

# The Association of Sexual Orientation Measures With Young Adults' Health-Related Outcomes

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Sexual orientation is composed of at least 3 dimensions—sexual identity, sexual behavior, and sexual attraction.<sup>1-4</sup> Yet, not until the Williams Institute released its report outlining best practices for asking questions about sexual orientation on surveys did a consensus exist among researchers regarding the best ways to measure these dimensions.<sup>5</sup> This previous lack of consensus, coupled with the evidence that data sources commonly used to investigate the association between sexual orientation and health do not measure all 3 dimensions, has left the field with an incomplete understanding of health differences not only between heterosexual and sexual minority (nonheterosexual) populations but also within sexual minority populations themselves.

Sexual identity is one of the most commonly assessed dimensions of sexual orientation in health research. However, items used to measure sexual identity have been the most difficult for respondents to answer,<sup>1,6-8</sup> not only because some feel discomfort admitting to a nonheterosexual identity but also because sexual minorities increasingly use diverse labels (e.g., two-spirited, same-gender loving, queer), have multiple identities (bilesbian, gay-curious heterosexual, pan-sexual), or use no labels at all when referring to their sexual identity.<sup>9-11</sup> Most measures of sexual identity force individuals to choose among a “heterosexual/straight,” “gay or lesbian,” “bisexual,” or “unsure” identity<sup>1,4-8</sup>; whereas others include intermediate options such as “mostly heterosexual/straight” and “mostly homosexual/gay,” which are preferred because they better reflect personal experiences and some view “heterosexual/straight,” “gay or lesbian,” and “bisexual” as static states or permanent identities.<sup>1,4-8</sup>

Sexual orientation has also been measured by identifying the gender of respondents' sexual partners. However, terminology used to define “sex” varies considerably, as do respondents' interpretations of sexual behaviors. For example, the terms “sex” and “sexual

**Objectives.** We examined associations among 3 dimensions of sexual orientation (identity, behavior, and attraction) and key health-related indicators commonly studied among sexual minority populations: depressive symptoms, perceived stress, smoking, binge drinking, and victimization.

**Methods.** We analyzed data from the National Longitudinal Study of Adolescent Health, Wave IV (2007–2008) when respondents were aged 24 to 32 years (n=14412). We used multivariate linear and logistic regressions to examine consistency of associations between sexual orientation measures and health-related indicators.

**Results.** Strength of associations differed by gender and sexual orientation measure. Among women, being attracted to both sexes, identifying as “mostly straight” or “bisexual,” and having mostly opposite-sex sexual partners was associated with greater risk for all indicators. Among men, sexual attraction was unrelated to health indicators. Men who were “mostly straight” were at greater risk for some, but not all, indicators. Men who had sexual partners of the same-sex or both sexes were at lower risk for binge drinking.

**Conclusions.** Using all 3 dimensions of sexual orientation provides a more complete picture of the association between sexual orientation and health among young adults than does using any 1 dimension alone. (*Am J Public Health.* 2012;102:1177–1185. doi:10.2105/AJPH.2011.300262)

intercourse” are often perceived as implicitly heterosexual, referring only to penile penetration. Using these terms may therefore exclude a range of sexual behaviors in which many sexual minorities have engaged.<sup>1,8,12</sup> Moreover, using sexual behavior as the sole measure of sexual orientation is uninformative for individuals who have never had any sexual experience and may misrepresent the sexual orientation of others who have had “sex” with partners of 1 gender but have sexual attractions to the other or both genders.<sup>1,8,12</sup>

Sexual attraction, or desire for sexual intimacy, is typically considered the defining feature of sexual orientation<sup>13-16</sup> but is the least studied of the 3 sexual dimensions with regard to health outcomes.<sup>17,18</sup> This fact is particularly perplexing given that women show greater variability than do men in the age at which they (1) first become aware of same-gender attractions, (2) consciously question their sexuality, and (3) pursue their first same-gender sexual contact—all of which women tend to experience later

in life than do men.<sup>19-25</sup> Moreover, women are more likely than are men to say they become attracted to or fall in love with the person as opposed to the person's gender<sup>21,26</sup> and to report that their sexuality is fluid over time.<sup>24,26-30</sup>

Decades of research have documented health disparities between heterosexual and lesbian, gay, and bisexual (LGB) populations,<sup>4,31-46</sup> with minority stress theory frequently used to explain these disparities.<sup>47</sup> However, Meyer's minority stress theory conceptualized the LGB population as homogenous; distinctions were not made on the basis of gender or dimension of sexual orientation.<sup>47</sup> Moreover, few studies have used nationally representative samples or examined all 3 dimensions of sexual orientation.<sup>48-50</sup> Among those that assessed all 3 dimensions, health disparities between LGB populations and heterosexuals differed by dimension of sexual orientation.<sup>17,18</sup>

For example, Bostwick et al. used nationally representative data to compare clinical measures of mental health among adults aged

20 years and older across all 3 dimensions of sexual orientation and found that adults with an LGB identity had higher odds of having any mood or anxiety disorder than did adults who self-identified as straight.<sup>17</sup> However, women who had only same-sex sexual partners and exclusive same-sex attractions had the lowest rates for most disorders, whereas men who had any same-sex attraction had the highest rates.<sup>17</sup>

McCabe et al. examined the prevalence of substance use and dependence across all 3 dimensions of sexual orientation using nationally representative data and found that substance use outcomes varied considerably across sexual orientation dimensions and were more pronounced among women than among men.<sup>18</sup> Unlike previous research, the authors found substance use to be less prominent among men and women who identified as bisexual than among those who identified as gay or lesbian.<sup>18</sup> Alternatively, they found greater risk for substance use and dependence among men and women who engaged in bisexual behavior but not among those who engaged in same-sex behavior.<sup>18</sup>

Few studies using nationally representative samples have assessed associations between health-related outcomes and all 3 dimensions of sexual orientation, and fewer, if any, have explored these associations within an exclusively young adult population—although early adulthood is often accompanied by greater anxiety and uncertainty because of transitions, career entry, and role formations.<sup>51</sup> We examined associations between several health-related indicators commonly used to investigate sexual minority health (i.e., depressive symptoms, perceived stress, smoking, binge drinking, and victimization) and 3 dimensions of sexual orientation (i.e., identity, attraction, and behavior) using a nationally representative sample of young adults. We hypothesized that significant differences would be reported in these health indicators among young adults by gender and the dimension of sexual orientation measured.

## METHODS

We analyzed Wave IV (2007–2008) restricted data from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative sample of individuals

who were enrolled in Grades 7 through 12 in 1994–1995.<sup>52</sup> Respondents were aged 24 to 32 years in 2007–2008. We restricted our analyses to respondents assigned a probability weight and excluded 388 respondents because they were missing data on variables included in the analyses. After exclusions, our final analytic sample consisted of 14 412 respondents: 7696 women and 6716 men.

## Measures

We measured depressive symptoms using a 9-item Center for Epidemiological Studies Depression scale. Respondents were asked how often in the past 7 days they

1. were bothered by things that usually do not bother them,
2. could not shake off the blues,
3. felt just as good as other people,
4. had trouble keeping their mind on what they were doing,
5. felt depressed,
6. felt too tired to do things,
7. enjoyed life,
8. felt sad, and
9. felt people disliked them.

Per convention, we reverse-coded the positively worded items and summed the 9 items (Cronbach  $\alpha=0.81$ ). The distribution was skewed, so we used a square root transformation to normalize the distribution.

We measured perceived stress using the 4-item Cohen Perceived Stress scale. Respondents were asked how often in the past 30 days they felt (1) they were unable to control the important things in life, (2) confident in their ability to handle personal problems, (3) things were going their way, and (4) difficulties were piling up so high they could not overcome them. We reverse-coded positively worded items and summed the 4 items (Cronbach  $\alpha=0.71$ ). We measured current smoking as smoking at least 1 cigarette in the past 30 days. We measured frequent binge drinking as drinking 4 (women) or 5 (men) drinks in a row at least 2 days a month for the past 12 months (i.e., 24 times in the past year). We measured victimization if, in the past 12 months, respondents experienced any of the following: (1) someone pulled a knife or gun on them; (2) they were shot or stabbed; (3) they were

slapped, hit, kicked, or choked; or (4) they were beaten.

We used 3 measures of sexual orientation: attraction, identity, and behavior. Respondents were asked using separate items whether they were romantically attracted to males and females. We categorized their attraction as only opposite sex, only same sex, both sexes, or no attraction. Respondents self-reported their sexual identity as straight, mostly straight, bisexual, mostly gay, gay, or no sexual identity. We measured sexual behavior on the basis of the number of female and male sexual partners respondents reported having in their lifetime. From this information, we calculated the proportion of respondents' sexual partners who were female or male and categorized sexual behavior as with only opposite-sex partners, mostly opposite-sex partners ( $>0.0$  to  $<0.3$ ), both male and female partners ( $\geq 0.3$  to  $<0.7$ ), mostly same-sex partners ( $\geq 0.7$  to  $<1.0$ ), and only same-sex partners.

We included the respondent's age as a continuous variable and categorized respondents' self-reported race/ethnicity as non-Hispanic White, non-Hispanic Black, Asian/Pacific Islander, Hispanic (any race), or other. Socioeconomic measures included education ( $<$ high school diploma, general equivalency diploma, high school diploma, some college or vocational training, or  $\geq$ college degree); household income (25th, 50th, or 75th percentile with an additional category for respondents missing income data); and employment (working  $\geq 10$  hours/week vs all else). We also included a measure of current relationship status (married; cohabitating; divorced, separated, or widowed; or single).

## Analytic Approach

Given previous research suggesting that dimensions of sexual orientation may have differential health effects by gender, all analyses were gender stratified.<sup>17,18</sup> We began with descriptive statistics to understand data distribution. Next, we examined bivariate associations between dimensions of sexual orientation to investigate the extent to which identity, attraction, and behavior overlap. We used multivariate linear regression and logistic regression to examine consistency of associations between measures of sexual orientation and dependent variables. We weighted all analyses to adjust for

Add Health's sampling design and respondent attrition using the SVY command in Stata version 11 (StataCorp LP, College Station, TX).<sup>53</sup>

**RESULTS**

Respondents primarily were White (68.1%), were married (43.9%), had at least some college or vocational training (43%), and worked at least 10 hours a week for pay (82.6%; Table 1). Mean age was 28.8 years, 49.6% were women, and 31.3% lived in households with income less than \$40000.

Most respondents identified as straight (86.6%), reported only opposite-sex attraction (92.4%), and had only opposite-sex sexual partners (87.0%). Compared with young men, more young women were attracted to both sexes, identified as bisexual or mostly straight, and had both male and female partners or mostly opposite-sex sexual partners. By comparison, more young men than women reported only opposite-sex or only same-sex attraction, identified as either straight or gay, and had only opposite-sex, mostly same-sex, or only same-sex sexual partners.

**Bivariate Analyses**

Consistency across identity, attraction, and behavior appeared greater among men than among women (Table 2). For example, among men with only opposite-sex sexual partners, 97.5% identified as straight compared with 88.2% of women with only opposite-sex sexual partners. Similarly, among men with only same-sex sexual partners, 70.7% identified as gay, compared with 58.6% of women with only same-sex sexual partners. Variability in identity and attraction appeared to be greater among respondents who had both male and female partners: among women 37.0% identified as straight, 18.9% identified as bisexual, 45.8% reported only opposite-sex attractions, and 34.7% reported attraction to both sexes, whereas 57.0% of men identified as straight, 11.0% identified as bisexual, 69.9% reported only opposite-sex attraction, and 19.7% reported attraction to both sexes.

**Multivariate Analyses**

We examined the extent to which identity, attraction, and behavior were consistently associated with depressive symptoms and

**TABLE 1—Sample Characteristics, Weighted Means, and Percentages: National Longitudinal Study of Adolescent Health Wave IV United States, 2007–2008**

Characteristic	Total (n = 14 412), % or Mean	Women (n = 7696), % or Mean	Men (n = 6716), % or Mean
Depressive symptoms <sup>a</sup>	2.4	2.5	2.3
Perceived stress <sup>a</sup>	4.8	5.1	4.6
Current smoker	39.0	34.6	43.4
Frequent binge drinker	21.7	14.8	28.4
Ever victimized <sup>b</sup>	21.6	18.8	24.4
Women	49.6	NA	NA
Race/ethnicity			
White	68.1	68.0	68.2
Black	15.3	15.8	14.7
Hispanic	11.7	11.7	11.8
Asian	3.2	3.0	3.4
Other	1.7	1.5	1.9
Age, y <sup>a</sup>	28.8	28.7	28.9
Education			
< high school diploma	7.2	6.3	8.1
General equivalency diploma	4.4	3.0	5.7
High school diploma	14.8	12.2	17.3
Some college or vocational training	43.0	44.4	41.7
≥ college degree	30.6	34.1	27.2
Working ≥ 10 h/wk	82.6	77.8	87.4
Household income, \$			
0–39 999	31.3	33.4	29.2
40 000–74 999	33.7	33.4	34.0
≥ 75 000	28.4	26.6	30.1
Missing	6.7	6.6	6.7
Relationship status			
Married	43.9	47.9	40.0
Cohabiting	19.7	19.7	19.6
Divorced/separated/widowed	3.9	4.3	3.5
Single	32.6	28.1	37.0
Sexual identity			
Straight	86.6	79.6	93.4
Mostly straight	9.6	15.8	3.5
Bisexual	1.5	2.4	0.6
Mostly gay	0.7	0.9	0.6
Gay	1.3	0.9	1.7
None reported	0.4	0.5	0.3
Sexual attraction			
Attracted to opposite sex	92.4	89.6	95.1
Attracted to both sexes	4.9	8.0	1.9
Attracted to same sex	1.8	1.5	2.1
No attraction reported	0.9	0.8	0.9

*Continued*

TABLE 1—Continued

Sexual behavior <sup>c</sup>			
Only opposite-sex sexual partners	87.0	83.2	90.8
Mostly opposite-sex sexual partners	6.4	11.0	1.9
Male and female partners	2.0	2.4	1.7
Mostly same-sex sexual partners	0.8	0.4	1.1
Only same-sex sexual partners	1.0	0.4	1.5
Never had sex	2.8	2.5	3.1

Note. NA = not applicable. Variables are binary or categorical and can be interpreted as percentages, unless otherwise noted. Percentages may not add to 100 because of rounding.

<sup>a</sup>Continuous variable, mean presented.

<sup>b</sup>Reported ever experiencing at least one of the following: (1) someone pulled a knife or gun on them; (2) they were shot or stabbed; (3) they were slapped, hit, kicked, or choked; or (4) they were beaten.

<sup>c</sup>Mostly opposite-sex sexual partners (>0.0 and <0.3); male and female sexual partners ( $\geq 0.3$  and <0.7); mostly same-sex sexual partners ( $\geq 0.7$  and <1.0).

perceived stress (Table 3) separately for men and women after adjustment for sociodemographic measures. Among women, measures of sexual identity, attraction, and behavior provided somewhat inconsistent results; women who identified as bisexual or reported attraction to both sexes had more depressive symptoms ( $b=0.42$  and  $b=0.29$ , respectively) and perceived stress ( $b=1.15$  and  $b=0.98$ , respectively) than did women who identified as straight or reported attraction to only the opposite sex; however, associations between measures of sexual behavior and the dependent variables were more varied. Additionally, women who identified as mostly straight or mostly gay or who had mostly opposite-sex sexual partners had more depressive symptoms ( $b=0.26$ ,  $b=0.26$ ,  $b=0.20$ , respectively) and perceived stress ( $b=1.05$ ,  $b=1.24$ ,  $b=0.66$ , respectively) than did straight women or women who had only opposite-sex sexual partners.

Among men, measures of sexual orientation were generally unrelated to depressive symptoms and perceived stress. However, men who identified as mostly straight had more depressive symptoms ( $b=0.34$ ) and perceived stress ( $b=0.83$ ) than did men who identified as straight and men who had mostly opposite-sex sexual partners ( $b=0.35$  and  $b=0.93$ , respectively) compared with men who had only opposite-sex sexual partners.

Next, we examined the extent to which sexual orientation measures were consistently associated with current smoking, frequent binge drinking, and victimization separately for men and women, after adjustment for

sociodemographic measures (Table 4). Among women, measures of sexual orientation differed somewhat in their association with dependent variables; bisexual women were at significantly greater risk for smoking (odds ratio [OR]=1.65), binge drinking (OR=2.21), and victimization (OR=1.58) than were straight women. Likewise, women who were attracted to both sexes were at significantly greater risk for smoking (OR=1.59), binge drinking (OR=2.05), and victimization (OR=1.43) than were women who were attracted only to the opposite sex.

Measures of sexual behavior yielded less consistent results; women who had male and female sexual partners or mostly same-sex sexual partners were at no greater risk of smoking, drinking, or victimization than were women who had only opposite-sex sexual partners. However, women with mostly opposite-sex sexual partners were at greater risk of smoking (OR=2.06), binge drinking (OR=2.30), and victimization (OR=1.55) than were women with only opposite-sex sexual partners. Gay women were at significantly greater risk of smoking (OR=2.08) than were straight women, as were women with only same-sex sexual partners (OR=2.68), but this association was only marginally significant (OR=1.59;  $P<.1$ ) when using measures of attraction. Women who identified as mostly straight or mostly gay were significantly more likely to smoke or binge drink than were straight women. Mostly straight women were also significantly more likely to be victimized (OR=1.40) than were straight women.

Among men, measures of sexual identity and attraction were generally unrelated to smoking, binge drinking, or victimization. Identifying as gay or mostly straight was unrelated to binge drinking or smoking, whereas only having same-sex sexual partners was associated with a significantly lower risk of binge drinking (OR=0.41). Having mostly opposite-sex sexual partners was associated with greater risk of smoking (OR=1.72) compared with men with only opposite-sex sexual partners. Likewise, men who had male and female partners were at significantly lower risk for binge drinking (OR=0.52) than were men who had only opposite-sex sexual partners. Measures of attraction were only marginally associated with binge drinking; men who were attracted to both sexes (OR=0.61;  $P<.1$ ) or attracted to the same sex only (OR=0.58;  $P<.1$ ) were marginally less likely to binge drink than were men who were attracted to the opposite sex only.

## DISCUSSION

Our investigation of associations between health-related outcomes and dimensions of sexual orientation among young adults indicated 4 major findings. First, as hypothesized, our results varied by gender, measure of sexual orientation, and outcome under investigation. Second, although some researchers may choose to collapse intermediate categories of mostly straight and mostly gay with straight or gay categories or collapse mostly opposite-sex sexual partners and mostly same-sex sexual partners into a bisexual category, our findings suggest that doing so obscures the association between sexual identity, sexual behaviors, and health-related outcomes. Third, regardless of sexual orientation measure, bisexual women experienced more depressive symptoms and perceived stress and were more likely to smoke, binge drink, and experience victimization than were straight women. Finally, among young men, identifying as gay, being attracted to men, or having exclusively male partners was generally unrelated to any health outcomes under investigation.

Consistent with previous research, we found that health-related outcomes varied across dimension of sexual orientation and by gender.<sup>17,18</sup> Although both men and women reported variability across dimensions of sexual

**TABLE 2—Weighted Cross-Tabulations Between Sexual Identity, Behavior, and Attraction Measures: National Longitudinal Study of Adolescent Health, United States, 2007–2008**

Characteristic	Sexual Behavior <sup>a</sup>						Sexual Attraction			
	Only Opposite-Sex Partners, %	Mostly Opposite-Sex Partners, %	Male and Female Partners, %	Mostly Same-Sex Partners, %	Only Same-Sex Partners, %	Never Had Sexual Partner, %	Attracted to Opposite Sex, %	Attracted to Both Sexes, %	Attracted to Same Sex, %	No Attraction Reported, %
<b>Women</b>										
Sexual identity										
Straight	88.2	28.2	37.0	6.8	0.0	90.0	87.6	5.9	8.0	68.3
Mostly straight	11.1	53.2	18.9	8.6	6.2	5.3	12.0	61.6	2.9	7.2
Bisexual	0.3	15.3	18.9	5.8	1.8	0.0	0.0	28.3	1.0	5.6
Mostly gay	0.0	2.2	14.4	17.5	33.4	0.0	0.0	4.2	31.2	0.0
Gay	0.0	0.9	10.0	61.3	58.6	0.0	0.0	0.2	54.0	0.0
None reported	0.4	0.3	0.7	0.0	0.0	4.7	0.3	0.0	3.0	18.9
Sexual attraction										
Attracted to opposite sex	95.7	59.0	45.8	1.0	5.0	94.0				
Attracted to both sexes	3.4	38.0	34.7	18.0	12.1	0.4				
Attracted to same sex	0.2	2.3	17.9	81.0	82.9	1.2				
No attraction reported	0.7	0.7	1.6	0.0	0.0	4.4				
<b>Men</b>										
Sexual identity										
Straight	97.5	49.3	57.0	4.7	12.6	89.9	96.6	38.7	1.6	79.8
Mostly straight	2.3	36.2	25.8	8.2	1.6	4.7	3.0	26.5	0.0	8.4
Bisexual	0.1	14.2	11.0	3.1	1.9	0.6	0.2	22.6	0.9	0.0
Mostly gay	0.0	0.2	3.4	27.6	13.0	0.4	0.0	8.7	20.3	0.0
Gay	0.0	0.0	0.3	55.1	70.7	0.7	0.0	3.5	77.2	0.0
None reported	0.1	0.0	2.5	1.3	0.2	3.7	0.2	0.0	0.0	11.9
Sexual attraction										
Attracted to opposite sex	98.5	84.0	69.9	7.0	9.0	86.7				
Attracted to both sexes	0.8	16.0	19.7	69.2	7.3	5.5				
Attracted to same sex	0.0	0.0	3.7	20.7	83.6	1.1				
No attraction reported	0.7	0.0	6.6	3.1	0.2	6.7				

Note. Column percentages reported may not add to 100 because of rounding.  
<sup>a</sup>All cross-tabulations significant at  $P < .05$ . Mostly opposite sex sexual partners ( $>0.0$  and  $<0.3$ ); male and female sexual partners ( $\geq 0.3$  and  $<0.7$ ); mostly same-sex sexual partners ( $\geq 0.7$  and  $<1.0$ ).

**TABLE 3—Weighted Regression Analyses of Associations Between Sexuality Measures and Depressive Symptoms and Perceived Stress: National Longitudinal Study of Adolescent Health Wave IV, United States, 2007–2008**

	Women		Men	
	Depressive Symptoms, b (SE)	Perceived Stress, b (SE)	Depressive Symptoms, b (SE)	Perceived Stress, b (SE)
<b>Model 1: Sexual identity</b>				
Intercept	1.97*** (0.22)	3.32*** (0.86)	1.63*** (0.24)	1.46* (0.72)
Mostly straight	0.26*** (0.03)	1.05*** (0.11)	0.34*** (0.07)	0.83*** (0.24)
Bisexual	0.42*** (0.09)	1.15** (0.37)	0.18 (0.14)	0.54 (0.41)
Mostly gay	0.26* (0.12)	1.24*** (0.37)	0.02 (0.14)	0.28 (0.53)
Gay	0.03 (0.13)	0.13 (0.45)	0.15 (0.11)	0.05 (0.28)
None reported	0.11 (0.28)	0.08 (0.84)	0.16 (0.26)	-0.50 (0.55)
<b>Model 2: Sexual attraction</b>				
Intercept	2.07*** (0.22)	3.69*** (0.86)	1.63*** (0.24)	1.49* (0.72)
Attracted to both sexes	0.29*** (0.04)	0.98*** (0.21)	0.16 (0.09)	0.19 (0.30)
Attracted to same sex	0.12 (0.12)	0.57 (0.38)	0.13 (0.09)	0.00 (0.27)
No attraction reported	0.10 (0.14)	0.14 (0.42)	0.09 (0.11)	0.14 (0.37)
<b>Model 3: Sexual behavior<sup>b</sup></b>				
Intercept	2.06*** (0.22)	3.75*** (0.87)	1.63*** (0.24)	1.51* (0.72)
Mostly opposite-sex sexual partners	0.20*** (0.04)	0.66*** (0.15)	0.35*** (0.10)	0.93* (0.42)
Male and female sexual partners	0.16 (0.09)	0.20 (0.36)	0.03 (0.08)	0.41 (0.39)
Mostly same-sex sexual partners	0.08 (0.18)	1.19 (0.71)	0.10 (0.10)	0.11 (0.30)
Only same-sex sexual partners	0.12 (0.19)	0.53 (0.60)	0.12 (0.11)	0.05 (0.34)
Never had sex	-0.01 (0.12)	0.20 (0.31)	0.05 (0.08)	0.23 (0.28)

Note. All models adjusted for age, race/ethnicity, relationship status, education, employment, and household income. Reference groups were straight (model 1), attracted to opposite sex (model 2), and only opposite-sex sexual partners (model 3).

<sup>a</sup>Mostly opposite-sex sexual partners (>0.0 and <0.3); male and female sexual partners (≥0.3 and <0.7); mostly same-sex sexual partners (≥0.7 and <1.0).

\**P* < .05; \*\**P* < .01; \*\*\**P* < .001.

orientation, more women than men identified with intermediate categories. These results were not surprising, considering women are more likely than are men to report nonexclusive sexual identities, behaviors, and attractions,<sup>2,6,24,26–30</sup> and they reinforce the importance of measuring sexual orientation across multiple dimensions and providing intermediate response options along each dimension. Furthermore, whereas most young adults responded consistently across the 3 dimensions (e.g., reported only opposite-sex attractions, reported having only opposite-sex sexual partners, and identified as straight), there was some discordance (i.e., sexual identity did not align with sexual behavior or attraction), particularly among women, which was also consistent with previous research.<sup>2,5</sup> Factors associated with this discordance likely included stigma, cultural values, legal risks, developmental stage of the population, or measurement error.<sup>5</sup> The meaning of various configurations of sexual orientation dimensions and how they relate to health outcomes, however, require further exploration.

By documenting variation within and across dimensions of sexual orientation, we identified distinct risk patterns that may have been obscured if we had focused on only 1 dimension or collapsed categories within a given measure. Among women, identifying as mostly straight and having mostly opposite-sex sexual partners was positively associated with every health outcome examined, whereas identifying as mostly straight and having mostly opposite-sex sexual partners was positively associated with depressive symptoms, perceived stress, or smoking among men. These results are consistent with a growing body of research that finds more health risk behaviors among adolescents who identify as mostly heterosexual compared with heterosexual.<sup>54–56</sup> Additional research is needed to understand the meaning of these intermediate categories as well as the mechanisms linking them to riskier behavior and poorer health-related outcomes among young adults.

Consistent with previous research, we also found that bisexual women, regardless of sexual orientation measure, reported greatest overall risk.<sup>17,18,37,57,58</sup> Yet, this was not true for men. The reasons for this finding are not completely understood because limited research has been conducted with bisexual young adults. Sexual minorities often experience stigma and discrimination, which have been associated with psychological distress<sup>59,60</sup> and engagement in health risk behaviors.<sup>61–64</sup> Research also suggests, however, that developing a distinct identity and crafting a collateral sense of purpose through group affiliation and friendships on the basis of sexual identity provide protection against such psychosocial stressors.<sup>65,66</sup> A potential explanation for the greater health risks among bisexual young adult women may be that they do not have the same opportunity to experience a sense of belonging tied to their sexual identity compared with their heterosexual or lesbian counterparts.<sup>67</sup> Research into the unique experiences and stressors that contribute to bisexual women's

**TABLE 4—Weighted Logistic Regression Analyses of Associations Between Sexuality Measures and Current Smoking, Frequent Binge Drinking, and Victimization: National Longitudinal Study of Adolescent Health Wave IV, United States, 2007–2008**

	Women			Men		
	Smoking, OR (95% CI)	Drinking, OR (95% CI)	Victimization, <sup>a</sup> OR (95% CI)	Smoking, OR (95% CI)	Drinking, OR (95% CI)	Victimization, <sup>a</sup> OR (95% CI)
<b>Model 1: Sexual identity</b>						
Straight (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Mostly straight	1.63* (1.35, 1.97)	1.95* (1.60, 2.38)	1.40* (1.13, 1.73)	0.88 (0.58, 1.34)	1.10 (0.75, 1.61)	0.74 (0.49, 1.11)
Bisexual	1.65* (1.02, 2.67)	2.21* (1.34, 3.63)	1.58* (1.01, 2.44)	1.65 (0.66, 4.15)	0.77 (0.32, 1.85)	1.04 (0.46, 2.38)
Mostly gay	2.14* (1.09, 4.21)	4.33* (2.12, 8.83)	1.78 (0.77, 4.11)	1.39 (0.57, 3.38)	0.51 (0.14, 1.82)	0.82 (0.37, 1.81)
Gay	2.08* (1.03, 4.19)	2.06 (0.98, 4.34)	0.83 (0.37, 1.84)	1.19 (0.75, 1.88)	0.65 (0.34, 1.23)	0.96 (0.54, 1.73)
None reported	0.38* (0.17, 0.86)	0.57 (0.11, 2.98)	2.79* (1.25, 6.21)	0.47 (0.13, 1.67)	0.23 (0.03, 2.09)	1.03 (0.26, 4.10)
<b>Model 2: Sexual attraction</b>						
Attracted to opposite sex (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Attracted to both sexes	1.59* (1.24, 2.06)	2.05* (1.57, 2.68)	1.43* (1.04, 1.96)	1.14 (0.63, 2.04)	0.61 (0.35, 1.09)	0.98 (0.56, 1.73)
Attracted to same sex	1.59 (0.92, 2.74)	2.15* (1.18, 3.91)	1.19 (0.65, 2.19)	1.18 (0.77, 1.82)	0.58 (0.32, 1.04)	1.03 (0.62, 1.71)
No Attraction reported	0.83 (0.46, 1.52)	0.37 (0.12, 1.20)	1.50 (0.74, 3.03)	0.57 (0.28, 1.16)	0.18* (0.04, 0.78)	0.52 (0.20, 1.38)
<b>Model 3: Sexual behavior<sup>b</sup></b>						
Only opposite sex sexual partners (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Mostly opposite-sex sexual partners	2.06* (1.64, 2.59)	2.30* (1.80, 2.95)	1.55* (1.23, 1.94)	1.72* (1.03, 2.86)	1.62 (0.95, 2.76)	0.97 (0.54, 1.74)
Male and female partners	1.52 (0.92, 2.48)	1.39 (0.85, 2.27)	1.58 (0.97, 2.56)	0.70 (0.40, 1.21)	0.52* (0.30, 0.91)	1.04 (0.60, 1.79)
Mostly same-sex sexual partners	0.83 (0.28, 2.49)	1.97 (0.58, 6.64)	1.61 (0.64, 4.04)	1.11 (0.56, 2.22)	0.68 (0.31, 1.48)	0.80 (0.38, 1.66)
Only same-sex sexual partners	2.68* (1.01, 7.14)	1.61 (0.47, 5.53)	2.12 (0.58, 7.70)	0.79 (0.43, 1.45)	0.41* (0.20, 0.83)	1.30 (0.70, 2.40)
Never had sex	0.05* (0.02, 0.13)	0.27 (0.05, 1.57)	0.91 (0.49, 1.68)	0.32* (0.18, 0.56)	0.16* (0.08, 0.33)	0.58* (0.34, 1.00)

Note. CI = confidence interval; OR = odds ratio. All models adjusted for age, race/ethnicity, relationship status, education, employment, and household income.

<sup>a</sup>Reported ever experiencing at least one of the following: (1) someone pulled a knife or gun on them; (2) they were shot or stabbed; (3) they were slapped, hit, kicked, or choked; or (4) they were beaten.

<sup>b</sup>Mostly opposite-sex sexual partners (>0.0 and <0.3); male and female sexual partners (≥0.3 and <0.7); mostly same-sex sexual partners (≥0.7 and <1.0).

\**P* < .05.

health disparities is needed. Furthermore, collective resilience among bisexual women should be explored and should include how their group identity and affiliation compare with those of lesbians and gay men, how bisexual women perceive LGB organizations' inclusiveness of their needs and issues, and how or whether such perceived inclusion (or exclusion) affects their psychosocial stress, health risk behaviors, and health-related outcomes.

Young adult men who identified as gay, were attracted to other men, and had only same-sex sexual partners were not at greater risk for any of the health indicators under investigation. In fact, men who only had same-sex sexual partners were at lower risk for binge drinking than were their heterosexual peers. These results are consistent with previous Add Health research in which adolescent boys with same-sex sexual partners or attractions were not at greater risk than were their peers with opposite-sex sexual partners or attractions for

a variety of health behaviors, including smoking, drinking alcohol, and victimization.<sup>37,58</sup>

Our results were not consistent, however, with previous research in which men with any same-sex attraction had higher rates of mental disorders.<sup>17,48,49</sup> Several reasons may explain these differences. First, we used a nonclinical measure of mental health (i.e., the Center for Epidemiological Studies Depression scale), whereas previous research used clinical measures of mood and anxiety disorders.<sup>17,48,49</sup> Second, our study focused exclusively on young adults, unlike other population-based studies, that included all adults.<sup>17,48,49</sup>

Society's attitudes toward sexual minorities have changed since the mid-20th century; for example, in 2008, 10 states provided some measure of spousal rights for same-sex couples, including 2 where same-sex marriage was legal.<sup>68–70</sup> Although sexual minorities still experience marginalization in society, today's young adults may not experience the same level of

marginalization older adults experienced in their youth.<sup>71–74</sup> By restricting our sample to young adults, we were able to control for potential confounding because of secular changes in attitudes toward sexual minority populations. Additional population-based studies of young adults using all 3 dimensions of sexual orientation are needed to verify or challenge these findings.

### Limitations

Our sample represents individuals who were attending Grades 7 through 12 in 1994–1995. As such, inferences can be made only for this population. To our knowledge, however, our study is the first to investigate dimensions of sexual orientation and health-related outcomes among young adults using a nationally representative sample. Our measure of attraction was somewhat restrictive. Questions that allow respondents to report degrees of attraction to males and females are the most consistently understood and easiest to answer.<sup>1</sup> Although we

provided intermediate categories of sexual behavior based on the proportion of partners who were male or female, the cutpoints for these categories were somewhat arbitrary. Sensitivity analyses using different cutpoints were consistent with those we present here. Our measure of victimization was restrictive, as it did not directly assess sexual assault. Some identity and behavior categories had between 32 and 100 individuals when gender stratified, which likely reduced our ability to detect significant differences, if they indeed existed. Finally, measurement error may have contributed to discordance between dimensions.

### Conclusions

Overall, our findings challenge presuppositions that sexual minorities uniformly engage in high-risk behavior or suffer from psychological problems. Rather, health risks varied by gender and dimension of sexual orientation examined. Thus, to achieve a more complete picture of sexual minority health, additional population-based studies measuring multiple dimensions of sexual orientation are needed. Such information is vital for health professionals to develop appropriate prevention and intervention strategies targeting the most vulnerable populations. ■

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This article was accepted April 24, 2011.

### Contributors

L.L. Lindley conceptualized the study and led the writing. K.M. Walsemann assisted with the conceptualization of the study and writing and led the data analysis. J.W. Carter Jr assisted with data management and writing.

### Acknowledgments

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen

Mullan Harris at the University of North Carolina at Chapel Hill, and funded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (grant P01-HD31921), with cooperative funding from 23 other federal agencies and foundations.

Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>).

**Note.** No direct support was received from grant P01-HD31921 for this analysis.

### Human Participant Protection

Institutional review board approval was obtained from George Mason University and the University of South Carolina.

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