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Disparities in Social Health by Sexual Orientation and the Etiologic Role of Self-Reported Discrimination

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Abstract

Some past work indicates that sexual minorities may experience impairments in social health, or the perceived and actual availability and quality of one's social relationships, relative to heterosexuals; however, research has been limited in many ways. Furthermore, it is important to investigate etiologic factors that may be associated with these disparities, such as self-reported discrimination. The current work tested whether sexual minority adults in the United States reported less positive social health (i.e., loneliness, friendship strain, familial strain and social capital) relative to heterosexuals and whether self-reported discrimination accounted for these disparities. Participants for the current study ($N = 579$) were recruited via Amazon's Mechanical Turk, including 365 self-identified heterosexuals (105 women) and 214 sexual minorities (103 women). Consistent with hypotheses, sexual minorities reported impaired social health relative to heterosexuals, with divergent patterns emerging by sexual orientation subgroup (which were generally consistent across sexes). Additionally, self-reported discrimination accounted for disparities across three of four indicators of social health. These findings suggest that sexual minorities may face obstacles related to prejudice and discrimination that impair the functioning of their relationships and overall social health. Moreover, because social health is closely related to psychological and physical health, remediating disparities in social relationships may be necessary to address other health disparities based upon sexual orientation. Expanding upon these results, implications for efforts to build resilience among sexual minorities are discussed.

Keywords

social disparities; social health; sexual minorities; discrimination; relationships

INTRODUCTION

Many theorists have proposed that well-functioning social relationships are a vital component of health and well-being (e.g., Baumeister & Leary, 1995; Bowlby, 1969; Durkheim, 1951) and much empirical research has confirmed this proposition (Berkman, Glass, Brissette, & Seeman, 2000; Hawkye & Cacioppo, 2010; Robles, Slaticher, Trombello,

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& McGinn, 2014; Ryff & Singer, 2000). Accumulating data indicate disparities in social health, or the perceived and actual availability and quality of one's social relationships (Donald, Ware, Brook, & Davies-Avery, 1978), for members of devalued relative to dominant groups in the United States (Hatzenbuehler, Phelan, & Link, 2013; Umberson & Montez, 2010). Of note, these gaps in social health could contribute to other well-documented health disparities, including greater mental (McGuire & Miranda, 2008; United States Department of Health and Human Services [HHS], 2014) and physical health burdens (Adler & Rehkopf, 2008; HHS, 2014; Williams & Mohammed, 2009) among members of devalued groups. A group for whom social health disparities may be especially stark is sexual minorities (e.g., Andersson, Noack, Seierstad, & Weedon-Fekjaer, 2006; Bos, Sandfort, de Bruyn, & Hakvoort, 2008; Fokkema & Kuyper, 2009; Valanis et al., 2000). Focusing on this population, the current work had two primary aims. First, we examined disparities in social health based upon sexual orientation. Second, we tested whether self-reported discrimination, which is predictive of impairments in psychological and physical health (Pascoe & Richman, 2009), might explain disparities in social health between sexual minorities and heterosexuals.

Social Relationships and Health

Because social relationships at multiple levels (e.g., with siblings, friends, neighbors, and even communities) are related to health outcomes (Kawachi & Berkman, 2001; Lin, Ye, & Ensel, 1999), the current research focused on social health, broadly conceptualized (Donald et al., 1978). Inherently a social species, humans rely on one another to both survive and thrive (Brewer & Caporeal, 1990; Buss & Kenrick, 1998). Perhaps unsurprisingly then, in order to understand the human condition it is necessary to understand human social relationships (Baumeister & Leary, 1995; Berscheid, 1999; Reis, Collins, & Berscheid, 2000).

Consistently, studies have shown that social isolation and loneliness are predictive of increased rates of psychological and physical illnesses (Berkman, 1995; Hawkey & Cacioppo, 2010). For example, a five-year longitudinal population-based investigation (Cacioppo, Hawkey, & Thisted, 2010) revealed that loneliness, or the subjective lack of social relationships, prospectively predicted increased depressive symptomatology. These findings held above and beyond other factors, including demographic characteristics, personality factors, and perceived stress. In an extreme example of the importance of social health, a lack of social relationships has been shown to predict increased mortality risk (Berkman & Syme, 1979; Holt-Lunstad, Smith, & Layton, 2010; House, Landis, & Umberson, 1988) to an extent that is on par with or even exceeds other powerful health risks, such as smoking (Holt-Lunstad et al., 2010; House, Landis, & Umberson, 1988).

In addition to the subjective experience of loneliness, the quality of one's relationships is also important for social health (Brooks & Dunkel Schetter, 2011; Kiecolt-Glaser & Newton, 2001). While well functioning social relationships are protective for health outcomes, poorly functioning social relationships may damage health and well-being (Brooks & Dunkel Schetter, 2011). For example, in one study (Holt-Lunstad, Birmingham, & Jones, 2008), married individuals evidenced lower (i.e., healthier) ambulatory blood pressure compared to

singles. However, this effect was moderated by marital quality such that those in higher quality marriages showed significantly lower blood pressure and those in lower quality marriages showed significantly higher blood pressure relative to singles. Similar moderating effects of relationship functioning have been reported for psychological health and well-being (e.g., Dush & Amato, 2005; Kiecolt-Glaser et al., 1987).

Over the past two decades, public health researchers have increasingly focused on another form of social health—social capital. Social capital refers to the resources to which one has access through social networks (Bourdieu, 1986). Although social capital is often posited as a higher-level social variable (e.g., neighborhood- or community-level), many researchers have investigated social capital as a resource available to the individual. According to one model (Grootaert & van Bastelaer, 2002), social capital may be divided along two axes, one ranging from structural to cognitive and the other ranging from macro to micro. Situated at the micro cognitive level (of primary interest in the current research) are constructs such as trust, local norms, and values (Grootaert & van Bastelaer, 2002). Social trust and perceptions of mutual aid are two operationalizations that have been frequently investigated in past work on micro cognitive social capital (e.g., Fujiwara et al., 2012). Importantly, the extent to which individuals perceive greater social capital has been shown to be protective for various health outcomes, including depression (Fujiwara & Kawachi, 2008), self-rated physical health (Hurtado, Kawachi, & Sudarsky, 2011), and cardiovascular and all-cause mortality (Hyppä, Mäki, Impivaara, & Aromaa, 2007).

Evidence for Social Health Disparities by Sexual Orientation

Patterns of social health may differ somewhat consistently between members of dominant and devalued groups (Hatzenbuehler et al., 2013; Umberson & Montez, 2010). In general, past research has found that sexual minorities evidence poorer social health relative to heterosexuals (e.g., Andersson et al., 2006; Bos et al., 2008; Diamond & Lucas, 2004; Fokkema & Kuyper, 2009; Valanis et al., 2000). However, there are a number of limitations to what little research has been conducted on this topic. First, much of the work has been conducted in a few European countries (e.g., the Netherlands, Norway, Sweden) that have historically been relatively accepting of sexual minority individuals and their social relationships (Merin, 2010). Second, while some studies have been conducted with sexual minority youths and older adults, little research has been conducted with sexual minority adults (i.e., aged 18–55 years old). Finally, insufficient attention has been paid to differences in social health by sex and sexual orientation subgroup (e.g., gay/lesbian, bisexual).

Population-level data on divorce among sexual minorities are not currently available in the United States, but research in Norway and Sweden, where registered partnerships have been legal since the mid-1990s, shows that sexual minorities are at greater risk for divorce compared to heterosexuals (Andersson et al., 2006). Another study (Fokkema & Kuyper, 2009), conducted in the Netherlands, used self-report data from two large surveys of institutionalized and independently living older adults to explore disparities in social relationship outcomes by sexual orientation. Results showed that sexual minority older adults had fewer social relationships, including with romantic partners, children, and other family members, and participated less frequently in church activities compared to

heterosexual older adults. Sexual minority older adults also reported significantly greater levels of loneliness. Among older adults in the United States, poorer social health has also been found among sexual minority compared to heterosexual women participating in the Women's Health Initiative Study (Valanis et al., 2000).

A number of studies have also linked same-sex attraction in youths to impaired social health (Radkowsky & Siegel, 1997). A study in the Netherlands found that sexual minority youth reported poorer quality relationships with peers and their fathers relative to heterosexual youth (Bos et al., 2008). Sexual minority youth also report fewer peer relationships and greater fear for the loss of current friendships compared to heterosexuals (Diamond & Lucas, 2004). Other research shows that sexual minority youth spend less time with their best friends and report less closeness with their mothers (Williams, Connolly, Pepler, & Craig, 2005). In fact, population-based data from the United States suggest that sexual minority youth are more likely to experience strained relationships with their families of origin (e.g., Pearson & Wilkinson, 2013).

Self-Reported Discrimination as an Etiologic Variable

In addition to examining disparities in social health among adults in the United States based upon sexual orientation, it is important to investigate etiological factors that may produce these disparities. Laypersons and researchers alike have sometimes assumed that disparities in health outcomes between members of dominant and devalued groups are caused by innate or essential group characteristics (e.g., genetic predispositions) (Dar-Nimrod & Heine, 2011; Krieger, 2005). In the past few decades, however, theorists have challenged essentialist explanations, arguing that the stress of living in a society that devalues one's social identity can lead to impaired health outcomes (Clark, Anderson, Clark, & Williams, 1999; Krieger, 1999; Meyer, 2003). Past work has confirmed that the stress of prejudice and discrimination is associated with impaired psychological and physical health (Paradies, 2006; Pascoe & Richman, 2009; Williams & Mohammed, 2009). Because stressors have also been shown to negatively affect social relationships (McCubbin & Patterson, 1983; Randall & Bodenmann, 2009), some scholars have proposed that prejudice and discrimination may lead to impaired social health (e.g., Doyle & Molix, 2014b; Trail, Goff, Bradbury, & Karney, 2012). However, no studies of which we are aware have tested whether self-reported discrimination explains disparities in social health between sexual minorities and heterosexuals.

Past work has linked self-reported discrimination to impaired romantic relationship functioning among sexual minorities (e.g., Doyle & Molix, 2014a; Kamen, Burns, & Beach, 2011; Otis, Rostosky, Riggle, & Hamrin, 2006). In a quantitative review of this literature (Doyle & Molix, 2015), it was revealed that across 35 studies there was evidence of a statistically significant inverse association between self-reported discrimination and romantic relationship functioning ($r = -.12$, 95% CI $[-.16, -.08]$). A few other studies have focused on associations between self-reported discrimination and other types of social relationships among sexual minorities. For sexual minority older adults in the Netherlands, it was found that self-reported discrimination was associated with greater levels of loneliness (Kuyper & Fokkema, 2010). Among sexual minority youth in the United States, self-

reported discrimination was also shown to be predictive of impaired social support from family and friends (Mustanski, Newcomb, & Garofalo, 2011).

The Current Study

The first aim of the current study was to explore disparities in social health between sexual minority and heterosexual adults in the United States. Based upon limited previous research (e.g., Andersson et al., 2006; Bos et al., 2008; Fokkema & Kuyper, 2009; Valanis et al., 2000), it was hypothesized that sexual minority adults would evidence greater levels of loneliness, greater social relationship strain (with both friends and family), and lesser social capital relative to heterosexual adults. In the current research, differences in social health by sex and sexual orientation subgroup were also explored. A second aim of the current study was to examine whether disparities in social health between sexual minorities and heterosexuals would be attenuated when accounting for the effects of self-reported discrimination among sexual minorities.

METHOD

Participants

A total of 579 participants (365 heterosexual and 214 sexual minority) were recruited for the current study. Approximately two thirds of the sample identified as male (63.6%) and about one third identified as female (35.9%). The mean age of the sample was 29.92 years ($SD = 9.17$). The majority of participants identified as Caucasian/White (80.1%), but the sample also included individuals identified as Asian/Asian Indian (7.1%), African American/Black (6.0%), Hispanic/Latino (4.0%), multiracial (1.9%), Native American (.5%), and Middle Eastern/North African (.2%). The mean household income of the sample was \$47,097 per year ($SD = 47,531$) and, on average, participants had completed some years of college education.

Procedure

Participants for the current study were all recruited via Amazon's Mechanical Turk (MTurk), a popular crowdsourcing platform. Much past work in the social and behavioral sciences has successfully utilized MTurk to recruit participants for a variety of research studies (Buhrmester, Kwang, & Gosling, 2011; Goodman, Cryder, & Cheema, 2013; Shapiro, Chandler, & Mueller, 2013), including those focused on sexual minority populations (e.g., Zou, Andersen, & Blosnich, 2013). In order to conduct studies utilizing MTurk, researchers post tasks, referred to as human intelligence tasks (HITs) on the website. Anyone who is over 18 years of age and possesses a valid social security or individual tax identification number is then able to complete these tasks. However, for the current study, a restriction was also placed limiting participation to those residing within the United States.

The survey itself was hosted on another website, Qualtrics, which was linked to the MTurk HIT. All participants were provided \$.50 as compensation for their time and effort. This amount was determined after evaluating a review of response rates and completion times for surveys of various lengths (Buhrmester et al., 2011). All workers residing in the United States were eligible to participate in the current study regardless of other demographic

characteristics, such as age, gender or race. However, prior to participating in the study, everyone was required to respond to a sexual orientation item (described in the following section). Based upon these responses, participants were either classified as heterosexual or sexual minority. The survey instrument was programmed such that each separate group had a fixed quota set at 365 participants. Once this quota was reached for either group, further individuals selecting that group membership were told that the study was full and thanked for their interest. Settings were also programmed to avoid “ballot-stuffing” (as recommended by Mason & Suri, 2012), meaning that Qualtrics tracked IP addresses and disallowed returning individuals who had previously responded to the first item from starting the survey over. This prevented potential participants from changing their sexual orientation identification in order to get around the fixed quotas. All other components of the survey instrument were identical between groups.

Measures

All measures for the current study were chosen with consideration of limitations due to the survey platform. Specifically, MTurk is oriented toward brief tasks that can be completed easily and consecutively in a short period of time in order to accrue multiple small payments. Therefore, it is optimal to select brief and relatively straightforward measures (Goodman et al., 2013). Where possible, previously utilized and validated abbreviated scales were selected for the current study.

Sexual orientation—Based upon previous research recommending a five-category self-identification measure of sexual orientation (Vrangalova & Savin-Williams, 2012), participants were asked to select from the following points on a 5-point Kinsey-type scale: heterosexual, mostly heterosexual, bisexual, mostly gay/lesbian, gay/lesbian. For the purposes of the survey quotas, as described previously, participants selecting heterosexual were grouped as heterosexual while participants selecting all other labels were grouped as sexual minority. Sexual orientation was also assessed near the end of the survey via a free-response item asking participants, “What term best describes your sexual orientation?”

Self-reported discrimination—Items from the Everyday Discrimination Scale (Williams, Yu, Jackson, & Anderson, 1997) were chosen and adapted to address discrimination based upon sexual identity. A few of the nine items on this scale, initially designed for use with racial minorities, do not apply particularly well to sexual minorities (e.g., “People act as if they are afraid of you”). Therefore, two items with the best face validity among this population were chosen for the current study. These items were, “You are called names or insulted because of your sexual orientation” and “You are threatened or harassed because of your sexual orientation.” Participants indicated how often they experienced both of these events on a scale ranging from 1 (*never*) to 6 (*almost everyday*). These two items were highly correlated among sexual minorities, $r(212) = .83$, $p < .001$, and thus average scores were utilized to assess self-reported discrimination.

Loneliness—The three-item loneliness scale is an abbreviated version of the Revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980) that has been validated in past research (Hughes, Waite, Hawkley, & Cacioppo, 2004). Participants responded to items such

as, “How often do you feel isolated from others?” on a scale from 1 (*hardly ever*) to 3 (*often*). Mean scores were then calculated for the overall scale. In past work, the three-item version has been shown to have adequate internal consistency, $\alpha = .72$, and correlates highly with the longer Revised UCLA Loneliness Scale, $r = .82$ (Hughes et al., 2004). This scale also evidenced good internal consistency in the current study, $\alpha = .86$.

Friendship and familial strain—Parallel measures of strain with friends and family (Walen & Lachman, 2000) were included to assess social relationship functioning. These scales are composed of four statements, such as “How often do they get on your nerves?” with participants rating their level of agreement to each statement on a scale ranging from 1 (*not at all*) to 4 (*a lot*). Mean scores across all four items were taken to assess relationship strain with friends and family, separately. Internal consistency has been shown to be adequate when considering friends, $\alpha = .79$, and family, $\alpha = .80$, in past research (Walen & Lachman 2000), and similarly in the current study, $\alpha = .79$ and $\alpha = .81$, respectively.

Social capital—In line with past research (Fujiwara et al., 2012), the cognitive domain of social capital was assessed via two items addressing social trust, “In general, would you say that your neighbors can be trusted?” and mutual aid, “Do you think that people in your neighborhood aid each other?” Responses were on a scale ranging from 1 (*not at all*) to 4 (*a lot*). These two items were highly correlated in the current study, $r(571) = .66$, $p < .001$, and were therefore combined via mean score on both items to indicate social capital. Social capital is thus operationally defined here as social trust and mutual aid in one’s neighborhood.

Analyses

Missing data were first considered in the current study. Overall, very few participants had missing data on any of the measures, with the most on the measure of self-reported discrimination ($n = 10$). In order to assess whether missing data affected the pattern of results, missing values were estimated via multiple imputations in SPSS software (Version 21). Analyses including imputed values did not differ meaningfully from those including only the original data; therefore, we present results from the original analyses in the following sections. In order to explore the primary hypothesis of the current study, that sexual minorities would experience impaired social health relative to heterosexuals, multivariate analysis of variance (MANOVA) was conducted. In this analysis, sexual orientation was entered as the independent variable and loneliness, friendship strain, familial strain, and social capital were entered as the dependent variables with follow-up ANOVAs conducted on each indicator separately. Complementary analyses of differences in social health by sexual orientation subgroup and sex were conducted via ANOVAs with post-hocs employing Fisher’s least significant difference (LSD) test to control for family-wise error rates. To address the second hypothesis regarding the etiologic role of self-reported discrimination, sexual minorities were divided into two groups—those relatively higher in self-reported discrimination and those relatively lower in self-reported discrimination (via mean split on self-reported discrimination). ANOVAs with post-hocs employing Fisher’s LSD test were then conducted to compare differences in social health between heterosexuals and sexual minorities relatively higher and lower in self-reported discrimination.

RESULTS

Sexual Orientation and Participant Grouping

Table 1 shows the frequencies of each self-identification label, coded into six separate categories, by selections on the initial sexual orientation item. Participants who selected *heterosexual* on the initial item were overwhelmingly likely to self-identify as heterosexual. The majority of those selecting *mostly heterosexual* on the initial item also identified as heterosexual, but this group included a significant number of participants self-identifying with a variety of other sexual minority labels, including unsure, questioning, and bi-curious. This finding was consistent with past work demonstrating that individuals who select *mostly heterosexual* represent a unique sexual minority group (Vrangalova & Savin-Williams, 2012). Participants who selected *bisexual* on the initial item predominantly self-identified as bisexual, but a fair number also used labels such as queer, fluid or pansexual. Mirroring the *mostly heterosexual* group, the majority of those who selected *mostly gay/lesbian* on the initial item also self-identified as gay or lesbian, but included a significant number who chose other sexual minority labels. All participants who selected *gay/lesbian* on the initial item also self-identified as gay or lesbian. Chi-square analyses confirmed non-independence, $\chi^2(20) = 1020.27, p < .001$, that is, self-identification labels were highly dependent upon responses to the initial sexual orientation item.

Participants were next divided into two groups based upon sexual orientation: heterosexual ($n = 365, 63\%$) and sexual minority ($n = 214, 37\%$). As described in the measures section, participants who selected *heterosexual* on the initial sexual orientation item were categorized as heterosexual while participants who selected any other response were categorized as sexual minority. These two categories were utilized in regression analyses related to the primary hypotheses of the study (similar results were observed when substituting self-identification as the criterion for determining heterosexual and sexual minority group categorization, with a high correlation between sexual orientation coded from the initial item and coded from self-identification responses, $r(553) = .74, p < .001$). Demographic data presented for each group separately is shown in Table 2. Sexual orientation was significantly associated with both sex and age, such that sexual minorities tended to be older and were more likely to be female. All results presented were robust to adjustment for these demographic covariates.

Disparities in Social Health by Sexual Orientation

Results from MANOVA revealed that, overall, sexual orientation had a significant multivariate association with social health, Wilk's $\lambda = .94, F(4, 566) = 8.45, p < .001, \eta^2 = .06$. Follow-up ANOVAs revealed significant associations between sexual orientation and each of the indicators, with the same general pattern of poorer social health among sexual minorities relative to heterosexuals across variables. Specifically, compared to heterosexuals, sexual minorities reported greater loneliness ($M = 1.82, SD = .04$ vs. $M = 1.60, SD = .03$), $F(1, 569) = 17.54, p < .001, \eta^2 = .03$, greater friendship strain ($M = 1.85, SD = .04$ vs. $M = 1.67, SD = .03$), $F(1, 569) = 13.16, p = .001, \eta^2 = .02$, greater familial strain ($M = 2.20, SD = .05$ vs. $M = 1.97, SD = .04$), $F(1, 569) = 13.64, p = .001, \eta^2 = .02$, and lesser social capital ($M = 2.21, SD = .05$ vs. $M = 2.41, SD = .04$), $F(1, 569) = 8.46, p = .004, \eta^2 = .02$).

Analyses of Sexual Orientation Subgroups by Sex

Results from analyses of sexual orientation subgroup by sex are shown in Table 3. Overall, these analyses replicated the main findings, with heterosexuals evidencing the greatest social health across each of the four measures. However, there were also some consistent patterns of differences between subgroups. Generally, those falling in the middle of the sexual orientation spectrum (i.e., mostly heterosexual, bisexual, mostly gay/lesbian) evidenced the poorest social health. Gays and lesbians, although scoring somewhat lower across indicators of social health relative to heterosexuals, did not differ from this group with statistical significance. The pattern of social health between sexual orientation subgroups was generally consistent across sexes with a few exceptions (e.g., mostly lesbian women reported the greatest loneliness while mostly gay men reported the least social capital).

Self-Reported Discrimination as an Etiologic Factor

In line with past work examining sexism as an etiological factor in mental health disparities between men and women (Klonoff, Landrine, & Campbell, 2000), we stratified on self-reported discrimination among sexual minorities to explore its role in producing observed disparities. Sexual minorities reporting higher levels compared to the mean ($M = 1.60$, $SD = .05$) were categorized as relatively higher in self-reported discrimination ($n = 70$) while those reporting lower levels compared to the mean were categorized as relatively lower in self-reported discrimination ($n = 141$). Results from analyses comparing these three groups (heterosexuals, sexual minorities lower in discrimination, sexual minorities higher in discrimination) are shown in Table 4. Consistent with hypotheses of discrimination as an etiological factor, sexual minorities lower in discrimination did not significantly differ from heterosexuals in friendship strain, familial strain, or social capital, while sexual minorities higher in discrimination differed from heterosexuals on all three of these indicators. Conversely, there was not evidence of an etiological role for discrimination in loneliness—both groups of sexual minorities evidenced elevated rates relative to heterosexuals that were also not significantly different from one another.

DISCUSSION

Confirming and extending past work (e.g., Andersson et al., 2006; Bos et al., 2008; Fokkema & Kuyper, 2009; Valanis et al., 2000), evidence was found for disparities in social health between sexual minority and heterosexual adults in the United States, such that sexual minorities reported significantly more loneliness, friendship strain and familial strain, and less social capital on average. The consistency of this pattern across indicators of social health suggests that sexual minorities do, in fact, face unique obstacles to forming and maintaining strong, healthy social relationships. Interestingly, while analyses of sexual orientation subgroups revealed the same overall pattern between heterosexuals and sexual minorities, there were some notable differences between sexual minority subgroups. In general, those falling in the middle of the sexual orientation spectrum (i.e., mostly heterosexual, bisexual, mostly gay/lesbian) tended to report the poorest social health (with few appreciable differences by sex). This is important because these groups are sometimes overlooked in research on sexual minority health, but they may evidence the largest disparities (Dodge & Sandfort, 2007). One possible reason is that members of these groups

may experience some degree of marginalization from gays and lesbians as well as heterosexuals (Weiss, 2004), making it more difficult to find supportive communities and social identification, which can be protective in the face of prejudice and discrimination (Doyle & Molix, 2014c).

Another finding to emerge from the current research provides insight into an important etiologic factor linking sexual orientation to impaired social health—self-reported discrimination. Indeed, as hypothesized, self-reported discrimination accounted for disparities in friendship strain, familial strain, and social capital. Sexual minorities reporting relatively lower levels of discrimination did not significantly differ from heterosexuals on these three indicators of social health while sexual minorities reporting relatively greater levels of discrimination did. Only loneliness continued to be elevated among all sexual minorities, irrespective of self-reported discrimination. To our knowledge, this is the first work to examine whether disparities in social health between sexual minorities and heterosexuals may be accounted for by prejudice and discrimination.

Limitations and Future Directions

It is important to consider the composition of the sample in this study, as it is both a limitation and strength of the current work. Internet-based sampling is a valid and practical epidemiologic method that has been recommended for use (with appropriate considerations), especially with commonly overlooked research populations, such as sexual minorities (Meyer & Wilson, 2009). While MTurk workers are certainly not fully representative of the population of the United States as a whole (see Paolacci & Chandler, 2014, for a description of average MTurk worker demographics), it is an informative starting point for tackling these research questions. Furthermore, it has been argued that not only are fully representative samples often unnecessary in epidemiologic research, but they may even be undesirable in some instances, such as when examining etiologic factors (cf. Rothman, Gallacher, & Hatch, 2013). More important to the current research than representativeness is comparability between groups.

It can be difficult to locate legitimate control groups of heterosexuals when studying sexual minority populations, and internet-based sampling provides a useful tool for solving this problem (Rothblum, 2007). Although in the current study heterosexuals and sexual minorities were found to differ across certain demographic characteristics, these differences may be more attributable to true sexual orientation differences than sampling biases (i.e., younger people and women are relatively more likely to identify as sexual minorities compared to older people and men). The heterosexual sample in the current study represents a valid comparison group for the sexual minority sample given there is no reason to suspect relevant systematic differences in the propensity to participate in MTurk based upon sexual orientation. However, it is worth noting that the MTurk workforce overall tends to skew younger and more educated than the general population (Paolacci & Chandler, 2014). This may be one reason for the relatively low rates of self-reported discrimination in the current sample, as attitudes toward sexual minorities tend to be improving at a steady rate in the United States. If this were the case, one would expect to see even more exaggerated social

health disparities in the general population, as we showed evidence for discrimination as a critical etiologic factor.

Another strength of the current study is that the recruitment materials made no mention of the fact that the study concerned sexual orientation; therefore, selection issues related to group identification (i.e., recruiting only those who are highly identified with their sexual minority identity) were greatly attenuated. For example, in response to the self-identification item, one participant responded that he identified as “closeted gay.” Individuals who are not out regarding their sexual orientation are often excluded from research on sexual minority issues (whether intentionally or unintentionally), but the current design may have enabled such individuals to participate.

While the current study recruited a relatively large sample of heterosexual and sexual minority participants, it should be noted that some cell sizes were limited when stratifying by sex and sexual orientation subgroup (samples sizes for these cells are available in Table 3). Because the focus of this research was primarily on social health disparities between heterosexuals and sexual minorities, statistical power was not compromised for the majority of the analyses presented. However, sexual orientation subgroup analyses should be interpreted with caution as some of these point estimates included wide confidence intervals (e.g., for those identifying as mostly gay and mostly lesbian). Future research aimed at uncovering potential disparities by sex and sexual orientation subgroup should endeavor to recruit even larger samples with adequate representation across subgroups. Relatedly, in order to examine even more fine-grained distinctions (including intersections of sex, sexual orientation, race and other relevant social identities), population-based data including variables related to social health will be required, and population-based surveys should include nuanced assessments of sexual orientation and gender identity (for recommendations, see Institute of Medicine, 2011).

Conclusion

Past research has shown that sexual minorities are burdened with higher rates of psychological and physical health problems, including but not limited to depression and anxiety (Cochran & Mays, 2009; King et al., 2008; Meyer, 2003) as well as cardiovascular disease and cancer (Dibble, Roberts, & Nussey, 2004; Lick, Durso, & Johnson, 2013; Wang, Häusermann, Vounatsou, Aggleton, & Weiss, 2007). The remediation of these burdens is slowly becoming a priority among some researchers and practitioners within the United States (HHS, 2014; IOM, 2011). However, as of yet, these health disparities have proven to be relatively intractable; it may be that current policies and interventions are too narrow in scope (Hong, Espelage, & Kral, 2011). The current work should be of particular interest to those concerned with the remediation of health disparities as impaired social relationships are a known risk factor for many of the most serious diseases inequitably burdening sexual minority men and women today (Berkman, 1995; Hawkley & Cacioppo, 2010). In neglecting the importance of social relationships for sexual minority health, researchers and policy makers may be overlooking one of the most critical avenues for intervention.

Although public policy and attitude change are the ultimate goals in eradicating prejudice and discrimination, something must be done in the short-term to help empower and build

resilience among sexual minorities who are struggling with prejudice and discrimination on a daily basis. According to Kwon's (2013) review of resilience factors, three important predictors of resilience among sexual minorities are social support, emotional openness, and optimism. Kwon speculated that these resilience factors reduce reactivity to prejudice and discrimination, thus protecting sexual minorities from negative health outcomes. Clinicians and practitioners working with sexual minority individuals and couples should focus on building these resilience factors with their clients. Clinicians and practitioners can also help sexual minority individuals and couples recognize the influence that minority stressors have on their social relationships, with awareness potentially disrupting negative effects. Interventions targeted toward reducing loneliness may also be effective among sexual minorities, as they have been shown to be among heterosexuals (Masi, Chen, Hawkley, & Cacioppo, 2011). However, primary prevention is also critical (Matthews & Adams, 2009); friends and allies of sexual minority individuals can play their part in supporting positive outcomes before the negative effects of minority stress lead sexual minorities to seek professional help.

Researchers have been remiss in neglecting to recognize the influence of social health disparities on other intractable health disparities inequitably affecting sexual minorities. The present work reveals consistent evidence of a divide in social health between sexual minority and heterosexual adults in the United States, as well as the etiologic role of self-reported discrimination. By its very nature, the term "social stigma" is *interpersonal*, but the majority of past research on social stigma has focused on *intrapersonal* outcomes (Major & Sawyer, 2009). A paradigmatic shift in the way researchers think about and conceptualize stigma will be necessary to advance study on the intersection of stigma and social relationships.

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Frequency of Self-Identification Labels by Sexual Orientation Response on Kinsey-Type Scale

Table 1

	Completely straight/heterosexual	Unsure, questioning	Bisexual, bi-curious	Queer, fluid, pansexual	Completely homosexual/gay/lesbian	Asexual
Heterosexual ($n = 365$, 63%)	345 (94.5%)	0	0	0	0	3 (.8%)
Mostly heterosexual ($n = 107$, 18.5%)	65 (60.7%)	20 (18.7%)	12 (11.2%)	2 (1.9%)	0	3 (2.8%)
Bisexual ($n = 51$, 8.8%)	1 (2.0%)	0	39 (76.5%)	10 (19.6%)	0	1 (2.0%)
Mostly gay/lesbian ($n = 16$, 2.8%)	0	0	2 (12.5%)	3 (18.8%)	10 (62.5%)	0
Gay/lesbian ($n = 40$, 6.9%)	0	0	0	0	37 (92.5%)	0

Note. $N = 579$. This table displays cross-tabulated values for participants responses to the initial sexual orientation item and the sexual orientation self-identification item calculated by row. Counts are displayed for each cell outside of parentheses and percentages are displayed inside of parentheses. Frequencies do not necessarily total to 100% because some participants did not provide a response to the self-identification item ($n = 26$, 4.5%).

Table 2

Descriptive Characteristics of Study Sample by Sexual Orientation

	Heterosexual (<i>n</i> = 365)	Sexual minority (<i>n</i> = 214)	<i>U</i> χ^2	<i>df</i>	<i>p</i>
Age	31.13	27.86	4.20	577	< .001
Income	\$47,867	\$45,778	.51	576	.61
Sex			22.63	1	< .001
Male	259	109			
Female	105	103			
Race			.37	1	.59
White	295	169			
Racial Minority	69	45			

Means and Standard Deviations for Social Health Indicators by Sexual Orientation Subgroup by Sex

Table 3

	Loneliness				Friendship strain				Familial strain				Social capital			
	Male		Female		Male		Female		Male		Female		Male		Female	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Heterosexual (<i>n</i> = 365)	1.63 _a	.04	1.51 _a	.06	1.73 _{a,b}	.04	1.54 _a	.05	1.95 _a	.04	2.01 _a	.07	2.37 _{a,b}	.05	2.50 _a	.08
Mostly heterosexual (<i>n</i> = 107)	2.05 _d	.09	1.76 _b	.08	1.90 _{a,b,c}	.08	1.87 _b	.07	2.10 _a	.10	2.26 _b	.10	2.16 _{a,b}	.11	2.25 _a	.11
Bisexual (<i>n</i> = 51)	1.70 _{a,b,c}	.13	1.76 _b	.11	1.63 _a	.12	1.81 _b	.10	2.22 _{a,b}	.15	2.13 _{a,b}	.14	2.11 _{a,b}	.16	2.23 _a	.15
Mostly gay/lesbian (<i>n</i> = 16)	2.03 _{b,c,d}	.20	2.33 _c	.24	2.23 _c	.18	1.92 _{a,b}	.22	2.63 _b	.22	2.58 _{a,b}	.29	1.90 _b	.24	2.50 _a	.33
Gay/lesbian (<i>n</i> = 40)	1.61 _{a,b}	.13	1.56 _{a,b}	.14	1.94 _{a,b,c}	.12	1.63 _{a,b}	.12	2.05 _a	.15	2.17 _{a,b}	.17	2.50 _a	.16	2.14 _a	.19

Note. Post-hocs with Fisher's least significant difference (LSD) test were conducted to compare group means. Differing subscripts within columns represent significant differences between sexual orientation subgroups by sex ($p < .05$). Sample sizes by sexual orientation subgroup for men are heterosexual ($n = 257$), mostly heterosexual ($n = 53$), bisexual ($n = 22$), mostly gay ($n = 22$). Sample sizes by sexual orientation subgroup for women are heterosexual ($n = 101$), mostly heterosexual ($n = 51$), bisexual ($n = 28$), mostly lesbian ($n = 6$), lesbian ($n = 18$).

Table 4

Means and Standard Deviations for Social Health Indicators by Sexual Orientation and Self-Reported Discrimination

	Heterosexual (<i>n</i> = 359)		Sexual minority: lower discrimination (<i>n</i> = 141)		Sexual minority: higher discrimination (<i>n</i> = 70)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Loneliness	1.60 _a	.03	1.82 _b	.05	1.82 _b	.07
Friendship strain	1.67 _a	.03	1.80 _{a,b}	.05	1.96 _b	.07
Familial strain	1.97 _a	.04	2.10 _a	.06	2.39 _b	.08
Social capital	2.41 _a	.04	2.27 _{a,b}	.07	2.10 _b	.09

Note. Sexual minority participants were categorized as relatively lower or higher in discrimination based upon a mean split on self-reported discrimination ($M = 1.60$, $SD = .05$). Post-hocs with Fisher's least significant difference (LSD) test were conducted to compare group means. Differing subscripts within rows represent significant differences between sexual orientations ($p < .05$).