

# Current Intimate Relationship Status, Depression, and Alcohol Use Among Bisexual Women: The Mediating Roles of Bisexual-Specific Minority Stressors

Yamile Molina<sup>1,2,3</sup> · Jacob H. Marquez<sup>1</sup> · Diane E. Logan<sup>4</sup> · Carissa J. Leeson<sup>3</sup> · Kimberly F. Balsam<sup>5</sup> · Debra L. Kaysen<sup>1</sup>

Published online: 6 June 2015

© Springer Science+Business Media New York 2015

**Abstract** Current intimate relationship characteristics, including gender and number of partner(s), may affect one's visibility as a bisexual individual and the minority stressors they experience, which may in turn influence their health. The current study tested four hypotheses: 1) minority stressors vary by current intimate relationship status; 2) higher minority stressors are associated with higher depressive symptoms and alcohol-related outcomes; 3) depressive symptoms and alcohol-related outcomes vary by current intimate relationship status; and 4) minority stressors will mediate differences in these outcomes. Participants included 470 self-identified bisexual women (65 % Caucasian, mean age: 21) from a sample of sexual minority women recruited from different geographic regions in the United States through advertisements on social networking sites and Craigslist. Participants completed a

45 min survey. Respondents with single partners were first grouped by partner gender (male partner:  $n=282$ ; female partner:  $n=56$ ). Second, women were grouped by partner gender/number (single female/male partner:  $n=338$ ; women with multiple female and male partners:  $n=132$ ). Women with single male partners and women with multiple male and female partners exhibited elevated experienced bi-negativity and differences in outness (H1). Experienced and internalized bi-negativity were associated with health outcomes, but not outness (H2). Differences in outcomes emerged by partner number and partner number/gender (H3); these differences were mediated by experienced bi-negativity (H4). These results suggest that experiences of discrimination may underlie differences in health related to bisexual women's relationship structure and highlight the importance of evaluating women's relational context as well as sexual identification in understanding health risk behaviors.

✉ Yamile Molina  
ymolina@fhcrc.org

Jacob H. Marquez  
jacobhmarquez@outlook.com

Diane E. Logan  
diane\_logan@brown.edu

Carissa J. Leeson  
redtop@uw.edu

Kimberly F. Balsam  
kbalsam@palaoaltou.edu

Debra L. Kaysen  
dkaysen@u.washington.edu

**Keywords** Bisexual women · Current intimate relationship status · Minority stress · Alcohol outcomes · Depression

## Introduction

The current study focuses on the mediating roles of bisexual-specific minority stressors on differences in depression and alcohol use across intimate relationship status among bisexual women residing in the United States (U.S.). Given the location of our study, the review of published work focuses on U.S. samples, unless otherwise noted. We anticipate that these relationships may also exist within other countries that have similar sociocultural emphases on opposite-gender relationships and monogamy (e.g., Canada, UK, European countries) and may not within other countries, wherein bisexuality is more accepted (Fox 2000).

<sup>1</sup> University of Washington, Seattle, WA, USA  
<sup>2</sup> Fred Hutchinson Cancer Research Center, Seattle, WA, USA  
<sup>3</sup> University of Illinois-Chicago, Chicago, IL, USA  
<sup>4</sup> Brown University, Providence, RI, USA  
<sup>5</sup> Palo Alto University, Palo Alto, CA, USA

Lesbian, gay, bisexual and transgender (LGBT) populations experience multiple forms of discrimination at internalized, interpersonal, and systemic levels in U.S. (Herek 2010; Hatzenbuehler et al. 2010; Wight et al. 2013). These experiences of discrimination can be understood as distal or external minority stressors, which include societal prejudice and stigmatizing experiences (experienced stigma) and proximal or internal minority stressors such as the degree to which one's minority status is known (outness) and internalization of negative societal attitudes (internalized stigma) (Goffman 1963; Herek et al. 2009; Hatzenbuehler 2009; Meyer 2003). Traditional gender beliefs and values in the U.S. include framing opposite-gender relationships and compulsive monogamy as normative and have been linked to discrimination against LGBT individuals, in part due to the number and gender of intimate partners (Goodman and Moradi 2008; Herek 2002; Israel and Mohr 2004; Parrott and Gallagher 2008; Whitley 2001; Whitley and Ægisdóttir 2000). Bisexual populations further represent a distinctive threat to traditional gender norms, values, and practices, due to their range of intimate partners and deviation from U.S. and other societies' normative binaries (Li et al. 2013, Canada; Rust 2000, 2002; Samji 2008). Their fluidity in sexual attraction, identity, and behavior, including engagement in heterosexual activity, also represent a challenge among U.S.-based lesbian/gay communities. Stigma associated with bisexuality (bi-negativity) can thus be understood as a multilevel consequence of dual exclusion from lesbian/gay and heterosexual communities (Cabaj 1997; Herek 2010; Ochs 1996; Steffens and Wagner 2004, Germany; Ross et al. 2010, Canada; Yost and Thomas 2012). These experiences and societal messages both from heterosexual and lesbian/gay communities may further underlie the greater proximal, internal stressors among bisexual populations compared to lesbian/gay individuals, including lower outness (D'Augelli et al. 2005; Herek et al. 2009; Kuypers and Fokkema 2011, Netherlands; Mulick and Wright 2002; Ochs 1996, 2007) and greater internalized minority stress (Weber 2008; Lewis et al. 2009; Moore and Norris 2005; Balsam and Mohr 2007). Bisexual populations thus represent a unique group to understand if and how U.S. societal and community norms concerning sexuality and the gender(s) of an individual and their intimate partners may influence health through exposure to minority stressors.

One's exposure to minority stressors as a bisexual individual may be related to one's visibility as a bisexual individual and, specifically, their current intimate relationship status, including partner number and gender(s). Proximal and distal minority stressors have been associated with elevated levels of mental health problems and substance use among LGBT populations (Brewster et al. 2013; Herek and Garnets 2007; Hughes and Eliason 2002; Mays and Cochran 2001; Waldo 1999; Weber 2008). Given this,

mental health problems and substance use may vary across current intimate relationship status among bisexual women, and minority stressors may mediate these differences. The current web-based U.S. survey research draws from the minority stress framework to test four hypotheses among a sample of bisexual women: 1) minority stressors vary across current intimate relationship status; 2) minority stressors are associated with depressive symptoms and alcohol-related outcomes; 3) depressive symptoms and alcohol-related outcomes vary across current intimate relationship status; and 4) minority stressors mediate differences in depressive symptoms and alcohol-related outcomes by current intimate relationship status. This research may be used to inform future studies that directly examine the impact of gender norms, values, and practices on individuals' health because of their current intimate relationship status, including the number and gender(s) of their partners.

### Minority Stressors Among Bisexual Women by Current Intimate Relationship Status

Bisexual women's exposure to minority stressors in the U.S. can be understood in relation to societal binary perceptions of sexual orientation (i.e., heterosexual or gay/lesbian) and relationship structure (i.e., compulsory monogamy), which may result in individuals making assumptions about individuals' identities and influence the amount of exposure to experienced stigma bisexual individuals face (Baumgardner 2007; Clark 2013; Firestein 1996; Mint 2004; Ochs 1996; Klesse 2005, 2006, UK; Ross et al. 2010, Canada; Rust 1996). Given this, minority stressors may rely not only on bisexual women's own gender and sexual identity, but also the gender and number of their partner(s) (Baumgardner 2007; Clark 2013; Firestein 1996; Hequembourg and Brallier 2009; Ochs 1996; Rust 1996).

Bisexual women with a single intimate partner may be more likely to be perceived to be a heterosexual woman or a lesbian than to be perceived as a bisexual woman. Bisexual individuals in relationships with single male partners may have fewer opportunities to disclose bisexuality (Balsam and Mohr 2007) as well as may be able to "pass" as heterosexual (Ochs 1996). These women may want to avoid male partners' and others' assumptions of bisexual individuals as promiscuous (Li et al. 2013, Canada; Samji 2008) and other negative societal attitudes about LGBT individuals and bisexuality specifically (Bradford 2004; Mint 2004; Robinson 2013, Canada). Simultaneously, they may have to make more of an effort to be "out", due to heterosexual assumptions. Recent research has found that bisexual women in a relationship with a single male partner were less open about their sexual orientation (Dyar et al. 2014; Li et al. 2013, Canada). Although not being visible as a bisexual individual may decrease experienced bi-negativity from heterosexual

communities (Mays and Cochran 2001; Li et al. 2013, Canada), being less out can also lead to greater internalized bi-negativity (Brewster et al. 2013). Bisexual women in a relationship with a single female partner conversely may be more “out” as a sexual minority, in part due to a more consistent visibility of their same-gender attractions. This may result in greater discrimination from heterosexual individuals, but potentially less discrimination from LGBT communities. Indeed, being in a relationship with a single female partner may have protective benefits in being “out”, including lower internalized bi-negativity and a greater sense of belonging and involvement with LGBT communities (Herek and Garnets 2007; Meyer 2003).

The number and gender(s) of partners are likely to have complex interactive effects on bisexual women’s exposure to minority stressors. Polyamory as a relationship structure is as common among bisexual individuals as it is among lesbian, gay, and heterosexual individuals (Weber 2002) and bisexual women with multiple male or multiple female partners are likely to experience the stigmas associated with polygamy (Mint 2004; Klesse 2005, 2006, UK; Ross et al. 2010, Canada). Nonetheless, bisexuality may be most visible among women who have multiple partners and whose partners are female and male. Bisexual individuals known to have multiple female and male partners may thus experience greater bi-negativity from both lesbian/gay and heterosexual individuals, including unique dual exclusion and discrimination, and being more ‘out’ as a bisexual individual relative to bisexual individuals with only female or only male partners. This greater exposure to experienced bi-negativity may further lead to greater internalized bi-negativity (Herek et al. 2009).

### Minority Stressors, Depressive Symptoms and Alcohol-Related Outcomes

Several theories have elucidated the potential adverse impacts of minority stressors on health outcomes (Hatzenbuehler 2009; Meyer 2003). Further, empirical evidence has demonstrated minority stressors are associated with poorer outcomes, including greater depressive symptoms and alcohol-related outcomes in the U.S. (e.g., Brewster et al. 2013; Herek and Garnets 2007; Hughes and Eliason 2002; Mays and Cochran 2001; Waldo 1999; Weber 2008) and internationally (e.g., King et al. 2008, UK; Kuyper and Fokkema 2011, Netherlands). Among bisexual populations, experiences with stigmatizing events has been associated with psychological distress in quantitative and qualitative studies (Brewster et al. 2013; Dodge et al. 2012a,b; Ross et al. 2010, Canada), though studies are often limited to instruments that address discrimination and prejudice by heterosexual communities. Outness and internalized bi-negativity have also been associated with worse mental health outcomes (Brewster et al.

2013; Dodge et al. 2012a,b; Ross et al. 2010, Canada; Ross et al. 2012; Szymanski and Carr 2008; Schrimshaw et al. 2013; Shilo and Savaya 2012, Israel). Notably, outness may be harmful or protective, as being more out may lead to both greater exposure to stigmatizing experiences but also to more support from LGBT communities (Brewster et al. 2013; Herek and Garnets 2007; Meyer 2003; Morris et al. 2001). This may lead to complicated relationships to health outcomes (Feldman and Wright 2013), including linear and non-linear associations.

### Current Intimate Relationship Status, Health, and Minority Stressors

Limited literature exists concerning health outcomes across current intimate relationship status. The two available studies suggest bisexual women who have been involved intimately with a male partner are more likely to experience worse mental health and illicit substance use than bisexual women with female partners (Dyar et al. 2014; Ross et al. 2012). Notably, this research has often dichotomized relationship status, by examining women with a single male or female partner (Dyar et al. 2014) or dichotomizing women according to their recent activity with a male partner (Ross et al. 2012). More research is warranted to assess differences in health across bisexual women’s current intimate relationship status, especially across both partner gender and number, given theory and literature described above with regard to differences in exposure to minority stressors and associations of minority stressors to health outcomes.

Indeed, minority stressors may serve as mediating variables in relationships of current intimate relationship status and health outcomes (Goffman 1963; Herek et al. 2009; Hatzenbuehler 2009; Meyer 2003). This hypothesis is supported by minority stress frameworks that have tied worse health outcomes experienced by LGBT individuals to their experiences with distal, experienced and proximal, internalized stressors (Almeida et al. 2009; Burton et al. 2013; Williams et al. 2005). In support of this, a recent study found bisexual women with a single male partner reported higher amounts of depressive symptoms, in part due to greater discrimination from LGBT communities (Dyar et al. 2014).

### Current Study

The current study tested several hypotheses concerning current intimate relationship status, minority stressors, and health outcomes among a sample of bisexual women. Before testing hypotheses, we conduct bivariate analyses to identify potential socio-demographic covariates (age, education, race/ethnicity), as these have been previously related

to outcomes of interest (depressive symptoms: Galambos et al. 2006; Lorant et al. 2003; Turner and Gil 2002; alcohol-related outcomes: Arnett 2005; Chen and Jacobson 2012; Galea et al. 2004; Turner and Gil 2002).

- H1 Minority stressors will vary across current intimate relationship status. H1a: We first test examine the effect of partner gender among women with a single partner. We predict that women with a single male partner may exhibit lower experienced bi-negativity and outness as well as greater internalized bi-negativity relative to women with a single female partner. H2a: Second, we test the effect of partner gender/number, by examining differences across women with a single female/male partner and women with multiple female/male partners. We predict that women with a single female/male partner may experience exhibit lower experienced bi-negativity, outness, and internalized bi-negativity relative to women with multiple female/male partners. We test these hypotheses by conducting two multivariate analyses of co-variance (MANCOVA) with minority stressors as outcomes (experienced bi-negativity, outness, internalized bi-negativity) and current intimate relationship status as independent variables (single female versus male partner; single female/male partner versus multiple female/male partners).
- H2 Minority stressors will be associated with depressive symptoms and alcohol-related outcomes. Given literature described above, we predict greater experienced bi-negativity and internalized bi-negativity will be associated with greater depressive symptoms and alcohol-related outcomes. Further, we test if outness may have linear and non-linear effects with depressive symptoms and alcohol-related outcomes. We conduct multivariable linear regressions with depressive symptoms and alcohol-related consequences as outcomes and a logistic regression with binge drinking as the outcome. For all regression models, minority stressors are included as independent variables (experienced bi-negativity, outness, internalized bi-negativity).
- H3 Depressive symptoms and alcohol-related outcomes will vary across current intimate relationship status. H3a: We first predict bisexual women with single male partners will exhibit greater depressive symptoms and negative alcohol-related outcomes relative to women with a single female partner. H3b: We hypothesize that women with multiple female/male partners will exhibit greater depressive symptoms and negative alcohol-related outcomes than women with single female/male partners. We test these hypotheses by conducting multivariate analyses of co-variance (MANCOVA) with depressive symptoms and alcohol-related consequences and logistic

regression with binge drinking as the outcome. Current intimate relationship status is first included to compare single female and male partner status among women with a single partner and second to compare women with a single female/male partner and women with multiple female/male partners.

- H4 We hypothesize that minority stressors will mediate differences in depressive symptoms and alcohol-related outcomes by current intimate relationship status. Specifically, we hypothesize that differences described in H3a and b will be mediated by differences in experienced bi-negativity, outness, and internalized bi-negativity described in H1 and H2. To test this hypothesis, we will conduct mediation models, using the Preachers and Hayes method (Hayes 2009; Preacher and Hayes 2008).

## Method

### Procedures

As part of a larger study, participants were recruited using 10 different advertisements on the social networking site Facebook. The advertisements were divided into LGB-specific and non-LGB specific content and were displayed in the sidebar of Facebook for sponsored advertisements only to women who met eligibility criteria, based on their Facebook profile (between the ages of 18–25, endorsed interest in relationships with women in their Facebook profile, female). Interested participants could respond to the ads by phone, email or clicking on the advertisement. This would take them to the screening assessment. The study was advertised on Craigslist in Atlanta, Austin, Boston, Chicago, Houston, Los Angeles, New York, Philadelphia, San Francisco, Seattle, South Florida, and Washington D.C. Cities were selected based on geographic range to sample various regions of the United States.

A brief information statement was shown to participants who agreed to participate in the 5-min screening assessment. A total of 4119 women completed the screening survey; 1877 women were deemed eligible to participate in the study. Eligibility criteria included women who (a) lived in the United States, (b) had a valid email address, (c) were between the ages of 18 and 25, and (d) self-identified as lesbian or bisexual woman at the time of the assessment. Eligible participants were sent two emails, one with the URL for the baseline survey followed by a separate email with a personal identification number. Duplicate respondents were identified by participants' first and last name, birth date, mailing address, and phone number. If duplicate data were found, the participant was informed that we could only accept one set of data from each individual. Custom survey programming eliminated the

possibility of a participant using the same email address more than once, wherein individuals attempting to enter the same e-mail were given an automatized error message. Participants who attempted to use different e-mail addresses but had similar name and mailing address/contact information were identified by study staff and removed from the dataset. Neither the number of attempts to enter the same or multiple e-mail addresses from the same participant was tracked.

Participants viewed a full consent form for the study after logging in to take the 45-min baseline survey. Upon agreement, they were administered the survey. Those who did not complete the baseline survey were reminded through an additional email and phone call. A total of 1083 women completed the survey and were compensated \$25 for their time. Only baseline survey data are used in the current study. For the current study, we only included women who 1) identified as a bisexual woman; and 2) indicated they were in an intimate relationship at the time of assessment. Table 1 depicts socio-demographic characteristics for the analytic sample.

## Measures

### *Current Intimate Relationship Status*

Operationalization of current intimate relationship status took several steps. First, women were asked what their current intimate relationship status was (*Single, Dating one person, Dating more than one person, In a committed relationship with one partner, In a committed relationship with more than one partner, Other*). Women who indicated they were single were excluded from the analyses, given that the purpose of this study was to examine the gender and number of current intimate partner(s). Groups were then collapsed by partner gender among women with a single partner, such that women

in relationships were categorized to have a single male partner ( $n=282$ ) and a single female partner ( $n=56$ ). We finally categorized women according to whether they were in a relationship with a single female/male partner ( $n=338$ ) or multiple female and male partners ( $n=132$ ). Notably, no women reported dating multiple male-only partners or multiple female-only partners (all respondents endorsing multiple partners identified male and female partners). Given this, we could not disentangle the effect of partner gender and number of partners.

### *Bisexual Minority Stress Scale (BMSS)*

To measure experienced bi-negativity, we used a 10-item instrument that was developed as part of a larger mixed-method research project that developed several instruments unique to LGBT community (“Rainbow Project”; Balsam et al. 2013) and specific sub-populations, including racial/ethnic minorities who identify as LGBT, bisexual individuals, and transgender individuals (Balsam et al. 2008). To develop these measures, focus groups and in-depth interviews were conducted with ethnically diverse LGBT adults in urban (e.g., Seattle) and rural (e.g., Yakima) parts of Washington State (Balsam et al. 2013), including one focus group focused on bisexual experiences specifically for BMSS item development. Individuals were assigned to focus groups according to identity and geographic location. Subsequently, items were tested, refined, and validated through two national web-based surveys. BMSS items were not refined across surveys, as they exhibited adequate psychometric properties with both of the Rainbow Project national web-based samples. All data from our own sample were examined through scree plots, eigenvalues, parallel analysis, and Cronbach’s alphas, which suggested a 1-factor solution best fit the data. For our sample, all items of the BMSS had factor loadings of 0.40 or greater. Cronbach’s  $\alpha$  for

**Table 1** Socio-demographic variables by current intimate relationship status

		Single female partner	Single male partner	Multiple female and male partners	
		<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>p</i> -value (df)
Race/ethnicity					.54 (6)
White		32 (63 %)	192 (74 %)	82 (67 %)	
African American		7 (14 %)	22 (9 %)	12 (10 %)	
Latina		5 (10 %)	24 (9 %)	16 (13 %)	
Other		7 (14 %)	21 (8 %)	12 (10 %)	
	Range	M (SD)	M (SD)	M (SD)	
Age	18–26	20.95 (2.16)	21.54 (2.12)	21.73 (1.98)	.60 (2, 467)
Education <sup>a</sup>	1–7	3.80 (1.53)	3.45 (1.46)	3.62 (1.41)	.20 (2, 467)

Analyses compare the following groups: single female partner, single male partner, and multiple female and male partners

<sup>a</sup> Education was coded as such: 1 = Less than a high school diploma, 2 = High school diploma, 3 = Vocational degree, 4 = Some college, 5 = Associate’s degree, 6 = Bachelor’s degree, 7 = Graduate or professional degree

the current sample was 0.76. Sample questions for this questionnaire concerned “Being asked ‘when are you going to come out all the way?’”; and “People assuming you will sleep with anyone.” Participants could respond from 0 = *Never* to 5 = *Almost Every Day*.

#### *Outness Inventory (OI)*

The 11-item OI was used to measure outness (Mohr and Fassinger 2000). This questionnaire was developed to assess the degree to which LGB populations are open about their sexual orientation and has been validated throughout a number of studies (Beaber 2008; Swearingen 2007). Individuals read “How open you are about your sexual orientation to the people listed below” and then responded to a list of family/friends, the world, and religious communities using a 7-point Likert scale (1 = *Person definitely does not know about your sexual orientation to 7 = Person definitely knows about your sexual orientation status, and it is openly talked about*). For our data, parallel analyses and exploratory factor analyses revealed comparable factor structure overall and for the three subscales (family, everyday life, religion) as previous studies, with items loading on their relevant factors with a value of 0.50 or greater. Cronbach’s  $\alpha$  for the overall summary score was 0.81. In line with standard scoring for this instrument, the overall summary score was calculated as the average of the three subscales, such that the greater the score, the greater the degree of outness.

#### *Internalized Bi-negativity Scale*

The 3-item *Internalized Bi-negativity* sub-scale of the Lesbian, Gay, and Bisexual Identity Scale (LGBIS; Mohr and Fassinger 2000) to measure internalized bi-negativity. This instrument is widely used and has adequate psychometric properties for LGBT communities (Moleiro et al. 2013; Schurr 2013). Parallel analyses and exploratory factor analyses on our data revealed comparable 1-factor structure as previous studies, with factor loadings greater than 0.40. Cronbach’s  $\alpha$  for the current sample was 0.77. A sample item for this questionnaire is “*I wish I were heterosexual*.” Participants were given a 7-point Likert scale that ranged from 1 = *Disagree strongly* to 7 = *Agree strongly*. Items were averaged to create summary scores, such that greater values indicated more internalized bi-negativity.

#### *Depressive Symptoms*

The Center for Epidemiological Studies Depression Scale (CES-D; Radloff 1977) was used to measure depressive symptoms. This 20-item instrument has exhibited adequate psychometric properties for LGBT populations (Hightow-Weidman et al. 2011; Cooperman et al. 2003). The original

instrument has nine different ‘symptom’ subscales, including sadness, loss of appetite, sleep, thinking/concentration, guilt, fatigue, movement, and suicidal ideation. With regard to our data, examination of scree plots, eigenvalues, parallel analysis, and Cronbach’s alphas suggested an overall summary score of items to be the preferred solution for adequate reliability (Cronbach’s  $\alpha=0.78$ ). Sample items for this scale include “I felt lonely” and “I felt depressed.” For the current study, participants were given a 4-point Likert scale for these items (1 = *Rarely or none of the time* to 4 = *Most or all of the time*). Overall summary scores were calculated as the sum of all items, wherein a greater score indicates more depressive symptoms.

#### *Binge Drinking*

Participants were provided with definitions of a standard alcoholic drink and asked how many they consumed on throughout the week using a modified version of the Daily Drinking Questionnaire (Sample item: “Consider a typical week during the last 12 months. How much alcohol, on average (measured in the number of drinks), do YOU drink on each day of a typical week?”; DDQ; Collins et al. 1985). Responses were summed for the mean weekly drinking quantity. Preliminary analysis revealed our data for this measure exhibited statistically irregular, but extremely typical, high prevalence of 0 responses (Buu et al. 2011; García et al. 2010). Responses were dichotomized based on the presence/absence of at least one binge drinking episode (defined as 4 or more standard drinks on one occasion).

#### *Alcohol-Related Consequences*

Participants completed the 48-item Young Adult Alcohol Consequences Questionnaire (YAACQ; Read et al. 2006), with responses to commonly experienced consequences within the past 30 days either confirmed or denied by participants. With regard to our data, parallel analyses and exploratory factor analyses revealed comparable factor structure with regard to the overall and eight subscales as previous studies, with items loading on their relevant factors with a value of 0.46 or greater. Sample items included “I have become very rude, obnoxious or insulting after drinking”; “I have neglected my obligations to family, work, or school because of my drinking”; “I have felt badly about myself because of my drinking”; “Because of my drinking, I have not eaten properly”; “I have taken foolish risks when I have been drinking”; “The quality of my work or school work has suffered because of my drinking”; “I have had ‘the shakes’ after stopping or cutting down on drinking”; and “I’ve not been able to remember large stretches of time while drinking.” Cronbach’s  $\alpha$  for the overall score was 0.95 for this sample. The overall scale was the sum of these dichotomous items.

Preliminary analysis revealed this measure was not normally distributed and was square-root transformed for further analyses.

## Results

The analytic sample included 470 women who 1) identified as bisexual; and 2) reported they were in a relationship. Given the relatively low amounts of missing data (<2 %), we used pairwise case deletions, wherein all non-missing data are used on an analysis by analysis basis. An overall MANCOVA of continuous variables indicated significant differences among women with a single female partner, single male partner, and multiple female/male partners, *Wilks' lambda* = 0.85,  $F(14, 890) = 5.36$ ,  $p < .0001$ . Tables 1 and 2 provide, respectively, descriptive information as well as univariate analyses concerning socio-demographic characteristics and study variables across current intimate relationship status. We first sought to identify potential socio-demographic covariates through examining the relationship of age, education, and race/ethnicity to current intimate relationship status, minority stressors, depressive symptoms, and alcohol-related variables through analyses of variance (ANOVAs), chi-square tests, and Pearson's correlations. Education was significantly correlated with experienced bi-negativity, outness, internalized bi-negativity, and depressive symptoms (all  $p < .05$ ). Age was significantly correlated with alcohol-related variables (both  $p < .05$ ). Racial/ethnic differences emerged with regard to internalized bi-negativity. Subsequent post-hoc comparisons found African American participants to exhibit more internalized bi-negativity relative to White participants. No other racial/ethnic comparisons were significant, including intimate relationship status ( $\chi^2 = 5.06$ ,  $df = 6$ ,  $p = .56$ ). Given these findings, age, education, and race/ethnicity (dummy-coded as African American or not) were included in covariates across subsequent analyses.

**H1** Minority stressors will vary across current intimate relationship status.

The adjusted means and standard deviations for minority stressors across current intimate relationship status are presented in Table 3. With regard to H1a (“Women with a single male partner may exhibit lower experienced bi-negativity and outness as well as greater internalized bi-negativity relative to women with a single female partner”), we first conducted a MANCOVA to examine differences in minority stressors (experienced bi-negativity, internalized bi-negativity, outness) across women with a single female partner and women with a single male partner, after adjusting for covariates (age, education, race/ethnicity). We use partial omega squared tests ( $\omega^2$ ) as measures of effect size. Women with a single male

partner reported greater experienced bi-negativity, partial  $\omega^2 = 0.02$ ,  $F(1302) = 7.74$ ,  $p = .006$ ; and lower outness relative to women with a single female partner,  $\omega^2 = 0.14$ ,  $F(1302) = 29.35$ ,  $p < .0001$ . There were no significant differences in internalized bi-negativity,  $\omega^2 = -0.003$ ,  $F(1302) = 0.85$ ,  $p = .36$ . For H2a (“Women with a single female/male partner may experience exhibit lower experienced bi-negativity, outness, and internalized bi-negativity relative to women with multiple female/male partners”), we conducted another MANCOVA to examine differences in minority stressors across women with a single female/male partner and women with multiple female/male partners. Women with multiple female/male partners exhibited greater experienced bi-negativity,  $\omega^2 = 0.03$ ,  $F(1424) = 17.17$ ,  $p < .0001$ ; and outness,  $\omega^2 = 0.03$ ,  $F(1424) = 7.85$ ,  $p = .005$ ; but did not differ with regard to internalized bi-negativity,  $\omega^2 = 0.0007$ ,  $F(1424) = 1.28$ ,  $p = .26$ .

**H2** Minority stressors will be associated with depressive symptoms and alcohol-related outcomes.

Our second set of hypotheses concerned associations of minority stressors, depressive symptoms, and alcohol-related outcomes. We conducted three multivariable linear regression models, including covariates (age, education, race/ethnicity), outcomes (depressive symptoms, binge drinking, alcohol-related consequences) and independent variables (experienced bi-negativity, internalized bi-negativity, outness). Formal tests for multicollinearity revealed VIF values ranging between 1.01 and 1.03. Standardized coefficients and odds ratios are used as measures of effect size. Experienced bi-negativity was positively related to all three outcomes: depressive symptoms,  $B = 0.21$ ,  $t(418) = 4.35$ ,  $p < .0001$ ; alcohol-related consequences,  $B = 0.21$ ,  $t(414) = 4.36$ ,  $p < .0001$ , and binge drinking,  $aOR = 1.38$ , 95 % CI [1.11, 1.73],  $df = 1$ ,  $p = .004$ . Internalized bi-negativity was positively related to depressive symptoms,  $B = 0.12$ ,  $t(418) = 2.44$ ,  $p = .02$ , and alcohol-related consequences,  $B = 0.22$ ,  $t(414) = 4.47$ ,  $p < .0001$ , but not binge drinking,  $aOR = 1.05$ , 95 % CI [0.86, 1.28],  $df = 1$ ,  $p = .67$ . We also examined linear and non-linear relationships between outness, depressive symptoms, binge drinking, and alcohol-related consequences. There were no significant linear or non-linear relationships between outness, depressive symptoms, and alcohol-related variables ( $ps = .19-.90$ ).

**H3** Depressive symptoms and alcohol-related outcomes will vary across current intimate relationship status.

Depressive symptoms and alcohol-related outcomes across current intimate relationship status are presented in Table 3. For H3a (“Bisexual women with single male partners will exhibit greater depressive symptoms and negative alcohol-related outcomes relative to women with a single female partner”), we first conducted a MANCOVA to examine

**Table 2** Minority stressors, depressive symptoms, and alcohol-related outcomes

		Single female partner	Single male partner	Multiple female/male partners	
		<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>p</i> -value (df)
Binge drinking		14 (25 %)	119 (42 %)	62 (47 %)	.02 (2)
	Range	M (SD)	M (SD)	M (SD)	
Experienced bi-negativity	0–4.67	2.08 (0.79)	2.33 (0.90)	2.68 (0.96)	<.0001 (2, 467)
Internalized bi-negativity	1–5.60	1.96 (1.00)	2.09 (1.03)	1.93 (1.03)	.32 (2, 467)
Outness	1–7	4.43 (1.34)	3.41 (1.39)	3.96 (1.39)	<.0001 (2, 464)
Depressive symptoms	0–59	24.04 (12.00)	21.42 (11.84)	25.96 (12.97)	.06 (2, 462)
Alcohol-related outcomes	0–6.71	2.32 (1.72)	1.77 (1.54)	2.75 (1.83)	.002 (2, 460)

Analyses compare the following groups: single female partner, single male partner, and multiple female and male partners

differences in depressive symptoms and alcohol-related consequences between women with a single female partner and women with a single male partner. We use partial omega squared tests ( $\omega^2$ ) as measures of effect size. Women with a single male partner reported slightly greater depressive symptoms relative to women with a single female partner, partial  $\omega^2=0.47$ ,  $F(1297)=2.84$ ,  $p=.09$ , and exhibited significantly greater alcohol-related consequences, partial  $\omega^2=0.006$ ,  $F(1, 297)=6.04$ ,  $p=.02$ . Next, we examined a multivariable logistic regression model with odds ratios as an measure of effect size, which revealed women with a single female partner to report lower binge drinking relative to women with a single male partner,  $aOR=0.47$ , 95 % CI [0.23, 0.94],  $df=1$ ,  $p=.03$ . For H3b (“Women with multiple female/male partners will exhibit greater depressive symptoms and negative alcohol-related outcomes than women with single female/male partners”), MANCOVA omnibus testing revealed significant differences in depressive symptoms and alcohol-related

consequences between women with a single female/male partner and women with multiple female/male partners. Women with multiple female/male partners reported greater depressive symptoms, partial  $\omega^2=0.60$ ,  $F(1417)=5.08$ ,  $p=.03$ ; and alcohol-related consequences relative to women with a single female/male partner, partial  $\omega^2=0.05$ ,  $F(1417)=7.79$ ,  $p=.005$ . A multivariable logistic regression model revealed comparable binge drinking,  $aOR=1.47$ , 95 % CI [0.96, 2.26],  $df=1$ ,  $p=.08$ .

**H4** Minority stressors will mediate differences in depressive symptoms and alcohol-related outcomes by current intimate relationship status

We tested our final set of predictions, that minority stressors would mediate differences in depressive symptoms, binge drinking, and alcohol-related consequences by current intimate relationship status, using the

**Table 3** Minority stressors, depressive symptoms, and alcohol-related outcomes by current intimate relationship status

		Single female partner	Single male partner		Single female/male partner	Multiple female/male partners	
	Range	M(SE) <sup>b</sup>	M(SE) <sup>b</sup>	<i>p</i> -value(df) <sup>b</sup>	M(SE) <sup>b</sup>	M(SE) <sup>b</sup>	<i>p</i> -value(df) <sup>b</sup>
Experienced bi-negativity	0–4.67	2.00(0.12)	2.37(0.06)	.006(1302)	2.31(0.05)	2.71(0.08)	<.0001(1424)
Internalized bi-negativity	1–5.60	1.91(0.14)	2.07(0.06)	.37(1302)	2.05(0.06)	1.92(0.09)	.27(1424)
Outness	1–7	4.55(0.20)	3.38(0.09)	<.0001(1302)	3.57(0.08)	4.00(0.13)	.02(1424)
Depressive symptoms	0–59	20.60(1.76)	23.86(0.77)	.09(1302)	23.34(0.71)	26.35(1.13)	.02(1, 417)
Alcohol-related consequences <sup>a</sup>	0–6.71	1.69(0.24)	2.34(0.11)	.02(1302)	2.24(0.10)	2.76(0.16)	.005(1417)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>p</i> -value(df) <sup>b</sup>	<i>n</i> (%)	<i>n</i> (%)	<i>p</i> -value(df) <sup>b</sup>
Binge drinking	195(42)	14(25)	119(42)	.03(1)	133(39)	62(47)	.08(1)

<sup>a</sup> Variable was square-root transformed, due to non-normal distribution

<sup>b</sup> adjusted for age, education, and African American identity



Preachers and Hayes method (Hayes 2009; Preacher and Hayes 2008). We only examined the mediating effects of experienced bi-negativity, given it was the only minority stressor that varied across current intimate relationship status and was associated with outcomes. This bootstrap method is a nonparametric resampling procedure that involves sampling from the data set multiple times (5000 for this study) and generating a sampling distribution. We calculated 95 % confidence intervals of the effect of current intimate relationship status on depressive symptoms and alcohol-related variables through minority stressors. For effect size, we calculated  $\kappa^2$  values as the indirect effect divided by the maximum possible indirect effect” (Preacher and Kelley 2011); effect sizes are comparable to coefficients of determination. We found experienced bi-negativity was a significant mediator in differences in binge drinking and alcohol-related consequences between women with a single male and single female partner and differences in depressive symptoms and alcohol-related consequences between women with a single female/male and women with multiple female/male partners (Table 4). Effect size values were comparable and small to medium (0.03-0.04).

## Discussion

Public relationships may influence the types of exposures a woman has with external minority stressors as well as her options and perceptions concerning her identity, which may

in turn influence health outcomes. Several studies have provided qualitative information on the unique experiences of bisexual individuals in varying types of relationships (Ochs 1996, 2007; Ross et al. 2012, Canada; McLean 2008, Australia). To date, little research has used quantitative methodologies to explore how differences in types of relationships may influence experiences of minority stressors among bisexual women (Clark 2013). This exploratory study offers several important, novel findings regarding current intimate relationship characteristics, minority stress, and health among bisexual women. First, we found significant, albeit mostly within the small-moderate range of magnitude, differences in minority stressors (experienced bi-negativity, outness, internalized bi-negativity) across current intimate relationship status. Interestingly, our findings suggest that women with a single male partner and women with multiple female and male partners may be more exposed to greater experienced bi-negativity. Women with a single male partner further appear to be less out than women with a single female partner. Second, we provide information concerning the role of minority stressors in relation to an understudied segment of the LGBT community: our study indicates that bisexual-specific minority stress (i.e., experienced bi-negativity) is, in particular, associated with health outcomes (small and large effect sizes). Our third and fourth hypotheses focus on the specific contribution of current intimate relationship status on health and extend the current literature by assessing the mediating effects of experienced bi-negativity. Our findings suggest that women with a single male partner and women with multiple female and male partners may be particularly vulnerable to depressive symptoms and alcohol-related outcomes due to greater exposure to

**Table 4** Models testing the mediating effects of experienced bi-negativity, using Preacher & Hayes methods

	$\kappa^{2b}$	Mediation effect	95 % Confidence Interval (CI) <sup>a</sup>		%Mediated <sup>c</sup>
			Lower	Upper	
Single female versus Single male partner <sup>d</sup>					
Alcohol-related consequences	<b>0.04</b>	<b>0.18</b>	<b>0.06</b>	<b>0.38</b>	<b>29 %</b>
Binge drinking	<b>0.03</b>	<b>0.15</b>	<b>0.03</b>	<b>0.35</b>	<b>19 %</b>
Single female/male partner versus Multiple female/male partners <sup>e</sup>					
Depressive symptoms	<b>0.04</b>	<b>1.13</b>	<b>0.50</b>	<b>2.05</b>	<b>39 %</b>
Alcohol-related consequences	<b>0.04</b>	<b>0.16</b>	<b>0.07</b>	<b>0.29</b>	<b>30 %</b>

Boldface type highlights a significant effect as determined by the 95 % bias corrected and accelerated confidence interval (95 % CI)

All models adjusted for age, education, and African American identity.

<sup>a</sup> 5,000 resamples

<sup>b</sup> Kappa-squared is a standardized “proportion of the maximum possible indirect effect” (Preacher and Kelley 2011)

<sup>c</sup> %Mediated was calculated as  $ab/(ab + c')$

<sup>d</sup>  $N=305-310$

<sup>e</sup>  $N=424-429$

experienced bi-negativity. These mediating effects were within the small/moderate range for our sample.

### Minority Stressors Among Bisexual Women by Current Intimate Relationship Status

Our first set of hypotheses concerned potential differences in minority stressors across current intimate relationship status. With regard to Hypothesis 1a, similar to previous literature (Dyar et al. 2014; Ochs 1996), women in our sample who had a single male partner appeared to be much less out relative to other bisexual women. Opportunities for disclosure of sexual minority status may not be as available within heteronormative relationships (Balsam and Mohr 2007) and may lead to increased experienced bi-negativity from the heterosexual community (Li et al. 2013, Canada). Women with single male partners also reported significantly greater experienced bi-negativity relative to women with single female partners, although the magnitude of this difference was smaller than differences in outness. These results may reflect the greater sensitivity of our experienced bi-negativity measures to assess stigma perpetuated by lesbian/gay communities, similar to other recent work (Dyar et al. 2014) and in contrast to other studies that have focused on individuals' experiences with heterosexual-based discrimination (e.g., Mays and Cochran 2001).

In line with our hypothesis concerning the visibility of women in multiple relationships with male and female partners (H1b), partner number and gender further appeared to influence exposure to minority stressors. Women with multiple female and male partners appear to experience greater stigma relative to women with single female/male partners and have greater outness; the magnitude of these differences also ranged within the small-moderate range. As described earlier, although polyamory, or non-monogamy, is not more common among bisexual populations (Li et al. 2013, Canada; McLean 2008, Australia), this stigma may augment discrimination against bisexual individuals. Indeed, a woman's number of partners and their genders can potentially expose a bisexual woman's sexuality to others in a unique way not experienced by individuals with single partners or with multiple partners of the same gender, which may increase her options in being out about her identity as well as the likelihood of experienced bi-negativity (Weitzman 2006). Future research comparing different levels of partner number and gender are needed to disentangle their potential effects as well as characterize their interactive effects on types of minority stressors women experience.

Our findings suggest few differences in internalized bi-negativity across current intimate relationship status. Previous studies have found less internalized homonegativity is reported by individuals in a committed same-gender relationship (Bauermeister et al. 2010; Riggle et al. 2010). The lack of a

similar finding within our study warrants further study, given our findings concerning differences in outness across current intimate relationship status and previous research linking experienced stigma and outness to internalized stigma (Brewster et al. 2013; Herek et al. 2009).

### Minority Stressors, Depressive Symptoms, and Alcohol-Related Outcomes

Our second set of hypotheses aligns with conceptualizations of minority stress as multifaceted and calls for research to quantify different forms of minority stress to compare the relative effects and identify target priorities for future interventions (Goffman 1963; Herek et al. 2009; Hatzenbuehler 2009; Meyer 2003). Similar to extant literature (Brewster et al. 2013; Dodge et al. 2012a,b; Ross et al. 2010, Canada; Szymanski and Carr 2008), our results indicated a positive association between poor mental health and both experienced and internalized stigma. These relationships ranged from small to large, indicating particularly large effects concerning experienced bi-negativity to depression and alcohol-related consequences, moderate relationships between internalized bi-negativity to alcohol-related consequences, and relatively small effects in relation to binge drinking. We also have addressed a gap in existing research concerning the relationship between minority stressors and alcohol use within the bisexual population. Our work suggests the potential of integrating stigma reduction interventions that target experienced and internalized bi-negativity with existing mental health and substance use interventions to increase efficacy and relevance for this high risk subgroup. Outness was not related to these outcomes, contrary to theory and findings concerning other segments of the bisexual community (e.g., men, different age cohorts; Brewster et al. 2013; Friedman et al. 2014; Schrimshaw et al. 2013), suggesting a more nuanced relationship. There is a need for further research to replicate and confirm findings, especially given that both bisexual women with single male partners and multiple female and male partners experience worse health outcomes, but differ in their levels of outness.

### Current Intimate Relationship Status, Health, and Minority Stressors

In line with our third hypothesis, we add to the literature through examining differences in depressive symptoms and alcohol-related outcomes among bisexual women and the mediating effects of minority stressors. Our work parallels two other studies in finding bisexual women with male partners to be vulnerable (Dyar et al. 2014; Ross et al. 2012, Canada) and, in our study, specifically with regard to alcohol-related

outcomes. Further, our work additionally indicates the importance of both partner gender and number in health conditions, wherein women with multiple female/male partners also demonstrated greater depressive symptoms and alcohol-related consequences relative to women with a single partner. Although differences in depressive symptoms were not statistically significant across partner gender, they were significantly different across partner number and effect size values were large for both comparisons. Conversely, binge drinking was significantly different across partner gender but not number; effect sizes ranged between small and medium. Differences across partner gender and number for alcohol-related consequences were both significant and ranged between small-moderate. Altogether, these findings suggest the importance of examining intimate relationship status across different health conditions for this vulnerable population.

To date, Meyer (1995, 2003) and others have suggested that minority stress may serve as a mediator, wherein individuals experiencing greater minority stress may subsequently be at risk for poorer health outcomes (Almeida et al. 2009; Burton et al. 2013; Williams et al. 2005). Notably, our work is among the first of studies to examine simultaneously the associations between current intimate relationship status and minority stressors as well as associations between minority stressors, depressive symptoms, and alcohol-related outcomes. This current study thus provides a major contribution to existing literature by examining the mediating effects of minority stressors. One study to date has examined the mediating effects of minority stress on associations of current intimate relationship status and health among bisexual populations (Dyar et al. 2014). Our data provide additional support to suggest that bisexual women with a single male partner are more likely to experience worse outcomes (binge drinking, alcohol-related consequences) than women with a single female partner, and that this may be due in part because of greater experiences with bi-negativity. Further, experienced bi-negativity may underlie the greater depressive symptoms and alcohol-related consequences women with multiple female/male partners report relative to women with a single female/male partner. These indirect effects appear to be small-moderate, but meaningful. Our preliminary research is valuable to future, directed work with bisexual populations: specifically, longitudinal research is warranted to confirm the causal pathways suggested by our and Dyar and colleagues' (2014) findings. These results suggest that social context is important, but it is important in the extent to which one's relationships are perceived and consequent influences on internal beliefs and external experiences of discrimination.

### Strengths and Limitations

Our study has several strengths. First, innovative social media recruitment techniques yielded a large and geographically

diverse sample of bisexual women. Although social media have been used to recruit individuals through listservs or Facebook pages who are already out, this is one of the first studies to systematically present targeted advertisements to individuals based on their demographics and Facebook profile. This may help to account for our large proportion of bisexual individuals. Second, our analytic approaches allowed us to test mediation in our distinct sample groups to not only document the increased risk but also demonstrate the putative mechanisms for poorer health outcomes (Fritz and MacKinnon 2007; Hayes and Preacher 2010). Third, we utilized a minority stress instrument developed to quantify the specific experiences of bisexual populations rather than attempting to generalize measures created for and tested with other populations. Future longitudinal, quantitative research should implement such population-specific measures to replicate our preliminary, cross-sectional evidence. Additionally, there is a need for follow-up qualitative research concerning *how* and *from whom* bisexual women in different relationship statuses experience stigma to understand our findings.

Simultaneously, a number of limitations warrant attention. First, most significantly, no participants in our sample endorsed multiple partners of the same gender (multiple male-only or multiple female-only); thus we are unable to disentangle the influence of partner gender and number. Second, our sample contained relatively few women with female partners (56 out of 470). This may be due to several different factors. Previously self-identified bisexual women in relationships with a single female partner may have identified as a lesbian at the point of data collection and therefore may not have been included in our sample (Diamond 2000, 2008). Previous research has found a negative sentiment among self-identified lesbian women and gay men towards bisexual individuals (Israel and Mohr 2004; Rust 1993; Sarno and Wright 2013), which may lead to a decrease in their willingness to date openly bisexual individuals and thus limit the number of bisexual women with only female partners. Third, our sample primarily identified as White non-Hispanic (65 %) and all lived in the U.S., so generalizability is uncertain for bisexual women of color or non-U.S. populations. Further work is warranted, especially research that quantifies these relationships in socio-cultural contexts that vary in gender norms, values, and practices concerning the acceptability of bisexuality. Indeed, future research examining other countries with similar values and norms as the U.S. as well as countries that have greater acceptance of same-gender and polyamorous relationships. Fourth, we did not collect information on perceptions of intimate relationships or information on relationship length and stability. These variables may play important roles in the well-being of bisexual women who have been in long-term, committed relationships. Finally, our study was cross-sectional which precludes causal inferences.

## Conclusions

A growing body of research proposes that the bisexual population suffers from particularly poor mental health (Fredriksen-Goldsen et al. 2010; Jorm et al. 2002, Australia; Leonard et al. 2012, Australia) and elevated substance use (Midanik et al. 2007; Conron et al. 2010). These disparities may be due to unique minority stressors bisexual populations face. The gender and number of one's partner(s) may contribute to one's visibility as a bisexual individual, and consequently the type and amount of discrimination within heterosexual and lesbian/gay communities. Nonetheless, little work to date had assessed experiences and outcomes by intimate relationship status. The current study adds to the literature by addressing a gap within previous research in regards to the associations between bisexual women's current intimate relationship status on minority stressors and health. The results of our study suggest that the gender and number of a bisexual woman's partner(s) are associated with women's experienced bi-negativity (small-medium effects) and outness (small-large effects) as well as depressive symptoms and alcohol-related outcomes. Greater experienced and internalized bi-negativity further appeared to be associated with greater depressive symptoms and alcohol-related outcomes (small-large effects). Experienced bi-negativity appears to have small-moderate mediating effects in relationships between characteristics of current intimate relationship status (gender, number/gender) on mental health and alcohol use. Bisexual women's current intimate relationship status and their experiences with minority stressors should thus potentially be taken into consideration when their health is being examined. Future interventions may consider these unique experiences when developing programs to address the disparities within the bisexual population.

**Acknowledgments** This work was supported by the National Institute on Alcohol Abuse and Alcoholism (R01AA018292; PI: Kaysen, DL; trainee DEL - NIAAA T32 AA007459 PI: Monti) and the National Cancer Institute (trainee YM - R25 CA92408; PI: Patrick D). We would like to thank Keren Lehavot and Deva Wells for their thoughts during early stages of this project.

**Compliance with Ethical Standards** The authors have no conflicts of interest to disclose. This research involves human participants and has been approved by the Institutional Review Board at the University of Washington. All participants read and completed informed consent prior to participation in this study.

## References

- Almeida, J., Johnson, R. M., Corliss, H. L., Molnar, B. E., & Azrael, D. (2009). Emotional distress among LGBT youth: the influence of perceived discrimination based on sexual orientation. *Journal of Youth and Adolescence*, 38, 1001–1014. doi:10.1007/s10964-009-9397-9399.
- Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues*, 35, 235–254. doi:10.1177/002204260503500202.
- Balsam, K. F., Beadnell, B., & Molina, Y. (2013). The daily heterosexual experiences questionnaire: measuring minority stress among lesbian, gay, bisexual, and transgender adults. *Measurement and Evaluation in Counseling and Development*, 46, 3–26. doi:10.1177/0748175612449743.
- Balsam, K.F., Beadnell, B., Simoni, J.M., & Cope, L. (2008). *Measuring marginalization: Minority stress among diverse LGBT adults*. Poster presented at the 116th Annual Convention of the American Psychological Association, Boston, MA.
- Balsam, K. F., & Mohr, J. J. (2007). Adaptation to sexual orientation stigma: a comparison of bisexual and lesbian/gay adults. *Journal of Counseling Psychology*, 54, 306–319. doi:10.1037/0022-0167.54.3.306.supp.
- Bauermeister, J. A., Johns, M. M., Sandfort, T. G. M., Eisenberg, A., Grossman, A. H., & D'Augelli, A. R. (2010). Relationship trajectories and psychological well-being among sexual minority youth. *Journal of Youth and Adolescence*, 39, 1148–1163. doi:10.1007/s10964-010-9557-y.
- Baumgardner, J. (2007). *Look both ways: Bisexual politics*. New York: Farrar, Straus and Giroux.
- Beaber, T. (2008). Well-being among bisexual females: The roles of internalized biphobia, stigma consciousness, social support, and self-disclosure. Paper presented at the 116th Annual Convention of the American Psychological Association, Boston, MA.
- Bradford, M. (2004). The bisexual experience: living in a dichotomous culture. *Journal of Bisexuality*, 4, 7–23. doi:10.1300/J159v04n01\_02.
- Brewster, M. E., Moradi, B., DeBlaere, C., & Velez, B. L. (2013). Navigating the borderlands: the roles of minority stressors, bicultural self-efficacy, and cognitive flexibility in the mental health of bisexual individuals. *Journal of Counseling Psychology*, 60, 543–556. doi:10.1037/a0033224.
- Burton, C. M., Marshal, M. P., Chisolm, D. J., Sucato, G. S., & Friedman, M. S. (2013). Sexual minority-related victimization as a mediator of mental health disparities in sexual minority youth: a longitudinal analysis. *Journal of Youth and Adolescence*, 43, 394–402. doi:10.1007/s10964-012-9901-5.
- Buu, A., Johnson, N. J., Li, R., & Tan, X. (2011). New variable selection methods for zero-inflated count data with applications to the substance abuse field. *Statistics in Medicine*, 30, 2326–2340. doi:10.1002/sim.4268.
- Cabaj, R. P. (1997). Gays, lesbians, and bisexuals. In J. H. Lowinson, P. Ruiz, R. B. Millman, & J. G. Langrod (Eds.), *Substance abuse: A comprehensive textbook* (pp. 725–733). Baltimore: Williams and Wilkins.
- Chen, P., & Jacobson, K. C. (2012). Developmental trajectories of substance use from early adolescence to young adulthood: gender and racial/ethnic differences. *Journal of Adolescent Health*, 50, 154–163. doi:10.1016/j.jadohealth.2011.05.013.
- Clark, E. A. (2013). Monogamously-partnered bisexual women's experiences of prejudice and support. *Dissertation Abstracts International*, 74.
- Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption: the effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology*, 53, 189–200. doi:10.1037/0022-006X.53.2.189.
- Conron, K. J., Mimiaga, M. J., & Landers, S. J. (2010). A population-based study of sexual orientation identity and gender differences in

- adult health. *American Journal of Public Health*, 100, 1953–1960. doi:10.2105/AJPH.2009.174169.
- Cooperman, N. A., Simoni, J. M., & Lockhart, D. W. (2003). Abuse, social support, and depression among HIV-positive heterosexual, bisexual and lesbian women. *Journal of Lesbian Studies*, 7, 49–66. doi:10.1300/J155v07n04\_04.
- D’Augelli, A. R., Grossman, A. H., & Starks, M. T. (2005). Parents’ awareness of lesbian, gay, and bisexual youths’ sexual orientation. *Journal of Marriage and Family*, 67, 474–482. doi:10.1111/j.0022-2445.2005.00129.x.
- Diamond, L. M. (2000). Sexual identity, attractions, and behavior among young sexual-minority women over a 2-year period. *Developmental psychology*, 36, 241–250. doi:10.1037/0012-1649.36.2.241.
- Diamond, L. M. (2008). Female bisexuality from adolescence to adulthood: results from a 10-year longitudinal study. *Developmental psychology*, 44, 5–14. doi:10.1037/0012-1649.44.1.5.
- Dodge, B., Schnarrs, P. W., Reece, M., Goncalves, G., Martinez, O., Nix, R., & Fortenberry, J. (2012a). Community involvement among behaviourally bisexual men in the midwestern USA: experiences and perceptions across communities. *Culture, Health & Sexuality*, 14, 1095–1110. doi:10.1080/13691058.2012.721136.
- Dodge, B., Schnarrs, P. W., Reece, M., Martinez, O., Goncalves, G., Malebranche, D., & Fortenberry, J. (2012b). Individual and social factors related to mental health concerns among bisexual men in the Midwestern United States. *Journal of Bisexuality*, 12, 223–245. doi:10.1080/15200716.2012.674862.
- Dyar, C., Feinstein, B. A., & London, B. (2014). Dimensions of sexual identity and minority stress among bisexual women: the role of partner gender. *Psychology of Sexual Orientation and Gender Diversity*, 1, 441–451. doi:10.1037/sgd0000063.
- Feldman, S. E., & Wright, A. J. (2013). Dual impact: outness and LGB identity formation on mental health. *Journal of Gay & Lesbian Social Services*, 25, 443–464. doi:10.1080/10538720.2013.833066.
- Firestein, B. A. (1996). *Bisexuality: The psychology and politics of an invisible minority*. Thousand Oaks: Sage Publications, Inc.
- Fox, R. (2000). Bisexuality in perspective: A review of theory and research. In B. Greene & G. L. Croom (Eds.), *Education, research, and practice in lesbian, gay, bisexual, and transgendered psychology: A resource manual* (pp. 161–206). Thousand Oaks: Sage Publications, Inc.
- Fredriksen-Goldsen, K. I., Kim, H.-J., Barkan, S. E., Balsam, K. F., & Mincer, S. L. (2010). Disparities in health-related quality of life: a comparison of lesbians and bisexual women. *American Journal of Public Health*, 100, 2255–2261. doi:10.2105/AJPH.2009.177329.
- Friedman, M. R., Stall, R., Silvestre, A. J., Mustanski, B., Shoptaw, S., Surkan, P. J., Rinaldo, C. R., & Plankey, M. W. (2014). Longitudinal HIV-related health disparities among men who have sex with men and women. *Journal of Acquired Immune Deficiency Syndromes*, 66, 213–220. doi:10.1097/QAI.0000000000000143.
- Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18, 233–239. doi:10.1111/j.1467-9280.2007.01882.x.
- Galambos, N. L., Barker, E. T., & Krahn, H. J. (2006). Depression, self-esteem, and anger in emerging adulthood: seven-year trajectories. *Developmental Psychology*, 42, 350–365. doi:10.1037/0012-1649.42.2.350.
- Galea, S., Nandi, A., & Vlahov, D. (2004). The social epidemiology of substance use. *Epidemiologic Reviews*, 26, 36–52. doi:10.1093/epirev/mxh007.
- García, E. G., Blasco, B. C., Roca, J., & Pol, A. L. P. (2010). Modelling alcohol consumption during adolescence using zero inflated negative binomial and decision trees. *The European Journal of Psychology Applied to Legal Context*, 2(2), 145–159.
- Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. New York: Touchstone.
- Goodman, M. B., & Moradi, B. (2008). Attitudes and behaviors toward lesbian and gay persons: critical correlates and mediated relations. *Journal of Counseling Psychology*, 55, 371–384. doi:10.1037/0022-0167.55.3.371.
- Hatzenbuehler, M. L. (2009). How does sexual minority stigma “get under the skin”? A psychological mediation framework. *Psychological Bulletin*, 135, 707–730. doi:10.1037/a0016441.
- Hatzenbuehler, M. L., McLaughlin, K. A., Keyes, K. M., & Hasin, D. S. (2010). The impact of institutional discrimination on psychiatric disorders in lesbian, gay, and bisexual populations: a prospective study. *American Journal of Public Health*, 100, 452–459. doi:10.2105/ajph.2009.168815.
- Hayes, A. F. (2009). Beyond Baron and Kenny: statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408–420. doi:10.1080/03637750903310360.
- Hayes, A. F., & Preacher, K. J. (2010). Quantifying and testing indirect effects in simple mediation models when the constituent paths are nonlinear. *Multivariate Behavioral Research*, 45, 627–660. doi:10.1080/00273171.2010.498290.
- Hequembourg, A. L., & Brallier, S. A. (2009). An exploration of sexual minority stress across the lines of gender and sexual identity. *Journal of Homosexuality*, 56, 273–298. doi:10.1080/00918360902728517.
- Herek, G. M. (2002). Heterosexuals’ attitudes toward bisexual men and women in the United States. *Journal of Sex Research*, 39, 264–274. doi:10.1080/00224490209552150.
- Herek, G. M. (2010). Sexual orientation differences as deficits: science and stigma in the history of American Psychology. *Perspectives on Psychological Science*, 5, 693–699. doi:10.1177/1745691610388770.
- Herek, G. M., & Garnets, L. D. (2007). Sexual orientation and mental health. *Annual Review of Clinical Psychology*, 3, 353–375. doi:10.1146/annurev.clinpsy.3.022806.091510.
- Herek, G. M., Gillis, J. R., & Cogan, J. C. (2009). Internalized stigma among sexual minority adults: insights from a social psychological perspective. *Journal of Counseling Psychology*, 56, 32–43. doi:10.1037/a0014672.
- Hightow-Weidman, L. B., Phillips, G., Jones, K. C., Outlaw, A. Y., Fields, S. D., & Smith, J. C. (2011). Racial and sexual identity-related maltreatment among minority YMSM: prevalence, perceptions, and the association with emotional distress. *AIDS Patient Care and STDs*, 25(Suppl 1), S39–S45. doi:10.1089/apc.2011.9877.
- Hughes, T. L., & Eliason, M. (2002). Substance use and abuse in lesbian, gay, bisexual and transgender populations. *The Journal of Primary Prevention*, 22, 263–298. doi:10.1023/A:1013669705086.
- Israel, T., & Mohr, J. J. (2004). Attitudes toward bisexual women and men: current research, future directions. *Journal of Bisexuality*, 4, 117–134. doi:10.1300/J159v04n01\_09.
- Jorm, A. F., Korten, A. E., Rodgers, B., Jacomb, P. A., & Christensen, H. (2002). Sexual orientation and mental health: results from a community survey of young and middle-aged adults. *The British Journal of Psychiatry*, 180, 423–427. doi:10.1192/bjp.180.5.423.
- King, M., Semlyen, J., Tai, S. S., Killaspy, H., Osborn, D., Popelyuk, D., & Nazareth, I. (2008). A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry*, 8. doi:10.1186/1471-244X-8-70.
- Klesse, C. (2005). Bisexual women, non-monogamy and differentialist anti-promiscuity discourses. *Sexualities*, 8, 445–464. doi:10.1177/1363460705056620.
- Klesse, C. (2006). Polyamory and its ‘Others’: contesting the terms of non-monogamy. *Sexualities*, 9, 565–583. doi:10.1177/1363460706069986.
- Kuyper, L., & Fokkema, T. (2011). Minority stress and mental health among Dutch LGBs: examination of differences between sex and sexual orientation. *Journal of Counseling Psychology*, 58, 222–233. doi:10.1037/a0022688.

- Leonard, W., Pitts, M., Mitchell, A., Lyons, A., Smith, A., Patel, S., Couch, M., & Barrett, A. (2012). *Private Lives 2: The second national survey of the health and wellbeing of gay, lesbian, bisexual and transgender (GLBT) Australians*. Monograph Series Number 86. Melbourne: The Australian Research Centre in Sex, Health & Society, La Trobe University.
- Lewis, R. J., Derlega, V. J., Brown, D., Rose, S., & Henson, J. M. (2009). Sexual minority stress, depressive symptoms, and sexual orientation conflict: focus on the experiences of bisexuals. *Journal of Social and Clinical Psychology, 28*, 971–992. doi:10.1521/jscp.2009.28.8.971.
- Li, T., Dobinson, C., Scheim, A. I., & Ross, L. E. (2013). Unique issues bisexual people face in intimate relationships: a descriptive exploration of lived experience. *Journal of Gay & Lesbian Mental Health, 17*, 21–39. doi:10.1080/19359705.2012.723607.
- Lorant, V., Delige, D., Eaton, W., Robert, A., Philippot, P., & Anseau, M. (2003). Socioeconomic inequalities in depression: a meta-analysis. *American Journal of Epidemiology, 157*, 98–112. doi:10.1093/aje/kw182.
- Mays, V. M., & Cochran, S. D. (2001). Mental health correlates of perceived discrimination among lesbian, gay, and bisexual adults in the United States. *American Journal of Public Health, 91*, 1869–1876. doi:10.2105/AJPH.91.11.1869.
- McLean, K. (2008). Inside, outside, nowhere: bisexual men and women in the gay and lesbian community. *Journal of Bisexuality, 8*, 63–80. doi:10.1080/15299710802143174.
- Meyer, I. H. (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior, 36*, 38–56. doi:10.2307/2137286.
- Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychological Bulletin, 129*, 674–697. doi:10.1037/0033-2909.129.5.674.
- Midanik, L. T., Drabble, L., Trocki, K., & Sell, R. L. (2007). Sexual orientation and alcohol use: identity versus behavior measures. *Journal of LGBT Health Research, 3*, 25–35. doi:10.1300/J463v03n01\_04.
- Mint, P. (2004). The power dynamics of cheating: effects on polyamory and bisexuality. *Journal of Bisexuality, 4*, 55–76. doi:10.1300/J159v04n03\_04.
- Mohr, J., & Fassinger, R. (2000). Measuring dimensions of lesbian and gay male experience. *Measurement and Evaluation in Counseling and Development, 33*, 66–90.
- Moleiro, C., Pinto, N., & Freire, J. (2013). Effects of age on spiritual well-being and homonegativity: religious identity and practices among LGB persons in Portugal. *Journal of Religion, Spirituality & Aging, 25*, 93–111. doi:10.1080/15528030.2012.741561.
- Moore, D. L., & Norris, F. H. (2005). Empirical investigation of the conflict and flexibility models of bisexuality. *Journal of Bisexuality, 5*, 5–25. doi:10.1300/J159v05n01\_02.
- Morris, J. F., Waldo, C. R., & Rothblum, E. D. (2001). A model of predictors and outcomes among lesbian and bisexual women. *American Journal of Orthopsychiatry, 71*, 61–71. doi:10.1037/0002-9432.71.1.61.
- Mulick, P. S., & Wright, L. W. (2002). Examining the existence of biphobia in the heterosexual and homosexual populations. *Journal of Bisexuality, 2*, 45–64. doi:10.1300/J159v02n04\_03.
- Ochs, R. (1996). Biphobia: It goes more than two ways. In B. A. Firestein (Ed.), *Bisexuality: The psychology and politics of an invisible minority* (pp. 217–239). Thousand Oaks: Sage Publications, Inc.
- Ochs, R. (2007). What's in a name? Why women embrace or resist bisexual identity. In B. A. Firestein (Ed.), *Becoming visible: Counseling bisexuals across the lifespan* (pp. 72–86). New York: Columbia University Press.
- Parrott, D. J., & Gallagher, K. E. (2008). What accounts for heterosexual women's negative emotional responses to lesbians? Examination of traditional gender role beliefs and sexual prejudice. *Sex Roles, 59*, 229–239. doi:10.1007/s11199-008-9436-0.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891. doi:10.3758/BRM.40.3.879.
- Preacher, K. J., & Kelley, K. (2011). Effect size measures for mediation models: quantitative strategies for communicating indirect effects. *Psychological Methods, 16*, 93–115. doi:10.2307/2094445.
- Radloff, L. S. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401. doi:10.1177/014662167700100306.
- Read, J. P., Kahler, C. W., Strong, D. R., & Colder, C. R. (2006). Development and preliminary validation of the Young Adult Alcohol Consequences Questionnaire. *Journal of Studies on Alcohol, 67*, 169–177. doi:10.15288/jsa.2006.67.169.
- Riggle, E. D. B., Rostosky, S. S., & Hone, S. G. (2010). Psychological distress, well-being, and legal recognition in same-sex couple relationships. *Journal of Family Psychology, 24*, 82–86. doi:10.1037/a0017942.
- Robinson, M. (2013). Polyamory and monogamy as strategic identities. *Journal of Bisexuality, 13*, 21–38. doi:10.1080/15299716.2013.755731.
- Ross, L. E., Dobinson, C., & Eady, A. (2010). Perceived determinants of mental health for bisexual people: a qualitative examination. *American Journal of Public Health, 100*, 496–502. doi:10.2105/AJPH.2008.156307.
- Ross, L. E., Siegel, A., Dobinson, C., Epstein, R., & Steele, L. S. (2012). “I don't want to turn totally invisible”: mental health, stressors, and supports among bisexual women during the perinatal period. *Journal of GLBT Family Studies, 8*, 137–154. doi:10.1080/1550428X.2012.660791.
- Rust, P. C. (1993). “Coming out” in the age of social constructionism: sexual identity formation among lesbian and bisexual women. *Gender and Society, 7*, 50–77. doi:10.1177/089124393007001004.
- Rust, P. C. (1996). Managing multiple identities: Diversity among bisexual women and men. In B. A. Firestein (Ed.), *Bisexuality: The psychology and politics of an invisible minority* (pp. 53–83). Thousand Oaks: Sage Publications, Inc.
- Rust, P. C. (2000). Two many and not enough: the meanings of bisexual identities. *Journal of Bisexuality, 1*, 31–68. doi:10.1300/J159v01n01\_04.
- Rust, P. C. R. (2002). Bisexuality: the state of the union. *Annual Review of Sex Research, 13*, 180–240. doi:10.1080/10532528.2002.10559805.
- Samji, T. (2008). Bi and in love: a phenomenological inquiry into the committed couple relationships of bisexual women. *Dissertation Abstracts International, 68*, 4844.
- Sarno, E., & Wright, A. J. (2013). Homonegative microaggressions and identity in bisexual men and women. *Journal of Bisexuality, 13*, 63–81. doi:10.1080/15299716.2013.756677.
- Schrimshaw, E. W., Siegel, K., Downing, M. J., Jr., & Parsons, J. T. (2013). Disclosure and concealment of sexual orientation and the mental health of non-gay-identified, behaviorally bisexual men. *Journal of Consulting and Clinical Psychology, 81*, 141–153. doi:10.1037/a0031272.
- Schurr, B. J. (2013). Empirical validation of a model of sexual minority identity formation. *Dissertation Abstracts International, 74*.
- Shilo, G., & Savaya, R. (2012). Mental health of lesbian, gay, and bisexual youth and young adults: differential effects of age, gender, religiosity, and sexual orientation. *Journal of Research on Adolescence, 22*, 310–325. doi:10.1111/j.1532-7795.2011.00772.x.
- Steffens, M. C., & Wagner, C. (2004). Attitudes toward lesbians, gay men, bisexual women, and bisexual men in Germany. *Journal of Sex Research, 41*, 137–149. doi:10.1080/00224490409552222.

- Swearingen, C. E. (2007). *The role of internalized homophobia, sexual orientation concealment and social support in eating disorders and body image disturbances among lesbian, gay and bisexual individuals* (Unpublished doctoral dissertation). University of Oregon, Eugene, OR.
- Szymanski, D. M., & Carr, E. R. (2008). The roles of gender role conflict and internalized heterosexism in gay and bisexual men's psychological distress: testing two mediation models. *Psychology of Men & Masculinity*, 9, 40–54. doi:10.1037/1524-9220.9.1.40.
- Turner, R. J., & Gil, A. G. (2002). Psychiatric and substance use disorders in South Florida: racial/ethnic and gender contrasts in a young adult cohort. *Archives of General Psychiatry*, 59, 43–50. doi:10.1001/archpsyc.59.1.43.
- Waldo, C. R. (1999). Working in a majority context: a structural model of heterosexism as minority stress in the workplace. *Journal of Counseling Psychology*, 46, 218–232. doi:10.1037/0022-0167.46.2.218.
- Weber, A. (2002). Who are we? And other interesting impressions. *Loving More*, 30, 4–6.
- Weber, G. N. (2008). Using to numb the pain: substance use and abuse among lesbian, gay and bisexual individuals. *Journal of Mental Health Counseling*, 30, 31–48.
- Weitzman, G. (2006). Therapy with clients who are bisexual and polyamorous. *Journal of Bisexuality*, 6, 137–164. doi:10.1300/J159v06n01\_08.
- Whitley, B. E., Jr. (2001). Gender-role variables and attitudes toward homosexuality. *Sex Roles*, 45, 691–721. doi:10.1023/A:1015640318045.
- Whitley, B. E., Jr., & Ægisdóttir, S. (2000). The gender belief system, authoritarianism, social dominance orientation, and heterosexuals' attitudes toward lesbians and gay men. *Sex Roles*, 42, 947–967. doi:10.1023/A:1007026016001.
- Wight, R. G., Leblanc, A. J., & Lee Badgett, M. V. (2013). Same-sex legal marriage and psychological well-being: findings from the California Health Interview Survey. *American Journal of Public Health*, 103, 339–346. doi:10.2105/ajph.2012.301113.
- Williams, T., Connolly, J., Pepler, D., & Craig, W. (2005). Peer victimization, social support, and psychosocial adjustment of sexual minority adolescents. *Journal of Youth and Adolescence*, 34, 471–482. doi:10.1007/s10964-005-7264-x.
- Yost, M. R., & Thomas, G. D. (2012). Gender and binegativity: Men's and women's attitudes toward male and female bisexuals. *Archives of Sexual Behavior*, 41, 691–702. doi:10.1007/s10508-011-9767-8.