Bisexuality, Union Status, and Gender Composition of the Couple: Reexamining Marital Advantage in Health

Ning Hsieh[1], **Hui Liu**[1]

[1]Department of Sociology, Michigan State University, 509 East Circle Drive, 317 Berkey Hall, East Lansing, MI 48824-1111, USA

Abstract

It has long been documented that married individuals have better health outcomes than unmarried individuals. However, this marital advantage paradigm has been developed primarily based on heterosexual populations. No studies to date have examined the health effects of marriage among bisexuals, one of the most disadvantaged but understudied sexual minority groups, although a few have shown mixed results for gays and lesbians. Similarly, no research has examined how the gender composition of a couple may shape bisexuals' health outcomes above and beyond the effects of sexual orientation. We analyzed pooled data from the 2013–2017 National Health Interview Survey ($n = 154{,}485$) and found that the health advantage of marriage applied only to heterosexuals and, to a lesser extent, gays and lesbians. Married bisexuals, however, exhibited poorer health than unmarried bisexuals when socioeconomic status and health behaviors were adjusted for. Moreover, bisexuals in same-gender unions were healthier than bisexuals in different-gender unions primarily because of their socioeconomic advantages and healthier behaviors. Together, our findings suggest that bisexuals, particularly those in different-gender unions, face unique challenges in their relationships that may reduce the health advantage associated with marriage.

Keywords

Bisexual; Gender; Health; Marriage; Sexual orientation

Introduction

According to multiple population-level surveys, 0.7 % to 3.1 % of American adults self-identify as bisexual, accounting for one-third to one-half of the sexual minority population (Gates 2011). Although the size of the U.S. bisexual population continues to grow,[1] the experiences of bisexuals have received much less public and scholarly attention compared with those of other sexual minority groups, such as gays and lesbians (Institute of Medicine

Ning Hsieh (corresponding author), hsiehnin@msu.edu.

[1]According to the General Social Survey (GSS), the percentage of self-identified bisexuals in the United States has steadily grown from 1.5 % in 2008 to 3.2 % in 2016. Data were accessed from the GSS Data Explorer website at gssdataexplorer.norc.org.

(IOM) 2011). An emerging number of population-based studies have noted that bisexuals exhibit worse health outcomes than heterosexuals and gays/lesbians, including poorer self-rated health, more functional limitations, higher risks of cardiovascular diseases, and higher prevalence of mental distress (Bostwick et al. 2010; Conron et al. 2010; Fredriksen-Goldsen et al. 2010; Gorman et al. 2015; Hsieh and Ruther 2016). Yet, our understanding of this group's health and well-being remains limited. In light of growing acceptance of same-sex relationships and the recent legalization of same-sex marriage in the United States, we explore how union status (married vs. unmarried) relates to the health of bisexuals in comparison with heterosexuals, gays, and lesbians. We also explore whether bisexuals have better or poorer health in a same-gender versus different-gender union.

Marriage, an institution of privilege, is strongly linked to favorable health outcomes (Carr and Springer 2010; Simon 2002; Waite and Gallagher 2000), but the ample evidence for this marriage-health relationship is largely based on heterosexual populations. Only very recently have studies started to examine how marriage and other formal unions are associated with the health of sexual minorities, mainly gays and lesbians. Findings from these few studies have been mixed: some studies suggest that married gays and lesbians have better health than their unmarried peers (Wight et al. 2012), whereas others suggest no such marital advantage (Reczek et al. 2017). No studies to date, however, have discussed how union status may relate to health similarly or differently for bisexuals than for heterosexuals, gays, and lesbians. This gap in knowledge reflects the relative invisibility of bisexuals in society at large and their marginalized position in the LGBTQ community (Elia 2014; Hackl et al. 2013). Additionally, prejudices and stereotypes associated with bisexuality still prevail in society and often include perceptions that bisexuals are sexually permissive and unable to commit to monogamous relationships (Anderson and McCormack 2016; Bostwick et al. 2010; Diamond 2008); these perceptions may affect bisexuals' intimate relationships. It is thus worth investigating whether bisexuals enjoy the health advantage of marriage as much as their heterosexual, gay, and lesbian counterparts.

We use pooled data from the National Health Interview Survey (NHIS) from 2013 to 2017 to address three major research questions. First, does union status relate to health differently for bisexuals than for heterosexuals, gays, and lesbians, and do these patterns differ between men and women? Second, do bisexuals in a same-gender union have different health than bisexuals in a different-gender union? Third, do socioeconomic resources and health behaviors explain the health effects of union status and gender composition of union across sexual orientation groups? This is the first national study to examine bisexual health in relation to union status, gender, and gender composition of the union, shedding light on the unique health disparities faced by bisexuals—one of the most underexplored segments of sexual minority population—and highlighting the importance of reconsidering the health effects of marriage in the context of stigmatization and gender dynamics.

Bisexuals' Health Disadvantage

A large number of studies have found that sexual minorities have poorer health outcomes than their heterosexual counterparts (e.g., IOM 2011; Meyer 2003). Many of these studies, however, have combined bisexuals with gays and lesbians in their analyses, assuming that

these populations experience similar prejudice and discrimination; have comparable levels of social, economic, and political resources; and face similar health risks (Bostwick et al. 2010; Fredriksen-Goldsen et al. 2010). Only recently have studies started to show that bisexuals are distinct in their health experiences, in the stigma attached to their identity, and in access to economic and social resources (Anderson and McCormack 2016; Bostwick et al. 2010; Conron et al. 2010; Gorman et al. 2015; Hsieh 2014; Thomeer and Reczek 2016; Zivony and Lobel 2014). A few studies based on state-level data have shown that bisexual-identified men and women report poorer self-rated health and higher rates of chronic conditions (e.g., CVDs) than their heterosexual-, gay-, and lesbian-identified counterparts (Conron et al. 2010; Gorman et al. 2015). These studies have attributed much of these health gaps to bisexuals' lower socioeconomic status (SES), often indexed by education, income, and employment status. Other research, based on national and state samples, has indicated that bisexual men and women experience higher risks of mental distress, including mood and anxiety disorders, than heterosexuals, gays, and lesbians even when SES is taken into account (Bostwick et al. 2010; Fredriksen-Goldsen et al. 2010; Hsieh 2014). Similarly, research on sexual behavior has also found that those with both-gender partners are less happy than those with same-gender or different-gender partners even when SES is adjusted for (Thomeer and Reczek 2016). These studies suggest that bisexuals face poorer mental health outcomes largely because of the unique stressors they face, such as lack of community and social support as well as negative stereotypes of them as indecisive, unfaithful, and promiscuous.

Marital Advantage for Bisexuals?

A long tradition of research has found that married people, on average, enjoy better mental health, fewer chronic illnesses, lower disability, and longer life expectancy than divorced, separated, widowed, and never-married people (Hughes and Waite 2009; Liu and Zhang 2013; Simon 2002). There are at least two primary explanations for this marital advantage: marriage protection and marriage selection (Carr and Springer 2010; Johnson and Wu 2002; Waite and Gallagher 2000). The marriage protection argument suggests that through marriage, people may accrue unique economic and psychosocial resources that are protective for health; other types of relationships, such as cohabitation and friendship, may not provide these resources or may not provide them to the same extent (Becker 2009; Waite and Gallagher 2000). For example, marriage encourages income and wealth-pooling and cost-sharing, which enhance economic stability; marriage also facilitates healthier behaviors and provides an important source of emotional support. On the other hand, the marriage selection argument suggests that people with higher SES and other health-favorable characteristics (such as healthier lifestyles) are more likely to be selected into marriage, which may explain the better health of married people relative to their unmarried counterparts (Fu and Goldman 1996; Musick et al. 2012).

For the most part, the marital advantage paradigm has been developed based on traditional heterosexual marriages, and only recently has it been tested on same-sex marriages. Wight et al. (2012) drew on the California Health Interview Survey to show that members of sexual minorities (lesbians, gays, and bisexuals combined) who were legally married to a same-sex spouse had better mental health than those who were not in a legal marriage or registered

domestic partnership, a pattern similar to that of their heterosexual counterparts. In contrast, in an analysis of NHIS data, Reczek et al. (2017) did not find that married gays and lesbians had better health than unmarried gays and lesbians, suggesting that legal status by itself may not improve health outcomes without broader social acceptance of same-sex relationships. No research to date, however, has examined whether and through which mechanisms bisexuals' union status is linked to health.

The union-health relationship observed primarily in heterosexual populations may not apply to bisexual populations. For example, although marriage may promote health by increasing access to economic resources (which can be translated into food security, safer neighborhoods, better-quality health services, and so on), this economically related health benefit may be limited among bisexuals because it may be more challenging for bisexuals than for heterosexuals or even gays and lesbians to find marriageable partners with decent SES given the prevailing bisexual stigma in society (Anderson and McCormack 2016; Bostwick et al. 2010). As previous research on mate selection has noted, being perceived as lacking desirable partner traits, including faithfulness and reliability, may lower the selectivity of the mating process (Blau 1964; Furnham 2009; Regan 1998). Consistently, quite a few studies have shown that bisexuals in general have lower family incomes and are more likely to live in poverty than heterosexuals, gays, and lesbians (Boehmer et al. 2007, 2012; Conron et al. 2010; Gorman et al. 2015). Therefore, the health advantage of marriage may be smaller among bisexuals than other sexual orientation groups because marriage selection based on SES and marriage protection resulting from resource pooling are likely more limited among bisexuals.

In addition to offering economic resources, a high-quality marriage may facilitate social control of health behaviors (i.e., spouses regulating each other's health behaviors) and provide a sense of belonging and access to social support, all of which may enhance the health and well-being of married individuals (Liu and Umberson 2008; Waite and Gallagher 2000). However, bisexuals may benefit less from these psychosocial resources in their relationships. Research based on small nonprobability samples has noted that bisexuals face unique challenges in their intimate relationships. Because of pervasive negative stereotypes, bisexual men and women are considered less dependable and trustworthy as romantic partners (Israel and Mohr 2004; Tabatabai 2015; Zivony and Lobel 2014). Some bisexuals even struggle with disclosing their sexual orientation to their nonbisexual partners (Anderson and McCormack 2016; Pallotta-Chiarolli 2016). And because bisexuals are attracted to both genders, their partners may feel insecure, conceiving that one lover can never satisfy their emotional, romantic, and sexual needs (Anderson and McCormack 2016). These challenges could cause conflict, weaken intimacy, disrupt healthy relationship dynamics (e.g., encouraging health-enhancing behavior and providing emotional support), and thus reduce the health-promoting effects of a committed relationship such as marriage. Because of this, the health advantage of marriage may be smaller among bisexuals than among heterosexuals, gays, and lesbians.

> *Hypothesis 1*: Although being married is associated with better health outcomes among heterosexuals, gays, and lesbians, the marital advantage in health is small or negligible among bisexuals.

Hypothesis 2: The health gaps by union status are partially explained by access to socioeconomic resources and health behaviors, but more so for heterosexuals, gays, and lesbians than for bisexuals.

Gender Differences in the Health Advantage of Marriage

Many studies based on heterosexual marriages have shown that married men enjoy more health benefits from marriage than do married women (Rendall et al. 2011; Waite and Gallagher 2000). As the gender-as-relational perspective posits, this is primarily because gender or gendered behaviors are enacted in interactions and relational contexts (Reczek et al. 2018; Thomeer et al. 2015; Umberson et al. 2018). In heterosexual relationships, women more often take on the role of monitoring and regulating their partners' health behaviors and do more care and emotion work to maintain/improve their partners' health than do men (Reczek and Umberson 2012; Thomeer et al. 2015; Umberson et al. 2018). The cultural ideals of femininity (e.g., women as experts in nurturing and caregiving) and masculinity (e.g., men as being independent, invulnerable, and incapable of understanding emotions) underlie these gendered practices (Courtenay 2000; Springer and Mouzon 2011).

Compared with heterosexual men and women, gays and lesbians are less likely to enact the cultural ideals of masculinity and femininity in their relationships and thus more often practice cooperative and mutually supportive health behavior work, such as taking turns to remind each other to drink less, eat healthier, and schedule regular medical checkups (Reczek and Umberson 2012; Reczek et al. 2018; Umberson et al. 2018). Therefore, we expect that gender difference in marital health advantage would be smaller for gays and lesbians than for heterosexuals because of more egalitarian relationship dynamics in gay/lesbian couples. Yet, few studies have explored how gender may shape health behaviors or marital advantage in health among bisexuals. Because of a nonnormative sexual identity and a higher chance of dating or marrying sexual minorities or individuals who do not follow feminine/masculine conventions, bisexuals—like gays and lesbians—may perform gender in more egalitarian ways in their relationships compared with heterosexuals. In this sense, gender difference in marital health advantage may be smaller for bisexuals than for heterosexuals.

Hypothesis 3: Gender difference in the health advantage of marriage is smaller among bisexuals, gays, and lesbians than among heterosexuals.

Does Gender Composition of A Couple Matter for Bisexuals?

Two theoretical perspectives have provided foundation for us to expect that the gender composition of a couple is important for bisexuals in a union: the gender-as-relational perspective and the minority stress theory.

According to the gender-as-relational perspective discussed earlier, relationship dynamics—such as the regulation of health behaviors—differ in a same-gender and different-gender context. Specifically, how individuals enact and perform gender (or gendered behaviors) may depend on the gender of the person with whom they interact, in addition to their own gender and/or sexual identity (Reczek et al. 2018; Thomeer et al. 2015; Umberson et al.

2018). However, previous studies have failed to separate the health effects of gender composition from those of sexual identity because most of them have compared same-gender and different-gender couples without knowing or controlling for individuals' sexual identities. Bisexuals in relationships provide a unique opportunity to test the gender-as-relational perspective while holding sexual identity constant. Partnered bisexuals may experience different health advantage in a same-gender versus different-gender relationship because of different relationship dynamics. From the gender-as-relational perspective, bisexuals with a same-gender partner may practice more cooperative and supportive health behavior work and thus have better health outcomes than bisexuals with a different-gender partner. Additionally, instead of following the traditional gender division of labor, same-gender partners are more likely than different-gender partners to both work and thus earn higher family incomes (Denney et al. 2013; Liu et al. 2013). This suggests that bisexuals with a same-gender partner may enjoy advantages in socioeconomic resources, health behaviors, and thus health relative to bisexuals with a different-gender partner.

In contrast, the minority stress perspective emphasizes prejudice, discrimination, and violence based on sexual orientation as a fundamental cause of health disparities (Meyer 2003). Compared with bisexuals with a different-gender partner, bisexuals with a same-gender partner may experience more relationship-based stressors because of the stigmatized status of their relationship, such as facing social disapproval and hiding a same-gender relationship from family members (LeBlanc et al. 2015; Thomeer et al. 2018). This can lead to relationship strain (e.g., conflict, lack of trust, and lack of desired intimacy), less supportive and health-enhancing behavior in the relationship, and thus poorer health outcomes. Moreover, because many states still lack anti-discrimination laws to protect the employment rights of sexual minorities (Stack 2016), having a same-gender relationship (and revealing such a relationship to coworkers) may lead to job loss, missed opportunities for promotion, or other labor market discrimination. Considering SES as a fundamental cause of health (Link and Phelan 1995), it is likely that bisexuals with a same-gender partner experience poorer health than those with a different-gender partner.

> *Hypothesis 4a (prediction from the gender-as-relational perspective):* Bisexuals in a same-gender union have better health outcomes than those in a different-gender union. Part of this health gap is explained by their different SES and health behaviors.

> *Hypothesis 4b (prediction from the minority stress perspective):* Bisexuals in a same-gender union have worse health outcomes than those in a different-gender union. Part of this health gap is explained by their different SES and health behaviors.

Data and Methods

Data and Sample

We used pooled data (2013–2017) from the NHIS, prepared by the IPUMS NHIS (Blewett et al. 2018). The NHIS, a household survey that has been conducted annually since 1957 and covers a broad range of health topics, collects information from nationally representative samples of the civilian, noninstitutionalized population in the United States. Since 2013, the survey has started to ask adult respondents (aged 18 and older) questions about sexual

identity. The initial sample from these years includes 164,696 adults. After excluding 10,211 (6 %) cases with missing values on one or more of the variables used in this study (except family income), our final analytic sample includes 154,485 adults. Because a larger number of cases lack information for the family income variable ($n = 24,351$), multiple imputations were carried out using the NHIS-imputed income files and the *mi* functions in Stata version 14 (StataCorp 2015) instead of listwise deletion. The final analytic sample includes 1,428 self-identified bisexuals, 2,654 self-identified gays or lesbians, and 150,403 self-identified heterosexuals.

Measures

We examined two health outcomes that are often documented to be related to union status: self-rated health (SRH) and functional limitation. *SRH*, an inclusive and robust predictor of mortality (Idler and Benyamini 1997), includes five ordinal response categories: poor, fair, good, very good, and excellent; higher SRH values reflect better health. Because SRH is general, subjective, and positional and thus may not accurately describe health disparities across social groups with different SES and access to health resources (Sen 2002), we further examined functional limitation, which includes multiple measurements for difficulty in performing essential movements and daily activities. Studies have noted that reports of functional limitation are less sensitive to SES (Hogan 2012). *Functional limitation* is a count of how many of the following 12 activities in which the respondent experienced difficulty without assistance or special equipment (with higher values indicating more limitations and thus poorer health): walking one-quarter of a mile; climbing 10 steps; standing for two hours; sitting for two hours; stooping, bending, or kneeling; reaching up over his or her head; using fingers to grasp or handle small objects; lifting or carrying something as heavy as 10 pounds; pushing or pulling large objects, such as a living room chair; going out to places, such as shops, movie theaters, or sporting events; participating in social activities, such as visiting friends and attending clubs and meetings; and doing things to relax at home or for leisure, such as reading and watching TV.

Sexual orientation was measured based on the question, "Which of the following best represents how you think of yourself?" The response included three categories: bisexual, gay or lesbian, and heterosexual. Although the original survey question had two additional response categories—"something else" and "I don't know the answer"—this study focuses on comparing respondents who self-identified as bisexual with those who self-identified as gay or lesbian or as heterosexual. We excluded the two ambiguous groups because of their small sample sizes.

Union status has four categories, indicating whether the respondent was married, cohabiting, never married, or previously married (including divorced, separated, and widowed).

Gender of the respondent indicates whether the respondent identified as female or male. *Gender composition of the couple* indicates whether a partnered respondent was in a same-gender or different-gender union.

Socioeconomic status was measured by four variables: educational attainment, family income, employment status, and perceived financial strain. *Educational attainment* includes

four categories: less than high school (reference), high school or equivalent, some college, or bachelor's degree or above. *Family income* is a continuous variable that indicates the respondent's total family income. *Employment status* includes three categories: working or in school (reference), unemployed or unable to work (e.g., being laid off, looking for work, or not working for health reasons), and retired. *Perceived financial strain* is a continuous composite scale that summarizes six items of financial worries (Cronbach's alpha = .9), including worries about not having enough money for normal monthly bills; rent, mortgage, or other housing costs; maintaining the standard of living the respondent enjoys; normal medical care; medical costs for a serious illness or accident; and retirement. Respondents rated each item on a 4-point scale ranging from 1 (not worried at all) to 4 (very worried). The final score is an average of the six items, with higher values indicating greater financial strain.

Health behaviors were measured by three variables: cigarette smoking, alcohol consumption, and exercise. *Cigarette smoking* indicates whether the respondent was a current smoker (1 = yes; 0 = no). *Alcohol consumption* includes three categories: not a current drinker (reference), current drinker with one to two drinks on days of drinking, and current drinker with three or more drinks on days of drinking. *Exercise* indicates whether the respondent engaged in vigorous physical activity at least twice weekly for at least 10 minutes each time during leisure time (1 = yes; 0 = no). Vigorous physical activities are those that cause heavy sweating or large increases in breathing or heart rate.

Finally, control variables include age (in years, 18–85), race (white (reference), black, or Asian and others), Hispanic ethnicity (1= yes; 0 = no), region of residence (Northeast (reference), North Central/Midwest, South, or West), and survey year (2013 (reference), 2014, 2015, 2016, or 2017).

Analytic Plan

We estimated ordinal logit regression models to predict SRH and negative binomial regression models to predict functional limitation. We examined both the main and interaction effects of sexual orientation and union status on health. Because the interaction analysis suggested that the union status–health association significantly differed by sexual orientation, we further conducted separate analyses for heterosexuals, bisexuals, and gays and lesbians. For each group, we estimated four models for SRH and functional limitation, respectively. In Model 1, we controlled for basic demographic covariates, including age, gender, race, Hispanic ethnicity, region of residence and survey years. In Model 2, we added education attainment and economic resource variables as additional controls to test the extent to which SES contributes to health disparities by union status within each group. In Model 3, we replaced SES variables with health behavior variables as additional controls to test whether health behaviors explain differences in health by union status. In Model 4, we included all covariates. Additionally, to examine gender difference in the health advantage of marriage across sexual orientation groups, we also estimated interaction effects of gender and union status on health outcomes for each sexual orientation group.

Finally, to test whether the gender composition of a couple (same-gender vs. different-gender union) further shapes bisexuals' health outcomes, we estimated four additional

models for SRH and functional limitation, respectively, with the same sets of controls described earlier in Models 1–4. These models were estimated only for bisexuals in a union.

We adjusted all analyses to account for the multistage sampling design, oversampling on racial/ethnic minorities, nonresponse, and poststratification in the NHIS. All analyses were conducted using the *svy* and *mi* functions in Stata version 14 (StataCorp 2015).

Results

Descriptive Statistics

Table 1 shows descriptive statistics of all analytic variables by sexual orientation and union status. Results suggest that in general, bisexuals reported poorer self-rated health than either heterosexuals or gays and lesbians. This pattern existed among the married, cohabiting, and the previously married, but it was less consistent among the never married. Married bisexuals also experienced more functional limitation than married heterosexuals or gays and lesbians. Among bisexuals and heterosexuals, never-married individuals tended to report better health and functional status than individuals of other union status, likely because of their younger ages. However, this pattern was not clear among gays and lesbians.

Although bisexuals were more likely to have a bachelor's or higher degree than heterosexuals, they generally had lower incomes, higher rates of being unemployed or unable to work, and higher perceived financial strain than heterosexuals of the same union status. Compared with gays and lesbians of the same union status, bisexuals had consistently lower or poorer educational attainment, income, and employment status and had consistently higher perceived financial strain. Further, within each sexual orientation group, married people consistently had higher incomes and were less likely to be unemployed or unable to work than unmarried people. Notably, the income gap by union status appears to be smaller among bisexuals than among heterosexuals and gays/lesbians primarily because married bisexuals had lower income than married heterosexuals and gays/lesbians. In terms of health behaviors, bisexuals were more likely to be current smokers and heavy drinkers (i.e., having three or more drinks on days of drinking) than heterosexuals and gays and lesbians of the same union status; the only exception is that never-married gays and lesbians smoked more often than never-married bisexuals. Within each sexual orientation group, smoking and heavy drinking were generally less prevalent among married individuals than individuals of other union statuses. Frequency of vigorous exercise was not clearly stratified by sexual orientation but was lowest among previously married people across all sexual orientation groups. Finally, the majority of partnered bisexuals were in a different-gender union; only about 7.2 % of married bisexuals and 18.6 % of cohabiting bisexuals were in a same-gender union. Expectedly, almost all partnered heterosexuals were in a different-gender union, and the majority of partnered gays and lesbians were in a same-gender union.

Regression Results

No Marital Advantage in Health Among Bisexuals (Hypothesis 1)—Table 2 shows that when we controlled for demographic factors, bisexuals remained the most likely sexual orientation group to report poorer health and functional limitation (Models 1a and 1b). In

supplementary analyses, results from *t* tests (not shown but available upon request) suggested that the differences in both SRH and functional limitation between bisexuals and gays/lesbians were also significant at the $p < .001$ level. Moreover, when the analysis was stratified by gender (not shown but available upon request), we found similar patterns for men and women (i.e., both bisexual men and women exhibited the poorest health). These results are consistent with previous studies showing that bisexuals have poorer health than heterosexuals, gays, and lesbians (e.g., Gorman et al. 2015).

Also consistent with previous studies, results in Table 2 indicate that unmarried people (including those who are cohabiting, never married, and previously married) reported poorer health (Model 1a) and were more likely to experience functional limitation (Model 1b) than married people. However, this marital advantage appears to have varied across sexual orientation groups. Table 2 shows that among heterosexuals, all unmarried groups reported poorer SRH and were more likely to experience functional limitation (Models 2a and 2b) than their married counterparts, as indicated by the significant main effects of union status. Specifically, compared with married heterosexuals, the odds of reporting better health were 32 % (i.e., $[1 - 0.68] \times 100$ %), 24 %, and 31 % lower, and the incidence rates of functional limitation were 37 %, 25 %, and 43 % higher among cohabiting, never-married, and previously married heterosexuals, respectively. These marital advantages were largely similar for gays and lesbians, which was indicated by the insignificant interaction effects between union status and gay/lesbian identity with only one exception: the gap in functional limitation between married and cohabiting individuals was less pronounced among gays and lesbians than among heterosexuals (Table 2, Models 2a and 2b). By contrast, many of the marital advantages were not present among bisexuals, as suggested by the significant interaction effects between union status and bisexual identity (Table 2, Models 2a and 2b). In particular, compared with married bisexuals, the odds of reporting better health were actually 16 % (i.e., $[0.77 \times 1.50 - 1] \times 100$ %) higher for never-married bisexuals (Model 2a); the incidence rates of functional limitation were also 19 % (i.e., $(1 - 1.40 \times 0.58) \times 100$ %), 18 %, and 16 % lower among cohabiting, never-married, and previously married bisexuals, respectively (Model 2b). These results support Hypothesis 1, that health advantages of marriage do not apply to bisexuals.

Finally, Fig. 1 summarizes the odds ratios of reporting better health and the incidence rate ratios of functional limitations by union status and sexual orientation based on the interaction models (Models 2a and 2b in Table 2). It clearly demonstrates that marital advantage in health exists among heterosexuals but not among bisexuals. Although gays and lesbians show similar patterns of marital advantage as heterosexuals (according to the point estimates), their health differences by union status are less clear because of the wider confidence intervals.

The Roles of Socioeconomic Resources and Health Behaviors (Hypothesis 2)

—Because of the significant differences in union status-health relationships across sexual orientation groups shown in Table 2, we estimated models separately by sexual orientation to better understand the specific mechanisms that link union status and health. Results are shown in Table 3 for bisexuals, Table 4 for heterosexuals, and Table 5 for gays and lesbians. These results reveal consistent patterns as shown in the interaction models of Table 2.

Specifically, among bisexuals, the relationship between union status and SRH or functional limitation is insignificant; that is, no health advantage of marriage was found (Table 3, Models 1a and 1b). After we adjusted for SES (educational attainment, employment status, income level, and perceived financial strain), being married even became associated with poorer health among bisexuals. For example, married bisexuals reported poorer health than never-married bisexuals (Table 3, Model 2a), and they also exhibited higher incidence rates of functional limitation than cohabiting, never-married, and previously married bisexuals (Table 3, Model 2b). When health behaviors—smoking, drinking, and exercise—were adjusted for, married bisexuals also had higher incidence rates of functional limitation than never-married bisexuals (Table 3, Model 3b). The pattern that being married is associated with poorer self-rated health and more functional limitations persisted when we adjusted for both SES and health behaviors (Table 3, Models 4a and 4b). These results suggest that the socioeconomic and behavioral factors suppressed some of the health disadvantage for married bisexuals. That is, without their current socioeconomic resources and healthy behaviors, married bisexuals' health would have fared worse than their unmarried bisexual counterparts.

The pattern for heterosexuals was quite the opposite. Consistently with previous studies, we found that being married was related to better SRH and lower functional limitation among heterosexuals (Table 4, Models 1a and 1b). The likelihood of reporting poorer health or functional status was higher for all unmarried respondents, including the cohabiting, never married, or previously married, than for married respondents. Results from additional analysis using t tests (not shown but available upon request) suggested that a significant share of this health advantage of marriage was attributable to married respondents' higher levels of SES at the $p < .05$ level (Table 4, Models 2a and 2b). In addition, some advantages were also attributable to married respondents' healthier behaviors at the $p < .05$ level, although their contribution was smaller than that of SES (Table 4, Models 3a and 3b). Together, SES and health behaviors accounted for a large proportion (but not all) of the health advantage among married people (Table 4, Models 4a and 4b).

Finally, we found that health disparity by union status among gays and lesbians was also unique. Although never-married and previously married gays and lesbians tended to exhibit poorer SRH than married gays and lesbians (Table 5, Model 1a), union status differences in functional limitation were not statistically significant among gays and lesbians (Table 5, Model 1b). When we adjusted for SES, health gaps between the married and the unmarried diminished (Table 5, Models 2a and 2b). The contribution of SES to the disparity in SRH was statistically significant at the $p < .05$ level based on t tests (results not shown but available upon request). Although the inclusion of health behaviors into the models also diminished the health gaps (Table 5, Models 3a and 3b), their contribution was not statistically significant (results not shown but available upon request). Finally, when we adjusted for both SES and health behaviors, no significant gaps by union status were observed for either health outcome among gays and lesbians (Table 5, Models 4a and 4b). Overall, results suggest that SES and health behaviors do not explain the union status–health relationship among bisexuals, but they do so among heterosexuals and, to a less extent, among gays/lesbians. These findings lend support to Hypothesis 2.

Difference by Gender (Hypothesis 3) and Gender Composition of the Couple (Hypothesis 4)—Table 6 tests gender difference in the health advantage of marriage for each sexual orientation group. Gender difference was found statistically significant for heterosexuals but not for sexual minorities. Specifically, there was mixed evidence for the notion that heterosexual men benefit from marriage more than heterosexual women. The significant interaction effects of union status and gender suggest that the gap in SRH between the married and the cohabiting was smaller among heterosexual men than among heterosexual women, and so was the gap between the married and the never married. However, the difference between the married and the previously married in both SRH and functional limitation was greater among heterosexual men than among heterosexual women. These findings suggest that gender difference in the health advantage of marriage among heterosexuals may depend on specific union status (see Fig. 2). By contrast, we found no gender differences in the union status–health association among bisexuals or among gays and lesbians. This is consistent with Hypothesis 3, that relationships dynamics are less shaped by conventional gender norms among sexual minorities, and thus gender difference in the health advantage of marriage is smaller among sexual minorities than among heterosexuals.

In addition to gender, the gender composition of a couple may also shape bisexuals' health experience. Because bisexuals in a union provide a unique opportunity to disentangle the effects of gender composition of a couple and sexual orientation, we further compared health outcomes between bisexuals in a same-gender and different-gender union. Table 7 shows that bisexuals in a same-gender union reported better SRH and less functional limitation than those in a different-gender union (Models 1a and 1b). These health gaps were attributable to both SES (Models 2a and 2b) and health behaviors (Models 3a and 3b), and the respective contribution of these factors was significant at the $p < .05$ level according to t tests (results not shown but available upon request). The effect of gender composition became insignificant when we adjusted for both SES and health behaviors (Models 4a and 4b). Additionally, descriptive statistics by gender composition of a couple (shown in Table A1, online appendix) also demonstrate that bisexuals in a same-gender union exhibited higher SES (e.g., higher educational attainment, income, and employment rates) and healthier behaviors (e.g., less smoking, less drinking, and more exercise) than bisexuals in a different-gender union. Together, these results support Hypothesis 4a, that bisexuals in a same-gender union have better health outcomes than those in a different-gender union and that this health gap is attributable to both SES and health behaviors.

Discussion

This study examined how union status is linked to health in different ways for people with different sexual orientations, and how gender and the gender composition of a couple shape health experience in unions. We focused on the health of bisexuals, a disadvantaged but overlooked segment of the sexual minority population. Our study adds to the growing evidence that bisexuals exhibit poorer health outcomes than heterosexuals, gays, and lesbians with the same demographic characteristics (Bostwick et al. 2010; Conron et al. 2010; Fredriksen-Goldsen et al. 2010; Gorman et al. 2015; Hsieh 2014). More importantly, we advance knowledge by reexamining the paradigm of marital advantage in health across

sexual orientation groups, a long-established finding in heterosexual populations (Carr and Springer 2010; Hughes and Waite 2009; Simon 2002). Our findings suggest that for bisexuals, marriage is not associated with health advantage.

We argue that the marital advantage paradigm (i.e., married people are healthier than their unmarried peers) applies to heterosexuals and likely to gays and lesbians but is limited in its ability to capture the experiences of bisexuals. Consistent with Hypothesis 1, we found that married individuals had better health outcomes than their cohabiting, never-married, or previously married counterparts among heterosexuals and, to a lesser extent, among gays and lesbians, but this pattern did not exist among bisexuals. This lack of marital advantage in health among bisexuals needs to be comprehended in the context of pervasive prejudices and stereotypes against bisexuality. The unique stressors that bisexuals face may bring additional disadvantages in their intimate relationships and health outcomes compared with heterosexuals, gays, and lesbians. In particular, the stigma associated with bisexual identity tends to target bisexuals' ability to commit to a marital or intimate relationship. This stigma may generate stress that directly compromises bisexuals' health and may also undermine health indirectly by increasing relationship strain, internalized biphobia, expectations of rejection, and/or efforts to conceal a bisexual identity (Meyer 2003; Pallotta-Chiarolli 2016; Pew Research Center 2013). Doubts about bisexuals' loyalty and commitment to an intimate relationship and whether bisexuals can be satisfied in monogamous relationships may make it difficult for bisexuals to form and maintain legally bound and culturally valued relationships such as marriage (Israel and Mohr 2004; Pallotta-Chiarolli 2016; Tabatabai 2015; Zivony and Lobel 2014). Such doubts may also lower the quality of bisexuals' marriages and in turn reduce their marriages' positive health effects, as suggested by ample evidence supporting the link between marital strain and a variety of poor health outcomes (Uchino et al. 2014; Umberson et al. 2006). However, as we will discuss later, experience of bisexual stigma and related stressors in relationships may differ between bisexuals in a same-gender and different-gender union.

We also found that health gaps by union status are attributable to access to socioeconomic resources and health behaviors among heterosexuals, a finding aligned with previous studies on heterosexual populations (Carr and Springer 2010; Liu and Umberson 2008; Waite and Gallagher 2000). By contrast, we found that health gaps by union status among bisexuals could not be explained by either SES or health behaviors. Results for gays and lesbians were mixed: SES, but not health behaviors, contributed to some health differences by union status. These findings lend partial support to Hypothesis 2, which anticipates that access to socioeconomic resources and health behaviors contribute to the union status–health association more for heterosexuals and gays and lesbians than for bisexuals. However, we also found that socioeconomic and behavioral factors suppressed some of the health disadvantage for married bisexuals; that is, without their current socioeconomic resources and healthy behaviors, the health of married bisexuals would have fared even worse than that of their unmarried counterparts. These findings point to other aspects of marriage as potential explanations for the lack of marital advantage in health among bisexuals. One aspect of marriage that this study did not directly test because of data limitations is the quality of the relationship, including emotional support and relationship strain. Because the stigma against bisexuality often focuses on traits associated with being an intimate partner,

such as promiscuity and disloyalty (Israel and Mohr 2004; Zivony and Lobel 2014), this stigma may particularly damage bisexuals' marital relationships by, for example, increasing conflict, weakening closeness, and lowering emotional support. As a result, the stigma may harm bisexuals in marital relationships more than it harms unmarried bisexuals. Future studies should continue to examine potential pathways that may explain the link among bisexuality, union status, and health.

Our results also showed no gender difference in the union status–health relationship between bisexual men and women and between gay men and lesbian women, but there was significant difference between heterosexual men and women. In support of Hypothesis 3, these findings suggest that sexual minorities are less likely to follow conventional gender rules in a relationship than heterosexuals. As previous studies based on the gender-as-relational approach have indicated, sexual minorities more often practice cooperative and mutually supportive health care work in a relationship than do heterosexuals (Reczek et al. 2018; Umberson et al. 2018). This suggests that the more egalitarian the relationship dynamics, the smaller the gender difference in the health effects of marriage.

Consistently, we found that bisexuals in a same-gender union had better health outcomes than bisexuals in a different-gender union because of the former group's relative socioeconomic advantages and healthier behaviors. This finding supports Hypothesis 4a (rather than Hypothesis 4b), that the gender composition of a couple shapes partners' health experience and provides additional evidence for the gender-as-relational perspective. Because same-gender partners are less likely to practice the traditional gender division of labor, they are more likely to both invest time in paid work and unpaid labor, such as health regulation/facilitation (Denney et al. 2013; Liu et al. 2013; Reczek and Umberson 2012; Thomeer et al. 2015). Accordingly, bisexuals in a same-gender union may enjoy higher SES (e.g., higher family income) and practice more health-enhancing behavior (e.g., more frequent exercise), which is linked to their better health outcomes. Last, to our surprise, although bisexuals were more likely than heterosexuals to be in a same-gender union, the majority of the partnered bisexuals remained in a different-gender union. This may simply reflect the fact that there are more heterosexuals than sexual minorities to date or marry in the mating pool. However, it may also suggest that the society has yet overcome prejudice and discrimination against same-gender relationships (LeBlanc et al. 2015; Thomeer et al. 2018), and thus bisexuals are more likely to maintain an intimate relationship with a different-gender person than a same-gender person.

This study has several limitations. First, we were unable to address causality issues with the pooled cross-sectional data. As we discussed earlier, marital advantage in health may result from both marital protection and marital selection. Although statistically disentangling the effects of protection and selection is beyond the scope of this study, future research should analyze multiple waves of longitudinal data to test these possibilities. Second, the relationship between union status and health may vary by race/ethnicity (Gorman et al. 2015; Hsieh and Ruther 2016; Reczek et al. 2017). Because of small sample sizes for sexual minorities across different union statuses, we were unable to further stratify our analysis by race/ethnicity. Instead, we could control only for the general effects of race/ethnicity. As more years of survey data are collected in the future, research should continue to explore

how the intersection of sexual orientation, gender, and race/ethnicity may affect the relationship between union status and health. Third, the NHIS data lack important information, including marital quality, marital history, and potential psychosocial mechanisms. All such information is important for understanding the relationship contexts of bisexual people and their experiences with discrimination and health disadvantages. Finally, our study used only sexual identity to measure sexual orientation. Although sexual identity is often used to study health disparities by sexual orientation, it does not fully represent the other aspects of sexual orientation, such as sexual behavior. Because the concept of bisexuality is quite fluid (Anderson and McCormack 2016), research that focuses only on sexual identity may misidentify some respondents, such as heterosexual-identified people who have sex with both men and women (Bauer and Jairam 2008; Hsieh 2014; Thomeer and Reczek 2016). If data allow, future research should examine more than one dimension of sexual orientation simultaneously.

Despite these limitations, our study makes significant contribution to the scientific understanding of the severely understudied bisexual population. We revisited the long-contended marital advantage paradigm and examined how sexual orientation, gender, and the gender composition of a couple intersect to shape the health advantage of marriage. Our results highlight the fact that marriage is not a panacea for poorer health and well-being for everyone. At least for bisexuals, being never-married, cohabiting, or previously married are associated with better health outcomes than being married when socioeconomic factors and health behaviors are accounted for. This implies that even with increasing social acceptance of same-gender relationships and the recent legalization of same-gender marriage in the United States, much more effort is needed to eliminate prejudice and discrimination against bisexuals (as well as other marginalized sexual and gender minorities). The legalization of same-gender marriage may not be enough to address the continuing stigma associated with sexual orientations such as bisexuality, and this stigma can negatively affects bisexuals' social lives including their intimate relationships. To make marriage not only accessible to all but also equally favorable for all, reducing stigma is an indispensable step.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgment

References

Anderson E, & McCormack M (2016). The changing dynamics of bisexual men's lives: Social research perspectives. Cham, Switzerland: Springer.

Bauer GR, & Jairam JA (2008). Are lesbians really women who have sex with women (WSW)? Methodological concerns in measuring sexual orientation in health research. Women & Health, 48, 383–408. [PubMed: 19301530]

Becker GS (2009). A treatise on the family. Cambridge, MA: Harvard University Press.

Blau PM (1964). Exchange and power in social life. New York, NY: John Wiley.

Blewett LA, Drew JAR, Griffin R, King ML, & Williams KCW (2018). IPUMS Health Surveys: National Health Interview Survey, Version 6.3 [Data set]. Minneapolis, MN: IPUMS Retrieved from 10.18128/D070.V6.3

Boehmer U, Bowen DJ, & Bauer GR (2007). Overweight and obesity in sexual-minority women: Evidence from population-based data. American Journal of Public Health, 97, 1134–1140. [PubMed: 17463369]

Boehmer U, Miao X, Linkletter C, & Clark MA (2012). Adult health behaviors over the life course by sexual orientation. American Journal of Public Health, 102, 292–300. [PubMed: 22390443]

Bostwick WB, Boyd CJ, Hughes TL, & McCabe SE (2010). Dimensions of sexual orientation and the prevalence of mood and anxiety disorders in the United States. American Journal of Public Health, 100, 468–475. [PubMed: 19696380]

Carr D, & Springer KW (2010). Advances in families and health research in the 21st century. Journal of Marriage and Family, 72, 743–761.

Conron KJ, Mimiaga MJ, & Landers SJ (2010). A population-based study of sexual orientation identity and gender differences in adult health. American Journal of Public Health, 100, 1953–1960. [PubMed: 20516373]

Courtenay WH (2000). Constructions of masculinity and their influence on men's well-being: A theory of gender and health. Social Science & Medicine, 50, 1385–1401. [PubMed: 10741575]

Denney JT, Gorman BK, & Barrera CB (2013). Families, resources, and adult health: Where do sexual minorities fit? Journal of Health and Social Behavior, 54, 46–63. [PubMed: 23315360]

Diamond L (2008). Female bisexuality from adolescence to adulthood: Results from a 10-year longitudinal study. Developmental Psychology, 44, 5–14. [PubMed: 18194000]

Elia JP (2014). Bisexuality and schooling: Erasure and implications for health. Journal of Bisexuality, 14, 36–52.

Fredriksen-Goldsen K, Kim H, Barkan S, Balsam K, & Mincer S (2010). Disparities in health-related quality of life: A comparison of lesbians and bisexual women. American Journal of Public Health, 100, 2255–2261. [PubMed: 20864722]

Fu H, & Goldman N (1996). Incorporating health into models of marriage choice: Demographic and sociological perspectives. Journal of Marriage and the Family, 58, 740–758.

Furnham A (2009). Sex differences in mate selection preferences. Personality and Individual Differences, 47, 262–267.

Gates G (2011). How many people are lesbian, gay, bisexual, and transgender? (Report). Los Angeles, CA: The Williams Institute, UCLA Law School Retrieved from https://williamsinstitute.law.ucla.edu/wp-content/uploads/Gates-How-Many-People-LGBT-Apr-2011.pdf

Gorman BK, Denney JT, Dowdy H, & Medeiros RA (2015). A New piece of the puzzle: Sexual orientation, gender, and physical health status. Demography, 52, 1357–1382. [PubMed: 26126883]

Hackl AM, Boyer CR, & Galupo MP (2013). From "Gay marriage controversy" (2004) to "Endorsement of same-sex marriage" (2012): Framing bisexuality in the marriage equality discourse. Sexuality & Culture, 17, 512–524.

Hogan DP (2012). Family consequences of children's disabilities. New York, NY: Russell Sage Foundation.

Hsieh N (2014). Explaining the mental health disparity by sexual orientation: The importance of social resources. Society and Mental Health, 4, 129–146.

Hsieh N, & Ruther M (2016). Sexual minority health and health risk factors: Intersection effects of gender, race, and sexual identity. American Journal of Preventive Medicine, 50, 746–755. [PubMed: 26803358]

Hughes ME, & Waite LJ (2009). Marital biography and health at mid-life. Journal of Health and Social Behavior, 50, 344–358. [PubMed: 19711810]

Idler EL, & Benyamini Y (1997). Self-rated health and mortality: A review of twenty-seven community studies. Journal of Health and Social Behavior, 38, 21–37. [PubMed: 9097506]

Institute of Medicine. (2011). The health of lesbian, gay, bisexual, and transgender people: Building a foundation for better understanding Washington, DC: National Academies Press.

Israel T, & Mohr JJ (2004). Attitudes toward bisexual women and men. Journal of Bisexuality, 4(1–2), 117–134.

Johnson DR, & Wu J (2002). An empirical test of crisis, social selection, and role explanations of the relationship between marital disruption and psychological distress: A pooled time-series analysis of four-wave panel data. Journal of Marriage and Family, 64, 211–224.

LeBlanc AJ, Frost DM, & Wight RG (2015). Minority stress and stress proliferation among same-sex and other marginalized couples. Journal of Marriage and Family, 77, 40–59. [PubMed: 25663713]

Link BG, & Phelan J (1995). Social conditions as fundamental causes of disease. Journal of Health and Social Behavior, 35, 80–94.

Liu H, Reczek C, & Brown D (2013). Same-sex cohabitors and health: The role of race-ethnicity, gender, and socioeconomic status. Journal of Health and Social Behavior, 54, 25–45. [PubMed: 23446120]

Liu H, & Umberson DJ (2008). The times they are a changin': Marital status and health differentials from 1972 to 2003. Journal of Health and Social Behavior, 49, 239–253. [PubMed: 18771061]

Liu H, & Zhang Z (2013). Disability trends by marital status among older Americans, 1997–2010: An examination by gender and race. Population Research and Policy Review, 32, 103–127.

Meyer IH (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. Psychological Bulletin, 129, 674–697. [PubMed: 12956539]

Musick K, Brand JE, & Davis D (2012). Variation in the relationship between education and marriage: Marriage market mismatch? Journal of Marriage and Family, 74, 53–69. [PubMed: 22563132]

Pallotta-Chiarolli M (2016). Women in relationships with bisexual men: Bi men by women. Lanham, MD: Lexington Books.

Pew Research Center. (2013). A survey of LGBT Americans attitudes, experiences and values in changing times. Retrieved from http://www.pewsocialtrends.org/2013/06/13/a-survey-of-lgbt-americans/

Reczek C, Gebhardt-Kram L, Kissling A, & Umberson D (2018). Health care work in marriage: How gay, lesbian, and heterosexual spouses encourage and coerce medical care. Journal of Health and Social Behavior, 59, 554–568. [PubMed: 30381973]

Reczek C, Liu H, & Spiker R (2017). Self-rated health at the intersection of sexual identity and union status. Social Science Research, 63, 242–252. [PubMed: 28202146]

Reczek C, & Umberson D (2012). Gender, health behavior, and intimate relationships: Lesbian, gay, and straight contexts. Social Science & Medicine, 74, 1783–1790. [PubMed: 22227238]

Regan PC (1998). What if you can't get what you want? Willingness to compromise ideal mate selection standards as a function of sex, mate value, and relationship context. Personality and Social Psychology Bulletin, 24, 1294–1303.

Rendall MS, Weden MM, Favreault MM, & Waldron H (2011). The protective effect of marriage for survival: A review and update. Demography, 48, 481–506. [PubMed: 21526396]

Sen A (2002). Health: Perception versus observation. BMJ, 324, 860–861. [PubMed: 11950717]

Simon RW (2002). Revisiting the relationships among gender, marital status, and mental health. American Journal of Sociology, 107, 1065–1096.

Springer KW, & Mouzon DM (2011). "Macho men" and preventive health care: Implications for older men in different social classes. Journal of Health and Social Behavior, 52, 212–227. [PubMed: 21490311]

Stack L (2016, June 30). The challenges that remain for L.G.B.T. people after marriage ruling. The New York Times. Retrieved from https://www.nytimes.com/2016/07/01/us/the-challenges-that-remain-for-lgbt-people-after-marriage-ruling.html

StataCorp. (2015). Stata 14 base reference manual. College Station, TX: Stata Press.

Tabatabai A (2015). Lesbian, queer, and bisexual women in heterosexual relationships: Narratives of sexual identity. Lanham, MD: Lexington Books.

Thomeer MB, LeBlanc AJ, Frost DM, & Bowen K (2018). Anticipatory minority stressors among same-sex couples: A relationship timeline approach. Social Psychology Quarterly, 81, 126–148.

Thomeer MB, & Reczek C (2016). Happiness and sexual minority status. Archives of Sexual Behavior, 45, 1745–1758. [PubMed: 27102605]

Thomeer MB, Reczek C, & Umberson D (2015). Relationship dynamics around depression in gay and lesbian couples. Social Science & Medicine, 147, 38–46. [PubMed: 26523788]

Uchino BN, Smith TW, & Berg CA (2014). Spousal relationship quality and cardiovascular risk: Dyadic perceptions of relationship ambivalence are associated with coronary-artery calcification. Psychological Science, 25, 1037–1042. [PubMed: 24501110]

Umberson D, Donnelly R, & Pollitt AM (2018). Marriage, social control, and health behavior: A dyadic analysis of same-sex and different-sex couples. Journal of Health and Social Behavior, 59, 429–446. [PubMed: 30052080]

Umberson D, Williams K, Powers DA, Liu H, & Needham B (2006). You make me sick: Marital quality and health over the life course. Journal of Health and Social Behavior, 47, 1–16. [PubMed: 16583772]

Waite L, & Gallagher M (2000). The case for marriage: Why married people are happier, healthier and better off financially. New York, NY: Doubleday.

Wight RG, LeBlanc AJ, & Lee Badgett MV (2012). Same-sex legal marriage and psychological well-being: Findings from the California Health Interview Survey. American Journal of Public Health, 103, 339–346. [PubMed: 23237155]

Zivony A, & Lobel T (2014). The invisible stereotypes of bisexual men. Archives of Sexual Behavior, 43, 1165–1176. [PubMed: 24558124]
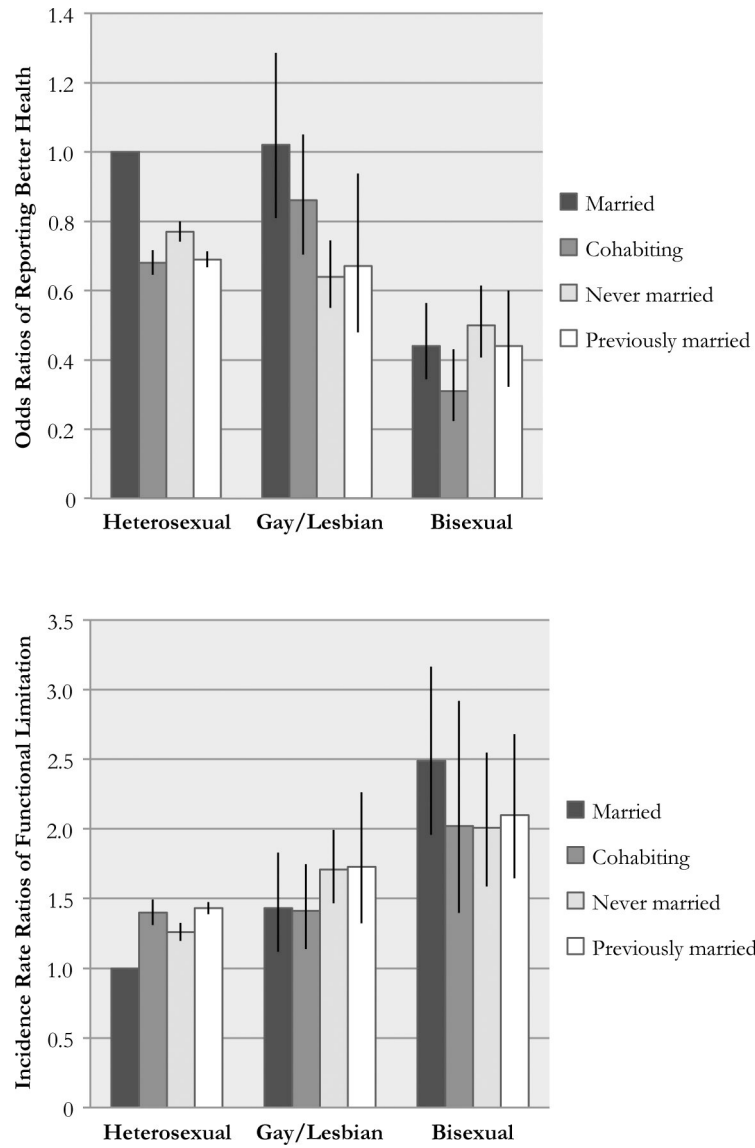
Fig. 1.
Odds ratios of reporting better health (top) and incidence rate ratios of functional limitation (bottom) by union status and sexual orientation. Values were calculated based on Models 2a and 2b in Table 2.
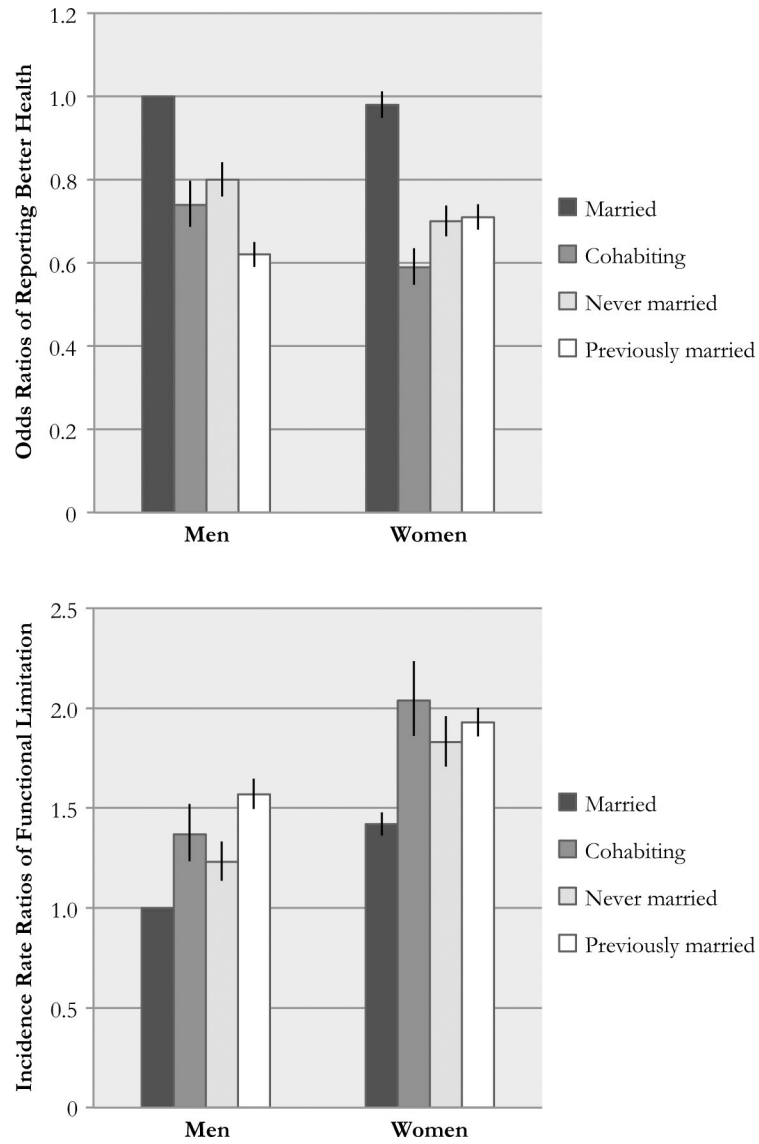
Fig. 2.
Odds ratios of reporting better health (top) and incidence rate ratios of functional limitation (bottom) by union status and gender among heterosexuals. Values were calculated based on the heterosexual models in Table 6.

Table 1

Descriptive statistics by sexual orientation and union status: NHIS, 2013–2017 (N = 154,485)

	Bisexual				Heterosexual				Gay and Lesbian			
	Married	Cohabiting	Never Married	Previously Married	Married	Cohabiting	Never Married	Previously Married	Married	Cohabiting	Never Married	Previously Married
Self-rated Health (range = 1–5)												
Mean	3.5	3.5	3.8	3.3	3.8	3.8	3.9	3.4	3.9	3.8	3.7	3.4
SD	1.1	1.1	1.0	1.2	1.0	1.0	1.0	1.1	1.0	1.0	1.1	1.2
Functional limitation (range = 0–12)												
Mean	2.0	1.1	1.0	2.5	1.4	1.1	0.8	2.8	1.5	1.3	1.3	2.5
SD	2.9	2.7	2.4	3.5	2.7	2.5	2.4	3.6	2.7	2.5	2.7	3.6
Education (%)												
Less than high school	6.8	12.9	14.0	14.4	10.8	13.6	13.3	17.1	5.4	4.8	7.8	12.9
High school or equivalent	19.7	23.1	26.6	15.2	23.2	30.4	26.0	28.7	18.0	14.2	20.4	18.2
Some college	31.8	36.2	37.1	38.0	27.7	33.1	37.2	31.5	20.5	35.6	35.6	38.1
Bachelor's degree or above	41.7	27.8	22.3	32.8	38.3	22.9	23.5	22.7	56.2	45.4	36.2	30.8
Family Income ($ 1,000s; range = 0–225K)												
Mean	81.4	53.1	49.2	47.2	89.5	63.3	56.2	44.8	102.5	91.5	50.9	47.3
SD	54.4	43.6	40.8	39,	55.3	45.6	41.4	35.6	59.6	59.0	42.4	40.7
Employment Status (%)												
Working/schooling	68.4	73.7	73.2	50.8	64.2	74.1	76.1	45.0	72.6	79.3	73.1	46.7
Unemployed/unable to work	24.8	24.5	24.2	32.9	17.1	21.0	20.4	19.9	13.6	14.3	21.0	28.7
Retired	6.8	1.8	2.6	16.3	18.7	4.9	3.5	35.1	13.8	6.4	5.9	24.6
Perceived Financial Strain (range = 1–4)												
Mean	2.2	2.4	2.2	2.5	2.1	2.3	2.0	2.2	2.1	2.2	2.1	2.2
SD	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	0.8	0.9	0.9	1.0

	Bisexual				Heterosexual				Gay and Lesbian			
	Married	Cohabiting	Never Married	Previously Married	Married	Cohabiting	Never Married	Previously Married	Married	Cohabiting	Never Married	Previously Married
Current Smoker (%)	15.4	36.3	18.7	35.4	11.7	28.5	16.9	20.3	10.5	24.3	24.8	29.9
Alcohol Consumption (%)												
Not a current drinker	22.2	13.3	30.2	22.3	31.9	21.9	37.8	42.4	19.8	17.7	23.9	29.6
Drinker, 1–2 drinks per day	55.4	50.8	33.0	43.1	52.1	45.5	35.7	43.2	58.7	55.0	44.6	50.0
Drinker, 3+ drinks per day	22.4	35.9	36.8	34.6	16.0	32.6	26.5	14.4	21.5	27.3	31.5	20.4
Vigorous Exercise 2+ Times per Week (%)	43.3	39.0	44.1	36.1	38.6	40.6	47.0	26.7	46.1	45.8	45.7	32.7
Female (%)	71.1	79.9	67.2	68.5	49.4	49.7	47.4	65.5	52.5	52.1	38.7	53.6
Age (range = 18–85)												
Mean	41.3	32.5	27.4	49.1	50.6	37.2	31.3	60.6	47,	43.3	37.0	56.9
SD	15.0	11.4	13.2	16.1	15.8	14.6	15.6	15.4	13.9	14.3	15.7	14.2
Race (%)												
White	83.9	87.0	72.8	83.4	82.9	80.4	69.6	78.8	86.3	84.2	70.3	81.2
Black	5.5	8.1	16.8	9.2	7.6	12.5	20.5	15.1	6.3	7.9	19.8	15.1
Asian and others	10.6	4.9	10.4	7.4	9.5	7.1	9.9	6.1	7.4	7.9	9.9	3.7
Hispanic (%)	12.8	13.5	16.7	15.3	14.7	20.0	18.5	12.2	13.4	14.9	15.5	16.3
Region (%)												
Northeast	21.1	16.8	14.2	14.4	17.3	16.8	19.1	17.0	21.2	18.6	18.4	13.3
Midwest	21.5	28.2	21.6	23.7	22.5	25.7	22.1	22.4	16.2	17.7	20.2	16.9
South	31.5	27.8	33.9	33.4	36.6	32.9	35.0	39.9	30.2	37.8	36.3	38.6
West	25.9	27.2	30.3	28.5	23.6	24.6	23.8	20.7	32.4	25.9	25.1	31.2
In a Same-Gender Union (%)	7.2	18.6	N/A	N/A	0.0	1.0	N/A	N/A	73.0	96.0	N/A	N/A
N	256	180	708	284	67,913	8,692	33,223	40,575	483	508	1,372	291

Table 2

Main and interaction effects of sexual orientation and union status on health outcomes: NHIS, 2013–2017 (N = 154,485)

	Self-rated Health (odds ratios)		Functional Limitation (incidence rate ratios)	
	Model 1a	Model 2a	Model 1b	Model 2b
Sexual Orientation (ref. = heterosexual)				
Gay/lesbian	0.98	1.02	1.28***	1.43**
	(0.05)	(0.12)	(0.07)	(0.18)
Bisexual	0.57***	0.44***	7.75***	2.49***
	(0.04)	(0.06)	(0.12)	(0.30)
Union Status (ref. = married)				
Cohabiting	0.68***	0.68***	1.37***	1.40***
	(0.02)	(0.02)	(0.04)	(0.05)
Never married	0.76***	0.77***	1.25***	1.26***
	(0.01)	(0.01)	(0.03)	(0.03)
Previously married	0.69***	0.69***	1.43***	1.43***
	(0.01)	(0.01)	(0.02)	(0.02)
Sexual Orientation × Union Status				
Gay/lesbian × Cohabiting		1.25		0.70*
		(0.20)		(0.12)
Gay/lesbian × Never married		0.82		0.95
		(0.12)		(0.14)
Gay/lesbian × Previously married		0.95		0.85
		(0.19)		(0.16)
Bisexual × Cohabiting		1.04		0.58*
		(0.22)		(0.13)
Bisexual × Never married		1.50*		0.65**
		(0.25)		(0.11)
Bisexual × Previously married		1.46		0.59**
		(0.30)		(0.10)
Age	0.97***	0.97***	1.04***	1.04***

	Self-rated Health (odds ratios)		Functional Limitation (incidence rate ratios)	
	Model 1a	Model 2a	Model 1b	Model 2b
	(0.00)	(0.00)	(0.00)	(0.00)
Female (ref. = male)	0.96**	0.96**		1.41***
	(0.01)	(0.01)	(0.02)	(0.02)
Race (ref. = white)				
Black	0.66***	0.66***	1.18***	1.18***
	(0.02)	(0.02)	(0.03)	(0.03)
Asian and others	0.85***	0.85***	0.86***	0.86***
	(0.02)	(0.02)	(0.03)	(0.03)
Hispanic (ref. = non-Hispanic)	0.67***	0.67***	0.96	0.96
	(0.02)	(0.02)	(0.03)	(0.13
Region of Residence (ref. = Northeast)				
Midwest	0.84***	0.84***	1.19***	1.19***
	(0.02)	(0.02)	(0.03)	(0.03)
South	0.86***	0.86***	1.19***	1.19***
	(0.02)	(0.02)	(0.03)	(0.03)
West	0.94*	0.94*	1.10**	1.10**
	(0.02)	(0.02)	(0.03)	(0.03)
Survey Year (ref. = 2013)				
2014	1.05*	1.04*	0.94**	0.94**
	(0.02)	(0.02)	(0.02)	(0.02)
2015	1.02	1.02	1.02	1.02
	(0.02)	(0.02)	(0.02)	(0.02)
2016	1.01	1.01	1.04	1.04
	(0.02)	(0.02)	(0.03)	(0.03)
2017	1.03	1.03	0.98	0.97
	(0.03)	(0.03)	(0.03)	(0.03)

Note: Standard errors are in parentheses.

*
$p < .05$;

$**$ $p < .01;$

$***$ $p < .001$

Table 3

Effects of union status on health outcomes for bisexuals: NHIS, 2013–2017 ($N = 1,428$)

	Self-rated Health (odds ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Union Status (ref. = married)								
Cohabiting	0.83 (0.18)	0.97 (0.22)	1.03 (0.23)	1.07 (0.24)	0.81 (0.18)	0.60* (0.13)	0.67 (0.15)	0.57** (0.12)
Never married	1.27 (0.22)	1.46* (0.27)	1.38 (0.24)	1.51* (0.28)	0.78 (0.12)	0.68* (0.12)	0.67* (0.11)	0.65* (0.12)
Previously married	0.86 (0.17)	1.43 (0.30)	1.09 (0.22)	1.56* (0.33)	1.00 (0.17)	0.70* (0.12)	0.85 (0.15)	0.69* (0.12)
Education (ref. = less than high school)								
High school or equivalent		1.67 (0.46)	1.60 (0.44)			1.08 (0.21)	1.08 (0.23)	
Some college		1.37 (0.34)		1.25 (0.30)		1.16 (0.24)		1.34 (0.27)
Bachelor's degree or above		2.00** (0.53)		1.62 (0.42)		0.92 (0.22)		1.19 (0.28)
Income ($1,000s)		1.01*** (0.00)		1.01** (0.00)		0.99*** (0.00)		0.99*** (0.00)
Employment (ref. = working/schooling)								
Unemployed/unable to work		0.27*** (0.05)		0.28*** (0.05)		2.82*** (0.40)		2.65*** (0.37)
Retired		1.25 (0.36)		1.31 (0.38)		1.21 (0.31)		1.36 (0.36)
Perceived Financial Strain		0.80* (0.08)		0.83* (0.08)		1.26** (0.10)		1.26** (0.09)
Current Smoker			0.48*** (0.07)	0.72* (0.12)			1.80*** (0.24)	1.27 (0.18)
Drinking (ref. = not a current drinker)								

	Self-rated Health (odds ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Drinker, 1–2 drinks per day of drinking			1.44	1.25			0.66**	0.78
			(0.29)	(0.25)			(0.10)	(0.13)
Drinker, 3+ drinks per day of drinking			0.94	0.91			0.74	0.74
			(0.21)	(0.20)			(0.13)	(0.13)
Vigorous Exercise 2+ Times per Week			2.06***	1.87***			0.47***	0.51***
			(0.28)	(0.24)			(0.06)	(0.07)
Age	0.98***	0.97***	0.98***	0.97***	1.03***	1.03***	1.03***	1.03***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
Female (ref. = male)	0.84	0.94	0.81	0.91	1.77***	1.47**	1.84***	1.46**
	(0.13)	(0.14)	(0.13)	(0.14)	(0.25)	(0.20)	(0.25)	(0.19)
Race (ref. = white)								
Black	1.32	2.05**	1.39	2.04**	0.85	0.55**	0.85	0.59**
	(0.35)	(0.54)	(0.39)	(0.57)	(0.17)	(0.10)	(0.16)	(0.10)
Asian and others	1.23	1.07	1.22	1.11	0.67*	0.74	0.68*	0.73
	(0.17)	(0.22)	(0.22)	(0.23)	(0.13)	(0.15)	(0.13)	(0.14)
Hispanic (ref. = non-Hispanic)	0.74	0.93	0.7	0.86	0.78	0.66*	0.73	0.65*
	(0.17)	(0.23)	(0.16)	(0.22)	(0.15)	(0.12)	(0.14)	(0.12)
Region of residence (ref. = Northeast)								
Midwest	0.89	0.93	0.97	0.95	0.89	0.89	0.96	0.92
	(0.19)	(0.21)	(0.22)	(0.22)	(0.17)	(0.17)	(0.17)	(0.17)
South	1.14	1.11	1.3	1.19	0.88	0.84	0.79	0.8
	(0.24)	(0.27)	(0.29)	(0.29)	(0.17)	(0.16)	(0.14)	(0.15)
West	1.19	1.2	1.27	1.25	0.58**	0.62*	0.62**	0.64*
	(0.26)	(0.28)	(0.29)	(0.30)	(0.12)	(0.12)	(0.11)	(0.12)
Survey Year (ref. = 2013)								
2014	1.43	1.14	1.16	1.01	0.51***	0.57**	0.61*	0.64*
	(0.28)	(0.23)	(0.23)	(0.21)	(0.11)	(0.12)	(0.13)	(0.13)
2015	0.83	0.65*	0.79	0.65*	0.87	1.04	0.92	1.04
	(0.32)	(0.13)	(0.16)	(0.14)	(0.17)	(0.20)	(0.17)	(0.20)

| | Self-rated Health (odds ratios) | | | | Functional Limitation (incidence rate ratios) | | | |
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
2016	1.11	0.97	1.04	0.98	0.73	0.81	0.79	0.81
	(0.21)	(0.22)	(0.21)	(0.22)	(0.15)	(0.17)	(0.16)	(0.17)
2017	1.03	0.72	0.99	0.73	0.62*	0.73	0.63*	0.71
	(0.21)	(0.16)	(0.21)	(0.16)	(0.13)	(0.14)	(0.12)	(0.13)

Note: Standard errors are in parentheses.

*
$p < .05$;

**
$p < .01$;

***
$p < .001$

Table 4

Effects of union status on health outcomes for heterosexuals: NHIS, 2013–2017 (*N* = 150,403)

	Self-rated Health (odds ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Union Status (ref. = married)								
Cohabiting	0.67***	0.86***	0.78***	0.90***	1.40***	1.15***	1.26***	1.12**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.04)	(0.04)	(0.04)
Never married	0.76***	0.89***	0.83***	0.90***	1.26***	1.15***	1.18***	1.15***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Previously married	0.69***	0.92***	0.78***	0.94**	1.43***	1.11***	1.27***	1.10***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Income ($1,000s)		1.004***		1.004***		0.998***		0.998***
		(0.00)		(0.00)		(0.00)		(0.00)
Education (ref. = less than high school)								
High school or equivalent		13.7***		1.32***		0.90***		0.92***
		(0.03)		(0.03)		(0.02)		(0.02)
Some college		1.56***		1.39***		0.92***		0.98
		(0.04)		(0.04)		(0.02)		(0.02)
Bachelor's degree or above		2.23***		1.81***		0.69***		0.80***
		(0.06)		(0.05)		(0.02)		(0.02)
Employment (ref. = working/schooling)								
Unemployed/unable to work		0.39***		0.41***		3.30***		3.02***
		(0.01)		(0.01)		(0.06)		(0.06)
Retired		0.92**		0.91***		1.66***		1.63***
		(0.02)		(0.02)		(0.03)		(0.03)
Perceived Financial Strain		0.68***		0.70***		1.44***		1.42***
		(0.01)		(0.01)		(0.01)		(0.01)
Current Smoker			0.46***	0.64***			1.79***	1.27***
			(0.01)	(0.01)			(0.04)	(0.03)
Drinking (ref. = not a current drinker)								

	Self-rated Health (odds ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Drinker, 1–2 drinks per day of drinking			1.51 ***	1.22 ***			0.73 ***	0.89 ***
			(0.02)	(0.02)			(0.01)	(0.02)
Drinker, 3+ drinks per day of drinking			1.26 ***	1.09 ***			0.75 ***	0.91 ***
			(0.03)	(0.02)			(0.02)	(0.02)
Vigorous Exercise 2+ Times per Week			2.11 ***	1.79 ***			0.45 ***	0.57 ***
			(0.03)	(0.03)			(0.01)	(0.01)
Age	0.97 ***	0.97 ***	0.97 ***	0.97 ***	1.04 ***	1.04 ***	1.04 ***	1.04 ***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Female (ref. = male)	0.97 *	1.10 ***	1.00	1.12 ***	1.40 ***	1.30 ***	1.36 ***	1.27 ***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Race (ref. = white)								
Black	0.66 ***	0.85 ***	0.69 ***	0.84 ***	1.18 ***	0.96	1.15 ***	0.97
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Asian and others	0.84 ***	0.88 ***	0.91 ***	0.92 **	0.87 ***	0.82 ***	0.83 ***	0.80 ***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Hispanic (ref. = non-Hispanic)	0.67 ***	1.08 **	0.71 ***	1.04	0.96	0.70 ***	0.92 **	0.71 ***
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
Region of Residence (ref. = Northeast)								
Midwest	0.84 ***	0.89 ***	0.88 ***	0.90 ***	1.19 ***	1.19 ***	1.17 ***	1.19 ***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
South	0.86 ***	0.92 ***	0.90 ***	0.93 **	1.20 ***	1.14 ***	1.15 ***	1.14 ***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
West	0.94 *	0.95	0.90 ***	0.92 **	1.11 ***	1.14 ***	1.16 ***	1.17 ***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Survey Year (ref. = 2013)								
2014	1.05 *	1.00	1.04	1.00	0.94 *	1.01	0.94 *	1.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2015	1.02	0.93 ***	0.99	0.93 ***	1.02	1.12 ***	1.04	1.11 ***

	Self-rated Health (odds ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2016	1.01	0.90***	0.96	0.90***	1.05	1.15***	1.09**	1.17***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
2017	1.04	0.89***	0.97	0.87***	0.98	1.13***	1.04	1.15***
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)

*
$p < .05$;

**
$p < .01$;

***
$p < .001$

Table 5

Effects of union status on health outcomes for gays and lesbians: NHIS, 2013–2017 ($N = 2{,}654$)

	Self-rated Health (odds ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Union Status (ref. = married)								
Cohabiting	0.85	1.00	0.93	1.04	0.95	0.87	0.95	0.88
	(0.13)	(0.17)	(0.15)	(0.18)	(0.15)	(0.15)	(0.15)	(0.14)
Never married	0.64**	1.00	0.74*	1.04	1.18	0.85	1.09	0.87
	(0.09)	(0.15)	(0.11)	(0.16)	(0.18)	(0.13)	(0.15)	(0.13)
Previously married	0.63*	1.19	0.75	1.22	1.24	0.81	1.09	0.82
	(0.12)	(0.25)	(0.15)	(0.27)	(0.23)	(0.16)	(0.21)	(0.16)
Income ($1,000s)		1.01***		1.01***		0.997*		1.00
		(0.00)		(0.00)		(0.00)		(0.00)
Education (ref. = less than high school)								
High school or equivalent		1.20		1.10		1.01		1.08
		(0.32)		(0.31)		(0.21)		(0.21)
Some college		1.18		1.05		0.88		1.01
		(0.31)		(0.28)		(0.16)		(0.18)
Bachelor's degree or above		1.38		1.11		0.84		0.97
		(0.35)		(0.29)		(0.18)		(0.20)
Employment (ref. = working/schooling)								
Unemployed/unable to work		0.27***		0.30***		3.61***		3.03***
		(0.04)		(0.05)		(0.41)		(0.35)
Retired		1.32		1.25		1.05		1.06
		(0.28)		(0.27)		(0.17)		(0.18)
Perceived Financial Strain		0.72***		0.72***		1.45***		1.44***
		(0.05)		(0.05)		(0.10)		(0.09)
Current Smoker			0.48***	0.63**			1.81***	1.25*
			(0.06)	(0.08)			(0.21)	(0.14)
Drinking (ref. = not a current drinker)								

	Self-rated Health (odds ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Drinker, 1–2 drinks per day of drinking			1.52**	1.34*			0.60***	0.73*
			(0.21)	(0.18)			(0.07)	(0.09)
Drinker, 3+ drinks per day of drinking			1.49*	1.39			0.69***	0.75*
			(0.24)	(0.23)			(0.10)	(0.10)
Vigorous Exercise 2+ Times per Week			2.07***	1.58***			0.43***	0.59***
			(0.23)	(0.17)			(0.05)	(0.07)
Age	0.97***	0.97***	0.98***	0.97***	1.04***	1.04***	1.04***	1.04***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female (ref. = male)	0.79*	0.96	0.87	1.01	1.77***	1.67***	1.67***	1.58***
	(0.08)	(0.10)	(0.08)	(0.10)	(0.18)	(0.17)	(0.17)	(0.15)
Race (ref. = white)								
Black	0.62**	0.90	0.62**	0.86	1.32	0.98	1.29	0.99
	(0.10)	(0.14)	(0.10)	(0.14)	(0.24)	(0.16)	(0.22)	(0.16)
Asian and others	0.81	0.84	0.81	0.84	0.89	1.03	0.80	0.93
	(0.15)	(0.17)	(0.15)	(0.17)	(0.20)	(0.28)	(0.17)	(0.21)
Hispanic (ref. = non-Hispanic)	0.91	1.07	0.90	1.02	0.96	0.84	0.98	0.84
	(0.15)	(0.17)	(0.16)	(0.17)	(0.16)	(0.16)	(0.17)	(0.16)
Region of residence (ref. = Northeast)								
Midwest	0.84	1.07	0.91	1.09	0.97	0.91	0.94	0.92
	(0.14)	(0.18)	(0.16)	(0.18)	(0.17)	(0.15)	(0.15)	(0.15)
South	0.90	1.12	0.95	1.11	0.97	0.8	0.92	0.82
	(0.13)	(0.17)	(0.14)	(0.17)	(0.16)	(0.13)	(0.14)	(0.13)
West	0.91	1.02	0.86	0.98	1.00	0.98	0.18	1.05
	(0.15)	(0.16)	(0.14)	(0.16)	(0.16)	(0.16)	(0.19)	(0.17)
Survey Year (ref. = 2013)								
2014	1.17	1.25	1.23	1.28	1.02	0.98	0.93	0.95
	(0.20)	(0.19)	(0.20)	(0.19)	(0.17)	(0.15)	(0.14)	(0.14)
2015	1.24	1.20	1.21	1.20	0.97	1.08	1.03	1.07
	(0.18)	(0.18)	(0.17)	(0.18)	(0.15)	(0.17)	(0.15)	(0.16)

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

	Self-rated Health (odds ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
2016	1.10	1.04	1.07	1.03	0.95	1.20	1.02	1.20
	(0.17)	(0.16)	(0.16)	(0.16)	(0.15)	(0.19)	(0.16)	(0.18)
2017	0.93	0.91	0.88	0.88	0.94	0.90	0.97	0.91
	(0.14)	(0.14)	(0.14)	(0.14)	(0.15)	(0.12)	(0.15)	(0.13)

Note: Standard errors are in parentheses.

*
$p < .05$;

**
$p < .01$;

***
$p < .001$

Table 6

Main and Interaction effects of union status and gender on health outcomes by sexual orientation, NHIS 2013–2017

	Self-rated Health (odds ratios)			Functional Limitation (incidence rate ratios)		
	Bisexual	Heterosexual	Gay/Lesbian	Bisexual	Heterosexual	Gay/Lesbian
Union Status (ref. = married)						
Cohabiting	0.48	0.74 ***	0.94	1.09	1.37 ***	0.83
	(0.21)	(0.03)	(0.22)	(0.50)	(0.07)	(0.19)
Never married	1.14	0.80 ***	0.59 **	0.78	1.23 ***	1.14
	(0.37)	(0.02)	(0.11)	(0.22)	(0.05)	(0.22)
Previously married	0.56	0.62 ***	0.50 *	1.18	1.57 ***	1.53
	(0.22)	(0.02)	(0.14)	(0.38)	(0.04)	(0.38)
Female (ref. = male)	0.66	0.98	0.74	1.93 *	1.42 ***	1.68 *
	(0.19)	(0.02)	(0.16)	(0.53)	(0.03)	(0.41)
Union Status × Female						
Cohabiting × Female	2.01	0.82 ***	0.83	0.68	1.05	1.28
	(0.97)	(0.04)	(0.26)	(0.34)	(0.08)	(0.42)
Never married × female	1.16	0.90 **	1.20	1.00	1.04	1.07
	(0.43)	(0.03)	(0.32)	(0.34)	(0.05)	(0.30)
Previously married × Female	1.85	1.18 ***	1.52	0.79	0.86 ***	0.65
	(0.85)	(0.04)	(0.53)	(0.28)	(0.03)	(0.20)
N	1,428	150,403	2,654	1,428	150,403	2,654

Notes: Standard errors are in parentheses. All models control for age, race, Hispanic ethnicity, region of residence, and year of survey.

*
$p < .05$;

**
$p < .01$;

***
$p < .001$

Table 7

Effects of gender composition of couple on health outcomes for partnered bisexuals: NHIS, 2013–2017 (*N* = 421)

	Self-rated Health (odd ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Union Type (ref. = different-gender union)								
Same-gender union	2.34*	1.48	1.82	1.26	0.39**	0.64	0.52†	0.75
	(0.84)	(0.52)	(0.62)	(0.44)	(0.13)	(0.20)	(0.17)	(0.24)
Cohabiting (ref. = marred)	0.69	0.80	0.83	0.88	0.77	0.62*	0.69†	0.61*
	(0.18)	(0.21)	(0.22)	(0.22)	(0.17)	(0.14)	(0.15)	(0.13)
Income ($1,000s)		1.01*		1.01*		1.00		1.00
		(0.00)		(0.00)		(0.00)		(0.00)
Education (ref. = less than high school)								
High school or equivalent		0.86		0.77		1.12		0.97
		(0.40)		(0.37)		(0.39)		(0.36)
Some college		0.75		0.61		1.25		1.28
		(0.34)		(0.29)		(0.42)		(0.46)
Bachelor's degree or above		1.07		0.85		1.20		1.15
		(0.54)		(0.44)		(0.45)		(0.45)
Employment (ref. = working/schooling)								
Unemployed/unable to work		0.26***		0.27***		3.18***		2.95***
		(0.08)		(0.09)		(0.64)		(0.59)
Retired		1.09		1.44		2.90**		2.76**
		(0.54)		(0.71)		(0.17)		(1.01)
Perceived Financial Strain		0.78		0.83		1.70***		1.60***
		(0.14)		(0.15)		(0.19)		(0.18)
Current Smoker			0.60†	0.84			1.04	0.72
			(0.16)	(0.24)			(0.24)	(0.15)
Drinking (ref. = not a current drinker)								
Drinker, 1–2 drinks per day			2.11*	1.32			0.44**	0.65†
			(0.65)	(0.40)			(0.10)	(0.15)

	Self-rated Health (odd ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Drinker, 3+ drinks per day			1.35	0.98			0.47*	0.59†
			(0.48)	(0.35)			(0.14)	(0.17)
Vigorous Exercise 2+ Times per Week			1.98**	1.97**			0.51**	0.59**
			(0.46)	(0.45)			(0.10)	(0.12)
Age	0.98**	0.96***	0.98**	0.96**	1.02**	1.01	1.01	1.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female (ref. = male)	0.75	0.93	0.67	0.84	1.47	1.02	1.51	1.02
	(0.21)	(0.26)	(0.19)	(0.25)	(0.34)	(0.26)	(0.33)	(0.24)
Race (ref. = white)								
Black	1.74	2.23†	2.41†	2.42†	0.83	0.75	0.53†	0.56†
	(0.71)	(0.95)	(0.20)	(0.13)	(0.36)	(0.28)	(0.19)	(0.19)
Asian and others	1.55	1.32	1.94*	1.55	0.62	0.68	0.47*	0.57
	(0.37)	(0.50)	(0.55)	(0.61)	(0.19)	(0.23)	(0.15)	(0.20)
Hispanic (ref. = non-Hispanic)	0.59	0.76	0.59	0.72	0.68	0.54†	0.68	0.52†
	(0.23)	(0.35)	(0.24)	(0.35)	(0.24)	(0.18)	(0.24)	(0.18)
Region of residence (ref. = Northeast)								
Midwest	0.80	1.00	1.04	1.08	0.85	0.75	0.74	0.67
	(0.29)	(0.39)	(0.41)	(0.43)	(0.22)	(0.21)	(0.20)	(0.20)
South	0.82	0.95	0.95	0.99	0.97	0.66	0.77	0.59†
	(0.30)	(0.39)	(0.36)	(0.41)	(0.27)	(0.18)	(0.22)	(0.17)
West	0.91	1.01	1.01	1.03	0.79	0.75	0.66	0.66
	(0.32)	(0.38)	(0.36)	(0.40)	(0.22)	(0.21)	(0.18)	(0.19)
Survey Year (ref. = 2013)								
2014	1.87	1.91	1.50	1.75	1.05	1.14	1.07	1.05
	(0.69)	(0.77)	(0.56)	(0.70)	(0.34)	(0.38)	(0.36)	(0.33)
2015	0.70	0.61	0.69	0.68	1.54	1.91*	1.34	1.53
	(0.21)	(0.22)	(0.22)	(0.23)	(0.44)	(0.58)	(0.45)	(0.48)
2016	1.06	1.18	1.06	1.24	1.18	1.16	0.96	0.96

	Self-rated Health (odd ratios)				Functional Limitation (incidence rate ratios)			
	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
	(0.32)	(0.47)	(0.35)	(0.49)	(0.34)	(0.36)	(0.32)	(0.32)
2017	1.00	0.89	0.88	0.89	0.93	1.20	0.78	0.97
	(0.32)	(0.34)	(0.29)	(0.33)	(0.27)	(0.36)	(0.25)	(0.29)

Note: Standard errors are in parentheses.

† *p* < .10;

* *p* < .05;

** *p* < .01;

*** *p* < .001