie, 2019). Religious faith among sexual minorities does not appear to have as robust effects on substance use, crime, and other health behavior as compared to heterosexual people (Lefevor et al., 2021). Educational attainment is generally protective against negative health outcomes for gay and straight people alike, but for sexual minority women in particular, average incomes and completed years of education tend to lag behind that of their straight counterparts (Conron et al., 2018). Thus, complications created by sexual minority stress might differentiate sexual minorities from heterosexuals in terms of how salient of a predictor sexual behavior is for violence and substance use.

Still other theoretical perspectives within the social sciences view links between sexual behavior and crime as largely spurious, reflecting individual differences in self-control (e.g., Gottfredson and Hirschi, 1990). According to Gottfredson and Hirschi (1990), self-control is acquired by children who receive consistent love and discipline from their parents and guardians. Prior research indicates that sexual minority children receive less parental monitoring and support when compared to heterosexual children (Montano et al., 2018). However, differences in self-control between individuals with different sexual orientations have been found to be statistically insignificant (Koeppel, 2015). Nevertheless, low self-control could contribute to violence and substance use among sexual minorities as it clearly does in the general population (Vazsonyi et al., 2017).

## Current Study

Accumulating many sexual partners is associated with an increased risk of violence and substance use. Whether sexual minorities have experiences similar to that of heterosexuals has yet to be investigated. Prior research on sexual minorities has one or more of the following limitations which has prevented this research question from being adequately addressed: (1) heavily focused on sexual orientation, leaving questions about sexual behavior unanswered, (2) lack of comparison with heterosexuals, and (3) no accounting for concomitant risk factors associated with crime, sexual behavior, and sexual minority stress.

In the current study, we accounted for the number of sex partners accumulated, which provides a measure of how regularly involved subjects were in the pursuit of mates. We also accounted for the choice to pursue same or opposite sex partners, which is clearly correlated with sexual orientation, but it may also modulate the level of risk associated with mate competition, by (1) limiting partners to one sex, which is predicted to decrease the level of risk, (2) expanding the pool of mate rivals to include both sexes, which is predicted to increase the level of risk, and (3) affecting the sex of mate rivals. Competition for women seems especially likely to increase the risk for interpersonal violence as the likely mate rivals would include heterosexual men. Finally, the current study controlled for a broad array of social, cultural, and psychological factors that are correlated with crime and sexual behavior including depression, religiosity, marital status, self-control, and socioeconomic status.

## Method

### Data

The National Study of Adolescent to Adult Health (Add Health) was the data source for the current study. The Add Health study is a nationally representative sample of adolescent youth containing five waves of longitudinal data. IRB approval for use of the restricted data was granted by [author's institution] in conjunction with the Carolina Population Center (see <https://addhealth.cpc.unc.edu/> for a detailed description of the dataset). The analytic sample included 5603 men and 6804 women. The average age of participants in wave 1 was 15.58 (SD, 1.71, 11–21) years, 16.20 (SD, 1.61, 13–21) years in wave 2, 21.94 (SD, 1.74, 18–28) years in wave 3, and 28.43 (SD, 1.75, 24–33) years in wave 4. The data are also racially and ethnically diverse [36.76 percent non-White] and includes participants from widely varying economic backgrounds [31.16 percent without a 4-year college degree]. Participants in the analytic sample must have provided valid responses to the number of male and female sex partners questions in the wave 4 interview. This excluded 627 out of the total possible 13,034 who participated in waves 1, 3, and 4. Missing cases constituted less than 2% of the analytic sample and were not found to be significantly correlated with the observed cases (i.e., were missing at random).

## Measures

Violence and victimization, drug, and alcohol use were assessed in each wave of the data. Four, dummy-coded, survey items were summed to create separate indexes for violence, victimization, and drug use. Violence items asked participants how often, in the past twelve months, they (1) pulled a knife or gun on someone, (2) seriously injured someone in a fight, (3) gotten into a group fight, and (4) shot, or stabbed someone. Victimization was measured with four similar items, but with the survey participant as the recipient of the violence. Drug use included items on how often respondents report using (1) marijuana, (2) cocaine, (3) injection drugs, and (4) hallucinogens or other drugs. Alcohol use was measured with a single item that asked respondents how often in the past 12 months they got drunk. For each of the dependent variables listed above, the average score was used in the analysis.

Mate choice was measured as the total number of male and female sex partners, assessed in wave 4 of the data. Respondents were asked “Considering all types of sexual activity, with how many female/male partners have you ever had sex? Sexual orientation was also assessed in wave 4. Following prior research, the current study compared individuals who identified as exclusively heterosexual, “mostly heterosexual”, “bisexual”, “mostly gay” and “gay/lesbian” (Udry & Chantala, 2002; Vrangalova & Savin-Williams, 2014). Six mutually exclusive dummy variables were created: heterosexual, mostly heterosexual, bisexual, mostly gay, gay/lesbian, and non-specified. Participants who reported no attraction to either sex or provided no response to the survey question were coded as (1) “sexuality not specified”, (0) was assigned otherwise. The sexual orientation variables were also collapsed into a smaller number of categories for purposes of regression analysis of specific subsamples. This was done to ensure enough statistical power for detection of significant effects. In these analyses, participants who identified as either “100% homosexual” or as mostly attracted to the same sex were coded as (1) “Gay sexual minority”, (0) was assigned otherwise. Participants who reported feeling either equally attracted to both sexes, or attracted to both sexes but mostly to the opposite sex, were coded as (1) “Heterosexual minority”, (0) was assigned otherwise.

Sexual minority stress was measured in terms of social and psychological risk factors. A single item on depression was assessed in waves 1–4 which asked participants “How often have you felt depressed (in the past week or month)”, range (0) never or rarely to (3) most of the time or all of the time. Religiosity items assessed how often survey participants attend religious service, importance of religion, frequency of prayer, and involvement in religiously affiliated social activities (e.g., Bible study). The numerical range of the response sets varied from item to item, thus scores were standardized. Cronbach’s alpha for the religiosity scale is 0.86. Self-control was measured with a single item in waves 1–4 that asked about going on gut feeling without considering alternatives. The participants’ average self-control, religiosity, and depression scores were used in the analysis.

Relationship status, married or cohabiting, was assessed in waves 3 and 4 of the data. Married and cohabiting were coded as (1), provided that participants were married or cohabiting for at least twelve months at the time of the interview, a (0) was assigned otherwise. While data were collected prior to the passage of the Marriage



Equality Act, some sexual minorities reported being married, nevertheless. The proportion of data waves in which participants reported being married or cohabiting was the measure then used in the analysis.

Controls for socioeconomic status were assessed in terms of educational attainment and employment. Educational attainment (8th grade to graduate degree) and full-time employment were assessed in wave 4. Age and race/ethnicity, assessed in wave 1, were also controlled for in the analysis. Racial/ethnic categories were Asian, Black, Hispanic (non-White), White, and other (e.g., multi-racial).

## Results

Tables 1 and 2 show results from one-way ANOVA models used to compare survey participants in terms of their sexual orientation and responses to key variables in the analysis. Survey respondents who did not specify a sexual orientation, or who reported no attraction to either sex, were not included in this analysis. Participants in the sample who reported equal attraction to men and women was relatively small, especially among men, as compared to the number of participants who reported being mostly attracted to the opposite sex (i.e., mostly heterosexual). Tukey HSD tests for mean differences were used in the analysis because of wide variation around the mean scores. To briefly summarize key results: gay men reported less violence, on average, than heterosexual men and lesbian women, but also reported less violence than men who are mostly heterosexual. Conversely, gay women reported significantly more violence than did heterosexual women. A similar pattern emerged for victimization among men, but for women differences were limited between women who identified as mostly heterosexual or bisexual and heterosexual women. Mostly heterosexual men reported higher average levels of drug use than heterosexual men and women, and gay men. Average alcohol use within the mostly heterosexual category for men was also higher than average use among heterosexual women, sexual minority women, and gay men.

Sexual minority women generally reported greater levels of drug and alcohol use than their heterosexual counterparts. Heterosexual women reported the lowest average levels of drug and alcohol use compared to other groups. Men who identified as mostly gay or gay reported a greater number of lifetime male sexual partners than most all other groups shown in the table, including women who are heterosexual or mostly heterosexual. Bisexual women, heterosexual men, and men who are mostly heterosexual reported the three highest average numbers of opposite sex partners.

Control variables in the study were also subjected to analysis of variance but are not presented in the tables. The results from these analyses are as follows. Heterosexual women were more likely to be married at some point in the study and were more religious than other groups. Heterosexual women also reported greater levels of self-control than lesbian women. Sexual minority women reported significantly more depression than heterosexual men, and in some cases more than heterosexual women and sexual minority men. Heterosexual men reported lower levels of educational attainment than heterosexual women and some sexual minorities but were



**Table 1** Sexual orientation comparisons for men: One-Way ANOVA Models with Tukey HSD Tests for Mean Differences

	<u>Men</u>				
	Hetero	Mostly Hetero	Bi	Mostly Gay	Gay
Total # of Men	(n=5,196)	(n=194)	(n=33)	(n=48)	(n=109)
Violence:	0.34 > MG <sub>m</sub> , G <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub> , MG <sub>f</sub>	0.32 > G <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub>	0.33	0.17	0.11
Mean = 0.34					
SD = 0.47					
Range = 0-4					
Victimization:	0.31 > G <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub> , MG <sub>f</sub>	0.30 > G <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub> , MG <sub>f</sub>	0.42 > G <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub> , MG <sub>f</sub>	0.28 > H <sub>f</sub>	0.11
Mean = 0.31					
SD = 0.36					
Range = 0-4					
Drug Use:	0.64 > H <sub>f</sub>	0.88 > H <sub>m</sub> , G <sub>m</sub> , H <sub>f</sub>	0.77 > H <sub>f</sub>	0.72 > H <sub>f</sub>	0.6
Mean = 0.65					
SD = 0.63					
Range = 0-4					
Alcohol Use:	1.05 > H <sub>f</sub>	1.24 > G <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub> , B <sub>f</sub>	1.24 > H <sub>f</sub>	0.97	0.81
Mean = 1.05					
SD = 0.99					
Range = 0-6					
Male Sex Partners:	0.24	1.69	5.61	32.33 > H <sub>m</sub> , MH <sub>m</sub> , B <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub> , B <sub>f</sub> , MG <sub>f</sub> , G <sub>f</sub>	26.01 > H <sub>m</sub> , MH <sub>m</sub> , B <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub> , B <sub>f</sub> , MG <sub>f</sub> , G <sub>f</sub>
Mean = 1.13					
SD = 11.06					
Range = 0-354					
Female Sex Partners:	16.42 > MG <sub>m</sub>	13.59 > MG <sub>m</sub>	5.67	2.83	0.66

Table 1 (continued)

	Men
Mean = 15.78	$G_m, H_m, MH_m, B_m$
SD = 29.92	$G_f, H_f, MH_f, B_f$
Range = 0–600	$G_m, H_m, MH_m, B_m, G_f, H_f, MH_f, B_f$

Descriptive statistics appear under variable names. Mean values appear in cells under orientation categories:  $H_m$  = Heterosexual Male,  $MH_m$  = Mostly Hetero Male,  $B_m$  = Bisexual Male,  $MG_m$  = Mostly Gay Male,  $G_m$  = Gay Male,  $H_f$  = Heterosexual Female,  $MH_f$  = Mostly Hetero Female,  $B_f$  = Bisexual Female,  $MG_f$  = Mostly Gay Female,  $G_f$  = Gay Female. (>) significance at the  $p < .05$  level

**Table 2** Sexual Orientation Comparisons for Women: One-Way ANOVA Models with Tukey HSD Tests for Mean Differences

	Women				
	Hetero	Mostly Hetero	Bi	Mostly Gay	Gay/Lesbian
Total # of Women (n=6,804)	(n=5,461)	(n=1,037)	(n=150)	(n=54)	(n=64)
Violence: Mean=0.14 SD=0.29 Range=0–4	0.13	0.19	0.25 > H <sub>f</sub>	0.17	0.28 > H <sub>f</sub>
Victimization: Mean=0.12 SD=0.27 Range=0–4	0.1	0.16 > H <sub>f</sub>	0.22 > H <sub>f</sub>	0.12	0.22
Drug Use: Mean=0.49 SD=0.59 Range=0–4	0.42	0.82 > H <sub>m</sub> , G <sub>m</sub> , H <sub>f</sub>	0.73 > H <sub>f</sub>	0.88 > H <sub>f</sub>	0.68 > H <sub>f</sub>
Alcohol Use: Mean=1.05 SD=0.99 Range=0–6	0.61	0.97 > H <sub>f</sub>	0.85 > H <sub>f</sub>	1.14 > H <sub>f</sub>	0.88
Male Sex Partners: Mean=9.23 SD=15.96 Range=0–800	7.77 > H <sub>m</sub> , MH <sub>m</sub>	15.48	23.10 > H <sub>m</sub> , MH <sub>m</sub> , B <sub>m</sub> , H <sub>f</sub> , MH <sub>f</sub> , MG <sub>f</sub> , G <sub>f</sub>	8.7	4.27
Female Sex Partners: Mean=0.49 SD=5.75 Range=0–400	0.09	0.8	6.98 > H <sub>f</sub> , MH <sub>f</sub> , G <sub>m</sub>	7.06	9.20 > H <sub>f</sub> , MH <sub>f</sub>

Same as Table 1

more likely to be employed full-time than other groups [results available upon request].

Tables 3 and 4 shows results from ordinary-least-squares regression models that examined lifetime risk for violence, victimization, drug, and alcohol use among men and women, respectively. All models were run separately for men and women and included controls for religiosity, self-control, depression, relationship status (married or cohabiting), educational attainment, employment, and demographic factors (age, race/ethnicity). Results for control variables are not shown in the tables. With few exceptions, the results from the first three models in Tables 3 and 4 indicate

**Table 3** Men's Violence, Victimization, Drug Use, and Alcohol Use Regressed on Sexual Orientation and Sexual Experience: Unstandardized Beta Estimates from Ordinary Least Squares Regression

	Violence				Victimization				MH(ref)	MH(ref)
	H	HSM	GSM	H(ref)	MH(ref)	H	HSM	GSM		
Heterosexual					0.006					-0.014
Mostly Hetero				-0.006					0.014	
Bi				-0.007	-0.064				0.065	0.051
Mostly Gay				-0.117	-0.111				0.014	-0.001
Gay				-0.197***	-0.191***				-0.174***	-0.188***
Not Specified				-0.145	-0.138				-0.193*	-0.208*
# of Male Sex Partners	0.001	-0.009	0.000	0.000	0.000	0.001	-0.006	0.000	0.000	0.000
# of Female Sex Partners	0.002***	0.006***	0.003	0.002**	0.002**	0.002***	0.003	0.008	0.002***	0.002***
n=	5,196	227	157	5,603	5,196	227	157	5,603		
R-square (adj)	12.7	24.0	5.4	13.5	12.5	18.3	00.0	12.7		
	Drug Use									
Heterosexual										-0.069
Mostly Hetero				0.165***					0.069	
Bi				0.072	-0.093				0.094	0.026
Mostly Gay				0.143	-0.022				-0.037	-0.105
Gay				0.011	-0.154*				-0.197*	-0.266*
Not Specified				-0.322**	-0.487***				-0.764***	-0.833***
# of Male Sex Partners	-0.004**	-0.014	0.00	-0.001	-0.001	-0.004	-0.025*	0.000	-0.001	0.000
# of Female Sex Partners	0.003***	0.006*	0.020	0.003***	0.003***	0.004***	0.005	0.12***	0.005***	0.004***
n=	5,196	227	157	5,603	5,196	227	157	5,603		
R-square (adj)	16.0	15.5	9.4	15.5	15.9	21.4	29.5	16.4		

H Heterosexual, HSM Heterosexual Sexual Minority, GSM Gay Sexual Minority, MH Mostly Heterosexual. Models control for religiosity, self-control, depression, marriage, cohabitation, educational attainment, employment, age, and race/ethnicity

\* p < .05, \*\* p < .01, \*\*\* p < .001

**Table 4** Women's Violence, Victimization, Drug Use, and Alcohol Use Regressed on Sexual Orientation and Sexual Experience: Unstandardized Beta Estimates from Ordinary Least Squares Regression

	H	HSM	GSM	H (ref)	MH (ref)	H	HSM	GSM	H (ref)	MH (ref)
Violence										
Heterosexual					-0.023*					
Mostly Hetero				0.023*					0.031***	
Bi				0.025	0.002				0.046*	0.015
Mostly Gay				0.002	-0.022				-0.010	-0.042
Gay				0.091**	0.067				0.068*	0.037
Not Specified				-0.008	-0.032				0.046	0.015
# of Male Sex Partners	0.020***	0.001***	0.000	0.001***	0.001***	0.002***	0.001***	-0.003	0.001***	0.001***
# of Female Sex Partners	0.008	0.000	0.002	0.000	0.000	0.020***	0.000	0.005*	0.000	0.000
n =	5,461	1,187	118	6,804	5,461	1,187	118	6,804		
R-square (adj)	13.9	13.1	17.6	14.6	9.4	8.2	15.0	9.0		
Drug Use										
Heterosexual					-0.225***					
Mostly Hetero				0.225***					0.174***	
Bi				0.038	-0.187***				-0.008	-0.183**
Mostly Gay				0.311***	0.086				0.344***	0.169
Gay				0.164*	-0.061				0.170	-0.004
Not Specified				-0.226**	-0.451***				-0.229*	-0.403
# of Male Sex Partners	0.013***	0.004***	0.014*	0.007***	0.007***	0.015***	0.003***	0.016	0.007***	0.007***
# of Female Sex Partners	0.004	0.001	0.009*	0.001	0.001	0.002	0.001	0.016*	0.001	0.001
n =	5,461	1,187	118	6,804	5,461	1,187	118	6,804		
R-square (adj)	22.9	14.3	15.0	25.0	20.0	9.0	21.0	19.3		

Same as Table 3

that same-sex relationships are statistically unrelated to average differences in risky behavior over the life course.

The same is not true, however, for opposite-sex relationships. For men and women with varying sexual orientations, having a relatively high number of opposite sex partners over the life course was statistically associated with an increased lifetime risk for violence, victimization, drug, and alcohol use. For gay sexual minority women, the risk for victimization and alcohol use was statistically greater for having same-sex partners but was unaffected by having opposite sex partners, while drug use was affected by having partners of either sex. Note, however, that some of these exceptions and/or deviations from the general pattern may be due to the relatively small sample sizes of the subsamples.

The next set of models in Tables 3 and 4 included the sexual orientation dummy variables. "Heterosexual" was the reference category in the first of these models. "Mostly heterosexual" was the reference category in the second. Based on these models, men and women who identified as mostly heterosexual (attracted to both sexes but prefer the opposite sex) were at greater lifetime risk than gay and heterosexual people for many of the outcomes. Gay men and women showed opposing patterns. Gay men were less violent, experienced less victimization, used fewer drugs, and got drunk less often than men who are mostly heterosexual or heterosexual. Lesbian women, however, were more violent, experienced more victimization, used more drugs, and got drunk more often than heterosexual women. Differences in violence and substance use among heterosexuals and sexual minorities remained stable, even after accounting for psychological and sociological factors and sexual history.

## Discussion

Violence and substance use have been linked to sexual behavior in prior studies; however, the focus of prior research has been on heterosexuals, leaving questions about sexual minorities largely unanswered. The current study compared sexual minorities to heterosexuals in an examination of whether differences in exposure to violence and substance use reflect variations in the number and choice of partners among individuals of varying sexuality statuses. Analysis of the Add Health data provided partial support for this proposition. In general, having a limited number of partners of either sex was found to be comparatively less risky than a relatively large number. Among hetero and mostly heterosexual men, having a large number of women as partners was found to be especially risky, probably because the likely mate rivals would include other heterosexual men. But there were some exceptions and unexpected results for sexual minorities. Among lesbian, mostly gay, and bi women, having many relationships, with either sex, increased drug use; however, an increased risk of victimization and alcohol use was associated with having many female partners, specifically. For sexual minority men and women, no relation between the number of partners (of either sex) and violence perpetration was found. Heterosexual men, who reported same-sex partners, were at a relatively lower risk for drug use. Sexual minorities who identified as being attracted to both sexes, but mostly attracted to the opposite sex

(i.e., mostly heterosexual), were at greater risk for drug use than those who identified as exclusively heterosexual. Also, it is important to note that accounting for the number and choice of mates (whether partners were men or women) failed to explain sexual orientation differences in violence and substance use. In sum, these findings reinforce the overall importance of human sexuality to the study of crime and risky behavior, and more specifically, the role that mate choice plays for sexual minority men who pursue opposite sex partners.

Several study limitations are noted. The effects of sexual behavior were small and not statistically equal across sexual minorities. This suggests that a more fine-grained assessment of relationship qualities, along with additional measures of sexual minority stress, are needed before any conclusive statements can be made about the relative risk of dating opposite-sex vs same-sex partners. For example, prior research has identified internalized homophobia as a potential risk factor for violence and substance use, especially among gay men (Edwards & Sylaska, 2013; Stephenson & Finnerman, 2017). We were also unable to explain the relatively high-risk facing men and women who identify as “mostly heterosexual” and bisexual. While this finding has been noted in prior research (Udry & Chantala, 2002), we found that even after controlling for social and psychological risk factors and differences in mate choice, these groups of individuals still experienced more violence/victimization, used more drugs, and drank to the point of getting drunk more often (on average) than other sexual minorities. This suggests that individuals who compete for partners in gay and straight dating arenas are doubly exposed to violence and substance use for reasons unrelated to their own mating success. Furthermore, the category of people who identified as “mostly heterosexual” was relatively well populated in the data, and according to prior research, “mostly heterosexual” does not appear to be a transitory state (Vrangalova & Savin-Williams, 2014). Fish and Russell (2018) found that the presence of a mischievous or “jokester” responding in Wave 1 may have resulted in the underestimation of differences between sexual minorities and heterosexual respondents. More research is needed on populations of sexual minorities in terms of risk factors that differentiate bisexual or pansexual individuals from those who identify as 100% same sex attracted.

Survey items measuring violence and victimization provided no context, so it is unclear if these altercations occurred in a public setting or at a private residence, between strangers or acquaintances, if premeditated or in response to provocation. Rates of domestic violence or intimate partner violence among LGBTQ populations are found to be similar to, if not greater than, the rates found for heterosexual populations (Whitfield et al., 2021). Thus, it is possible that some of the violence and victimization measured in the survey involved intimate partners, not rivals. A similar problem exists as to whether the use of drugs and alcohol occurred while pursuing mates or in a different context that was largely unrelated to mate competition. Additional research on the context of risky behavior among sexual minorities will be needed to address these survey limitations.

The number and choice of partners did not fully explain disparities in violence and substance use among people of varying sexual orientations. We caution, though, against viewing these results as evidence that sexual orientation, itself, predicts



violence and substance use. What might appear attributable to sexual orientation may more accurately reflect variations in feminine and masculine traits, as prior research suggests (e.g., LeVay, 2011; Richardson & Hammock, 2007). For example, as young children, lesbian women are more likely than straight women to have preferred stereotypical male interests and activities, such as contact sports and other forms of rough-and-tumble play. Gay men are sometimes gender non-conforming in childhood as well, but in a feminine direction, showing preferences for games and activities more often favored by girls (Gu Li et al., 2017). Moreover, there is ongoing debate on whether gender and sexual orientation are best understood as social constructs (Messerschmidt, 2018) or products of biology (Ganna et al., 2019). With growing sensitivity to, and awareness of trans, fluid, and non-binary gender categories, it is likely that future research will be better situated to study the influences of gender identity, sex, and sexual orientation on risky and violent behavior.

The current study integrated evolutionary and social science theories because together they are compatible and applicable to a broad range of behavioral phenomena. But as general as these theories may be, they are insufficient for explaining something as complex as the relationship between human sexuality and high-risk behavior. Psychologically based theories of human attraction have emphasized the importance of intelligence (Miller, 2000), whereas socioeconomic status is central to a sociological understanding of mate choice (McClintock, 2014). Still other research has stressed the importance of race and ethnicity as key factors that shape sexual interactions (Gamson & Moon, 2004). For example, research by Green (2013) and others has highlighted the importance of social norms for structuring social interactions as they relate to sex and romantic courtship. Indeed, while prior research has discovered remarkable similarities in the mating preferences of men and women from vastly different cultures (Buss, 1989), there remains substantial cultural variability that this study was unable to address. The current study did include a variety of social and psychological risk factors along with demographic variables, such as race/ethnicity, but they were treated as statistical controls in analyses focused on sex/gender, sexual orientation, and sexual behavior. Future advances in research on how human sexuality relates to violence and substance use might benefit by taking a closer look at socio-demographic differences and integrating additional social and psychological complexity for a more comprehensive view.

Policy implications of the study's findings include improved education and awareness concerning the risks associated with sexual relationships. The AIDS crisis of the 1980's prompted educators and medical professionals to make information on safe sex practices widely available. Discussion of dating violence and/or domestic violence is now a part of health curricula within high schools, along with information on substance use (Wolfe et al., 2009). Curriculum on LGBTQ issues have also been integrated into school lesson plans (Antonelli & Sembiante, 2022). However, what the current study shows is that the risks associated with sexual relationships are more expansive than previously thought. Competition for and selection of mates may be a root cause of interpersonal violence and other high-risk behavior. Emphasizing the benefits of stable and monogamous relationships might prove to be a useful strategy for reducing high-risk behavior among gay and straight people alike.

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**Data Availability** Data for this study is available upon request from: <https://addhealth.cpc.unc.edu/>

## Declarations

**Conflict of interest** The authors endorse no competing financial or non-financial interests regarding this study.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Institutional Review Board at Marywood University.

**Consent to Participate** Informed consent was obtained from all individual participants included in the study.

**Consent to Publish** The participant has consented to the submission of the case report to the journal.

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