Sexual orientation, social support, and mental distress: A study of middle-aged US population

Ning Hsieh

University of Pennsylvania

Abstract

In contrast to a large body of research reporting that sexual minorities are at higher risks of mental distress compared to heterosexuals, only few studies have investigated the determinants of mental health disparities by sexual orientation in a systematic manner. This study examines the role of social support for middle-aged Americans, a significant yet under-investigated component that potentially contributes to the disparities. Using representative data from three waves (2003-2008) of the National Health and Nutrition Examination Survey (NHANES), the study shows that emotional support and the number of close friends significantly buffer the excess mental distress experienced by sexual minorities, particularly self-identified homosexuals, bisexuals, and others. Further, sufficient amounts of support even help these individuals attain the level of mental health status comparable to their heterosexual counterparts' level. The finding suggests that strengthening social support for sexual minorities may be key in closing the mental health gap by sexual orientation.

Introduction

A large body of research has reported that sexual minorities are at higher risks of mental distress such as depression, substance abuse, and suicide attempts compared to heterosexuals (e.g., Bostwick et al. 2009; Cochran 2001; Conron, Mimiaga, and Landers 2010; Gilman et al. 2001; Herrell et al. 1999; Sandfort et al. 2001). In contrast, only few studies have investigated the determinants of mental health disparities by sexual orientation in a systematic manner (Ueno 2005, 2010). Further, more research on the protective factors of sexual minorities' health is badly in need (Institute of Medicine 2011). Therefore, this article examines the function of social support, a significant yet under-investigated component that potentially contributes to mental health disparities by sexual orientation (I. Meyer 2003). It argues that social support contains strong moderating effects, though only weak mediating effects, on the negative relationship between sexual-minority status and mental health for middle-aged people in the US.

The study focuses on the middle-aged US population (age 40-59), a cohort born between 1944 and 1968. This group of people is distinct from other age or birth cohorts in at least two aspects. First, they came of age or lived their early adulthood during the AIDS epidemic. For sexual minorities in particular, the epidemic dramatically altered their communities (Levine, Nardi, and Gagnon 1997). The loss of partners or networks of friends not only caused emotional trauma, but also took away an important source of social support, which would have sustained through their life course if the epidemic had never occurred. Second, the majority of the cohort, by definition, is baby boomers, who have already entered their retirement or are doing so soon. Aging experience is likely to be very different by sexual orientation in part because sexual minorities rely more on non-traditional sources of support and care, such as friends and other non-family members, than their heterosexual counterparts, who mostly rely on a partner or adult

children (Barker 2002), although it does not necessarily imply that sexual minorities are less prepared for or more poorly adapted to their later life (MetLife 2010). This study is dedicated to middle-aged Americans, among which sexual minorities have not received much research attention, especially when recent studies on social support and health largely focus on adolescents and youth (e.g., Teasdale and Bradley-Engen 2010; Ueno 2005).

Using data representative of the middle-aged US population from the National Health and Nutrition Examination Survey (NHANES), the paper addresses several methodological limitations commonly found in the studies of sexual minorities' health. First, the majority of previous research relies on non-probability samples that contain only a small number of observations from particular geographical areas or social spaces. Moreover, these studies often focus on sexual minorities only, unable to explain the health differences between sexual minorities and heterosexuals. Finally, most studies consider only one dimension of sexual orientation, usually either sexual behavior (e.g., men who have sex with men (MSM)) or sexual identity (e.g., self identified as lesbian, gay, bisexual (LGB)). Defining sexual minorities just according to sexual behavior may miss important health implications of communities, relationships, and social networks (Young and I. H. Meyer 2005), while definition simply based on certain sexual-identity classification ignores the health experiences of sexual-minority subgroups such as people of color and age cohorts that do not identify with the classification (Chae and Ayala 2010). The present study provides improvements on all these methodological concerns.

Sexual Orientation and Mental Health

The Stress Process

Previous studies indicate that individuals who stand in disadvantageous positions in the social structure, including women, racial/ethnic minorities, and people with low socioeconomic status, exhibit a higher prevalence of mental distress, particularly depressive symptoms (Aneshensel 2009; Mirowsky and Ross 1989, 1995; Pearlin et al. 1981; Thoits 1995; Turner and Marino 1994; Turner, Wheaton, and Lloyd 1995; Turner and Lloyd 1999). They argue that systematic inequity and discrimination, as well as structural powerlessness and alienation, contribute to the compromised mental health status of these individuals. In specific, the studies identify two major social origins of health disparities—unequal exposure to stress and unequal distribution of coping resources. Meyer (2003) further elaborates this stress process model to explain the higher rates of mental conditions experienced by sexual minorities in contrast to heterosexuals. On one hand, he attributes the mental health disparities in part to extra stressors that are faced by sexual minorities, including stigma, prejudice, victimization, and discrimination. On the other hand, he argues that community-level and individual-level coping resources, such as social support and mastery (i.e., sense of control over life), are crucial for resilience from stressful events. The coping resources provide both stress-buffering and direct salutary effect on mental health.

Social Support for Sexual Minorities

As social support is identified beneficial for the mental health of individuals in disadvantaged social positions (Aneshensel 2009; Turner and Marino 1994), several studies specifically examine whether and how it influences sexual minorities. Grossman, D'Augelli, and Hershberger (2000) argue that the lesbian, gay, and bisexual elderly with domestic partners have better mental health status than those living alone. Further, Blair and Holmberg (2008) find that perceived social support from romantic relationships predicts positive mental health outcomes

for homosexuals, as it does for heterosexuals. By studying a group of self-identified Latino lesbians and gay men in their adulthood, Zea, Reisen, and Poppen (1999) also suggest that social support, active coping, and identification with the Latino gay and lesbian community are all positively related to psychological well-being. Moreover, based on a nationally representative sample of adolescents, Ueno (2005) shows that having sexual-minority friends reduces psychological distress that is linked to interpersonal problems at home and at school for sexual-minorities, but not for their heterosexual counterparts. Besides, through simultaneously examining a variety of mechanisms underlying mental health disparities by sexual orientation among youths, Ueno (2010) indicates that deficiency in family support and other coping resources partly explains the gap in depressive symptoms between sexual minorities and heterosexuals, although no stress-buffering effects are found. However, in a comparison of sexual-minority and heterosexual adults in New York City, Meyer et al. (2008) find that sexual orientation does not predict the amount of coping resources including size of social networks and mastery, implying that social support might not explain the health inequality based on sexual orientation.

Although this small number of studies suggest that social support, in general, seems to promote the mental well-being of sexual minorities, their targeted populations and analytical strategies vary greatly from one another. In particular, most of them are based on non-probability samples drawn from a wide array of geographical areas or social venues/communities. They also target different age groups or birth cohorts that express divergent concerns for health and social well-being. Further, many studies focus on sexual minorities only, not intending to explain the health disparities between sexual minorities and heterosexuals. Finally, due to small sample size, some studies are unable to control for a full range of socio-demographic characteristics, leaving

the interpretation of their findings open. In view of the limited evidence and inconsistent methodology, the present study builds on the theory of stress process and examines the role of social support in sexual minorities' mental health. It contributes to the literature by testing the theory on an under-studied population—middle-aged people in the US—with significant improvements in methodology.

Hypotheses

The study examines the role of social support in mediating and moderating the difference in mental health status between sexual minorities and heterosexuals. Two hypotheses are tested:

(a) Social support *mediates* the negative relationship between sexual-minority status and mental health condition. Insufficient social support, due to rejection by original family and unfair treatment by the broader society, explains the higher rates of mental distress among sexual minorities.

(b) Social support *moderates* the negative relationship between sexual-minority status and mental health condition. Receiving support from family, friends, or communities helps ameliorate the mental distress in relation to being a sexual minority. Social support buffers the negative health consequence of stress from prejudice, victimization, and discrimination.

Methods

Data and Sample

The study uses data from three waves (2003-2008) of the National Health and Nutrition Examination Survey (NHANES). The three waves of cross-sectional data are pooled to increase the power of statistical analyses because sexual minorities only account for a tiny proportion of

the sample in each wave. There are originally 4,755 individuals aged 40-59 who were assigned to answer both the section of sexual behavior and the section of social support in the NHANES, 2003-2008. The final analytical sample includes 3,613 individuals (76% of the original sample) after eliminating those who never had sex, refused to report or reported "not sure" or "don't know" about their sexual identity[1], or had missing values in any of the variables. In the final sample, 93.0% are self-identified heterosexual or straight who never had same-sex sexual intercourse[2], 3.3% are self-identified heterosexual or straight who had same-sex sexual intercourse in their lifetime, and 3.7% are self-identified homosexual, lesbian, gay, bisexual, or something else who, in majority, had same-sex sexual intercourse in their lifetime.

Measures

Mental health is measured by "the number of days the respondent reported her/his mental health was not good during the past 30 days". The survey question specifies that bad mental health condition includes stress, depression, and any problems with emotions. Although this self-rated measure is relatively crude compared to the multiple-item indices of mental distress, such as the Center for Epidemiology Studies Depression Scale (CES-D), it is a general evaluation of mental well-being that avoids using a specific type of distress or disorder to represent the overall mental functioning. As Aneshensel, Rutter, and Lachenbruch (1991) has argued, when studying the stress process, focusing on a particular kind of disorder as a proxy for overall psychological

[1] Two types of people may report "not sure" about their sexual identity: those who choose not to define their sexual identity and those who do not understand the survey question. Because the respondents can select "something else" if none of the description—heterosexual/straight, homosexual/lesbian/gay, and bisexual—fits their identity, I suspect that those who select "not sure" are more likely to be confused with the survey question. Therefore, I exclude individuals who report "not sure" from the analyses.

[2] Sexual intercourse includes vaginal, oral, and anal intercourse.

functioning can bias the estimation of the consequences of stress. The measure used here provides a general reference to mental health.

Sexual orientation is measured by two dimensions simultaneously: sexual identity and sexual behavior. It is summarized into three major categories: self-identified heterosexual or straight *without* any experience of same-sex sexual intercourse, self-identified heterosexual or straight *with* experiences of same-sex sexual intercourse, and self-identified homosexual, lesbian, gay, bisexual, or something else with and without same-sex sexual experiences (homosexual/LGB/else)[3]. The measure expands the conventionally one-dimensional measures for sexual orientation, allowing a more careful and refined comparison among groups of diverse sexuality.

Social support is represented by two variables. One is whether an individual has "anyone to help with emotional support such as talking over problems or helping making difficult decisions". It has three ordinal categories: having no emotional support, having emotional support but needing more in the past year, having sufficient emotional support. The other variable is the number of close friends the respondent reports. By close friends, it means "relatives or non-relatives that the respondent feels at ease with, can talk to about private matters, and can call on for help". These two variables measure perceived social support, which in previous studies is suggested as a stronger predictor of mental health compared to actual received support (Thoits 1995; Wethington and Kessler 1986).

[3] There are only a small number of individuals who identify as homosexual, lesbian, gay, bisexual, or something else do not have any experience of same-sex sexual intercourse (N=25). Excluding them from the analyses does not change the results in any significant ways.

Control variables include race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and others including multiracial), female gender, age, US citizenship[4], education (having at least some college or not), being married/cohabited, and physical health (number of days physical health was not good during the past 30 days).

Analytical Strategy

Bivariate analysis is first used to examine the unstandardized relationship between sexual orientation and the key variables (mental health and social support). Then the multivariate analysis of zero-inflated negative binomial regression is applied because the model fits the statistical property of the dependent variable (a count variable, the number of days mental health was not good during the past 30 days)[5]. In specific, the regression model is suitable for count data with a skewed and over-dispersed distribution (i.e., variance much greater than mean), especially when there is a high proportion of zeros. Figure 1 shows the distribution of the number of days mental health was not good by sexual orientation. For all types of sexual orientation, the number of days has a skewed and over-dispersed distribution, and it is overly concentrated on zero. Note that sexual minorities tend to have more days of mental distress.

All the analyses are adjusted for sampling design to account for oversampling on African Americans and Hispanics, survey non-response, post-stratification to match the 2000 US population, and data-pooling across survey waves.

[4] Including citizenship into the model helps control for some of the reporting bias due to cross-cultural differences.

[5] This regression model fits the data the best compared to other candidate models for count data such as Poisson regression, negative binomial regression, and zero-inflated Poisson regression, according to a Likelihood ratio test for over-dispersion and the Vuong test for zero inflation.

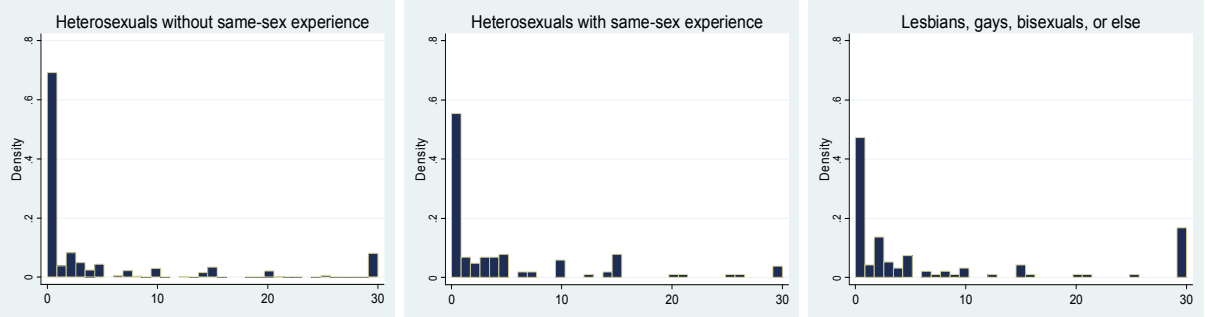


Figure 1: Distribution of mental health status—the number of days mental health was not good in the past 30 days—by sexual orientation

Results

Bivariate Relationships

According to the bivariate analysis, there are significant differences in mental health status, social support, socio-demographic characteristics, and self-rated health by sexual orientation (Table 1). In consistence with previous findings, it appears that sexual minorities, especially self-identified homosexuals/LGB/else, have lower levels of mental well-being than heterosexuals in general. Among heterosexuals, however, having any experience of same-sex sexual intercourse does not seem to matter for mental health. Further, individuals also show unequal levels of emotional support according to their sexual orientation. Both heterosexuals with same-sex sexual experience and homosexuals/LGB/else are less likely to report having sufficient resources of emotional support, compared to heterosexuals without any same-sex experience. Even if there is not much difference in the percentage of reporting no support at all, individuals with same-sex sexual behavior and/or non-heterosexual identity express a higher level of dissatisfaction with their supporting resources. By the same token, sexual minorities tend to have a smaller number of close friends to whom they can resort to talk about private matters or

call on for help, although the difference in the number of friends is not significant by the statistical standard.

In addition to psychosocial status, socio-demographic profiles and health condition also vary among middle-aged people of different sexual orientation. In particular, heterosexuals with same-sex experience are overwhelmingly female, while homosexuals/LGB/else are more likely to be male. Moreover, as expected, heterosexuals are much more likely to be married, especially among those without any same-sex experience. In contrast, homosexuals/LGB/else have the highest rate of being never married or cohabited. Educational level is also significantly related to sexual orientation. Homosexuals/LGB/else are generally more educated than heterosexuals, having a better possibility to receive higher education. Lastly, heterosexuals with same-sex experience report the greatest number of days feeling physically ill, followed by homosexuals/LGB/else and then heterosexuals without same-sex experience. In sum, the patterns of gender, marital status, education, and health vary greatly among people of diverse sexual orientation. Because these characteristics themselves are also relevant to mental health and social support (Aneshensel 2009; Mirowsky and Ross 1989, 1995; Pearlin et al. 1981; Thoits 1995; Turner et al. 1995; Turner and Lloyd 1999), it is important to consider all of them when examining the interrelationship between sexual orientation, social support, and mental health.

[Table 1 about here]

Multivariate Analysis

Table 2 presents the results from the zero-inflated negative binomial models that predict mental health status. It shows that, in general, sexual orientation does not drive the mental health disparity anymore after the socio-demographic and health correlates are all controlled for (Model

1). Further, emotional support, though directly promotes better mental health, does not mediate the relationship between sexual orientation and mental health status (Model 2). In specific, the inclusion of the emotional support variable does not either diminish or strengthen the coefficients of sexual orientation. However, the number of close friends not only improves mental health directly, but also alters the coefficient of sexual orientation (Model 4). In particular, when the number of close friends is held constant, heterosexuals with same-sex experience (who in general have fewer close friends, as shown in Table 1) becomes significantly healthier compared to their heterosexual counterparts without any same-sex experience. This result lends some support to my first hypothesis that social support *mediates* the negative relationship between sexual-minority status and mental health condition although the mediation only takes effect on heterosexuals with same-sex experience but not on homosexuals/LGB/else.

Next, there is strong evidence indicating that social support *moderates* the negative relationship between sexual-minority status and mental health condition as my second hypothesis states. This is demonstrated by the interaction between sexual orientation and social support examined in Models 3 and 5. Specifically, among middle-aged homosexuals/LGB/else, those who have at least some emotional support report much better mental well-being than those who do not have any support (Model 3). Having some, though not enough, emotional support already buffers a great proportion of negative health consequences of being a homosexual/LGB/else. Having sufficient support further diminishes the consequences, making sexual minorities and heterosexuals equivalent in mental health status. Based on the estimated model, Figure 2 clearly demonstrates the finding in the predicted number of days mental health was not good during the past 30 days. It shows that, for both men and women, the perceived level of emotional support

matters a lot more for homosexuals/LGB/else than for their heterosexual counterparts. Men, as expected, fare better than women in general.

Similar results are found for another social support measure—the number of close friends, which also moderates the mental health disparity by sexual orientation (Model 5). In particular, having more close friends ameliorates the harmful effect of being homosexual/LGB/else on mental health. Figure 3 suggests that the benefit of friendship is especially important for homosexuals/LGB/else. Having about six friends helps them attain the mental health status comparable to their heterosexual counterparts'. Having more than six friends may further improve their well-being and succeed better mental health outcomes than heterosexuals.

[Table 2 about here]

[Figure 2 about here]

[Figure 3 about here]

Discussion

In view of the urgent need for research on the protective factors of sexual minorities' health, this study investigates the role of social support in explaining mental health disparities based on sexual orientation. Through analyzing a representative sample of the middle-aged US population, the study shows that social support, measured by the level of emotional support and the number of close friends, significantly moderates though only weakly mediates the negative relationship between sexual-minority status and mental health condition. Regarding the moderating effect, having any emotional support or close friends buffers the mental distress of being a homosexual/LGB/else. Sufficient amounts of support further help this sexual-minority group attain the level of mental health status that is comparable to their heterosexual counterparts'

level. However, this stress-buffering effect is not found for another sexual-minority group—heterosexuals with same-sex sexual experience—possibly because they do not experience much excess stress and have similar mental health status compared to the sexual-majority group. In fact, if heterosexuals with same-sex experience had had as many close friends as heterosexual without same-sex experience, their mental health status would have been better than the latter, which lends some support to the mediating effect of social support. In sum, the finding generally demonstrates the importance of social support as a resilient resource to ameliorate the negative mental-health impact of sexual-minority stress, particularly among the middle-aged homosexuals/LGB/else.

In contrast to the majority of previous research on sexual minorities' health, this study significantly improves a number of methodological concerns. In particular, it uses a probability sample that represents the middle-aged US population to examine the mental health difference between sexual minorities and sexual majority. Moreover, when comparing mental health status by sexual orientation, the study controls for a series of socio-demographic and health variables that are important correlates of mental well-being. The standardized analysis simply reduces the chance of omitted variable bias and allows more rigorous interpretation of the results. Finally, by integrating two dimensions of sexual orientation, sexual identity and sexual behavior, the study takes a more inclusive view on sexuality to investigate the disparities of social support and mental health.

Further, the analysis targets a population that is under-studied about mental health inequalities in relation to sexual orientation and social support. The middle-aged cohort have lived through the AIDS epidemic that has severely changed social networks among some of them,

particularly sexual minorities, since their early adulthood. Now at the point of entering retirement, one of the most difficult issues they are facing is about access to sufficient and quality social support. In fact, the finding suggests that middle-aged sexual minorities are more likely to report having insufficient emotional support and a fewer number of close friends, and that these social resources are extremely important to their mental health status, especially among homosexuals/LGB/else. Table 3 shows the most important source of emotional support for those who have at least some emotional support. Compared to heterosexuals, homosexuals/LGB/else more often rely on friends, siblings, parents, professionals, and others, while less often receive support from spouse and children[6]. As they move onto their late adulthood, one of the most important sources—parent—will gradually vanish. This may imply a widening disparity of social support by sexual orientation although whether homosexuals/LGB/else will find equivalent replacement for parental support is still an open question. Future studies should continue to trace the differences in the quantity, quality, and sources of social support into late adulthood, for the changing patterns can be informative to understanding mental health disparities by sexual orientation at older ages.

[Table 3 about here]

Despite the merits discussed above, the study has several limitations. First, it only examines part of the stress process related to sexual orientation. In particular, the analysis focuses on the role of social support in explaining mental health disparities by sexual orientation. It does not investigate what types of stressors, such as episodes of discrimination and negative

[6] Even if we consider "others" together with "spouse", as sexual minorities may include their partner into "others" instead of "spouse", homosexuals/LGB/else are still less likely to receive emotional support from these two categories combined in a significant fashion.

life events, are associated with higher rates of mental distress among middle-aged sexual minorities. In addition, it does not consider the potential impact of psychosocial resources other than social support, such as self-esteem and mastery. Because the dataset used in this study does not include information of these factors, it is impossible to estimate how they correlate and interact with social support and whether the correlation and interaction shifts the currently estimated influence of social support on mental distress. Future research will benefit from considering various aspects of the stress process simultaneously. Another research limitation lies in the sexual orientation measure. Even though the study takes into account different dimensions of sexual orientation, the fluidity and diversity of gender and sexuality and their implications for mental health are perhaps far more complicated than what is presented here. For example, making homosexuals, bisexuals, and something else into one sexual identity category ignores all their differences in stress exposure, social resources, mental health status, and other characteristics. Besides, lifetime sexual behavior and sexual behavior during the past year, though overlap, may have distinct relevance to minority stress and the expression of mental health. However, the current analysis cannot use more refined or alternative sexual orientation categories because the sample size is not large enough to support that operation.

In conclusion, the study suggests that social support is especially beneficial to the mental well-being of middle-aged sexual minorities in the US, in particular for those self-identified as homosexual, lesbian, gay, bisexual, or something else. The finding implies that strengthening social support for these individuals can be one of the key solutions for closing the mental health gap by sexual orientation.

References

Aneshensel, C. S, C. M Rutter, and P. A Lachenbruch. 1991. "Social structure, stress, and mental health: Competing conceptual and analytic models." *American Sociological Review* 56(2):166–178.

Aneshensel, C. S. 2009. "Toward explaining mental health disparities." *Journal of Health and Social Behavior* 50(4):377.

Barker, J.C. 2002. "Neighbors, friends, and other nonkin caregivers of community-living dependent elders." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 57(3):S158–S167.

Blair, K.L., and D. Holmberg. 2008. "Perceived social network support and well-being in same-sex versus mixed-sex romantic relationships." *Journal of Social and Personal Relationships* 25(5):769.

Bostwick, Wendy B., Carol J. Boyd, Tonda L. Hughes, and Sean Esteban McCabe. 2009. "Dimensions of Sexual Orientation and the Prevalence of Mood and Anxiety Disorders in the United States." *American Journal of Public Health*.

Chae, DH, and G Ayala. 2010. "Sexual Orientation and Sexual Behavior among Latino and Asian Americans: Implications for Unfair Treatment and Psychological Distress." *JOURNAL OF SEX RESEARCH* 47(5):451–459. Retrieved June 13, 2011.

Cochran, S. D. 2001. "Emerging issues in research on lesbians' and gay men's mental health: Does sexual orientation really matter." *American Psychologist* 56(11):931–947.

Conron, Kerith J., Matthew J. Mimiaga, and Stewart J. Landers. 2010. "A Population-Based Study of Sexual Orientation Identity and Gender Differences in Adult Health." *American Journal of Public Health*.

Gilman, S. E et al. 2001. "Risk of psychiatric disorders among individuals reporting same-sex sexual partners in the National Comorbidity Survey." *American Journal of Public Health* 91(6):933.

Grossman, A.H., A.R. D'Augelli, and S.L. Hershberger. 2000. "Social support networks of lesbian, gay, and bisexual adults 60 years of age and older." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 55(3):P171.

Herrell, R. et al. 1999. "Sexual orientation and suicidality: a co-twin control study in adult men." *Archives of General Psychiatry* 56(10):867.

Institute of Medicine. 2011. *The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding*. Washington, D.C.: National Academies Press.

Levine, M.P., P.M. Nardi, and J.H. Gagnon. 1997. *In changing times: gay men and lesbians encounter HIV/AIDS*. University of Chicago Press.

Meyer, IH. 2003. “Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence.” *PSYCHOLOGICAL BULLETIN* 129(5):674–697. Retrieved June 13, 2011.

Meyer, S. Schwartz, and D. M Frost. 2008. “Social patterning of stress and coping: Does disadvantaged social statuses confer more stress and fewer coping resources?” *Social Science & Medicine* 67(3):368–379.

Mirowsky, J., and C. E Ross. 1995. “Sex differences in distress: Real or artifact?” *American Sociological Review* 60(3):449–468.

Mirowsky, J., and C.E. Ross. 1989. *Social causes of psychological distress.* Aldine de Gruyter.

Pearlin, L.I., E.G. Menaghan, M.A. Lieberman, and J.T. Mullan. 1981. “The stress process.” *Journal of Health and Social behavior* 337–356.

Sandfort, T. G.M, R. de Graaf, R. V Bijl, and P. Schnabel. 2001. “Same-sex sexual behavior and psychiatric disorders: findings from the Netherlands Mental Health Survey and Incidence Study (NEMESIS).” *Archives of General Psychiatry* 58(1):85.

Teasdale, and Bradley-Engen. 2010. “Adolescent Same-Sex Attraction and Mental Health: The Role of Stress and Support.” *Journal of homosexuality* 57(2):287–309.

Thoits, P. A. 1995. “Stress, coping, and social support processes: Where are we? What next?” *Journal of health and social behavior* 35:53–79.

Turner, R. J, and F. Marino. 1994. “Social support and social structure: A descriptive epidemiology.” *Journal of Health and Social Behavior* 35(3):193–212.

Turner, R.J., and D.A. Lloyd. 1999. “The stress process and the social distribution of depression.” *Journal of Health and Social Behavior* 374–404.

Turner, R.J., B. Wheaton, and D.A. Lloyd. 1995. “The epidemiology of social stress.” *American Sociological Review* 104–125.

Ueno, K. 2010. “Mental Health Differences between Young Adults with and without Same-Sex Contact: A Simultaneous Examination of Underlying Mechanisms.” *JOURNAL OF HEALTH AND SOCIAL BEHAVIOR* 51(4):391–407. Retrieved June 13, 2011.

Ueno, K. 2005. “Sexual orientation and psychological distress in adolescence: Examining interpersonal stressors and social support processes.” *Social Psychology Quarterly* 68(3):258–277.

Wethington, E., and R. C Kessler. 1986. “Perceived support, received support, and adjustment to stressful life events.” *Journal of Health and Social behavior* 27(1):78–89.

Young, R.M., and I.H. Meyer. 2005. “The trouble with ‘MSM’ and ‘WSW’□: Erasure of the sexual-minority person in public health discourse.” *American Journal of Public Health* 95(7).

Zea, M.C., C.A. Reisen, and P.J. Poppen. 1999. “Psychological well-being among Latino lesbians and gay men.” *Cultural Diversity and Ethnic Minority Psychology* 5(4):371.

Table 1: Descriptive Statistics by Sexual Orientation

Variable	Heterosexual without same-sex experience	Heterosexual with same-sex experience	Homosexual, Lesbian, gay, bisexual, or else	Difference
# Days feeling mentally ill (mean)	4.2	4.2	5.7	***
Emotional support (%)				
No support	4.6	7.7	4.7	**
Have support, but need more	20.5	32.1	32.5	
Have sufficient support	75.0	60.2	62.9	
Number of close friends (mean)	6.8	5.1	5.8	
Race/Ethnicity (%)				
Non-Hispanic white	76.3	79.6	81.1	
Non-Hispanic black	10.7	11.0	6.1	
Hispanic	8.8	5.3	10.1	
Others	4.3	4.2	2.7	
Female (%)	52.3	70.6	40.7	**
Age (mean)	48.8	48.1	48.0	
US Citizen (%)	94.9	96.5	98.8	+
Marital status (%)				
Married	70.0	51.5	12.2	***
Cohabited	4.6	8.2	27.7	
Widowed/separated/divorced	19.5	33.9	25.8	
Never married	5.9	6.4	34.3	
Education (%)				
Less than 9th grade	3.5	4.7	1.0	**
9th-11th grade	9.0	7.1	4.9	
High school grad/ GED	25.5	15.1	11.9	
Some college/ AA degree	33.3	36.8	37.9	
College grad or above	28.7	36.3	44.3	
# Days feeling physically ill (mean)	3.8	5.4	4.5	**
N	3419	120	111	

+ $p<0.1$ * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Note: Differences by sexual orientation are tested using Pearson Chi-squared statistics for categorical variables, t statistics for continuous variables (age), and Kruskall-Wallis statistics for count variables.

Table 2: Zero-inflated Negative Binomial Regression Models Predicting Mental Health Status (Number of Days That Mental Health Was Not Good during the Past 30 Days)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Sexual orientation (Ref: Heterosexual without same-sex experience)					
Heterosexual with same-sex experience	-0.27	-0.29	-0.80	-0.30 *	-0.20
	(0.16)	(0.15)	(0.43)	(0.14)	(0.26)
Homosexual/LGB/else	0.15	0.10	1.01 ***	0.10	0.55 *
	(0.18)	(0.17)	(0.25)	(0.17)	(0.22)
Race/ethnicity (Ref: White)					
Hispanic	-0.05	-0.10	-0.08	-0.09	-0.08
	(0.08)	(0.09)	(0.09)	(0.08)	(0.08)
Black	0.02	0.01	0.02	-0.04	-0.03
	(0.08)	(0.09)	(0.09)	(0.08)	(0.08)
Others	0.04	0.10	0.11	0.06	0.08
	(0.17)	(0.18)	(0.18)	(0.18)	(0.18)
Female	0.26 ***	0.26 ***	0.25 ***	0.25 ***	0.25 ***
	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)
Age	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Citizen	0.17	0.17	0.17	0.19	0.20
	(0.17)	(0.19)	(0.19)	(0.17)	(0.17)
Married/cohabited	-0.30 ***	-0.22 **	-0.21 **	-0.3 ***	-0.30 ***
	(0.07)	(0.08)	(0.08)	(0.07)	(0.07)
Some college and above	-0.35 ***	-0.35 ***	-0.35 ***	-0.33 ***	-0.32 ***
	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)
# Days of physical illness	0.04 ***	0.03 ***	0.04 ***	0.03 ***	0.03 ***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Emotional support (Ref: no support)					
Having insufficient support		-0.15	-0.13		
		(0.11)	(0.10)		
Having sufficient support		-0.52 ***	-0.47 ***		
		(0.13)	(0.12)		
Heterosexual with same-sex experience × Having insufficient support			0.68		
			(0.45)		
Homosexual/LGB/else × Having insufficient support			-0.87 *		
			(0.34)		

Heterosexual with same-sex experience × Having sufficient support			0.46		
			(0.48)		
Homosexual/LGB/else × Having sufficient support			-1.14 **		
			(0.33)		
Number of close friends				-0.05 **	-0.05 **
				(0.01)	(0.02)
(Number of close friends)^2				0.00 **	0.00 *
				(0.00)	(0.00)
Heterosexual with same-sex experience × Number of close friends					-0.02
					(0.03)
Homosexual/LGB/else × Number of close friends					-0.10 *
					(0.04)
Constant	1.93 ***	2.2 ***	2.18 ***	2.09 ***	2.08 ***
	(0.24)	(0.28)	(0.27)	(0.25)	(0.25)
N	3,613	3,613	3,613	3,613	3,613
F statistics	20.12 ***	12.04 ***	11.66 ***	20.02 ***	17.15 ***

* p<0.05 ** p<0.01 *** p<0.001. Standard errors are in parentheses.

Table 3: Most Important Source of Emotional Support by Sexual Orientation (%)

	Heterosexual without same-sex experience	Heterosexual with same-sex experience	Homosexual, Lesbian, gay, bisexual, or else	Difference
Spouse	62.4	50.8	16.6	***
Daughter	13.2	14.8	2.9	*
Son	8.3	8.8	1.2	+
Sibling	18.0	15.5	30.3	**
Parent	15.8	15.0	27.7	**
Other relatives	5.6	3.6	6.8	
Friend	32.4	42.6	48.9	**
Professional	1.1	7.4	6.3	***
Neighbor	1.2	1.8	0.4	
Coworker	2.5	0.7	2.2	
Church member	3.4	4.7	1.8	
Club member	0.1	0.0	0.0	
Others	3.0	2.0	16.4	***

+ $p<0.1$ * $p<0.05$ ** $p<0.01$ *** $p<0.001$

The percentages do not add up to one in each sexual orientation group because the respondent can choose more than one source. Differences by sexual orientation are tested using Pearson Chi-squared statistics. All the statistics are adjusted for sampling design.

Figure 2:

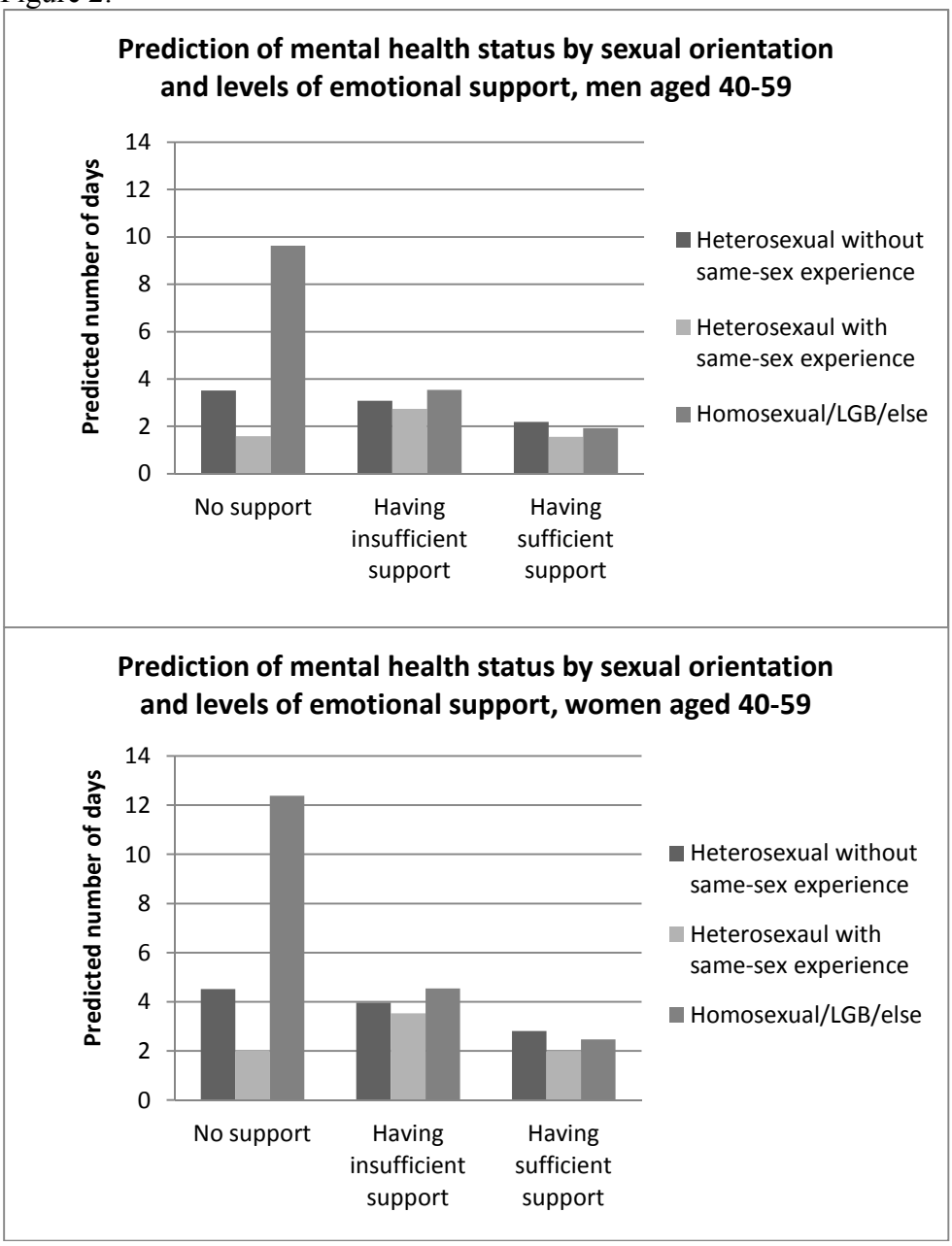
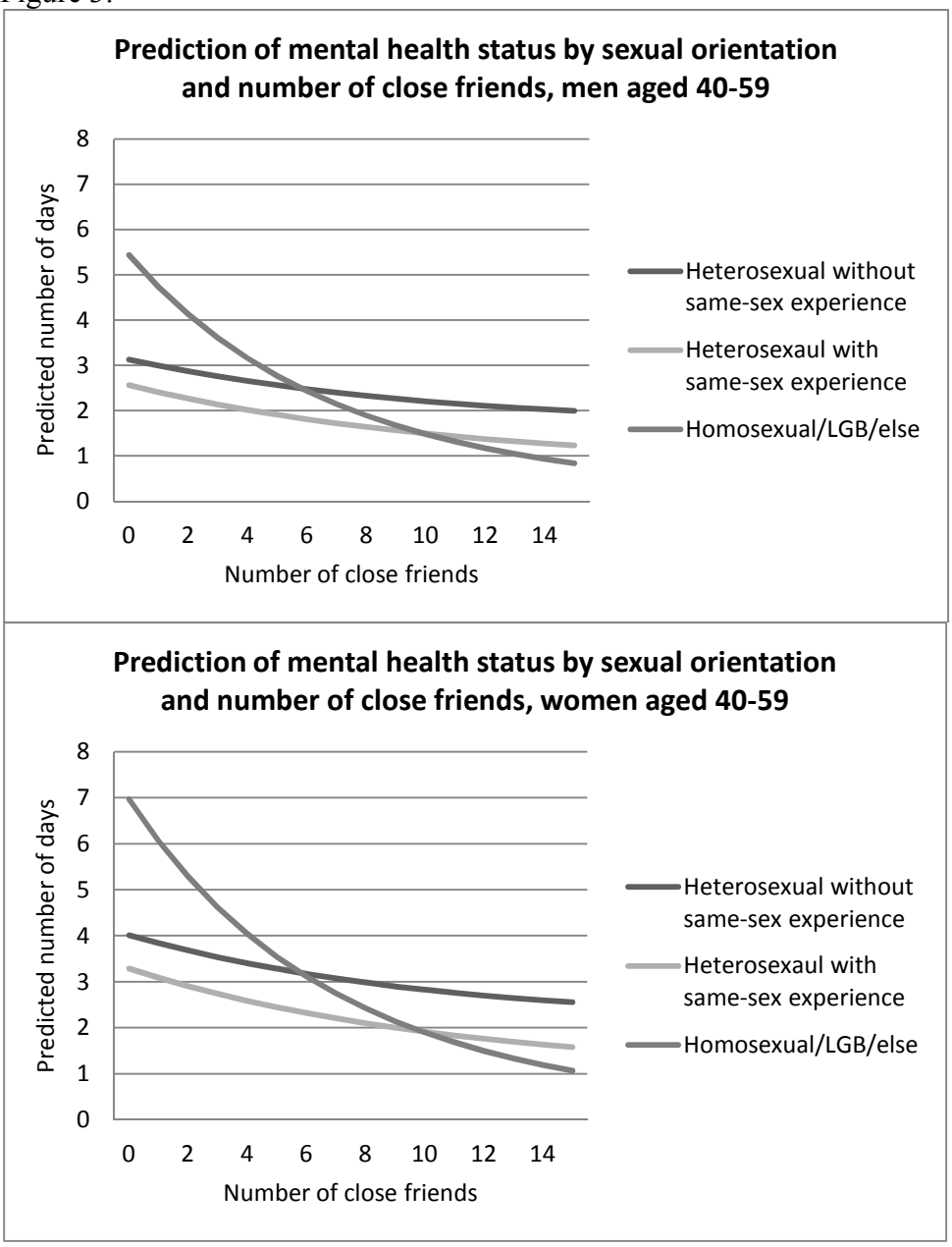

Prediction of mental health status by sexual orientation and levels of emotional support, men aged 40-59
Predicted number of days
14
12
10
8
6
4
2
0
No support
Having insufficient support
Having sufficient support
Heterosexual without same-sex experience
Heterosexaul with same-sex experience
Homosexual/LGB/else
Prediction of mental health status by sexual orientation and levels of emotional support, women aged 40-59
Predicted number of days
14
12
10
8
6
4
2
0
No support
Having insufficient support
Having sufficient support
Heterosexual without same-sex experience
Heterosexaul with same-sex experience
Homosexual/LGB/else

Figure 3:


Prediction of mental health status by sexual orientation and number of close friends, men aged 40-59
Predicted number of days
0
1
2
3
4
5
6
7
8
0
2
4
6
8
10
12
14
Number of close friends
Heterosexual without same-sex experience
Heterosexaul with same-sex experience
Homosexual/LGB/else
Prediction of mental health status by sexual orientation and number of close friends, women aged 40-59
Predicted number of days
0
1
2
3
4
5
6
7
8
0
2
4
6
8
10
12
14
Number of close friends
Heterosexual without same-sex experience
Heterosexaul with same-sex experience
Homosexual/LGB/else