

Mental Health Disparities by Sexual Orientation in the U.S.: Current Patterns and Recent Trends*

Ning Hsieh

Department of Sociology, Michigan State University
509 E. Circle Dr, 317 Berkey Hall, East Lansing, MI 48824, USA
E-mail: hsiehnin@msu.edu

Abstract

In the past few decades, U.S. society has gradually become more accepting of gays, lesbians, and bisexuals (LGB). The recent nationwide legalization of same-sex marriage is a monumental example of that acceptance. Despite the progress in civil rights, population-based studies since the early 2000s have noted that LGB populations continue to exhibit poorer health outcomes compared to their heterosexual counterparts. According to minority stress theory, prejudice, discrimination, and violence directed at sexual minorities over the course of their lives accounts for this health inequality. Using representative data from the 2013-2016 National Health Interview Survey, the current study examines recent patterns of, and potential explanations for, mental health disparities

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by sexual orientation in the U.S. The study investigates whether mental health disparities have narrowed significantly since the introduction of marriage equality and whether younger LGB people experience fewer health disadvantages compared to older ones. Results show that LGB people continue to experience higher levels of mental distress than heterosexuals. Most of the health disadvantages faced by gay men and bisexual men and women cannot be explained fully by access to socioeconomic resources or marital status, whereas disadvantages faced by lesbian women are largely attributable to these factors. Moreover, not only do mental health disparities by sexual orientation persist in the years from 2013-2016, but the disparities are actually larger among younger people. These findings suggest that marriage equality is not a panacea for the mental health of sexual minorities and that much more effort is needed to address fundamental rights for sexual minorities.

Key Words: LGB, mental health, marriage equality, sexual orientation

I. Background

In the past 15 years, population-based studies have shown that sexual minorities (e.g., individuals who self-identify as gay, lesbian, or bisexual) experience more mental distress and exhibit a higher prevalence of mental disorders such as depression and anxiety than heterosexual people (Bostwick, Boyd, Hughes, & McCabe, 2010; Conron, Mimiaga, & Landers, 2010; Institute of Medicine, 2011; Meyer, 2003). A leading explanation for this disparity is the unfriendly and unequal social environment in which sexual minorities encounter a substantial amount of stress related to their sexual orientation (Hatzenbuehler, McLaughlin, Keyes, & Hasin, 2010; Meyer, 2003; Pearlin, Menaghan, Lieberman, & Mullan, 1981). Important contributors to poorer mental health outcomes observed among sexual minorities include (but are not limited to) barriers to economic/educational opportunities and marital relationships resulting from discriminatory acts, such as rejection by one's original family, denial of legal spousal rights, and negative bias in school and the labor market (Badgett, Lau, Sears, & Ho, 2007; Hatzenbuehler, 2011; Hsieh, 2014).

Although many studies in the U.S., at the state or national level, have documented mental health inequalities by sexual orientation, very few have examined trends relating to health inequality. Considering the progress of social acceptance and the pursuit of equal rights for sexual minorities in recent decades, mental health inequality might have been expected to narrow during these years. According to Pew Research Center, public support for same-sex marriage has increased dramatically from 37% to 62% within a decade, 2007-2017 (Masci, Brown, & Kiley, 2017). The legalization of same-sex marriage started in Massachusetts in 2003 and extended to 13 states and the District of Columbia before the Defense of Marriage Act was struck down in 2013 (*United States v. Windsor*), followed by nationwide legalization in 2015 (*Obergefell v. Hodges*) (Romero, 2017). In light of these legal changes, many assumed that the more accepting social climate induced by policy changes might

significantly relieve some of the mental distress experienced by sexual minorities. However, few studies have empirically examined this claim.

Similarly, some might suppose that the mental health disparity among younger age groups would be smaller than the disparity among older age groups because younger groups have grown up in a more LGBTQ-friendly environment than their older counterparts (Institute of Medicine, 2011). This expectation has rarely been tested with population-representative data. In fact, optimistic views may be premature because recent marriage equality laws have also encouraged legislation to restrict or repeal legal protections for the civil rights of sexual minorities. A notable example is the recent enactment of religious exemption laws in several states, where businesses and healthcare providers may deny services to sexual minorities in the name of religious freedom (Moreau, 2018; Pear & Peters, 2018; Stack, 2016). In addition, many states still have not established anti-discrimination laws to protect employment, housing, adoption/foster care, and public accommodations for sexual minorities (Moreau, 2018). These remaining challenges may continue to compromise the mental well-being of sexual minorities. Finally, while younger sexual minorities are generally brought up in a more liberal environment that allows them to be more visible and vocal, confrontations may increase with families, local communities, and the broader society as a consequence. When support systems are weak, younger sexual minorities may not always fare better in the face of mental health challenges than older sexual minorities (Ryan, Russell, Huebner, Diaz, & Sanchez, 2010; Snapp, Watson, Russell, Diaz, & Ryan, 2015).

In this study, I use nationally representative data from the National Health Interview Surveys from 2013 to 2016 to address the following research questions: (a) Do sexual minorities still exhibit higher levels of mental distress than their heterosexual counterparts post marriage equality? (b) If so, why? In particular, is it because sexual minorities continue to experience disadvantages in

socioeconomic status and marital status as a result of prejudice or discrimination based on sexual orientation? (c) Has the mental health disparity narrowed over time since the recognition of same-sex marriage? (d) Do younger people experience less mental health disparity by sexual orientation than older people? Findings from this study contribute to our understanding of the continuing struggles faced by sexual minorities and the potential health consequences thereof in contemporary U.S. society.

II. Minority Stress and Health Consequences

In Meyer's minority stress theory (2003), he points out that sexual minorities, including gays, lesbians, and bisexuals (LGB), experience excess stress due to their stigmatized sexual identities or behaviors, and their marginalized social position. Experiencing chronic or acute negative events, such as discrimination, harassment, and bullying in school and work, can take heavy toll on the mental well-being of LGB people. The expectation of such events and the corresponding vigilance that this expectation requires can erode mental health on a daily basis. In the face of the dominant heteronormative culture, sexual minorities often internalize stigmatizing social values, thereby developing low self-esteem and a sense of limited control over their lives, two important factors of mental well-being. Additionally, attempts to conceal one's sexual orientation over fears of disapproval, unfair treatment, or social rejection commonly lead to higher levels of distress.

As both earlier and recent studies have consistently suggested, individuals identifying as LGB show significantly poorer health outcomes, mental or physical, compared to individuals identifying as heterosexual. For example, LGBs have higher rates of psychological distress, depression and anxiety disorders, cardiovascular risks, lung diseases, cancer, and functional limitations than their heterosexual peers (Hsieh & Ruther, 2016; Institute of Medicine, 2011; Meyer, 2003). In addition, research has shown that sexual minorities are

more likely to engage in unhealthy behaviors, such as smoking, heavy drinking, and illicit drug use (Gonzales & Henning-Smith, 2017; Hsieh & Ruther, 2016; McCabe, Hughes, Bostwick, West, & Boyd, 2009). The minority stress perspective provides a means to understanding these disparities in health and health behaviors (Meyer, 2003). As discussed above, stigma associated with minority sexual identity can have direct and indirect impact on mental health. For example, stigma can create barriers to quality schooling, job opportunities, income security, and supportive social relationships. In order to relieve minority stress, LGBs may engage in more risk behaviors as coping strategies, including tobacco and alcohol consumption (Institute of Medicine, 2011), which may further compromise health and lead to chronic conditions such as cardiovascular diseases, cancer, and addiction. Moreover, studies have found that disrespectful attitudes, unfair treatment, or inadequate cultural competency among health providers lead to sexual minorities having poorer access to quality health care (Everett & Mollborn, 2014; Hsieh & Ruther, 2017; McNair, Hegarty, & Taft, 2012; Ponce, Cochran, Pizer, & Mays, 2010). As a result, sexual minorities are more likely to delay or forego needed care, risking detrimental health consequences in the long run (Agénor, Krieger, Austin, Haneuse, & Gottlieb, 2014; Solazzo, Gorman, & Denney, 2017).

Although sexual minority groups share challenges related to their minority status, differences remain in health experiences between gays/lesbians and bisexuals. A number of recent studies have shown that bisexuals have poorer health outcomes, including higher rates of mental disorders and more barriers to health services than gays and lesbians (Bostwick et al., 2010; Conron et al., 2010; Dahlhamer, Galinsky, Joestl, & Ward, 2016; Gorman, Denney, Dowdy, & Medeiros, 2015; Hsieh & Ruther, 2017). These studies note that the unique stressors faced by bisexual men and women, including being perceived as confused or indecisive about their sexual orientation, sexually permissive, and disloyal and

untrustworthy as romantic partners, may contribute to their poorer health. Significantly, the prejudices and stereotypes against bisexuals may come from both heterosexuals and gays/lesbians; some describe the phenomenon as a “double stigma” (Bostwick et al., 2010). Research has also indicated that bisexuals experience health and healthcare disadvantages stemming from lower socioeconomic status as compared to other sexual orientation groups (Conron et al., 2010; Gorman et al., 2015). For the reasons enumerated above, analyses in this study separate bisexuals from gays and lesbians.

Finally, health experiences may differ by gender among sexual minority groups. The AIDS epidemic has affected the health of men more seriously than women (Fredriksen-Goldsen, Kim, Barkan, Muraco, & Hoy-Ellis, 2013; Institute of Medicine, 2011), which may contribute to a larger health disparity by sexual orientation for men than for women. Also, many sexual minority men have lost a life partner to the epidemic and thus are more likely to be single, living alone, and/or lacking social support (Fredriksen-Goldsen et al., 2013; Grossman, D’Augelli, & Hershberger, 2000). This may lead to greater loneliness and mental distress among sexual minority men than sexual minority women. However, studies have also noted that sexual minority women are more likely to be economically disadvantaged and have poorer access to healthcare services than sexual minority men (Gonzales & Henning-Smith, 2017; Hsieh & Ruther, 2016; Ponce et al., 2010). This gender gap in economic and healthcare resources may cancel out some of the health disadvantages experienced by sexual minority men described above.

III. SES, Marital Status, and Mental Health by Sexual Orientation

Both socioeconomic status (SES) and marital status are considered crucial factors in health, including mental health. In particular, individuals with higher income and wealth, educational attainment, and/or occupational status tend to experience lower

levels of stress and mental distress (Grzywacz, Almeida, Neupert, & Ettner, 2004; Hemingway, Nicholson, Stafford, Roberts, & Marmot, 1997; Kessler et al., 1994; Reiss, 2013). With fewer financial strains, better access to health care, more job satisfaction, and a better sense of control over work, individuals with higher SES tend to experience fewer mental health problems than those with lower SES. Since sexual minorities are more likely to face challenges in employment and income insecurity caused by a lack of legal protection against discrimination (Badgett et al., 2007; Ragins, Singh, & Cornwell, 2007), LGB persons may experience more job and financial strains than heterosexual persons of a similar educational level. However, studies have consistently shown that sexual minorities, particularly gays and lesbians, are more educated than heterosexuals (e.g., Conron et al., 2010; Gorman et al., 2015), despite the fact that LGB youth attending school are much more likely to be bullied and attempt suicide than heterosexual youth (Hatzenbuehler, 2011). Accordingly, educational attainment may be a protective rather than risk factor for the health of gays and lesbians, mitigating some of their health disadvantages resulting from employment-related and economic hardships.

Married people often exhibit a mental health advantage over people who are cohabiting, never married, or previously married (Carr & Springer, 2010; Simon, 2002; Waite & Gallagher, 2000). This is in part because marriage provides intimacy, emotional and material support, and a sense of meaning and belonging. These factors act as buffers against stress and provide benefits to mental health, but may not accrue from other types of relationships. Since sexual minorities are less likely to live in a marital relationship due to historical legal restrictions on same-sex marriage and continuing social disapproval, e.g., lack of support from family and religious institutions (Hsieh, 2014; Reczek, Liu, & Spiker, 2017), they may have less access to psychosocial and material resources associated with marriage and, in turn, exhibit poorer mental health compared to heterosexuals. However, sexual minorities may hold a more

critical attitude toward marriage, a historically heterosexual institution, and thus are less likely to view and rely on marriage as a primary or sole source of support (Goldberg & Kivalanka, 2012). Many studies have noted that sexual minorities depend more heavily on friendships, even during later stages of life (de Vries & Hoctel, 2007; Fokkema & Kuypers, 2009; Grossman et al., 2000). Therefore, it is likely that sexual minorities and heterosexuals differ somewhat in the ways they value relationships and that lack of a marital partner may not carry the same weight or generate similar health effects for these two groups. Accordingly, marital status may not play a pivotal role in explaining mental health disparities between sexual orientation groups.

Lastly, the contribution of socioeconomic status and marital status to health may differ by gender among sexual minority groups. Previous studies have indicated that employment and income contribute to a larger proportion of healthcare and health disparities faced by sexual minority women than sexual minority men (Hsieh & Ruther, 2016; Hsieh & Ruther, 2017). This is in part because sexual minority women are more likely to be unemployed or live in poverty compared to both sexual minority men and heterosexual women (Gonzales & Henning-Smith, 2017; Ponce et al., 2010). This economic disadvantage may be compounded by marital status. Among married/cohabiting couples, lesbian couples may be economically worse-off than heterosexual couples, whereas gay couples may be economically better-off than heterosexual couples due to the persistent gender gap in pay (Graf, Brown, & Patten, 2019). In general, households with two women experience a double disadvantage in income while households with two men experience double privilege. Meanwhile, because the vast majority of bisexuals in a marital or cohabiting relationship have a different-gender partner (Hsieh & Liu, in press), the extent to which socioeconomic status and marital status jointly influence health outcomes may be relatively similar between bisexual men and women.

IV. Hypotheses

Based on the minority stress theory, the literature on sexual minority health, and recent changes in the sociopolitical and legal environment, this study tests the following four hypotheses:

A. Despite recent progress in the social climate and equality of rights as signaled by the legalization of same-sex marriage, sexual minorities remain more distressed than their heterosexual counterparts.

B. The mental health disparity is attributable to differences in educational attainment, economic factors, and marital status between sexual orientation groups. However, these factors may be more important to the mental health disadvantaged faced by sexual minority women than sexual minority men.

C. Mental health disparities by sexual orientation may narrow during the 2013-2016 period as a result of same-sex marriage gaining recognition from federal and state authorities.

D. Considering that younger adults are more likely to grow up in a social climate with greater acceptance of sexual minorities, mental health disadvantages may be smaller among those who identify as LGB in younger age groups than those in older ones.

V. Data and Methods

A. Data and Sample

The study uses pooled cross-sectional data for the period 2013-2016 from the National Health Interview Survey (NHIS). The NHIS collects nationally representative samples of the civilian non-institutionalized US population (Blewett, Drew, Griffin, King, & Williams, 2018). Conducted annually by the US Census Bureau since 1957, the NHIS covers a wide range of health issues such as self-reported health outcomes and diagnoses, health care access and utilization, and health behaviors and risks. Beginning in 2013, the survey has asked sampled adults (ages 18 and above) about sexual

identity. The initial adult sample from the 2013-2016 surveys includes 137,954 individuals. After excluding 7,675 cases with missing values on any covariates used in this study (except family income), our analytic sample includes 130,279 respondents. Because the family income variable has more missing values (about 8% of the original sample did not provide detailed income data), we created a missing category for this variable instead of removing cases with missing values. Of the 130,279 respondents, 2,209 (1.7%) self-identify as gay or lesbian; 1,105 (0.9%) self-identify as bisexual; 126,965 (97.4%) self-identify as heterosexual.

B. Analytic Plan

I first used ordinary least squares (OLS) regression models to predict the level of psychological distress and ordered logistic regression models to predict the degree to which distress interferes with daily life. For each of these mental health outcomes, I estimated four models for men and women separately. In Model 1, I included sexual orientation and basic demographic covariates, including age, race, Hispanic ethnicity, region of residence, and survey years. In Model 2, I added educational attainment to test its contribution to health disparities by sexual orientation. In Model 3, I included economic factors such as employment, income, and perceived financial strains as further controls. In Model 4, I incorporated marital status to assess whether marital status explains additional differences in mental health outcomes by sexual orientation. Additionally, I used the KHB (Karlson-Holm-Breen) method for mediation analysis to test the significance of educational attainment, economic factors, and marital status in mediating the relationship between sexual orientation and mental health outcomes in Model 4. The KHB method can decompose the effects of sexual orientation on mental health outcomes into direct and indirect (mediation) effects via multiple factors at one time (Breen, Karlson, & Holm, 2013).

To test whether health gaps narrowed over time, I examined the interaction effects of sexual orientation and survey years on both mental health outcomes. This analysis combined the samples of men and women for greater statistical power, but separate analysis by gender shows consistent results (these results are not presented but available upon request). Finally, to test if health disparities differ by age group, I also tested the interaction effects of sexual orientation and age, combining men and women again for greater statistical power. All analyses in this study were adjusted to account for the multistage sampling design, oversampling on racial/ethnic minorities, nonresponse, and post-stratification in the NHIS using the *svy* functions in Stata 14 (StataCorp, 2015).

C. Variables

Two mental health outcomes are examined in this study: *psychological distress* and *life interference by distress*. To measure psychological distress, I used the Kessler Psychological Distress Scale-K6, which includes six items: in the past 30 days how often the respondent “felt sad that nothing could cheer him/her up”; “hopeless”; “nervous”; “restless or fidgety”; “everything was an effort”; “worthless”. Each of these six items was rated on a 5-point scale from none of the time (0) to all of the time (4). The summary scale therefore ranges from 0 to 24, with higher values indicating more distress (Cronbach’s $\alpha = 0.87$); respondents who did not answer one or more of the six items were treated as missing cases. A follow-up question about life interference by psychological distress was then asked: “Altogether, how much did these feelings interfere with your life or activities?” Respondents may answer with one of four choices: a lot, some, a little, or not at all.

Sexual orientation was measured by respondents answering a question asking about sexual identity: Which of the following best represents how you think of yourself? Five possible answers are offered from which to choose: lesbian or gay, straight (that is, not

lesbian or gay), bisexual, something else, or I don't know. The study focuses on comparing respondents who self-identify as lesbian or gay, straight, and bisexual, excluding the two groups with ambiguous answers because it is difficult to interpret whether respondents do not understand the question or they are uncertain about their sexual orientation.

Educational attainment was measured by asking respondents to select which of these four categories best describes their education level: less than high school, high school or equivalent, some college, and bachelor's degree or above.

Economic factors were measured by three variables: *family income*, *employment status*, and *perceived financial strain*. *Family income* includes six categories: \$0-34,999, \$35,000-49,999, \$50,000-74,999, \$75,000-99,999, \$100,000 and above, and missing income information. *Employment status* has five categories: working or in school, laid-off or looking for work, retired, not working due to disability, and not working for other reasons. *Perceived financial strain* is a summary scale that integrates six items of financial worries, 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 (Cronbach's $\alpha = 0.9$). Each item was rated on a 4-point scale from 1 (not worried at all) to 4 (very worried). The summary score is an average of these six items, with higher values indicating greater financial strain.

Marital status indicates whether the respondent is currently married, cohabiting, never married, or previously married. Because of small sample size, I combined those who were divorced, separated, and widowed into a single category—previously married.

Control variables include *age group* (ages 18-33, 34-53, and 54 and older), *race* (white, black, Asian, multiracial, or Native American and others), *Hispanic ethnicity* (1=yes; 0=no), *region of residence* (Northeast, Midwest, South, or West), and *survey year* (2013, 2014, 2015, or 2016).

Finally, in analyses that include family income as one of the explanatory variables, I also adjust for *family size* (number of persons in family) to more accurately assess the respondent's income level. The divisions for *age group* were chosen to reflect some of the major historical events and progress experienced by sexual minorities in the past 60-70 years. In particular, I separated the respondents into three groups based on their birth years: before 1960 (age 54 or older in 2013), 1960-1979 (age 34-53 in 2013), and 1980 or later (age 18-33 in 2013). According to the Institute of Medicine (2011), before 1960 the LGB communities were largely hidden and much less organized. Individuals who exhibited non-heterosexual attraction, behavior, or identification were extremely stigmatized. However, with the civil rights movement and changing social climate in the early 1960s, sexual minorities and their allies publicly began to confront anti-LGB discrimination and challenge the labeling of homosexuality as a mental disorder. This momentum contributed to the Stonewall riots in 1969 (which marked the "beginning" of the sexual minority rights movement in the U.S.) and the removal of homosexuality as a mental disorder from the Diagnostic and Statistical Manual of Mental Disorders in 1973. Starting in the early 1980s, the AIDS epidemic reshaped LGB communities. While the epidemic wiped out many lives in the 1980s and 1990s, it also amplified activism and created the infrastructure of community-based organizations dedicated to the health and social needs of many LGB people today. I expect that these historical contexts may set apart the experience of sexual minorities of different age groups, but I also acknowledge that such age groupings are a rather crude approximation of individuals' experience.

VI. Results

A. Descriptive Statistics

Table 1 describes mental health and sociodemographic characteristics by gender and sexual orientation. For both men and women, sexual minorities show higher scores of psychological distress (K6) than do heterosexuals. Bisexual men and women are the most distressed groups. Consistently, sexual minorities are more likely to experience life interference due to psychological distress. For example, while 83% of heterosexual men report never experiencing such emotional interference in the past month, 71% of gay men and 63% of bisexual men report never having such negative feelings interfering their life. A similar pattern is observed among women.

Notable differences appeared in socioeconomic status by sexual orientation. In terms of education, gay men and lesbian women have higher levels of educational attainment than heterosexuals and bisexuals, who have quite similar levels of education. For example, 43% of gay men and 40% of lesbian women have a bachelor's degree, whereas 28-31% of heterosexual or bisexual men and women do so. In terms of employment status, gay men and lesbian women are also the most likely to be working or in school, while bisexual men and women are the most likely to be laid off or looking for work, and heterosexual men and women are the most likely to be retired. Regarding family income, bisexuals are more disadvantaged than heterosexuals and gays/lesbians, and the income gap is particularly notable among women. While roughly 30% of heterosexual and lesbian women report having an income lower than \$35,000, 47% of bisexual women do so. In addition, despite having higher levels of education, gays and lesbians still show similar levels of income compared to heterosexual men and women. Finally, lesbian and bisexual women perceive more financial strains than heterosexual women, but this difference by sexual orientation is not significant among men.

Table 1 Descriptive Statistics by Gender and Sexual Orientation, NHIS 2013-2016

	Men			Women		
	Heterosexual	Gay	Bisexual	Heterosexual	Lesbian	Bisexual
K6 (mean) ^{ab}	2.2	3.5	5.0	2.8	3.4	5.9
Life interference (%) ^{ab}						
Not at all	83.3	71.4	62.8	78.0	71.0	53.9
A little	8.4	14.1	17.2	10.3	12.8	19.4
Some	5.4	8.6	8.2	7.8	11.3	13.5
A lot	2.9	5.9	11.9	3.8	4.9	13.3
Education (%) ^{ab}						
Less than high school	13.3	6.0	15.9	12.4	8.3	13.0
High school or equivalent	26.6	18.5	17.5	24.6	19.3	21.4
Some college	29.8	32.9	35.9	32.3	32.3	37.6
Bachelor's degree or above	30.3	42.6	30.8	30.7	40.2	28.0
Employment status (%) ^{ab}						
Working/schooling	70.2	74.9	61.5	57.9	71.1	67.4
Laid-off/looking for work	5.6	5.2	12.6	4.3	6.5	13.0
Retired	15.6	8.9	11.0	18.6	9.0	3.6
Not working due to health reasons	6.7	8.4	9.4	7.1	9.0	7.8
Not working due to other reasons	1.9	2.5	5.5	12.0	4.5	8.2
Family income (%) ^{ab}						
0-34,999	25.7	29.9	37.9	30.3	31.5	47.4
35,000-49,999	11.4	11.0	7.7	11.4	11.2	10.6
50,000-74,999	16.6	17.6	16.8	15.4	14.8	13.4
75,000-99,999	12.2	10.8	11.9	11.0	12.1	8.3
100,000 and above	25.4	25.7	19.0	22.3	25.2	14.2
Missing	8.7	5.0	6.8	9.6	5.2	6.1
Perceived financial strain (mean) ^b	2.1	2.0	2.1	2.2	2.3	2.3
Marital status (%) ^{ab}						
Married	57.0	18.9	16.7	51.8	23.3	22.5
Cohabiting	7.3	22.8	11.5	6.7	31.1	16.9
Never married	23.4	52.1	55.7	19.4	36.8	46.9
Previously married	12.3	6.1	16.2	22.0	8.9	13.7
Family size ^{ab}	2.8	2.0	2.3	2.8	2.5	2.7
Age (mean) ^{ab}	46.4	42.4	39.5	47.8	42.5	32.3
Age group 18-33 (%) ^{ab}	29.1	35.2	47.2	27.0	34.1	66.1
34-53	34.9	39.4	29.2	33.9	40.6	24.8
54 and older	36.1	25.5	23.6	39.0	25.3	9.1
Race (%) ^{ab}						
White	80.4	80.2	80.3	78.6	77.3	78.7
Black	11.2	11.9	10.9	12.8	14.8	11.8
Asian	5.7	3.3	7.2	6.0	2.7	3.4
Multiracial	1.7	3.6	1.3	1.7	3.2	3.8
Native American	1.1	1.0	0.4	1.1	2.0	2.3
Hispanic (%)	15.9	15.4	18.8	14.9	15.1	12.6

Table 1 (Continued)

	Men			Women		
	Heterosexual	Gay	Bisexual	Heterosexual	Lesbian	Bisexual
Region (%) ^a						
Northeast	17.4	18.9	17.4	17.5	19.7	14.8
Midwest	22.9	17.2	25.1	22.4	18.9	22.7
South	36.2	36.0	28.5	37.4	36.4	34.2
West	23.5	27.9	29.0	22.7	25.0	28.3
Year of survey (%)						
2013	24.7	25.1	21.2	24.8	25.1	19.8
2014	24.9	26.6	19.7	25.0	24.1	24.1
2015	24.9	25.9	25.0	25.0	25.2	25.2
2016	25.5	22.4	34.1	25.3	25.6	31.0
N	57,000	1,198	333	69,965	1,011	772

Note: ^a Difference by sexual orientation among men is significant at least at the $p < .05$ level. ^b Difference by sexual orientation among women is at least at the $p < .05$ level. Differences by sexual orientation are tested using Pearson's chi-square statistics for categorical variables and *t* statistics for continuous variables. Percentages may not sum to 100% due to rounding.

Marital status varies widely across sexual orientation groups, which suggests that recent changes in marriage equality laws have not yet shown their full impact. Heterosexual men and women are much more likely to be married than gay, lesbian, and bisexual men and women, who are often cohabiting with a partner or never married. However, some of these differences, as well as those in mental health and socioeconomic status, may be attributable to the distribution of age and other demographic characteristics. For example, sexual minorities tend to be younger than heterosexuals: the mean age of heterosexual, lesbian, and bisexual women is 48, 42, and 32 years old, respectively. Because depression has become more prevalent in younger cohorts (Kessler et al., 2007), age may explain at least some of the mental health disadvantages among sexual minorities. Also, younger generations tend to achieve higher levels of education than older generations, and this may explain why gays and lesbians are more educated than heterosexuals. In the next section, I discuss analyses that are adjusted for differential demographic characteristics.

Table 2 OLS Regression Models of Psychological Distress on Sexual Orientation for Men (Models 1-4) and for Women (Models 5-8), NHIS 2013-2016

	Men				Women			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Sexual orientation (ref: heterosexual)								
Gay/lesbian	1.20*** (0.18)	1.34*** (0.19)	1.12*** (0.18)	1.05*** (0.18)	0.49** (0.17)	0.61*** (0.17)	0.31* (0.15)	0.21 (0.15)
Bisexual	2.70*** (0.53)	2.70*** (0.52)	2.28*** (0.47)	2.19*** (0.47)	2.92*** (0.29)	2.86*** (0.29)	2.33*** (0.26)	2.28*** (0.26)
Age group (ref: ages 18-33)								
Ages 34-53	0.03 (0.05)	0.08 (0.05)	-0.41*** (0.05)	-0.29*** (0.05)	0.13* (0.06)	0.19*** (0.06)	-0.43*** (0.05)	-0.32*** (0.06)
Ages 54 and older	-0.33*** (0.05)	-0.33*** (0.05)	-0.81*** (0.06)	-0.65*** (0.06)	-0.23*** (0.06)	-0.34*** (0.06)	-0.72*** (0.06)	-0.59*** (0.07)
Race (ref: white)								
Black	0.02 (0.07)	-0.10 (0.06)	-0.51*** (0.06)	-0.56*** (0.06)	-0.02 (0.06)	-0.21** (0.07)	-0.71*** (0.06)	-0.79*** (0.06)
Asian	-0.54*** (0.08)	-0.40*** (0.09)	-0.41*** (0.08)	-0.40*** (0.07)	-0.84*** (0.07)	-0.71*** (0.07)	-0.65*** (0.07)	-0.63*** (0.07)
Multiracial	1.11*** (0.23)	1.03*** (0.23)	0.77*** (0.20)	0.73*** (0.20)	0.96*** (0.18)	0.85*** (0.18)	0.39* (0.17)	0.35* (0.16)
Native American	0.77** (0.25)	0.64* (0.25)	0.31 (0.23)	0.29 (0.23)	0.30 (0.24)	0.07 (0.23)	-0.13 (0.21)	-0.14 (0.21)
Hispanic	-0.10 (0.06)	-0.41*** (0.06)	-0.62*** (0.06)	-0.62*** (0.06)	0.00 (0.07)	-0.45*** (0.07)	-0.75*** (0.07)	-0.76*** (0.07)
Region (ref: Northeast)								
Midwest	0.14 (0.07)	0.10 (0.07)	0.19** (0.06)	0.21** (0.06)	0.30*** (0.07)	0.20** (0.07)	0.28*** (0.07)	0.30*** (0.07)
South	0.01 (0.07)	-0.02 (0.07)	0.00 (0.06)	0.01 (0.06)	0.11 (0.07)	0.03 (0.07)	0.05 (0.07)	0.08 (0.07)
West	0.19** (0.07)	0.20** (0.07)	0.22*** (0.07)	0.22*** (0.07)	0.27*** (0.07)	0.25*** (0.07)	0.32*** (0.07)	0.33*** (0.07)
Year of survey (ref: 2013)								
2014	-0.25*** (0.06)	-0.24*** (0.06)	-0.11* (0.05)	-0.11* (0.05)	-0.23*** (0.06)	-0.22*** (0.06)	-0.05 (0.05)	-0.06 (0.05)
2015	-0.02 (0.06)	0.00 (0.06)	0.16** (0.05)	0.16** (0.05)	-0.02 (0.06)	0.02 (0.06)	0.23*** (0.05)	0.23*** (0.05)
2016	-0.06 (0.06)	-0.03 (0.06)	0.16** (0.06)	0.16** (0.06)	-0.05 (0.06)	0.00 (0.06)	0.22*** (0.06)	0.22*** (0.06)
Education (ref: less than high school)								
High school		-0.68*** (0.08)	-0.25** (0.08)	-0.24** (0.08)		-0.90*** (0.09)	-0.48*** (0.08)	-0.45*** (0.08)
Some college		-0.79*** (0.08)	-0.10 (0.08)	-0.10 (0.08)		-1.00*** (0.09)	-0.35*** (0.08)	-0.34*** (0.08)
Bachelor's degree		-1.35*** (0.08)	-0.20* (0.08)	-0.15* (0.08)		-1.91*** (0.08)	-0.62*** (0.08)	-0.58*** (0.08)

Table 2 (Continued)

	Men				Women			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Employment (ref: working/in school)								
Laid-off/looking for work		1.10***	1.04***			1.26***	1.24***	
		(0.12)	(0.12)			(0.12)	(0.12)	
Retired		0.62***	0.63***			0.60***	0.60***	
		(0.06)	(0.06)			(0.05)	(0.05)	
Not working due to health reasons		3.91***	3.86***			3.85***	3.83***	
		(0.14)	(0.14)			(0.11)	(0.11)	
Not working due to other reasons		0.75***	0.70***			0.18**	0.30***	
		(0.18)	(0.18)			(0.06)	(0.06)	
Family income (ref: \$0-34,999)								
\$35,000-49,999		-0.25***	-0.21**			-0.49***	-0.42***	
		(0.07)	(0.07)			(0.07)	(0.07)	
\$50,000-74,999		-0.30***	-0.24***			-0.57***	-0.46***	
		(0.06)	(0.06)			(0.06)	(0.06)	
\$75,000-99,999		-0.38***	-0.30***			-0.55***	-0.41***	
		(0.07)	(0.07)			(0.07)	(0.07)	
\$100,000 and above		-0.20**	-0.11			-0.53***	-0.35***	
		(0.06)	(0.07)			(0.06)	(0.07)	
Missing		-0.48***	-0.43***			-0.74***	-0.66***	
		(0.07)	(0.07)			(0.07)	(0.07)	
Family size		-0.07***	-0.03			-0.04**	-0.01	
		(0.01)	(0.02)			(0.02)	(0.02)	
Perceived financial strain		1.24***	1.26***			1.48***	1.48***	
		(0.03)	(0.03)			(0.03)	(0.03)	
Marital status (ref: married)								
Cohabiting			0.19*				0.44***	
			(0.08)				(0.09)	
Never married			0.42***				0.48***	
			(0.06)				(0.06)	
Previously married			0.48***				0.49***	
			(0.07)				(0.05)	
Constant	2.35***	3.23***	0.27*	-0.22	2.80***	4.07***	0.51***	-0.02
	(0.07)	(0.10)	(0.12)	(0.13)	(0.08)	(0.11)	(0.13)	(0.14)

*** p<0.001, ** p<0.01, * p<0.05

B. Regression Analysis

(A) Disparities in Psychological Distress and Potential Contributing Factors

Table 2 shows the relationship between sexual orientation and psychological distress for men (Models 1-4) and for women (Models 5-8). Gay or bisexual men have higher levels of psychological distress than their heterosexual peers with similar age, race/ethnicity, region of residence, and year of interview (Model 1). In particular, bisexual men exhibit the lowest level of psychological well-being across all sexual orientation groups. These disparities in psychological distress are not attributable to educational attainment (Model 2). While more education predicts better psychological well-being, the level of education actually suppresses some of the gaps in distress between gay and heterosexual men. This is likely because on average gay men have higher levels of education than heterosexual men. Furthermore, economic factors may contribute to some of the mental health disparities by sexual orientation (Model 3). Not currently working, having less income, and perceiving more financial strain are all related to poorer psychological well-being. Taking these factors into account modestly reduces the health disparities between heterosexual men and sexual minority men. Similarly, identifying as cohabiting, never married, or previously married predicts more distress, and adjusting for marital status explains some of the mental health disparities by sexual orientation (Model 4). The KHB (Karlson-Holm-Breen) method that formally tests the mediation effects of educational attainment, economic factors, and marital status also indicates that economic factors and marital status partially mediate the association between sexual orientation and psychological distress for bisexual men ($p=0.002$), but not for gay men ($p=0.54$). Regardless, the level of psychological distress remains significantly higher among gay and bisexual men than heterosexual men after all the sociodemographic factors are accounted for.

Although the general pattern for men is similar to that for

women, a couple of notable gender differences do appear (Models 5-8). Specifically, the psychological disadvantage among lesbian women compared to heterosexual women is smaller (Model 5). Also, this health gap is largely diminished when economic factors and marital status are adjusted for (Models 7 & 8). Unlike lesbian women, however, bisexual women remain much more disadvantaged compared to their heterosexual counterparts when sociodemographic characteristics are controlled for. The KHB tests suggest that economic factors and marital status partially mediate the relationship between lesbian and bisexual identity and psychological distress, respectively ($p=0.04$; $p<0.001$).

(B) Disparities in Life Interference by Psychological Distress and Potential Contributing Factors

Sexual minorities not only report higher levels of psychological distress, but also experience negative feelings to the extent that their lives or daily activities are affected. Table 3 demonstrates the link between sexual orientation and life interference due to psychological distress for men (Models 1-4) and for women (Models 5-8). Both gay and bisexual men exhibit higher odds of life interference than heterosexual men, by 1.9 and 3.0 times respectively (Model 1). While educational attainment appears to suppress some of the health disadvantage (Model 2), economic factors and marital status explain some, despite limited, amount of the disadvantage (Models 3 & 4). The KHB tests confirm that the partial mediation is significant for bisexual men ($p=0.001$) but not for gay men ($p=0.45$). With all socioeconomic and demographic characteristics being adjusted for, sexual minority men still experience more life difficulties resulting from psychological distress than their heterosexual peers.

Results for women mirror the pattern of men regarding life interference by psychological distress. Both lesbian and bisexual women have higher odds of experiencing life interference from distress than heterosexual women, by 1.4 and 2.8 times respectively (Model 5). Some of these disadvantages may be attributed to

Table 3 Ordinal Logistic Regression Models of Life Interference on Sexual Orientation for Men (Models 1-4) and for Women (Models 5-8), NHIS 2013-2016 (Odds Ratios)

	Men				Women			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Sexual orientation (ref: heterosexual)								
Gay/lesbian	1.91*** (0.17)	2.06*** (0.19)	1.94*** (0.20)	1.86*** (0.19)	1.38*** (0.12)	1.47*** (0.13)	1.27** (0.11)	1.19 (0.11)
Bisexual	2.95*** (0.53)	2.98*** (0.53)	2.78*** (0.53)	2.61*** (0.48)	2.79*** (0.29)	2.77*** (0.30)	2.47*** (0.27)	2.39*** (0.26)
Age group (ref: ages 18-33)								
Ages 34-53	0.99 (0.04)	1.02 (0.04)	0.73*** (0.03)	0.79*** (0.03)	0.97 (0.03)	1.00 (0.03)	0.70*** (0.03)	0.76*** (0.03)
Ages 54 and older	0.85*** (0.03)	0.85*** (0.03)	0.57*** (0.03)	0.65*** (0.03)	0.80*** (0.03)	0.77*** (0.03)	0.57*** (0.02)	0.62*** (0.03)
Race (ref: white)								
Black	1.16*** (0.05)	1.09 (0.05)	0.82*** (0.04)	0.80*** (0.04)	1.09* (0.04)	1.00 (0.04)	0.75*** (0.03)	0.71*** (0.03)
Asian	0.90 (0.07)	0.97 (0.08)	0.96 (0.08)	0.96 (0.08)	0.66*** (0.04)	0.70*** (0.04)	0.70*** (0.04)	0.71*** (0.04)
Multiracial	1.81*** (0.20)	1.74*** (0.19)	1.62*** (0.18)	1.57*** (0.17)	1.43*** (0.12)	1.38*** (0.12)	1.10 (0.10)	1.08 (0.10)
Native American	1.64*** (0.23)	1.55** (0.22)	1.33 (0.20)	1.31 (0.20)	1.19 (0.16)	1.08 (0.14)	0.96 (0.13)	0.95 (0.12)
Hispanic	0.97 (0.04)	0.82*** (0.04)	0.69*** (0.04)	0.69*** (0.04)	0.97 (0.04)	0.80*** (0.03)	0.67*** (0.03)	0.66*** (0.03)
Region (ref: Northeast)								
Midwest	1.08 (0.05)	1.06 (0.05)	1.15* (0.06)	1.16** (0.06)	1.23*** (0.05)	1.18*** (0.05)	1.25*** (0.06)	1.26*** (0.06)
South	1.01 (0.05)	0.99 (0.05)	0.99 (0.05)	1.01 (0.05)	1.09* (0.05)	1.05 (0.04)	1.06 (0.05)	1.08 (0.05)
West	1.14** (0.06)	1.15** (0.06)	1.19** (0.06)	1.19** (0.06)	1.21*** (0.05)	1.20*** (0.05)	1.27*** (0.06)	1.28*** (0.06)
Year of survey (ref: 2013)								
2014	0.85*** (0.03)	0.85*** (0.04)	0.92 (0.04)	0.92 (0.04)	0.93* (0.03)	0.93* (0.03)	1.00 (0.04)	1.00 (0.04)
2015	0.99 (0.04)	1.00 (0.04)	1.14** (0.05)	1.13** (0.05)	1.05 (0.04)	1.07* (0.04)	1.22*** (0.05)	1.22*** (0.05)
2016	0.94 (0.04)	0.95 (0.04)	1.09 (0.05)	1.09 (0.05)	0.98 (0.04)	1.00 (0.04)	1.14** (0.04)	1.13** (0.04)

Table 3 (Continued)

	Men				Women			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Education (ref: less than high school)								
High school	0.70*** (0.03)	0.87** (0.04)	0.87** (0.04)		0.73*** (0.03)	0.87** (0.04)	0.88** (0.04)	
Some college	0.68*** (0.03)	1.00 (0.05)	1.01 (0.05)		0.72*** (0.03)	0.96 (0.04)	0.97 (0.04)	
Bachelor's degree	0.48*** (0.02)	0.97 (0.06)	0.99 (0.06)		0.44*** (0.02)	0.82*** (0.04)	0.84*** (0.04)	
Employment (ref: working/in school)								
Laid-off/looking for work		1.75*** (0.11)	1.66*** (0.10)			1.77*** (0.10)	1.75*** (0.10)	
Retired		1.59*** (0.09)	1.61*** (0.09)			1.54*** (0.06)	1.55*** (0.06)	
Not working due to health reasons		6.23*** (0.36)	6.03*** (0.35)			5.41*** (0.25)	5.40*** (0.25)	
Not working due to other reasons		1.48*** (0.16)	1.42** (0.16)			1.12** (0.05)	1.22*** (0.05)	
Family income (ref: \$0-34,999)								
\$35,000-49,999		0.92 (0.05)	0.95 (0.05)			0.79*** (0.03)	0.83*** (0.04)	
\$50,000-74,999		0.91 (0.04)	0.95 (0.05)			0.77*** (0.03)	0.83*** (0.03)	
\$75,000-99,999		0.84** (0.05)	0.89 (0.05)			0.78*** (0.05)	0.86* (0.05)	
\$100,000 and above		0.87* (0.05)	0.93 (0.06)			0.75*** (0.04)	0.84*** (0.04)	
Missing		0.71*** (0.05)	0.73*** (0.05)			0.63*** (0.03)	0.65*** (0.04)	
Family size		0.96*** (0.01)	0.99 (0.01)			0.98 (0.01)	1.00 (0.01)	
Perceived financial strain		2.19*** (0.04)	2.22*** (0.05)			2.19*** (0.04)	2.20*** (0.04)	
Marital status (ref: married)								
Cohabiting			1.12 (0.07)				1.34*** (0.07)	
Never married			1.40*** (0.07)				1.41*** (0.06)	
Previously married			1.44*** (0.07)				1.36*** (0.05)	

Table 3 (Continued)

	Men				Women			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant cut1	4.78*** (0.24)	3.08*** (0.18)	22.35*** (1.98)	32.86*** (3.34)	3.59*** (0.16)	2.22*** (0.12)	15.85*** (1.28)	22.76*** (2.08)
Constant cut2	10.61*** (0.55)	6.86*** (0.42)	55.12*** (5.05)	81.19*** (8.44)	7.72*** (0.36)	4.80*** (0.27)	38.12*** (3.14)	54.88*** (5.10)
Constant cut3	31.85*** (1.81)	20.67*** (1.40)	185.71*** (17.95)	274.05*** (29.71)	25.50*** (1.24)	15.98*** (0.96)	144.13** (12.53)	207.97** (20.13)

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

economic resources and marital status (Models 7 & 8). According to the KHB tests, partial mediation through these variables is significant for both lesbian and bisexual women ($p = 0.02$ and $p < 0.001$, respectively). The mental health gap between lesbian and heterosexual women is relatively small and diminishes further after the adjustment for economic factors and marital status. By contrast, the mental health gap between bisexual and heterosexual women remains wide and significant after a variety of socioeconomic and demographic characteristics are taken into consideration.

(C) Trend of Mental Health Gaps, 2013-2016

In light of the legalization of marriage equality first at the federal level in 2013 and then across all the states in 2015, mental health disparities by sexual orientation may narrow in recent years as a result of the more friendly climate. However, data from the NHIS do not support this hypothesis. Table 4 shows the interaction effects between sexual orientation and time period for psychological distress (Model 1) and for life interference by distress (Model 2). These models indicate that none of the interaction terms are statistically significant. Results suggest that the gaps in mental health outcomes across sexual orientation groups have not decreased over the four years. Additional analysis on these models that adjusts

Table 4 Interaction Effects of Sexual Orientation and Time Period on Mental Health Outcomes, NHIS 2013-2016

	Model 1: psychological distress	Model 2: life interference (odds ratio)
Sexual orientation (ref: heterosexual)		
Gay/lesbian	0.81*** (0.21)	1.52*** (0.19)
Bisexual	2.83*** (0.51)	2.62*** (0.51)
Year of survey (ref: 2013)		
2014	-0.24*** (0.04)	0.89*** (0.02)
2015	-0.02 (0.04)	1.02 (0.03)
2016	-0.06 (0.05)	0.96 (0.03)
Sexual orientation X year		
Gay/lesbian X 2014	0.27 (0.38)	1.13 (0.23)
Gay/lesbian X 2015	-0.06 (0.31)	1.11 (0.19)
Gay/lesbian X 2016	-0.09 (0.33)	0.95 (0.17)
Bisexual X 2014	-0.41 (0.74)	0.93 (0.25)
Bisexual X 2015	0.56 (0.69)	1.52 (0.40)
Bisexual X 2016	0.26 (0.72)	1.16 (0.30)
Age group (ref: ages 18-33)		
Ages 34-53	0.09* (0.04)	0.98 (0.02)
Ages 54 and older	-0.26*** (0.04)	0.83*** (0.02)
Race (ref: white)		
Black	0.02 (0.05)	1.13*** (0.03)
Asian	-0.69*** (0.06)	0.76*** (0.04)
Multiracial	1.04*** (0.14)	1.59*** (0.10)
Native American	0.53** (0.17)	1.38** (0.14)
Hispanic	-0.05 (0.05)	0.97 (0.03)

Table 4 (Continued)

	Model 1: psychological distress	Model 2: life interference (odds ratio)
Region (ref: Northeast)		
Midwest	0.22*** (0.05)	1.16*** (0.04)
South	0.07 (0.05)	1.06 (0.03)
West	0.23*** (0.05)	1.17*** (0.04)
Constant(s)	2.57*** (0.05)	4.11*** (0.13)
		8.93*** (0.30)
		28.30*** (1.06)

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Model 1 is an OLS regression model. Model 2 is an ordinal logit regression model.

for marital status also shows consistent results (not presented here but available upon request).

(D) Age Differences in Mental Health Gaps

Considering that younger sexual minorities have grown up in an environment more accepting of non-heterosexual sexual orientation, their mental health disadvantages may be smaller as compared to older sexual minorities. However, this hypothesis is not supported by the data. Table 5 demonstrates the interaction effects of sexual orientation and age groups for psychological distress (Model 1) and for life interference by distress (Model 2). Unexpectedly, the mental health gaps by sexual orientation are wider among younger people than their older counterparts. While sexual minorities generally report higher rates of psychological distress and life interference due to distress as indicated by the main effects, older sexual minorities (ages 54 and older) do not experience health disadvantages as large as younger sexual minorities do. Older age significantly mitigates some of the mental health gaps between sexual orientation groups, as indicated by the interaction effects.

Table 5 Interaction Effects of Sexual Orientation and Age Group on Mental Health Outcomes, NHIS 2013-2016

	Model 1: psychological distress	Model 2: life interference (odds ratio)
Sexual orientation (ref: heterosexual)		
Gay/lesbian	1.16*** (0.22)	1.82*** (0.18)
Bisexual	3.39*** (0.32)	3.41*** (0.38)
Age group (ref: ages 18-33)		
Ages 34-53	0.10* (0.04)	0.99 (0.03)
Ages 54 and older	-0.23*** (0.04)	0.84*** (0.02)
Sexual orientation X Age group		
Gay/lesbian X Ages 34-53	-0.28 (0.31)	0.91 (0.14)
Gay/lesbian X Ages 54 and older	-0.79** (0.30)	0.66* (0.11)
Bisexual X Ages 34-53	-0.23 (0.65)	0.99 (0.21)
Bisexual X Ages 54 and older	-2.69*** (0.57)	0.33*** (0.09)
Year of survey (ref: 2013)		
2014	-0.24*** (0.04)	0.89*** (0.02)
2015	-0.02 (0.04)	1.02 (0.03)
2016	-0.05 (0.05)	0.96 (0.03)
Race (ref: white)		
Black	0.02 (0.05)	1.13*** (0.03)
Asian	-0.69*** (0.06)	0.76*** (0.04)
Multiracial	1.04*** (0.14)	1.59*** (0.10)
Native American	0.52** (0.17)	1.38** (0.14)
Hispanic	-0.05 (0.05)	0.97 (0.03)
Region (ref: Northeast)		
Midwest	0.22*** (0.05)	1.16*** (0.04)

Table 5 (Continued)

	Model 1: psychological distress	Model 2: life interference (odds ratio)
South	0.07 (0.05)	1.06 (0.03)
West	0.23*** (0.05)	1.17*** (0.04)
Constant(s)	2.56*** (0.05)	4.15*** (0.14)
		9.02*** (0.30)
		28.60*** (1.08)

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Model 1 is an OLS regression model. Model 2 is an ordinal logit regression model.

Supplementary analysis using age, a continuous variable, instead of age group reveals the same pattern (not presented here but available upon request).

VII. Discussion

This study uses data from the National Health Interview Surveys, 2013-2016, to examine the most recent pattern of mental health disparities by sexual orientation and potential contributing factors to such disparities since the legalization of same-sex marriage in the U.S. Overall, findings demonstrate that gays, lesbians, and bisexuals continue to experience more psychological distress that interferes with their life than heterosexuals. In particular, bisexual men and women exhibit the highest rates of psychological distress among the three sexual orientation groups. Moreover, the study indicates that most of the mental health disparities by sexual orientation are not attributable to differences in educational attainment, economic resources, and marital status. Struggles faced by sexual minorities and corresponding health consequences persist in the U.S. even after the legalization of same-sex marriage. Despite

the monumental policy change, mental health gaps have not narrowed in a significant way since 2013. Surprisingly, younger sexual minorities do not fare better than older sexual minorities. In fact, mental health gaps by sexual orientation among younger people are larger than those among older people.

A major finding suggests that socioeconomic status and marital status make limited contributions to mental health gaps by sexual orientation. Specifically, education barely explains why sexual minority men and women tend to have poorer psychological well-being than their heterosexual peers. In fact, education suppresses some of the disadvantages experienced by gays and lesbians; that is, without their educational attainment (which is generally higher than that of heterosexuals), gays and lesbians would likely fare even worse in regards to mental health. While economic factors (income, employment status, perceived financial strain) and marital status contribute to some of the health disparities, they cannot explain fully the considerable health disadvantages among sexual minority groups, except for those experienced by lesbian women. With all these characteristics being accounted for, gay men and bisexual men and women still experience more psychological distress and related life difficulties than their heterosexual peers. The finding that economic factors and marital status play a more important role in mental health distress among lesbian women than gay men is likely explained by women's economic disadvantage, which can be aggravated in female same-sex households (Graf et al., 2019; Ponce et al., 2010). The results also suggest that in addition to having fewer economic and psychosocial resources (perhaps arising from employment discrimination and challenges in forming or maintaining relationships), other sources of stress may be responsible for the psychological distress among gay men and bisexual men and women.

Notably, sexual minority men may suffer more distress than sexual minority women because of health conditions related to HIV infection and the stigma of living with HIV/AIDS (Fredriksen-Goldsen et al., 2013; Grossman et al., 2000). Additionally, bisexual

men and women report the lowest levels of psychological well-being, which could be attributed to the “double stigma,” a unique stressor coming from both heterosexual and gay/lesbian communities (Bostwick et al., 2010; Conron et al., 2010; Institute of Medicine, 2011; Meyer, 2003). This strain may make bisexuals less socially accepted, integrated, and supported than gays and lesbians (Anderson & McCormack, 2016; Hsieh, 2014; Pew Research Center, 2013). According to findings in the current study and discussions in previous research, reducing sexual minority stress by eliminating the stigma associated with HIV/AIDS and sexual orientation (particularly bisexuality) remains an indispensable step toward health equality.

Several factors could help explain the persistent gaps in psychological well-being by sexual orientation during 2013-2016. First, marriage equality may not have an immediate effect on the mental health of sexual minorities. Although signifying an important achievement of diversity and civil rights, the law has been in place for only a few years. According to Romero (2017), there were more than half a million same-sex married couples as of June 2017, and many of them got married after *United States v. Windsor* in 2013 or *Obergefell v. Hodges* in 2015. More same-sex couples have not yet married but will benefit from legalization in the near future. Whether marriage equality has a long-term and broader impact on health remains to be tested in future research. Second, while entering a marital relationship may provide benefits to mental health because the relationship often offers economic stability, emotional support, and a sense of purpose (Carr & Springer, 2010; Waite & Gallagher, 2000), not every sexual minority would choose to be (or is ready to be) legally married. In fact, recent statistics showed that only about 10% of LGBT adults in the U.S. are in a same-sex marriage (Romero, 2017), suggesting that the vast majority of sexual minorities do not currently benefit from the institution of marriage. Therefore, marriage equality, at least for now, is more symbolic than practical for many. Lastly, rather than deciding whether or not to enter a

marital relationship, most sexual minorities are faced with other pressing concerns, such as discrimination in employment, housing, health care, and public accommodations, which are yet legally addressed in many states (Moreau, 2018). These issues may have greater and more direct impact on the mental well-being of sexual minorities than the legal right to marry. As Reczek, Liu, & Spiker (2017) point out, without broader social acceptance of same-sex relationships and further de-stigmatization of sexual minority identities, marriage equality itself may not promote the health and well-being of sexual minorities. Much more effort is needed to improve civil rights across the board for sexual minorities.

The unexpected widening of mental health gaps by age may be explained by confrontations and conflicts resulting from more visibility or “outness” among younger sexual minorities. Although society has gradually become more inclusive of non-heterosexual sexuality over time, prejudice and discrimination at the family, community, and institutional levels remain prevalent (Institute of Medicine, 2011). Without well-developed support systems, young sexual minorities who are out and proud may be particularly vulnerable to rejection, bullying, homelessness, and depression that could lead to suicide (Hatzenbuehler, 2011; Ryan et al., 2010; Snapp et al., 2015). By contrast, older sexual minorities are likely more financially and emotionally independent from their family or community of origin after years of work and social experience. As the socioemotional selectivity theory suggests, older peoples’ networks are more likely to include social ties who are loving and supportive of them because unpleasant relationships tend to filter out over time (Carstensen, Isaacowitz, & Charles, 1999). Another explanation for the unexpected finding is mortality selection. Since sexual minorities generally have higher morbidity and mortality rates than heterosexuals (Gonzales & Henning-Smith, 2017; Hsieh & Ruther, 2016; Institute of Medicine, 2011), those who survive to an advanced age are likely a select group with robust health and well-being. Accordingly, older sexual minorities may experience limited

mental health disadvantages compared to older heterosexuals.

Several limitations in this study should be acknowledged. First, because the study relies on pooled cross-sectional data, results are correlational and do not address causality issues. Second, the data do not include measurements of stress. Although this study uses minority stress theory to explain the mental health disparities by sexual orientation, the lack of data on stress prevented empirical analysis on stress distribution across sexual orientation groups. To compensate for this limitation, indicators that shape individuals' experience of stress, including educational level, access to economic resources, and marital status, are included as proxies for stress exposure. If data permit, future research should include direct measures for stress exposure. Moreover, the age differences in mental health disparities observed in the data include both age and cohort effects. Given such a short period of observation, the study cannot effectively separate the two, making interpretation more difficult. Continuing data collection efforts for many more years are needed to untangle the age and cohort effects. Lastly, the study could benefit from data stretching back over a span of years before the legalization of same-sex marriage. However, few national-level surveys have collected both sexual orientation and health data from an earlier time. The National Health Interview Survey only started asking questions related to sexual orientation since 2013. As more waves of survey data are collected in the years to come, future studies will be able to document the long-term trends of mental health disparity by sexual orientation.

Despite these data limitations, this study describes the most updated pattern of mental health disparity among sexual orientation groups using a nationally representative sample of the U.S. population. Considering the current sociopolitical climate and the legal circumstances (including the backlash over the legalization of same-sex marriage), the findings suggest that marriage equality is not a panacea for the poorer mental well-being of sexual minorities. However, marriage equality may serve as a wake-up call to the public

regarding the many other civil rights that remain unprotected for sexual minorities. Unless society addresses the fundamental issue of prejudice and discrimination based on sexual orientation, sexual minorities will continue to lead lives that are unequal to their heterosexual counterparts. In other words, the legalization of same-sex marriage is only a starting point, and we still have a long way to go.

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當代美國心理健康不平等的趨勢： 性傾向的差異

謝寧

Department of Sociology, Michigan State University
509 E. Circle Dr, 317 Berkey Hall, East Lansing, MI 48824, USA
E-mail: hsiehnin@msu.edu

摘 要

過去幾十年來，美國社會逐漸接納同志社群（同性戀及雙性戀），並在2015年全面通過同性婚姻法案。然而，自2000年初以來的大規模人口調查研究持續發現，同志與異性戀間仍存有顯著的健康差異，同志的健康狀況普遍較差。性少數壓力理論 (minority stress theory) 指出，同志群體在社會上面臨的偏見、歧視和暴力，為此健康不平等的主要原因。本研究使用2013-2016全國健康訪查資料 (National Health Interview Survey) 分析美國當代性傾向與心理健康的關聯和趨勢，以及健康不平等的相關因素。研究發現，同性婚姻法案通過後，同志與異性戀之間的心理健康差異並未顯著下降，且年輕人口中的健康差異反而大於老年人口。此外，社經條件和婚姻狀態無法解釋多數同志群體的健康劣勢（女同性戀除外）。研究結果顯示，婚姻平權並非同志健康的萬靈丹，社會應同時落實其他基本人權保障，才能減低同志與異性戀間的健康不平等。

關鍵詞：同志、心理健康、婚姻平權、性傾向